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Preface

The first set of West Virginia EMS Statewide ALS protocols was a monumental event in the history of EMS in West Virginia. These protocols are the product of many years of discussion, collaboration, debate, revisions, and hard work on the part of a legion of dedicated professionals. They are evidence of the ongoing effort to continually improve emergency medical care in West Virginia.

Unified statewide protocols had been a dream of countless EMS providers, administrators, and medical directors for many years. The development of statewide protocols began in the mid-1990s with the early development of Statewide BLS protocols. The experience and lessons learned from that project led to the realization that the same could be accomplished with ALS protocols as well.

Over the last thirty years, Emergency Medicine has matured as a specialty. This has led to fewer and fewer localized variations in standards of emergency care. From a patient care prospective, these more uniform standards should be applicable to EMS on a statewide basis. To be sure, many individual providers who work in different regions of the state have faced the challenge of learning several different protocols for the treatment of a patient with the same condition.

In the spring of 2000, building on the success of the Statewide BLS Protocols, the State Critical Care Committee unanimously approved the concept to begin development of Statewide ALS protocols. Realizing the magnitude of this endeavor, the Regional Program Directors developed the early framework documents which combined the regional protocols into common state protocols. A list was developed and refined by the Medical Directors outlining the title to be used for each needed protocol.

In February 2001, a protocol work group composed of EMS representatives from every region of the state convened at Flatwoods for an intense two day session. During this session, participants were instructed to use all available resources to construct a set of draft Statewide ALS Protocols. They were mandated to put old regional differences aside and cooperatively write the best patient care protocol possible. This effort produced the first draft of 54 ALS Protocols. This first draft was circulated across the state and reviewed by numerous personnel. Over 1,000 corrections and comments were received and reviewed. These comments were condensed into 13 pages of specific issues requiring discussion, debate, and action by the State Critical Care Committee. With input from the Medical Directors and providers in their region, the Regional Medical Directors discussed and debated these issues. The ultimate goal was consistent quality patient care and consensus was reached and the second draft was completed. Further refinement led to approval of the final version by the State Critical Care Committee in October and December of 2001. The West Virginia EMS Statewide EMS Protocols went into effect on February 15, 2002.

This was the beginning of unified protocols for EMS care in West Virginia and has led to additional protocols and modifications. The most recent revision began in December 2013. Forty-six representatives from the EMS community met in Flatwoods, WV. Five subcommittees were formed to review and update Trauma, Medical, Pediatric, Cardiac and Children with Special Needs protocols. The members were instructed to review and make changes, remove outdated material, or review and approve. Several meetings occurred during the first seven months of 2014. Protocols were developed and compiled into a new format. These revisions were submitted to the Regional Medical Directors and Medical Policy and Care Committee in July 2014. Multiple minor corrections were made over the following six months.

EMS personnel who use these protocols on a daily basis are encouraged to provide suggestions for improvement and feedback through their Agency Medical Director to their Regional Medical Director.

These protocols are a critical part of our quest to provide the citizens and visitors of the State of West Virginia the finest emergency medical care in the country.

Michael Mills, D.O., FACEP
West Virginia State EMS Medical Director
December 2014
Acknowledgments

Captain D. J. Weller
Emergency Medical Services Advisory Council Chairman
City of Martinsburg Fire Department

WV Medical Policy and Care Committee

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Dr. David Seidler Dr. Beth Toppins
Dr. Charles Bess Dr. James Kyle
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Chris Burge Darlene Scott
Pete Formato Dave Shields
The West Virginia EMS Statewide Protocols are designed to enable EMS personnel to provide a wide variety of treatments to many types of patients. Understanding the organization and terminology of the protocols is important and will vastly improve the usability by the EMS provider.

Protocol Layout:

The following information is found at the top each protocol page contained in boxes:

- WVOEMS logo
- Type of Protocol
- Protocol Number
- Title of Protocol

Example:

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The following information is found at the bottom each protocol page contained in boxes:

- Edition Date
- West Virginia Office of Emergency Medical Services - Statewide Protocols
- Number of pages within protocol

Example:

2019 EDITION

Protocol Numbering System:

Each Protocol is assigned a four (4) digit number. The first digit represents the level of care of the provider using the protocol. The second digit specifies the category of care. The last two digits indicate the specific protocol number.
Example:

Chest Pain Protocol 4202

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<td>02</td>
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Classifications of Levels of Care: (first digit)

- 1000 - CCT-RN
- 2000 - CCT-Paramedic
- 3000 - C3-IFT (Interfacility Transport Paramedic)
- 4000 - Paramedic
- 5000 - AEMT
- 6000 - EMT

Note: 7, 8 and 9 thousand series are used as follows:
- 7000 - BLS Procedural Protocols
- 8000 - ALS Procedural Protocols
- 9000 - Special Operational Policies and Protocols

Category of Care: (second digit)

- 4100 - Trauma
- 4200 - Cardiac
- 4300 - Respiratory
- 4400 - Pediatrics
- 4500 - Environmental
- 4600 - Medical
- 4700 - Special Healthcare Needs
- 4800 - Open
- 4900 - Special Treatment Protocols

Initial Treatment / Universal Patient Care:

The Initial Treatment / Universal Patient Care protocol is the first protocol within these guidelines. It is to be used universally on all patients as a starting point for assessment and treatment prior to moving on to a specific protocol. This protocol is designed to establish support at the beginning of patient care while identifying specific signs and symptoms that will direct the EMS provider to a more complaint specific protocol.
Special Shading and Icons:

The following shaded boxes with icons indicate that specific contact is required with Medical Command (red telephone) or the Medical Command Physician (physician) in order to perform specific treatments.

Examples:

Treatment requires consultation with medical command

Treatment requires consultation or direct contact with Medical Command Physician

Special Pediatric Notes:

For the purposes of these protocols, any patient under the age of 12 years will be considered a pediatric patient. Certain patients who are larger or smaller than the norms for their age may require modification of treatment. Providers should consult with Medical Command as needed in making this determination.
INITIAL TREATMENT / UNIVERSAL PATIENT CARE

- Initial Treatment / Universal Patient Care protocol is designed to guide the EMS provider in the initial and ongoing approach to assessment and management of medical and trauma patients.

- The patient examination should focus on rapid assessment and interventions. On-scene management of high priority patients should be limited to stabilization of life-threatening problems. Other procedures should always be performed while en route to the hospital or a landing zone.

- The goal for on-scene time should not exceed ten minutes for high priority trauma and medical patients. Shorter scene times are desirable for high priority patients. Rescue efforts for patients that are entrapped or have access/egress problems should be coordinated to minimize scene time.

- Medical Command should be notified as soon as possible when applicable to prepare the receiving hospital for the patient.

- At any time a provider is uncertain of how to best manage a patient, on-line Medical Command must be contacted for instruction.

- Rarely are emergent transports (red lights and sirens) required once the patient has been evaluated and treated. It is important that the attendant in charge (AIC) carefully evaluate the risks and benefits of an emergency transport to the hospital. The time saved transporting in an emergent mode is frequently very short. Furthermore, the time saved is unlikely to affect patient outcome. Ultimately, the mode of transportation decision is the responsibility of the AIC.

A. SCENE SIZE-UP

1. Take appropriate standard precautions. Put on personal protective equipment as appropriate, including gloves, eye protection mask and gown.

2. Assess scene safety.

3. Assess mechanism of injury and/or nature of illness.
   a. Medical – determine nature of the illness from the patient, family, or bystanders. Why EMS was activated?
   b. Trauma – determine the mechanism of injury from the patient, family, or bystanders, and inspection of the scene.

4. Determine total number of patients. Initiate a mass casualty plan if necessary and initiate triage.

5. Summon additional resources as necessary to manage the incident. Additional resources include, but are not limited to: fire, rescue, advanced life support, law enforcement, utilities.
B. PRIMARY SURVEY

1. Form a general impression of the patient. Consider appearance, work of breathing, and circulation to skin. If a life-threatening condition is found, treat immediately.

2. Pediatric Patients may experience respiratory distress as a result of many different causes. A general impression should be established utilizing the Pediatric Assessment Triangle (PAT). Appearance, work of breathing, and circulation. (Appendix C)

3. Determine the Mechanism of Injury (MOI) or Nature of Illness (NOI)

4. Assess patient's mental status (maintain spinal immobilization if required)
   a. Assess using GLASGOW COMA SCALE. (Appendix E)
   b. If the victim is unresponsive with no breathing or abnormal breathing (ie only gasping), see Cardiac Arrest Protocol 4205 / 5202 / 6205 as applicable.
   c. Perform a Blood Glucose Reading on all patients exhibiting altered mental status

   a. For a complete airway obstruction, see AIRWAY MANAGEMENT protocol 4901 / 5901 / 6901 as applicable.

6. Assess the patient’s breathing.
   a. If respirations are inadequate, ventilate with 100% oxygen.
      i. If optional EtCO2 is available, maintain CO2 level at 35 - 45 mm/hg for patients without head trauma.
      ii. If signs of impending Central Nervous System herniation (increasing BP, bradycardia, decreasing GCS, dilation of one pupil, paralysis, and decerebrate or decorticate posturing) are present, then ventilate 12 - 20 breaths per minute to maintain EtCO2 at 30 - 35 mm/hg.
   b. If spontaneous respirations are adequate:
      i. Severe Distress – Administer Oxygen with a non-rebreather mask at 15 L/minute.
      ii. Mild to Moderate Distress – Administer Oxygen with a nasal cannula at 2
to 6 L/minute to maintain SpO2 at 94 - 99%.

iii. Do not use nasal cannula in infants and small children. Blow-by oxygen or mask to keep SpO2 at 94 - 99%.

7. Assess the patient’s circulation.
   a. Assess pulses at appropriate pulse points.
   b. Control major bleeding.
   c. Check perfusion by evaluating skin color, temperature, and moisture.
   d. Acquire 12 lead ECG and transmit if applicable.
   e. ALS providers – Establish IV/IO access and apply cardiac monitor if applicable.

8. Expose patient.

9. Identify the priority of the patient based on assessment findings.

10. Expedite transport for high priority patients

C. SECONDARY SURVEY

1. Obtain vital signs, including:
   a. Respirations
   b. Pulse
   c. Blood pressure
   d. Skin color, temperature, and condition

2. Obtain chief complaint.

3. Obtain history of present illness and past medical history

4. Conduct a physical examination (head-to-toe assessment) or focused exam

D. Perform Ongoing Exam and assess interventions.

E. Consider Patient Comfort Protocol 5902 / 4902 as applicable for ALS providers.

NOTE: Assessment Mnemonics can be found in Appendix D.
If Severe External Bleeding

Apply Direct Pressure to site while maintaining ABC’s

If Severe External Bleeding

Apply Hemostatic agent (if available). Packing the wound is appropriate and acceptable treatment.

Apply pressure dressing. Do not remove once applied

Bleeding Controlled?

YES

Apply appropriate pressure dressing, monitor for continued hemostasis and transport to appropriate facility

Consider Pain Management Protocol

NO

Extremity?

YES

Apply commercial tourniquet proximal to bleeding site and tighten until bleeding stops

Bleeding Controlled?

YES

NO

Consider a second tourniquet (if available and bleeding is brisk).

Ensure pressure is applied directly to site of bleeding

Open Chest or Abdominal Wound?

YES

NO

NO

Continue direct pressure.

Transport as soon as possible to appropriate facility

NO

YES

NO

Continued hemostasis and transport to appropriate facility

Transport as soon as possible to appropriate facility
SELECTIVE SPINAL IMMOBILIZATION

Backboards are not the standard of care in most cases of potential spinal injury and have not been shown to provide any benefit for spinal injuries. Backboards may be appropriately utilized as an extrication device and/or tool to carry non-ambulatory patients. Neurological exam is mandatory in patients with potential spinal trauma.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Identify risk of spinal column and spinal cord injury/injuries.

C. Prevent and/or reduce further spinal column or spinal cord injury through application of appropriate evidenced-based immobilization.

D. Use Long Spine Board (or any of the multiple equipment devices) to TRANSFER patient to stretcher with minimal spinal movement, remove the device, and then secure patient to stretcher. Backboards used only to transport the patient to the ambulance gurney should be gently removed except in the following instances:

1. The backboard is being utilized as an element of the splinting strategy such as multiple long bone fractures.
2. The patient is at risk of vomiting but unable to protect their own airway and may need to be turned to provide airway protection.
3. Cases in which the patient is agitated or unresponsive.
4. Removal of the backboard would otherwise delay transport in a critical patient.

E. Extrication of a patient to a stretcher:

1. If patient does not meet criteria for c-spine immobilization and has no other injury, including thoracic or lumbar injury that would preclude standing or ambulating, patient may self-extricate with assistance to a waiting stretcher.
2. Patients who are on the ground with c-collar applied who have altered mental status with GCS < 15, neurological signs of injury, and are unable to stand from a sitting position should be positioned and immobilized to a long spine board or scoop stretcher for extrication to the stretcher.
F. Treatment and Interventions:

1. Apply cervical restriction if a patient is assessed and there is suspicion of cervical injury. If it does not cause increased agitation or pain, apply a properly fitted cervical collar. Suspicion of cervical injury includes:
   a. Patient complains of neck pain
   b. Tenderness upon palpation of the neck
   c. Abnormal mental status including agitation or neurological deficit
   d. Evidence of drug or alcohol ingestion

2. Apply full immobilization if the patient is assessed and exhibits with any of the following:
   a. Abnormal sensory/motor exam – abnormal findings such as paresthesia, loss of sensation in extremities, weakness or paralysis in extremities, or loss of urethral or sphincter control.
   b. Distracting injuries that produce pain that may distract the patient from the pain of a spine injury.
   c. Complaints of pain or tenderness on examination of the spine including palpation of the entire spine and range of motion (if appropriate).
   d. Patient reliability is questioned such as the following examples: intoxicated, elderly, young, altered mental status, chemically altered, or those patients that you cannot adequately perceive or communicate with.

G. Exclusion Criteria

1. No history of injury consistent with spinal injury

2. Patients with penetrating trauma to the chest, abdomen, head, neck, or back. These patients may be harmed by immobilization on a spine board.

3. Patients with non-traumatic back or neck pain related to movement, position, or heavy lifting.

H. Precautions and Considerations:

1. Caution should be exercised in high risk patients >65 years of age and patients <3 years of age as spinal assessments may be less sensitive in these age groups. This criteria in and of itself is not a factor in the providers decision making process to immobilize or not.
2. Consider airway adjuncts if needed to maintain an adequate airway.

3. There is no evidence that the “standing backboard” technique is beneficial or appropriate. Ambulatory patients should simply be eased to a sitting position on the stretcher without the use of a backboard.

4. Use care with patients that have spinal abnormalities such as kyphosis. Padding or other alternatives may be required for patient comfort.
Twenty-five percent of all motor vehicle deaths are due to thoracic trauma. Rapid recognition and immediate treatment of chest injuries can prove to be life-saving.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Perform the following, if indicated:
   1. Stabilize flail segment of chest.
   2. Seal any open chest wounds by taping three (3) sides with an occlusive dressing or use an optional commercial chest seal.
   3. Stabilize any impaled objects.

4. If signs of a tension pneumothorax are present, (absent breath sounds and SBP < 90 mm Hg in adults or SBP < 80 mm Hg in children) and patient has altered mental status, then perform Chest Decompression Protocol 8302 on affected side. Contact Medical Command immediately. Remember that tracheal deviation is a late sign.

C. Transport immediately.

D. Notify Medical Command.

E. Treat cardiac dysrhythmias per appropriate cardiac protocol.

Note:
   1. Chest pain after trauma could be a sign of significant injury and not cardiac chest pain. Nitroglycerin should not be used without MCP order.
   2. If tension pneumothorax develops in a patient with a sealed sucking chest wound, attempt to resolve by releasing air from the seal prior to decompressing chest.
   3. Chest decompression is only indicated for a true tension pneumothorax with the signs listed above. It is not appropriate to needle decompress a simple pneumothorax. If the patient is awake and talking; do not perform a chest decompression unless by direct MCP order.
Pre-hospital care is directed toward rapid stabilization and transport to an appropriate medical facility for definitive surgical intervention and treatment.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Treatment:

C. Penetrating trauma:
   1. Stabilize impaled objects with bulky dressings.
   2. Control external bleeding.
   3. Search and locate exit wounds, when applicable.

D. Eviscerating trauma:
   1. Cover eviscerations with moist, sterile dressings.
   2. Apply occlusive bandage over dressings.

E. Blunt trauma:
   1. Recognize and reassess.
   2. Rapid transport.
   3. If patient is in shock, perform Shock Protocol 4108.
   4. Contact Medical Command.
Isolated musculoskeletal and extremity injuries are rarely a first priority. Pelvic injuries are high risk for serious internal bleeding. Total or partial amputations require special treatment procedures.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. Treatment:

1. Treat all painful, swollen, or deformed areas as fractures.

2. Determine patient priority status:
   a. Stable patients - splint before transporting.
   b. Unstable patients - immobilize completely on long spine board - load and go.

3. Use bandaging, dressing, and splinting device(s) appropriate to the injury.

4. If isolated injury **only**, perform **Patient Comfort / Pain Management Protocol 4902**.

5. If pelvic injury: stabilize, monitor closely, and perform **Shock Protocol 4108**, if indicated.

6. Total or partial amputations:
   a. Wrap severed part in sterile gauze slightly dampened with normal saline and place in sealed container (waterproof bag) immersed in ice water.
   b. In **consultation with Medical Command**, determine best mode of transport and most appropriate destination.

7. Contact **Medical Command** and transport to closest appropriate facility.
The goal of pre-hospital treatment of head injuries is to prevent further neurological deterioration until definitive care can be provided. This is best done by maintaining an adequate airway, oxygenation, and prevention and treatment of hypotension combined with smooth, rapid transport to an appropriate facility with minimal on-scene time.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Maintain airway as indicated by Airway Management Protocol 4901 with the following special considerations in patients requiring assisted ventilation:
   1. If signs of impending Central Nervous System herniation (increasing BP, bradycardia, decreasing GCS, dilation of one pupil, paralysis, and decerebrate or decorticate posturing) are present, then ventilate 12 - 20 breaths per minute to maintain end tidal CO2 at 30 mm/Hg.
   2. If no signs of CNS herniation, ventilate 10 - 12 breaths per minute to maintain end tidal CO2 at 35 - 40 mm/Hg.

C. If no signs of shock or hypotension, maintain IV normal saline at KVO.

D. Elevate head of bed 30 degrees above horizontal.

E. Perform and document neurological status checks every five (5) minutes.

F. If patient is confused or unconscious, consider checking serum glucose and treat as indicated in Diabetic Protocol 4604. Do not delay treatment or transport to check serum glucose but should be done as soon as possible.

G. If patient develops seizure activity, refer to Seizure Protocol 4603.

H. Monitor airway, vital signs, and level of consciousness repeatedly at scene and during transport; status changes are important.

Note:

1. When head injury patients deteriorate, first check for proper airway, adequate oxygenation, and adequate blood pressure.

2. Avoid hypoxemia and hypotension.
Shock, or hypoperfusion, is decreased effective circulation causing inadequate delivery of oxygen to tissues. Signs of early (compensated) shock include tachycardia, poor skin color, cool/dry skin, and delayed capillary refill. Systolic blood pressure is normal in early shock. In late (decompensated) shock, perfusion is profoundly affected. Signs include low blood pressure, tachypnea, cool/clammy skin, agitation, and altered mental status.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Categories of Shock:
   1. Hypovolemic
   2. Distributive
   3. Cardiogenic

C. Determine most likely cause of shock:
   1. Hypovolemic (loss of fluid) is most common. Usually from bleeding or vomiting and diarrhea.
   2. Distributive (loss of vascular tone) is usually from sepsis (infection). Other causes include anaphylaxis, toxic chemicals, or spinal cord injury.
   3. Cardiogenic (heart pump failure) - most common cause in adults is acute MI or CHF. Is rare in children.

D. If hypovolemic shock is suspected (most common):
   1. Monitor vital signs, ECG, and pulse oximeter.
   2. Expedite transport.
   3. As soon as possible, and without delaying transport, establish two (2) IV lines of normal saline with as large a catheter as possible up to a 14 gauge.
   4. If systolic blood pressure < 90 or patient has other signs and symptoms of shock such as tachycardia, delayed capillary refill, cool/clammy skin, or altered mental status, then administer 20 ml/kg normal saline IV up to a maximum of 2 liters and reassess.
5. If on reassessment blood pressure is still < 90 or other signs and symptoms of shock are still present, then contact Medical Command and reconsider causes.

E. If still felt to be hypovolemic shock:

1. Repeat 20 ml/kg normal saline IV per order of Medical Command.

2. Continue treatment per MCP orders.

F. If blood pressure is > 90 systolic and patient has no other signs or symptoms of shock, administer 100 ml/hour normal saline IV and continue to monitor patient.

G. If distributive shock is suspected:

1. If anaphylaxis or allergic reaction, refer to Allergic Reaction / Anaphylaxis Protocol 4501.

2. Initial treatment same as hypovolemic shock above.

3. If hypotension (BP < 90 systolic) and other signs and symptoms of shock persist after administration of second 20 ml/kg normal saline bolus, then:
   a. Reassess that shock is distributive and not from untreated hypovolemia.
   b. Contact Medical Command and consider Dopamine IV drip infusion at 5 micrograms/kg/minute per MCP order.
   c. Titrate Dopamine drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion per MCP order.

H. If cardiogenic shock is suspected:

1. Immediate transport.

2. Establish IV normal saline and administer fluid bolus of 250 ml assessing for signs of fluid overload.

3. Reassess appearance, vital signs, and signs and symptoms of shock.

4. If there is no rhythm disturbance and patient remains poorly perfused after the initial fluid bolus:
HYPOPERFUSION / SHOCK

a. Contact Medical Command and consider repeat 250 ml fluid bolus or Dopamine IV drip infusion at 5 micrograms/kg/minute per MCP order.

b. Titrate Dopamine drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion per MCP order.

Note: Patients with distributive shock from infection may also have hypovolemia from vomiting, diarrhea, and poor fluid intake.
Patients who are found in full cardiac arrest as a result of trauma have an essentially zero chance of survival. If on the arrival of EMS personnel the patient has any signs of life (pulse or respirations), rapid transportation and treatment offer the only hope for survival. Trauma patients who have a witnessed cardiac arrest require rapid treatment and transportation. Early recognition of tension pneumothorax and immediate treatment can prove life-saving.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. If patient is found pulseless and apneic, contact MCP directly for consultation on not beginning resuscitation. Follow Death in the Field Protocol 9101.

C. If patient has any pulse or respirations or has arrest witnessed by EMS personnel, begin CPR with C-spine protection.

D. Establish and secure airway according to Airway Management Protocol 4901.

E. If intubated and unable to ventilate due to increased airway pressures, reconfirm proper ET placement and perform bilateral chest decompression.

F. As soon as possible and without delaying transport, establish two (2) IV lines of normal saline with as large a catheter as possible up to a 14 gauge and administer 20 ml/kg normal saline IV up to 2 liters and reassess.

G. Full immobilization.

H. On scene time should be < 5 minutes, if possible.

I. If patient is entrapped, consider Cease-Efforts Protocol 9102 per direct MCP order.

J. Consult MCP for further treatment orders.
Burns can be caused by direct thermal injury, exposure to caustic chemicals, or contact with electrical sources. Factors to be considered when treating burn patients include the nature of the burn, whether the patient was in an enclosed space, the source of the burn, the patient’s history, the duration of the contact, and the temperature of the thermal agent. Always protect providers from exposures to hazardous materials. NEVER ATTEMPT TO REMOVE PATIENT FROM AN IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH) ENVIRONMENT UNLESS TRAINED, CERTIFIED, AND PROPERLY EQUIPPED. NEVER PLACE YOURSELF OR YOUR CREW IN DANGER. Decontamination, if necessary, should be done by appropriate certified personnel.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Stop the burning process:

1. **Thermal burns:** Flush the burned area with tepid water (sterile, if possible) to cool the skin. Do not attempt to wipe off semisolids (grease, tar, wax, etc.). Do not apply ice. Dry the body when the burn area is ≥ 10% BSA to prevent hypothermia.

2. **Dry chemical burns:** Brush off dry powder, then flush with copious amounts of tepid water (sterile, if possible) for 20 minutes. Continue en route to the hospital.

3. **Liquid chemical burns:** Flush the burned area with copious amounts of tepid water (sterile, if possible) for 20 minutes. Continue en route to the hospital.

C. If signs of respiratory involvement are present such as facial burns, singed face or nasal hairs, swollen, sooty, or reddened mucous membranes, or patient was in a confined space and/or unconscious, assume inhalation injury and treat per Inhalation Injury Protocol 4304.

D. Remove clothing from around burned area, but do not remove/peel off skin or tissue. Remove and secure all jewelry and tight fitting clothing.

E. Assess the extent of the burn using the **Rule of Nines** and the degree of burn severity.

F. **Minor Burns:**

1. Cover with clean dressing.
2. Consider application of cool/moist compress.

3. Consider Patient Comfort/Pain Management Protocol 4902

G. Major Burns:

1. Cover with clean dry dressing.


3. Consider Patient Comfort / Pain Management Protocol 4902

4. In consult with Medical Command, establish transport mode (ground vs. air) considering transport to burn center.

H. Thermal Burns:

1. Cool water immersion of minor localized burns may be effective if accomplished in the first few minutes after a burn.

2. Cover extensive partial and full thickness burns with a dry, sterile dressing. Keep the patient warm and infuse fluid per Shock / Hypoperfusion Protocol 4108.

3. Use soft, non-adherent dressings between areas of full thickness burns, as between the fingers and toes, to prevent adhesion.

4. Be cautious and conservative when administering fluids to the burn patient with inhalation injury.

I. Electrical Injuries:

1. Commonly occurring with electrical injuries are long bone fractures, cardiac dysrhythmias, and neurological deficits. Victims of lightning strikes may be in cardiac arrest, but frequently can be resuscitated quickly after intubation and assisted ventilations.

2. Assess for multiple entrance and exit wounds.

3. Perform 12 lead ECG and continual monitoring for possible cardiac disturbances. Electrical current may induce dysrhythmia’s such as bradycardia’s, tachycardia’s, ventricular fibrillation, and asystole.
J. **Chemical Burns:**

1. Attempt to identify substance from labels, data sheets, or other personnel on-scene, but do not delay treatment or transport during this process.

2. Request additional resources as needed. (ERG, Haz Mat Team, etc.)

3. Contact **Medical Command** with the nature of the substance. Medical Command shall notify WV Poison Control for further information as required.

4. Avoid self-contamination by using protective clothing and gloves.

5. Decontaminate grossly by removal of excess chemical.

6. Common chemicals that cause burns:

   a. **Phenol** is a gelatinous caustic used as an industrial cleaner. It is difficult to remove because it is insoluble in water. Use alcohol, which may be found in areas where Phenol is regularly used, to dissolve the product. Follow removal with irrigation using large volumes of cool water.

   b. **Dry Lime** is a strong corrosive that reacts with water. It produces heat and subsequent chemical and thermal injuries. Brush dry lime off the patient gently, but as completely as possible. Then rinse the contaminated area with large volumes of cool to cold water.

   c. **Sodium** is an unstable metal that reacts destructively with many substances, including human tissue and water. Decontaminate the patient quickly with gentle brushing. Then, cover the wound with oil used to store the substance.

   d. **Riot Control Agents** (Mace, Pepper Spray, etc.) cause intense irritation of the eyes, mucous membranes, and respiratory tract. Treatment is supportive and most patients recover in 10 - 20 minutes of exposure to fresh air. If necessary, irrigate the patient’s eyes with Normal Saline if you suspect the agent remains in the eyes.

   e. **Hydrofluoric Acid** is a common corrosive that reacts with water. It produces heat and subsequent chemical and thermal injuries resulting in extreme pain to the affected areas. Cover the wound and avoid contact with water.
### Minor Burns Criteria
1. Superficial and partial thickness: Adult <18%, Child <9%
2. Full thickness <2%.
3. Does not meet major burn criteria 3 thru 6.

### Major Burns Criteria
1. Superficial and partial thickness: Adult >18%, Child >9%
2. Full thickness >2%.
3. Partial or full thickness of: face, neck, hands, feet, genitalia
4. Suspected or positive airway involvement.
5. Electrical burns
6. Circumferential burns or associated injuries.
A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. Penetrating trauma to globe:
   1. Observe for bleeding and leakage of iris material or clear fluid.
   2. Do not palpate globe or apply any pressure to the eye.
   3. Shield injured eye and patch the non-injured eye.
   4. Stabilize impaled objects in place.
   5. Avoid unnecessary movement. Advise patient not to cough, sneeze or move.

C. Ultraviolet light exposure (i.e., arc welder or sun lamp burns):
   1. Symptoms may be delayed 3 - 10 hours after exposure.
   2. Place cool compresses lightly over both eye lids.

D. Sudden, painless loss of vision:
   1. May be due to central retinal artery occlusion, stroke or other embolic event.
   2. Administer oxygen 2 – 6 LPM via nasal cannula.
   3. Transport supine.

E. Transport and continue treatment en route.

F. Contact **Medical Command**
Tranexamic Acid (TXA) is an anti-fibrinolytic that inhibits the activation of plasminogen to plasmin, thereby preventing fibrinolysis and the breakdown of clots. Early administration of tranexamic acid (TXA) has been shown to reduce mortality and death secondary to trauma.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Indications:
   1. Known or suspected hemorrhage after crush, blunt or penetrating trauma
   2. Age ≥ 18 years
   3. Sustained hypotension (systolic blood pressure (SBP) < 90mmHg) and sustained tachycardia (>110 beats per minute)
   4. Time of injury is less than 3 hours from initiation of TXA

C. Initiate transport to a definitive trauma center that has the capability to administer/continue TXA.

D. Contraindications:
   1. Time since injury >3 hours
   2. Known Pregnancy
   3. Known allergy to TXA

E. Dosage and Administration: Consult MCP for destination determination
   - **Loading Dose:** IV infusion of 1 gram Tranexamic Acid (TXA) diluted in 100ml or 250 ml NS infused over 10 minutes.
   - **Maintenance Dose:** IV infusion of 1 gram Tranexamic Acid (TXA) diluted in 100ml or 250 ml NS infused over 8 hours.

**NOTE:** If patient is taking beta-blocker medications, reflex tachycardia may not be present. These patients, while in traumatic hemorrhagic shock, may present with hypotension and a normal heart rate.
A. Indications for this protocol include one or more of the following:

1. The classic symptom associated with an Acute Coronary Syndrome (ACS) is chest discomfort, but symptoms may also include discomfort in other areas of the upper body, shortness of breath, sweating (diaphoresis), nausea, vomiting, and dizziness. Many patients complain of substernal chest pain, pressure, or discomfort unrelated to an injury or other readily identifiable cause.

2. Most patients complaining of substernal chest pain, pressure, or discomfort unrelated to an injury or other readily identifiable cause.

3. History of previous ACS / AMI with recurrence of similar symptoms.

4. Any patient with a history of cardiac problems who experiences lightheadedness or syncope.

5. Patients of any age with suspected cocaine abuse and chest pain.

6. Diabetic, female, and/or elderly patients with atypical chest discomfort or other symptoms associated with ACS / AMI in the absence of pain.

B. Perform Initial Treatment / Universal Patient Care Protocol. Assessment should be directed toward identifying ACS / AMI vs. identifying a non-cardiac cause of the symptom(s).

C. If patient has no history of a true allergy to aspirin and has no signs of active bleeding (i.e., bleeding gums, bloody or tarry stools, etc.), administer 4 (four) 81 mg chewable Aspirin orally (324 mg total). Note: May be administered prior to obtaining 12 lead ECG and/or establishment of IV access.

D. Obtain 12 lead ECG, unless it significantly delays treatment or transport. Transmission of 12 lead ECG or interpretation should be sent to the receiving facility or Medical Command. Pre-treatment 12 lead ECG preferred.

1. If 12 lead ECG indicates STEMI or presumably new LBBB, transport patient to nearest facility capable of emergency PCI if this transport can be accomplished in < 30 minutes. If transport time to a facility with these capabilities will be > 30 minutes, consider transport options in the following order. All transport destinations should be directed by consultation with Medical Command.

   a. Aeromedical transport to PCI capable facility, if available.
b. Transport to closest facility with fibrinolytic capability.

c. Transport to closest facility capable of providing stabilizing care and expeditious transfer to facility with PCI.

2. If 12 lead ECG indicates signs of ischemia, possible NSTEMI, or is normal/non-diagnostic, transport to closest facility capable of providing stabilizing care and transfer to facility with PCI, if indicated.

3. If patient has a BP < 90 **DO NOT** administer nitroglycerin.

   a. If 12 lead ECG indicates Inferior Wall AMI as indicated by ST Segment elevation in two or more of leads II, III or aVF, a 12 lead ECG should be obtained using right chest leads (V4R at a minimum). If right chest leads show ST Segment elevation, **DO NOT** administer sublingual Nitroglycerin. Follow **Right Ventricular Infarct Protocol 4213**.

4. If 12 lead ECG indicates PVC's evaluate for underlying causes. Consult **Medical Command Physician** for treatment options.

5. If blood pressure is > 90 mm/hg systolic and patient has **not** taken Sildenafil (Viagra®) or Vardenafil (Levitra®) within last 24 hours or Tadalafil (Cialis®) within the last 72 hours:

   a. Administer **Nitroglycerin** 0.4 mg SL. Note: May be administered prior to establishment of IV access.

   b. Repeat **Nitroglycerin** 0.4 mg SL every 3 - 5 minutes to a maximum of three (3) doses unless pain is relieved.

   c. If blood pressure falls below 90 systolic or decreases more than 30 mm/Hg below patient's normal baseline blood pressure, then discontinue dosing and consult **Medical Command Physician** to discuss further treatment.

   d. If blood pressure < 90 systolic and/or patient is experiencing severe bradycardia or tachycardia, treat according to appropriate protocol. Further treatment **per MCP orders**. If patient has taken Sildenafil (Viagra®) or Vardenafil (Levitra®) within last 24 hours, or Tadalafil (Cialis®) within the last 72 hours, nitroglycerin should only be given by **Medical Command Physician order**.
E. If chest pain persists:

1. Administer **Morphine Sulfate** 2 mg slow IV; may repeat every five (5) minutes up to 10 mg unless pain is relieved.
   - Use caution if hypotensive and/or bradycardic. Consider use of **Fentanyl (Sublimaze®)**.
   - If systolic BP drops below 90 mm/Hg during administration of **Morphine Sulfate**, discontinue analgesic administration and administer IV fluid bolus 250 mL Normal Saline and contact Medical Command.

   -OR-

   Administer **Fentanyl (Sublimaze®)** 1 microgram/kilogram – up to 100 micrograms max single dose, slow IV. Additional doses require **MCP order**.

   **NOTE:** Administration of pain medications may not be tolerated well in patients over 55 years of age. Doses should be initiated low and repeated as needed. Administration of these medications in patients > 55 years of age shall be as follows:

   Administer **Morphine Sulfate** 1 mg slow IV; may repeat every five (5) minutes up to 10 mg unless pain is relieved.
   - Use caution if hypotensive and/or bradycardic. Consider use of **Fentanyl (Sublimaze®)**.
   - If systolic BP drops below 90 mm/Hg during administration of **Morphine Sulfate**, discontinue analgesic administration and administer IV fluid bolus 250 mL Normal Saline and contact Medical Command.

   -OR-

   Administer **Fentanyl (Sublimaze®)** 0.5 microgram/kilogram – up to a max initial dose of 100 micrograms. Additional doses require **MCP order**.

2. If discomfort persists, consult **Medical Command Physician** to discuss further treatment with nitroglycerin, additional Morphine Sulfate, or Fentanyl. Monitor blood pressure and respiratory effort.

F. Treat dysrhythmias according to specific protocols.
G. If transport time permits, complete AHA Fibrinolytic Checklist. (Appendix A)
An elevated blood pressure reading in emergency patients is not uncommon and usually is not by itself an emergency. The goals of pre-hospital treatment should be focused on the following: prevent a neurologic or cardiovascular catastrophe, rapidly identify those patients who are in a hypertensive crisis and the body system(s) affected or potentially affected, and control symptomatic elevated blood pressure in certain situations.

This protocol is only applicable to patients with hypertensive crisis without signs and symptoms of stroke.

Specific problems such as chest pain, pulmonary edema, and preeclampsia/eclampsia should be treated per appropriate protocols. Drug therapy shall be considered in careful consultation with the Medical Command Physician.

A. Perform Initial Treatment / Universal Patient Care Protocol

B. Systolic BP > 240 mm/Hg and/or Diastolic BP > 120 mm/Hg taken manually and repeated in opposing arms.

Patient may exhibit one or more of the following symptoms:

1. Chest pain
2. Seizures
3. Focal motor deficits
4. Changes in mental status
5. Decreased or blurred vision
6. Shortness of breath
7. Headache

C. Cardiovascular problems such as angina, acute CHF, and aortic dissection may also be the presenting symptoms. Patients with suspected cocaine overdose or alcohol withdrawal may exhibit similar symptoms.

Note: HYPERTENSION IS ALSO A NEUROPROTECTIVE REFLEX IN THE SETTING OF TRAUMATIC BRAIN INJURY OR INCREASED INTRACRANIAL PRESSURE. GREAT CAUTION MUST BE EXERCISED IN ADMINISTERING ANTI-HYPERTENSIVE AGENTS.
D. Specific symptoms such as chest pain, CHF, etc. should be treated per appropriate protocol.

E. Treatment goal: reduce MAP by 10 - 15% of initial value. **DO NOT** reduce BP to normal range (i.e. 120 / 80) as it may lead to a decrease in cerebral perfusion.

Measure blood pressure manually every five (5) minutes. If two (2) successive readings have a systolic > 240 or a diastolic >120 mmHg, consider intervention **if symptomatic per MCP order**.

**Labetalol (Trandate®)** *(first line medication)*
Initial: 10 mg slow IV push over 2 minutes.
Repeat in 10 minutes at 20 mg if BP remains > 180/120 and symptoms remain.

**ALERT:** CAUTION IN PATIENTS WITH ASTHMA AND COPD DUE TO BETA BLOCKING ACTIVITY

-OR-

**Nitroglycerin** *(second line medication)*
0.4 mg SL every 3 - 5 minutes.
Repeat if BP remains > 200/120 mm/Hg and symptoms remain (max. dose 1.2 mg).

CONSIDER NITROGLYCERIN AS A FIRST LINE ANTIHYPERTENSIVE IN THE SETTING OF HYPERTENSIVE CRISIS WITH CHEST PAIN OR ISCHEMIC EKG CHANGES.

-OR-

**Morphine Sulfate** *(third line medication)*
2 - 10 mg IVP or IM
Follow Initial Treatment Protocol

Rhythm Shockable?

**VT / VF**

Shock Max Joules per Manufacturer Guidelines

CPR 2 Min.
Obtain IV / IO Access

Rhythm Shockable?

**Asystole / PEA**

CPR 2 Min
Obtain IV / IO Access
Epinephrine 1 mg repeated every 3 - 5 min.
Consider Advanced Airway: ET or Supraglottic and Capnography

Rhythm Shockable?

CPR 2 Min
Treat Reversible Causes

If Non-Shockable rhythm remains after 20 min. of resuscitative efforts, Call Medical Command and consider Cease Efforts Protocol 9102

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**A**

**B**

**Assess for Reversible Causes**

- Hypoxia
- Hydrogen Ion
- Hypothermia
- Hypovolemia
- Hypo/Hyperkalemia
- Hypoglycemia
- Toxins
- Tension Pneumothorax
- Cardiac Tamponade
- Thrombus (cardiac)
- Thrombus (pulmonary)
- Trauma

*(OPTIONAL) Sodium Bicarbonate 50 mEq may be administered per MCP order.*

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If no ROSC – Go to B
If ROSC – Proceed to ROSC Protocol 4214

Contact Medical Command for additional post cardiac arrest treatment

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Amiodarone 300 mg and treat reversible causes; consider 150 mg dose if no conversion in 3 - 5 min. May substitute **Lidocaine** 1.0 – 1.5 mg/kg IV/IO repeated at 0.5 – 0.75 mg/kg IV/IO at 10 min. intervals to a max dose of 3 mg/kg.

In cases of Torsades administer **Magnesium Sulfate** 1 gram diluted in 10 ml NS over 5 – 20 min.
ADULT TACHYCARDIA

Heart Rate Typically > 150 bpm and one of the following: BP < 90 mm/Hg or Altered Level of Consciousness

Yes

Immediate Synchronized Cardioversion
100 J or equivalent biphasic. If no conversion then repeat with 200 J, 300 J, 360 J
Check for conversion after each shock
If no conversion then prepare for expedited transport
Perform Initial Treatment Protocol

Contact Medical Command Physician
Consider other treatment:
- Consider Adenosine only if ECG QRS is regular and monomorphic.
- Consider antiarrhythmic infusion per Medical Command Physician

No

Is QRS Narrow (< 0.12 sec) or Wide (≥ 0.12 sec)

Narrow

Supraventricular Tachycardia
Valsalva/Vagal maneuvers
Adenosine 6 mg IV push
- If no conversion in 1 - 2 min then Adenosine 12 mg IVP
- If conversion then support and transport

Wide

Wide Complex Tachycardia

If 12 lead ECG shows waveform Monomorphic and Regular then consider:
Adenosine 6 mg rapid IV push; follow with NS flush. Second dose 12 mg if required.
Consider antiarrhythmic:
Amiodarone -150 mg IV over 10 minutes. Repeat 150 mg if Ventricular Tachycardia recurs
-Lidocaine - 0.5 to 0.75 mg/kg every 5 - 10 minutes with maximum total dose of 3 mg/kg

If no conversion consider Diltiazem (Cardizem®) 0.25 mg/kg slow IVP repeated in 15 minutes at 0.35 mg/kg slow IVP Per MCP Order.

If patient loses pulse then go to Adult Cardiac Arrest Protocol 4205 Consult Medical Command

If rhythm changes to wide QRS, then follow Wide Complex Tachycardia algorithm

Consider Amiodarone or Lidocaine Drip Per Medical Command. Use the same drug that was initially given.
**SYMPTOMATIC BRADYCARDIA**

**Adult Bradycardia (with pulse)**

- Perform Initial Treatment Protocol
- Oxygen (if Hypoxic)
- ECG Monitor
- Monitor BP and Sp02
- Obtain IV / IO Access
- Perform 12 lead ECG

**Heart Rate < 50**

**YES**

- **Is Bradycardia associated with signs of poor perfusion:**
  - Hypotension
  - Acutely Altered Mental Status
  - Signs of Shock
  - Chest Discomfort
  - Acute Heart Failure
  - Ischemic or abnormal ECG findings

  **Increase Heart Rate With:**

  **Atropine** 1.0 mg IV. May repeat every 3 - 5 minutes up to a maximum dose 3 mg; Atropine administration should not delay implementation of external pacing for patients.

  **Transcutaneous Pacer:** If Atropine is ineffective, patient with poor perfusion, or high degree AV Block. *(consider pre-medication with Midazolam (Versed®) 2 mg for TCP)*

  **Fentanyl (Sublimaze®)** 1 microgram/kilogram–up to 100 micrograms max single dose, slow IV.

  If no pain relief after two (2) minutes, may repeat Fentanyl **PER MCP order** at 1 microgram/kilogram up to 100 micrograms max per dose.

**NO**

- Closely monitor and observe for possible deterioration during transport

- Identify and Treat Underlying causes for all patients

**Consider:**

**Apply transcutaneous pacer pads to patients presenting in AV Block**

- If pacing ineffective **contact Medical Command Physician** for possible

- **Dopamine** IV infusion 5 - 10 micrograms/kg/min
A. Perform Initial Treatment / Universal Patient Care Protocol

B. Indication for this protocol is any patient with signs of an Inferior Wall ST Elevation Myocardial Infarction (STEMI) with concurrent ST elevation in right chest lead V4R.

Note: Administration of sublingual nitroglycerin is CONTRAINDICATED in this situation.

C. Administer oxygen by appropriate route to maintain SpO2 at 94 - 99%.

D. If patient has no history of a true allergy to aspirin and has no signs of active bleeding (i.e., bleeding gums, bloody or tarry stools, etc.), then administer 4 (four) 81 mg chewable Aspirin orally (324 mg total). Aspirin may be administered prior to establishing IV.

E. Establish two (2) IV lines, preferably 18 gauge or larger, of normal saline.

F. If chest pain persists:

1. Administer Morphine Sulfate 2 mg slow IV may repeat every five (5) minutes up to 10 mg unless pain is relieved.

   - Use caution if hypotensive and/or bradycardic. Consider use of Fentanyl (Sublimaze®).

   - If systolic BP drops below 90 mm/Hg during administration of Morphine Sulfate, discontinue analgesic administration and administer IV fluid bolus 250 mL Normal Saline and contact Medical Command.

   -OR-

2. If discomfort persists, Contact Medical Command Physician to discuss further treatment. Monitor blood pressure and respiratory effort.
NOTE: Administration of pain medications may not be tolerated well in patients over 55 years of age. Doses should be initiated low and repeated as needed. Administration of these medications in patients > 55 years of age shall be as follows:

Administer **Fentanyl** (Sublimaze®) 0.5 microgram/kilogram– up to a max initial dose of 100 micrograms. Additional doses require **MCP order**.

-OR-

Administer **Morphine Sulfate** 1 mg slow IV; may repeat every five (5) minutes up to 10 mg unless pain is relieved.

- Use caution if hypotensive and/or bradycardic. Consider use of **Fentanyl** (Sublimaze®).
- If systolic BP drops below 90 mm/Hg during administration of **Morphine Sulfate**, discontinue analgesic administration and administer IV fluid bolus 250 mL Normal Saline and contact Medical Command.

G. Monitor blood pressure carefully. If systolic BP falls below 90 mm/Hg, discontinue pain medications and treat hypotension per **Shock Protocol 4108**

H. Treat dysrhythmias according to specific protocols.

I. If transport time permits, complete AHA Fibrinolytic Checklist (Appendix A).
This protocol should be followed for all adult cardiac arrests with ROSC. If it is unknown whether the arrest is traumatic or medical, continue with this protocol.

A. Follow Initial Treatment / Universal Patient Care Protocol

B. If ventilation assistance is required, ventilate at 10 - 12 breaths per minute. Do not hyperventilate.
   1. Avoid excessive ventilation. Start at 10 - 12 breaths/minute. **If capnography available:** Titrate to target ETCO2 of 35 - 40 mm/Hg.
      a. Titrate oxygen to minimum necessary to achieve SpO2 at 92 - 98%.
      b. Start with 100% oxygen during the CPR phase.

C. Consider Advance Airway: ET or Supraglottic

D. Reassess patient. If patient becomes pulseless, begin CPR and follow Cardiac Arrest Protocol 4205.

E. Continue to monitor ABC’s.

F. Follow Initial Treatment / Universal Patient Care Protocol

G. Start an IV / IO NS KVO if not already performed.

H. Treat hypotension (SBP < 90 mm/Hg) with an IV/IO fluid bolus consistent with Hypoperfusion / Shock Protocol 4108.

I. Perform 12 lead ECG. If STEMI, follow STEMI guidelines.

J. Consider treatable causes. (H’s and T’s)

K. If ventilation assistance is required with an advanced airway in place and quantitative

### Assess for Reversible Causes

<table>
<thead>
<tr>
<th>Hypoxia</th>
<th>Toxins</th>
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<tbody>
<tr>
<td>Hydrogen Ion</td>
<td>Tension Pneumothorax</td>
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<tr>
<td>Hypothermia</td>
<td>Cardiac Tamponade</td>
</tr>
<tr>
<td>Hypovolemia</td>
<td>Thrombus (cardiac)</td>
</tr>
<tr>
<td>Hypo/Hyperkalemia</td>
<td>Thrombus (pulmonary)</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Trauma</td>
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</tbody>
</table>

**OPTIONAL** Sodium Bicarbonate 50 mEq may be administered per MCP order
waveform capnography *(if available)*; target ETCO2 is 35 - 40 mm/Hg.

**L.** Transport to a facility capable of Percutaneous Coronary Intervention (PCI) and/or therapeutic hypothermia in consultation with Medical Command.

**M.** If patient remains unresponsive after ROSC, consider cooling the patient with 250 ml Normal Saline 4 degrees Centigrade *(optional equipment if available)*; cold packs to axilla, groin, neck, etc.

**N.** Consider the administration of *Amiodarone* Infusion or *Lidocaine* infusion if the patient was resuscitated following an episode of VF/VT and is without profound bradycardia or high-grade heart block (2nd degree Type II or 3rd degree or idioventricular rhythm).

**Note:** *Continue using the anti-arrhythmic medication that was administered during resuscitation.*

- Amiodarone administration is 150 mg in 100 ml D5W infused at 1mg/min. utilizing a 60 drop set.

- Lidocaine administration is administered 1 g in 250 ml NS titrated at 1 – 4 mg/min.

**O.** If hypotension persists after 250 ml IV / IO fluid bolus, administer Dopamine 5 – 20 micrograms/kg/min **per MCP Order**.
Bronchospasm may be the manifestation of several disease processes, most commonly asthma, chronic bronchitis, and emphysema (COPD). Physical examination reveals wheezing and prolonged expiratory phase of breathing. Respiratory Distress is categorized as follows:

- **Minimal Distress**: A slight increase in work of breathing with no wheezing or stridor evident.
- **Moderate Distress**: A considerable increase in work of breathing with wheezing and/or abnormal breath sounds evident.
- **Severe Distress**: Extreme work of breathing (retractions) with decreased lung sounds or decreased lung compliance, inability to speak in full sentences, and/or lethargy.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. If patient is in moderate distress and:

1. Heart rate is < 130:

2. Administer **Albuterol** 5.0 mg combined with **Ipratropium Bromide (Atrovent®)** 0.5 mg with oxygen 8 - 10 LPM. If Ipratropium Bromide (Atrovent®) is contraindicated, administer Albuterol only.

3. Reassess vital signs and lung sounds.

4. If distress is unrelieved and patient appears severe:
   a. Expedite transport.
   b. Administer a second dose of **Albuterol** 5.0 mg combined with **Ipratropium Bromide (Atrovent®)** 0.5 mg with oxygen 8 – 10 LPM. If Ipratropium Bromide (Atrovent®) is contraindicated, administer Albuterol only.
   c. If no relief, administer **Dexamethasone** 10 mg IV/IO/IM

5. If distress is relieved:
   a. Monitor vital signs and transport.
   b. Notify **Medical Command**.
C. If patient is in severe distress and:

1. Heart rate is < 130:
   a. Treat as outlined in “B” above.
   b. If transport time permits, consider administration of Magnesium Sulfate 2 grams in 100 ml of Normal Saline IV/IO drip administered over 20 minutes.
   c. Apply CPAP with in-line nebulizer if indicated. CPAP may be useful in lowering the work of breathing in severe episodes.

2. Heart rate is > 130:
   a. Confirm that patient’s tachycardia appears to be from respiratory distress and not from other causes.
   b. Treat as outlined in “B” above.
   c. Monitor patient’s symptoms and vital signs closely.
   d. If any signs of increasing chest pain or cardiac symptoms develop, stop nebulizer, and treat per appropriate protocol.
   e. Contact Medical Command for further treatment options.

D. For extreme respiratory distress marked by diminished air movement or bronchospasm refractory to treatment, resulting in questionable delivery of nebulized medication, apnea, or other signs of impending respiratory arrest; administer Epinephrine (1:1,000) 0.3 mg IM.
Patients experiencing pulmonary edema will have rales or crackles on lung exam and may exhibit with JVD and/or peripheral edema and/or frothy sputum. Rales can also be heard in patients with lung infections who are not in pulmonary edema and furosemide is not appropriate treatment for these patients. Patients in severe pulmonary edema may benefit from assistance with positive pressure ventilation.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. If patient is in severe respiratory distress, consider CPAP if available per CPAP Protocol 8301. CPAP should be initiated for a minimum of five (5) minutes prior to administration of nitroglycerine.

C. If patient has rales and an initial blood pressure is > 110 systolic; administer Nitroglycerine 0.4 mg every 3 – 5 minutes up to a total of three (3) doses or 1.2 mg. Obtain a manual BP between doses of Nitroglycerine and assess the patient’s response prior to administering subsequent doses.

NOTE: If patient has taken Sildenafil (Viagra®) or Vardenafil (Levitra®) within last 24 hours, or Tadalafil (Cialis®) within the last 72 hours, treat per D - K of this protocol.

D. If patient DOES NOT take Furosemide (Lasix®) and systolic BP remains > 100; administer Furosemide 40 mg IV/IO.

E. If patient DOES take Furosemide (Lasix®) and systolic BP remains > 100; administer Furosemide 80 mg IV/IO.

F. If patient is in severe respiratory distress, consider CPAP if available per CPAP Protocol 8301.

G. If wheezing is present, administer Albuterol 2.5 mg combined with Ipratropium Bromide (Atrovent®) 0.5 mg (Combi-Vent / Duo-Neb) with oxygen 8 - 10 LPM. If Ipratropium Bromide (Atrovent®) is contraindicated or the patient is a pediatric, administer Albuterol only.

H. May repeat Albuterol 2.5 mg combined with Ipratropium Bromide (Atrovent®) 0.5 mg (Combi-Vent / Duo-Neb) per order of Medical Command. If Ipratropium Bromide (Atrovent®) is contraindicated or the patient is a pediatric, administer Albuterol only.

I. Transport with further orders per MCP.
J. If blood pressure < 90 systolic and patient has rales and JVD:

   1. Expedite transport and monitor vital signs closely.

   2. Contact Medical Command for further orders per MCP.

K. If blood pressure is < 90 systolic, refer to Shock Protocol 4108.
Inhalation injury may be caused by toxins or thermal burns. In either case, the patient should be removed from the environment. **NEVER ATTEMPT TO REMOVE PATIENT FROM AN IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH) ENVIRONMENT UNLESS TRAINED, CERTIFIED, AND PROPERLY EQUIPPED. NEVER PLACE YOURSELF OR YOUR CREW IN DANGER.** Decontamination, if necessary, should be done by appropriate certified personnel.

Note: Obtain Data Sheets for inhalant and/or refer to DOT Emergency Response Guide for direction. Contact Medical Command which may consult with WV Poison Control Center.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Specific history and physical exam:
   1. Type and amount of toxin, if known.
   2. Duration of exposure.
   3. History of loss of consciousness.
   4. If thermal injury, assess nares and oropharynx for singeing and soot.
   5. Assess lung sounds; if wheezing, refer to Bronchospasm Protocol 4302.
   6. If burns are present, treat per Burn Protocol 4110.

C. Transport.

D. Notify Medical Command.
AIRWAY OBSTRUCTION

A. Conscious Patient:
   1. Able to talk or cough:
      a. Reassure victim and encourage coughing.
      b. Oxygen 15 LPM non-rebreather mask.
   2. Unable to talk or cough, or weak ineffective cough:
      a. Deliver repeated abdominal thrusts until obstruction relieved or victim becomes unconscious. For patients < 1 year of age, do alternating 5 back blows and 5 chest thrusts.
      b. Chest thrusts are preferred on advanced pregnancy and marked obesity.
      c. Transport immediately and notify Medical Command.

B. Unconscious:
   1. Open airway and attempt ventilation.
   2. Reposition airway, if necessary, and attempt ventilation.
   3. Begin CPR starting with compressions.
   4. Finger sweep for foreign body if visible. **DO NOT perform finger sweep on patients < 8 years of age.**
   5. Repeat steps 1 - 5 above.
   6. If still obstructed, visualize with laryngoscope, remove obstruction with Magill forceps.
   7. If unsuccessful, transport immediately. Repeat steps 1 - 5 en route.
   8. **Contact Medical Command.**
The initial procedures needed to assess and manage pediatric medical patients are similar. Primary cardiac problems are rare in children. Pediatric patients may experience respiratory distress as a result of many different causes.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.
   
   

   3. Do Not use nasal cannula in infants and small children. Use blow-by oxygen or mask to keep SpO2 at 94 - 99%.

   4. Perform focused history, more detailed physical exam, and ongoing assessment at the appropriate time before or during transport.

B. Provide immediate resuscitation, as needed, and immediately make transport decision.
**PEDIATRIC HYPOPERFUSION (SHOCK)**

Shock, or hypoperfusion, is decreased effective circulation causing inadequate delivery of oxygen to tissues. Signs of early (compensated) shock include tachycardia, poor skin color, cool/dry skin, and delayed capillary refill. Systolic blood pressure is normal in early shock. In late (decompensated) shock, perfusion is profoundly affected. Signs include low blood pressure, tachypnea, cool/clammy skin, agitation, and altered mental status.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. Shock is categorized as:
   1. Hypovolemic
   2. Distributive
   3. Cardiogenic

C. Determine the most likely cause of shock.
   1. Hypovolemic (loss of fluid) is most common. Usually from bleeding or vomiting and diarrhea.
   2. Distributive (loss of vascular tone) is usually from sepsis (infection). Other causes include anaphylaxis, toxic chemicals, or spinal cord injury.
   3. Cardiogenic (heart pump failure) is rare in children. Most common cause is congenital heart disease.

D. If hypovolemic shock is suspected:
   1. If associated with trauma, refer to **Pediatric Trauma Assessment Protocol 4408**.
   2. If history of vomiting and/or diarrhea and normal vital signs and minimal evidence of dehydration, such as decreased tearing and dry mucous membranes, then transport and monitor vital signs.
   3. If dehydrated with signs of early shock such as tachycardia and cool/dry skin and delayed capillary refill:
      a. Begin transport.
b. Establish IV normal saline and administer 20 ml/kg bolus.

c. Continue fluids **per order of Medical Command.**

4. If signs of late (decompensated) shock such as low blood pressure, tachypnea, cool/clammy skin, agitation, and altered mental status:

   a. Make one (1) attempt on-scene to establish IV/IO normal saline and administer 20 ml/kg bolus.

   b. Transport.

   c. If still evidence of shock, repeat 20 ml/kg normal saline bolus up to two (2) times for a maximum total of 60 ml/kg.

   d. **Contact Medical Command** for further fluid management orders.

E. If distributive shock is suspected:

1. If anaphylaxis or allergic reaction, refer to **Allergic Reaction/Anaphylaxis Protocol 4501.**

2. Initial treatment same as hypovolemic shock above.

3. If hypotension, markedly increased heart rate, and mental status changes persist after administration of three 20 ml/kg normal saline boluses:

   a. Reassess that shock is distributive and not from untreated hypovolemia.

   b. **Contact Medical Command** and consider Dopamine IV drip infusion at 5 micrograms/kg per minute **per MCP order.**

   c. Titrate Dopamine drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion **per MCP order.**

F. If cardiogenic shock is suspected:

1. Immediate transport.

2. Establish IV normal saline and administer fluid bolus of 10 ml/kg assessing for signs of fluid overload.

3. Reassess appearance, vital signs, and work of breathing.
4. If there is no rhythm disturbance and patient remains poorly perfused after the initial fluid bolus:

   a. Contact Medical Command and consider Dopamine IV drip infusion at 5 micrograms/kg per minute per MCP order.

   b. Titrate Dopamine drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion per MCP order.

**Note:** Patients with distributive shock from infection may also have hypovolemia from vomiting, diarrhea, and poor fluid intake.
A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Protect patient from injury and place on left side.

C. Obtain history to help determine origin of seizure:
   1. Refer to appropriate protocol
   2. History of seizures in the past and is patient taking anti-seizure medications.

D. If child is actively seizing:
   1. Protect airway, **DO NOT** attempt intubation during convulsion.
   2. Calm caregiver's fears.
   3. Obtain key information and prepare for transport.
   4. If patient has been provided a prescription for Diastat and is still seizing, administer Diastat rectally at prescribed dose and contact Medical Command.
   5. Quickly assess serum glucose and attempt to establish IV normal saline KVO or saline lock.
   6. If glucose level is < 60 mg/dl refer to the pediatric diabetic emergencies protocol 4411.
   7. Expedite transport and contact Medical Command.

8. If seizure lasts longer than five (5) minutes or two (2) or more episodes of seizure activity occur between which the patient does not regain consciousness:
   a. Administer Midazolam (Versed®) IV/IO/IM 0.1 mg/kg up to a max initial dose of 5 mg per MCP order.
   b. If no IV access is available, administer Midazolam (Versed®) 0.2 mg/kg intranasal (IN) via atomizer up to a max initial dose of 5 mg per MCP order.

9. If seizure continues, further treatment as ordered by Medical Command.
E. If child is Not actively seizing:

1. Monitor vital signs closely and be alert for recurrence of seizure.
2. Transport.
3. Perform remaining assessment, as indicated.
4. Notify Medical Command.

**Note:** If child is administered their personal prescription of Diastat by EMS, the child must be transported to the hospital for further evaluation.
Pediatric patients require the same skills and techniques as adult patients; however, unless you are calm and professional, the emotional reaction of the patient and others on the scene may become more intense. **Use extreme tact and professionalism. Do not let emotions or prejudices interfere with appropriate patient care.**

A. Assure that scene is safe for both rescuers and patient.

B. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

C. Provide appropriate emergency medical treatment for all injuries found (refer to appropriate trauma protocols).

D. Obtain history from all available sources including child, parent/caregiver, and other witnesses.

E. Alleged sexual abuse:
   1. Discourage patient from going to bathroom.
   2. Don’t allow patient to change clothes or wash.
   3. Give nothing by mouth.

F. Transport.

G. Contact **Medical Command**.

H. Upon arrival at the hospital, inform the receiving medical personnel of your findings and/or suspicions. Document the call carefully and thoroughly. Use the telephone to relay pertinent information to **Medical Command**.

**Note:** Current WV law sets forth that as mandated reporters of child abuse and neglect, EMS providers are required to report the circumstances of child abuse/neglect or cause a report to be made to the WV Department of Health and Human Resources (WVDHHR) within 48 hours after suspecting abuse. Additionally, they are required to report the circumstances to the person in charge of the receiving institution or a designated person thereof. That person is then required to make the report or cause a report to be made. While EMS providers may report the circumstances to WVDHHR themselves, they must always make a report to the person in charge of the receiving institution, or a designated person thereof, who then has a statutory duty to report.
Sudden Infant Death Syndrome (SIDS) is the unexpected, sudden death of a seemingly normal, healthy infant that occurs during sleep with no physical evidence of disease or injury.

A. Begin resuscitation immediately unless rigor mortis, severe lividity, or tissue breakdown is evident. If any doubt, resuscitate. Refer to Pediatric Emergencies Cardiac Arrest Protocol 6406.

B. Note the position and condition of the victim and the surroundings.

C. Use extreme tact and professionalism. Do not let emotions or prejudices interfere with carrying out appropriate patient care or family support.
   1. Do not make judgments concerning the situation.
   2. Do not add to the parent’s sense of guilt or helplessness.
   3. Remember, people react differently to stressful situations.

D. If resuscitation is begun:
   1. Transport immediately.
   2. Continue treatment en route per appropriate protocol.
   3. Contact Medical Command for further orders.

E. If resuscitation has not begun:
   1. Contact Medical Command immediately for confirmation of decision not to begin efforts by direct MCP order and follow Death in the Field Protocol 9101.
Cardiac arrest in infants and children is rarely a primary event. It is usually a result of deterioration of respiratory function resulting in decreased cardiac function. Cardiac arrest can be prevented if the symptoms of respiratory failure and/or shock are recognized and quickly treated.

A. Ventricular Fibrillation/Pulseless V-tach:

1. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.
   a. Immediate defibrillation in witnessed arrest.
   b. Administer Epinephrine 1:10,000, 0.01 mg/kg IV/IO every 3 - 5 minutes (tracheal tube 0.1 mg/kg, 1:1000).
   c. Confirm effectiveness of CPR during resuscitative effort.

2. Defibrillate at 2 joules/kg.

3. If no conversion after two (2) minutes of CPR:
   a. Defibrillate at 4 joules/kg and repeat two (2) minutes of CPR.
   b. If no conversion, defibrillate again at 4 joules/kg.
   c. If no conversion, establish airway and IV/IO access and administer Epinephrine (1:10,000) 0.01 mg/kg IV/IO, or Epinephrine (1:1000) 0.1 mg/kg down ET tube.
   d. If no conversion, within 30 - 60 seconds defibrillate at 4 joules/kg.
   e. If no conversion, continue Epinephrine every 3 - 5 minutes and administer Lidocaine 1 mg/kg IV/IO or Amiodarone 5 mg/kg IV/IO.
   f. If no conversion, defibrillate again at 4 joules/kg.
   g. If no conversion, repeat Lidocaine 1 mg/kg IV/IO or Amiodarone 5 mg/kg IV/IO.
   h. If no conversion, defibrillate at 4 joules/kg.
   i. If no conversion, continue to alternate drug therapy with defibrillation and
contact Medical Command.

j. Transport.

4. If conversion occurs:
   a. Follow ROSC Protocol 4214.
   b. Notify Medical Command and transport.

B. Asystole:

1. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

2. Confirm true asystole:
   a. Check lead and cable connections.
   b. Check monitor power is “on” and gain is “up.”
   c. Verify asystole in at least two (2) leads.

3. Administer Epinephrine (1:10,000) 0.01 mg/kg IV/IO, or Epinephrine (1:1000) 0.1 mg/kg down ET tube. Repeat every 3 - 5 minutes.

4. Notify Medical Command and transport.

5. Search for and treat reversible causes.

6. Further treatment as ordered by MCP.

7. If conversion occurs:
   a. Follow ROSC Protocol 4214.
   b. Notify Medical Command and transport.

C. PEA (Pulseless Electrical Activity):

1. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.
2. Review potentially reversible causes.

3. Administer **Epinephrine** (1:10,000) 0.01 mg/kg IV/IO, or **Epinephrine** (1:1000) 0.1 mg/kg down ET tube. Repeat every 3 to 5 minutes.

4. Notify **Medical Command** and transport.

5. If conversion occurs:
   
a. Follow ROSC Protocol 4214.

   b. Further treatment as **ordered by MCP**.
Cardiac dysrhythmias are rare in children. Bradycardia is almost always caused by hypoxia and is frequently a pre-arrest situation. Tachycardia may be SVT, VT, or sinus tachycardia. Tachycardia may be from hypoxia or pain, however, children may tolerate heart rates >200 without immediate serious consequences. Carefully assess the patient, and if they are essentially asymptomatic, then expedite transport and monitor closely.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Bradycardia (Heart Rate < 60): usually due to hypoxia. Always look for potentially reversible causes. Aggressively manage the airway.

1. If no pulse, treat per Cardiac Arrest Protocol 4406.

2. If pulse present but patient is hemodynamically unstable with low blood pressure, poor perfusion, and decreased level of consciousness:
   a. Reassess airway and assist ventilations.
   b. Contact Medical Command and administer Epinephrine (1:10,000) 0.01 mg/kg IV/IO, or Epinephrine (1:1000) 0.1 mg/kg down ET tube per MCP order. Repeat every 3 to 5 minutes per MCP order.
   c. If ordered by MCP, administer Atropine 0.02 mg/kg IV/IO, or ET. Minimum dose: 0.1 mg. Maximum single dose: 0.5 mg for child; 1.0 mg for adolescent.

3. If child is essentially asymptomatic, monitor closely and expedite transport. Continually reassess airway and oxygenation.

C. Narrow Complex with rate > 220 (probably SVT), with a pulse and no evidence of hemodynamic instability, shock, or decreased level of consciousness.

1. Vagal maneuvers.

2. If no conversion, administer Adenosine 0.1 mg/kg IV/IO followed by immediate 20 ml flush of normal saline per order of MCP. Maximum first dose of 6 mg.

3. If no conversion, may double and repeat dose once per order of MCP. Maximum second dose of 12 mg.
### D. Narrow complex with rate > 220 (probably SVT), with low blood pressure and other signs and symptoms of shock including decreased level of consciousness.

1. If vascular access is in place and **Adenosine** can be given within 90 seconds, then treat as in "C2 and C3" above **per order of MCP**.

2. If no conversion and still in shock, then synchronized cardioversion at 0.5 - 1.0 joules/kg **per order of MCP**.

3. If no conversion and still in shock, then synchronized cardioversion at 2.0 joules/kg **per order of MCP**.

### E. Wide complex with rate > 150 (probably VT).

1. If conscious, administer **Lidocaine** 1mg/kg IV/IO or **Amiodarone** 5 mg/kg over 20 – 60 minutes, **per order of MCP**.

2. If unconscious with signs of shock, deliver synchronized cardioversion as outlined in “D2 and D3” above **per order of MCP**.
In the trauma patient, time is critical. Only initial assessment and treatment of life-threatening injuries should be performed on scene. For severely injured patients, after appropriate airway management, “load and go” is more appropriate.

If dispatch information gives the responding ambulance reason to suspect the possibility of a significant accident situation (multiple vehicles, etc.), alert Medical Command prior to arrival at scene and consider aeromedical standby.

A. Scene evaluation:
   1. Note potential hazard to rescuers and patient.
   2. Identify number of patients and organize triage operations, if needed.
   3. Observe patient position and surroundings.
   4. Consider need for aeromedical evacuation.

B. Consider mechanism of injury:
   1. Cause, precipitating factors, and weapons used.
   2. Trajectories and forces involved to patient.
   3. For vehicular trauma: condition of vehicle, windshield, steering wheel, compartment intrusion, car seat, type and use of seatbelts. Specific description of mechanism (i.e. auto vs pole, rollover, auto vs pedestrian, etc.).
   4. Helmet use?

C. Patient assessment:
   1. Determine responsiveness.
      a. Establish and maintain airway.
      b. Maintain C-spine.
      c. Perform Airway Management Protocol 4901, as indicated.
   2. Breathing:
      a. If adequate, oxygen 15 LPM non-rebreather mask to maintain SpO2 at 94 - 99%.
b. If inadequate, ventilate with 100% oxygen and perform Airway Management Protocol 4901, as indicated.

3. Circulation:
   a. Control bleeding.
   b. Assess perfusion status.

4. Neurological status:
   a. Determine level of consciousness using AVPU or GCS.
   b. Check pupils.

5. Limit on-scene time. Unless unusual circumstances, the goal should be:
   a. Not trapped: 10 minutes or less.
   b. Entrapped: within 5 minutes of extrication.

6. In consultation with Medical Command, establish mode (ground vs. air) and destination of transport.

D. Treatment:

1. Immobilize patient on long spine board or as indicated in Spinal Trauma Protocol 4103.

   **Note:** All multiple trauma patients are considered to have a significantly distracting, painful injury. Infants and toddlers with minor injuries or no apparent injury may be left in child safety seats and immobilized, provided the seat is undamaged. Pediatric patients 10 – 40 lbs, not in a viable car seat, shall be transported utilizing an approved method of securing the child.

2. Transport.

3. Monitor vital signs, obtain ECG, and monitor pulse oximeter.

4. If child has significant injuries or mechanism for significant injury, establish at least one IV line of normal saline with as large a catheter as possible up to a 14 gauge.
a. If any signs of shock such as tachycardia, tachypnea, cool/clammy skin, or low blood pressure, or high suspicion of major blood loss, administer 20 ml/kg normal saline IV bolus and refer to Pediatric Shock Protocol 4402.

b. If patient has no signs or symptoms of shock, maintain normal saline IV at KVO.

5. Prevent heat loss.

6. Consider nasogastric tube placement if patient is intubated and has no facial trauma.

7. Refer to Pain Management Protocol 4902, if indicated.

8. Notify Medical Command.
Fever is defined as a measured temperature of 100.4° F (38° C) or greater. Fever is a sign of infection rather than a problem itself. Body temperature < 105° F is not harmful in and of itself. Emergency management of the febrile child involves an assessment to determine if any associated problems are present which require emergent treatment.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. If child appears acutely ill, do not delay transport to check temperature. Transport and treat associated problems per appropriate protocol.

C. Check temperature. If temperature is > 102° F:
   1. Facilitate passive cooling by removing excess clothing and blankets.
   2. If child has not been given Acetaminophen in the last four (4) hours, administer Acetaminophen at 15 mg/kg with the assistance of the parent or legal guardian to calm child.

D. If child has temperature > 105° F:
   3. Treat as in “C” above and also facilitate active cooling by applying wet towels with tepid water to trunk and head.
   4. Do not submerge in water or use ice or rubbing alcohol.

E. Notify Medical Command.

F. Transport.
A. Temperature Control: Whether infant is full term or premature, avoid “cold stress”.
   1. Dry quickly.
   2. Keep the infant as warm as possible.
   3. Turn ambulance heater on high to reduce radiant heat loss.
   4. Cover head and body with dry blankets.
   5. Maintain axillary temperature at 97° F. Check temperature every 15 minutes.

B. Airway and Breathing:
   1. Position, supine with head in sniffing position. Suction only if there is believed to be an airway obstruction while being cognizant of bradycardia and hypoxia. If copious secretions are noted, place infant on his/her side with neck slightly extended, continue intermittent suctioning.
   2. Assess breathing rate (normal 30 - 60 per minute):
      a. If adequate respirations, proceed to circulation.
      b. If inadequate respirations, cyanosis, or gasping/grunting respirations, apply 100% oxygen via non-rebreather mask at 15 LPM held firmly on infant’s face. If no response/improvement after 5 - 10 seconds, begin positive pressure ventilations by bag valve mask with supplemental oxygen at rate of 40 - 60 per minute.
      c. If prolonged ventilation by bag valve mask is needed, consider intubation.

C. Circulation:
   1. If heart rate within normal ranges (normal heart rate > 100 bpm at apical or umbilical sites), assess skin color, continue treatment, and transport as in “D” below.
   2. If heart rate is < 100 per minute, apply 100% oxygen by positive pressure ventilation with bag valve mask and ventilate at 40 - 60 per minute.
   3. Reassess after 30 seconds.
4. If no improvement and heart rate remains 80 - 100 per minute, continue ventilation.

**NOTE:** Neonates with heart rates < 80 bpm are in eminent danger of cardiac arrest.

5. CPR should be started if the heart rate drops below 60 or persists between 60 and 80 beats per minute despite adequate ventilation with 100% oxygen ventilation by bag valve mask.

6. Treat per **Pediatric Dysrhythmias Protocol 4407** or **Pediatric Cardiac Arrest Protocol 4406** as required.

7. Notify **Medical Command.**

D. **Transportation:**

1. Ensure infant remains warm.

2. Maintain airway and oxygenation.

3. Transport.

E. **APGAR Score**

<table>
<thead>
<tr>
<th>The APGAR Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance (Skin color)</td>
<td>Body and extremities blue, pale</td>
<td>Body pink, extremities blue</td>
<td>Completely pink</td>
</tr>
<tr>
<td>Pulse rate</td>
<td>Absent</td>
<td>Below 100/minute</td>
<td>100/minute or above</td>
</tr>
<tr>
<td>Grimace (Irritability)</td>
<td>No response</td>
<td>Grimace</td>
<td>Cough, sneeze, cry</td>
</tr>
<tr>
<td>Activity (Muscle tone)</td>
<td>Limp</td>
<td>Some flexion of extremities</td>
<td>Active motion</td>
</tr>
<tr>
<td>Respiratory effort</td>
<td>Absent</td>
<td>Slow and irregular</td>
<td>Strong cry</td>
</tr>
</tbody>
</table>

**TOTAL SCORE =**
Diabetic patients may have various complaints and are at risk for a multitude of medical problems. Diabetic patients may also become ill from hyperglycemia which may lead to diabetic ketoacidosis.

A. Perform Initial Treatment / Universal Patient Care Protocol.

B. Assess level of consciousness and blood glucose level by glucometer.

C. Draw blood sample (if available).

D. Treatment:

1. If patient is awake and oriented with no signs of altered mental status or confusion and simply has a blood glucose reading <60 mg/dl which is abnormal for the patient: Administer 15 gm of oral glucose and recheck blood glucose level. This treatment is based on the patient’s ability to maintain a patent airway.

2. Patient 1 month of age or younger – If blood glucose is < 60 mg/dl, administer 5 ml/kg Dextrose 10% IV/IO (D10 is prepared by mixing 40 ml of NS with 10 ml of D50W).

3. Patient older than 1 month but younger than 2 years old – If blood glucose is < 60 mg/dl, administer 2 ml/kg of D25 IV/IO; (D25 is prepared by mixing 25 ml NS with 25 ml D50W).

4. Patient 2 years of age or older – If blood glucose is < 60 mg/dl, administer D50W 1 ml/kg IV/IO. Maximum dose is 25 grams.

5. If no IV available, administer Glucagon as follows:
   a. Patient < 20 kg, administer 0.5 mg IM.
   b. Patient > 20 kg, administer 1 mg IM.

E. Hyperglycemia:

   a. If blood glucose is > 300 mg/dl and patient has signs and symptoms of diabetic ketoacidosis such as Kussmal respirations, acetone smell on breath, and/or history of not taking insulin administer 20 mg/kg bolus of Normal Saline; may repeat once if glucose remains > 300 mg/dl.

   b. After each bolus reassess patient for signs of fluid overload.
F. Reassess mental status and blood glucose level.

G. If blood glucose level remains < 60 mg/dl or > 300 mg/dl with associated signs and symptoms, contact Medical Command for additional treatment.
PEDIATRIC ALLERGIC REACTION / ANAPHYLAXIS

Anaphylaxis is an acute allergic reaction characterized by varying degrees of respiratory distress, hypotension, wheezing, hives, non-traumatic edema, and tachycardia. It may be precipitated by a bite or sting or from exposure to certain drugs or allergens. Respiratory Distress is categorized as follows:

- **Minimal Distress**: A slight increase in work of breathing with no wheezing or stridor evident.
- **Moderate Distress**: A considerable increase in work of breathing with wheezing and/or abnormal breath sounds evident.
- **Severe Distress**: Extreme work of breathing (retractions) with a decreased LOC.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. If reaction is secondary to a sting, remove injection mechanism, if present.

C. If patient is in mild distress with hives or itching but no or minimal respiratory distress (i.e. no wheezing or stridor):
   1. Consider **Diphenhydramine (Benadryl®)**.
      a. Pediatric: 1 mg/kg, IM or slow IV - Maximum 25 mg.
   2. Reassess for improvement or worsening of reaction.
   3. Transport and notify **Medical Command**.

D. If patient is in moderate distress with severe hives and/or moderate respiratory distress (i.e. wheezing):
   1. Immediately administer **Epinephrine, 1:1000**:
      a. 0.3 mg IM for patients > 30 kg
      b. 0.15 mg IM for patients < 30 kg
   2. Administer **Diphenhydramine (Benadryl®)**:
      a. Pediatric: 1 mg/kg, IM or slow IV - Maximum 25 mg.
   3. Expedite transport if not already in transport.
   4. If patient still wheezing, administer **Albuterol 2.5 mg with oxygen 8 - 10 LPM**.
5. If patient is still in moderate distress, consider repeating *Epinephrine* one time per MCP order.

E. If patient is in severe distress with signs of shock such as low blood pressure and/or decreased level of consciousness, treat as in “D” above, and if no response, then as follows:

1. Administer normal saline IV bolus of 20 ml/kg.

2. **Contact Medical Command** for further treatment options.

3. Reassess and expedite transport.
Pediatric Bronchospasm is a manifestation of several disease processes. In children, the most common are reactive airway disease (asthma), viral bronchiolitis, pneumonia, bronchopulmonary dysplasia, and foreign body obstructions. Physical examination reveals wheezing with a prolonged expiratory phase of breathing. Cough and dyspnea are often present. Respiratory Distress is categorized as follows:

- **Minimal Distress**: A slight increase in work of breathing and respiratory rate with minimal wheezing or stridor evident.
- **Moderate Distress**: A considerable increase in work of breathing and respiratory rate with wheezing and/or abnormal breath sounds evident. Nasal flaring and mild intercostal retractions are present.
- **Severe Distress**: Extreme work of breathing with nasal flaring and intercostal, subcostal, and suprasternal retractions. Additional accessory muscle use (sternocleidomastoid) may be evident. The expiratory phase becomes prolonged and may be silent. Wheezes may be absent as airflow is significantly compromised.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. If patient is in moderate distress and:

1. Heart rate is < 180:
   a. Administer **Albuterol**
      - 5.0 mg with oxygen 8 - 10 LPM for children 6 – 12 years of age.
      - 2.5 mg with oxygen 8 - 10 LPM for children < 6 years of age.
   b. Administer **Ipratropium Bromide (Atrovent®)** *(may be nebulized with the albuterol)*
      - 0.5 mg with oxygen 8 - 10 LPM for children 6 – 12 years of age.
      - 0.25 mg with oxygen 8 - 10 LPM for children > 1 – < 6 years of age.
      - *Contraindicated in children <1 year of age.*
   c. Reassess vital signs and lung sounds.

2. If distress is unrelieved and patient appears severe:
   a. Expedite transport.
   b. Administer a second dose of **Albuterol**
      - 5.0 mg with oxygen 8 - 10 LPM for children 6 – 12 years of age.
      - 2.5 mg with oxygen 8 - 10 LPM for children < 6 years of age.
c. Administer a second dose of Ipratropium Bromide (Atrovent®) (may be nebulized with the albuterol)
   • 0.5 mg with oxygen 8 - 10 LPM for children 6 – 12 years of age.
   • 0.25 mg with oxygen 8 - 10 LPM for children > 1 - < 6 years of age.
   • Contraindicated in children <1 year of age.

d. Administer Dexamethasone IV/IO/IM 0.6 mg/kg to a maximum dose of 10 mg

3. If distress is relieved:
   a. Monitor vital signs and transport.
   b. Notify Medical Command.

C. If patient is in severe distress and:

1. Heart rate is < 180:
   a. Administer Albuterol
      • 5.0 mg with oxygen 8 - 10 LPM for children 6 – 12 years of age.
      • 2.5 mg with oxygen 8 - 10 LPM for children < 6 years of age.
   b. Administer Ipratropium Bromide(Atrovent®) (may be nebulized with the albuterol)
      • 0.5 mg with oxygen 8 - 10 LPM for children 6 – 12 years of age.
      • 0.25 mg with oxygen 8 - 10 LPM for children 1 – 6 years of age.
      • Contraindicated in children <1 year of age.

   c. Administer Dexamethasone IV/IO/PO/IM 0.6 mg/kg to a maximum dose of 10 mg
   d. If transport time permits, consider administration of Magnesium Sulfate 50 mg/kg IV/IO diluted in 100ml of Normal Saline administered over 1 hour.

2. If heart rate > 180:
   a. Confirm that patient’s tachycardia appears to be from respiratory distress and not from other causes.
   b. Proceed with treatment as in “B” above.
c. Monitor patient’s symptoms and vital signs closely.

d. If any signs of increasing chest pain or cardiac symptoms develop, stop nebulizer, and treat per appropriate protocol.

D. **Contact Medical Command** for further treatment options

E. For extreme respiratory distress marked by diminished air movement or bronchospasm refractory to treatment, resulting in questionable delivery of nebulized medication, apnea, or other signs of impending respiratory arrest; administer Epinephrine (1:1,000) 0.15 mg IM.
Anaphylaxis is an acute allergic reaction characterized by varying degrees of respiratory distress, hypotension, wheezing, hives, non-traumatic edema, and tachycardia. It may be precipitated by a bite or sting or from exposure to certain drugs or allergens. Respiratory Distress is categorized as follows:

- **Minimal Distress:** A slight increase in work of breathing with no wheezing or stridor evident.
- **Moderate Distress:** A considerable increase in work of breathing with wheezing and/or abnormal breath sounds evident.
- **Severe Distress:** Extreme work of breathing (retractions) with a decreased LOC.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. If reaction is secondary to a sting, remove injection mechanism, if present.

C. If patient is in mild distress with hives or itching but no or minimal respiratory distress (i.e. no wheezing or stridor):
   1. Consider **Diphenhydramine (Benadryl®)**.
      a. Adult: 25 mg IM or slow IV/IO repeated in 30 minutes if symptoms persist.
   2. Reassess for improvement or worsening of reaction.
   3. Transport and notify **Medical Command**.

D. If patient is in moderate distress with severe hives and/or moderate respiratory distress (i.e. wheezing):
   1. Immediately administer **Epinephrine**, 1:1000 0.3 mg IM.
   2. Administer **Diphenhydramine (Benadryl®)**:
      a. Adult: 25 mg IM or slow IV/IO repeated in 30 minutes if symptoms persist.
   3. Expedite transport if not already in transport.
   4. If patient still wheezing, administer **Albuterol** 2.5 mg combined with **Ipratropium Bromide (Atrovent®)** 0.5 mg (Combi-Vent / Duo-Neb) with oxygen 8 - 10 LPM. If **Ipratropium Bromide (Atrovent®)** is contraindicated or the patient is a pediatric, administer **Albuterol** only.
5. If patient is still in moderate distress, consider repeating **Epinephrine** one time *per MCP order*.

E. If patient is in severe distress with signs of shock such as low blood pressure and/or decreased level of consciousness, treat as in “D” above and, if no response, then as follows:

1. Administer normal saline IV bolus of 20 ml/kg.

2. **Contact Medical Command** and consider **Epinephrine 1:10,000, 0.5 - 1.0 mg, slow IV per order of MCP**.

3. Reassess and expedite transport.
Heat exposure can cause various types of heat illness. Heat cramps, heat exhaustion, and heat stroke are the most often encountered. Heat cramps are often associated with heat exhaustion. Initial treatment for all heat illness is similar. Secondary treatment may differ after the signs and symptoms are specifically identified. Heat stroke is a serious life-threatening condition requiring rapid treatment and transport.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

1. Remove patient from hot environment and place in cool environment.
2. Loosen or remove clothing.

B. If patient has warm, moist skin, with general weakness, dizziness, nausea, or occasionally syncope (heat exhaustion):

1. If patient has normal level of consciousness and is not nauseated, encourage patient to drink oral fluids (cool water or an electrolyte replenisher).
2. If patient has decreased level of consciousness or is vomiting, administer normal saline IV 250 ml bolus, then run at 250 ml/hour.
3. Cool by fanning without chilling the patient. Watch for shivering.
4. If patient experiences muscle cramps, apply moist towels over cramped muscles.
5. Transport and notify **Medical Command**.

C. If patient has very hot, dry skin with rapid pulse, rapid shallow breathing, and/or altered mental status or unconsciousness (heat stroke):

1. Expedite transport.
2. Administer normal saline IV at 250 ml/hr initially.
3. If signs and symptoms of shock continue, treat per **Shock Protocol 4108**.

**Note:** Shock associated with heat stroke may be hypovolemic, distributive, or cardiogenic shock.

4. Cover patient with moist sheet.
5. Apply ice packs to axilla, neck, ankles, and wrists. Do not overcool and watch for shivering.

6. Monitor vital signs and temperature closely.

7. Notify Medical Command.

8. If no change in patient condition seek further treatment options per order of Medical Command.
When cold exposure affects the entire body: hypothermia or general cooling develops. When cold exposure affects a particular body part: local cooling, or frostbite occurs. Frostbite most commonly affects the ears, nose, face, hands, feet, and toes.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

1. Place patient in warm environment.
2. Treat with warm, humidified oxygen and warmed IV fluids.
3. Remove all wet clothing.
4. Insulate core (head, neck, and trunk) with warm blankets.
5. Rapid smooth transport.

B. If patient is hypothermic, alert, and responding appropriately:

1. Keep the patient still and handle very gently.
2. Actively rewarm the patient by applying heat packs, hot water bottles, or electric heating pads to neck, chest, and abdomen.
3. Allow patient to slowly drink warm fluids, but do not allow patient to drink stimulants.

4. **In consultation with Medical Command**, establish mode (ground vs. air) and destination of transport.

5. Monitor vital signs closely during transport.

C. If patient is hypothermic, unconscious or not responding appropriately:

1. Handle patient as gently as possible and expedite transport.
2. Wrap patient in insulated blankets for passive rewarming only.
3. Give nothing by mouth.
4. Continue IV normal saline at KVO.
5. If patient has no pulse, perform CPR with the following cautions:
ENVIRONMENTAL EMERGENCIES – COLD EXPOSURE

a. Check pulse for at least 60 seconds.
b. Defibrillate VF/VT at max joules.
c. Withhold IV medications until patient is rewarmed to core temperature of > 86° F.


7. In consultation with Medical Command, establish mode (ground vs. air) and destination of transport.

8. Further treatment per order of Medical Command.

D. Frostbite:

1. Remove constrictive clothing and jewelry and cover with dry dressing.

2. Do not rub, massage area or break blisters. Do not apply direct heat, allow patient to use affected area, or re-expose to cold.

3. Transport and notify Medical Command.
West Virginia has two native venomous snakes. These are the timber rattlesnake and copperhead. Both are hemotoxic. Not all venomous snakebites involve envenomation. Envenomed patients will have one or more fang marks with ecchymosis, progressive edema, severe burning pain, and/or non-clotted oozing blood.

A. Upon arrival, make sure the patient and snake are not in close proximity. Retreat well beyond striking range. Persons are often bitten again while trying to capture or kill the snake.

B. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

C. Keep patient calm. Movement can increase venom absorption.

D. Remove all jewelry and constrictive clothing on affected extremity.

E. Do not place IV in bitten extremity.

F. Locate fang puncture(s) and mark progression of erythema (redness around bite mark) and swelling at the initial assessment and every five (5) minutes thereafter.

G. Immobilize the extremity at the level of the heart. Do not apply ice.

H. Transport and notify Medical Command.

I. Contact Medical Command for further treatment orders and consider use of Pain Management Protocol 4902 per MCP order.

Note:

1. Do not bring a live snake to ER. If experienced personnel are available to properly kill and transport snake, then do so.

2. Patients previously envenomated are at risk of anaphylactic reaction. Be prepared to treat per Anaphylaxis Protocol 4501.
With near-drowning or drowning, always look for associated problems such as airway obstruction, cardiac arrest, heart attack, hypothermia, or substance abuse. Also be alert to associated injuries especially to the head and neck. **Do not** attempt a rescue in which you must enter deep water or swim unless trained to do so.

A. Remove patient from water as rapidly as possible while protecting C-spine.

B. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

C. If cold water drowning (< 70° F at recovery depth), refer to **Cold Exposure Protocol 4503**.

D. Expedite transport and notify **Medical Command**.

**Note:**

1. If patient is unconscious, assume spinal injury and fully immobilize patient on long backboard.

2. If confirmed cold water drowning, **Cease-Efforts Protocol 9102** should not be instituted unless patient has been rewarmed as **per MCP order**.
Shock, or hypoperfusion, is decreased effective circulation causing inadequate delivery of oxygen to tissues. Signs of early (compensated) shock include tachycardia, poor skin color, cool/dry skin, and delayed capillary refill. Systolic blood pressure is normal in early shock. In late (decompensated) shock, perfusion is profoundly affected. Signs include low blood pressure, tachypnea, cool/clammy skin, agitation, and altered mental status.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Categories of Shock:
   1. Hypovolemic
   2. Distributive
   3. Cardiogenic

C. Determine most likely cause of shock:
   1. Hypovolemic (loss of fluid) is most common. Usually from bleeding or vomiting and diarrhea.
   2. Distributive (loss of vascular tone) is usually from sepsis (infection). Other causes include anaphylaxis, toxic chemicals, or spinal cord injury.
   3. Cardiogenic (heart pump failure) - most common cause in adults is acute MI or CHF. Is rare in children.

D. If hypovolemic shock is suspected (most common):
   1. Monitor vital signs, ECG, and pulse oximeter.
   2. Expedite transport.
   3. As soon as possible, and without delaying transport, establish two (2) IV lines of normal saline with as large a catheter as possible up to a 14 gauge.
   4. If systolic blood pressure < 90 or patient has other signs and symptoms of shock such as tachycardia, delayed capillary refill, cool/clammy skin, or altered mental status, then administer 20 ml/kg normal saline IV up to a maximum of 2 liters and reassess.
5. If on reassessment blood pressure is still < 90 or other signs and symptoms of shock are still present, then contact Medical Command and reconsider causes.

E. If still felt to be hypovolemic shock:

1. Repeat 20 ml/kg normal saline IV per order of Medical Command.

2. Continue treatment per MCP orders.

F. If blood pressure is > 90 systolic and patient has no other signs or symptoms of shock, administer 100 ml/hour normal saline IV and continue to monitor patient.

G. If distributive shock is suspected:

1. If anaphylaxis or allergic reaction, refer to Allergic Reaction / Anaphylaxis Protocol 4501.

2. Initial treatment same as hypovolemic shock above.

3. If hypotension (BP < 90 systolic) and other signs and symptoms of shock persist after administration of second 20 ml/kg normal saline bolus, then:
   a. Reassess that shock is distributive and not from untreated hypovolemia.
   b. Contact Medical Command and consider Dopamine IV drip infusion at 5 micrograms/kg/minute per MCP order.
   c. Titrate Dopamine drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion per MCP order.

H. If cardiogenic shock is suspected:

1. Immediate transport.

2. Establish IV normal saline and administer fluid bolus of 250 ml assessing for signs of fluid overload.

3. Reassess appearance, vital signs, and signs and symptoms of shock.

4. If there is no rhythm disturbance and patient remains poorly perfused after the initial fluid bolus:
a. Contact Medical Command and consider repeat 250 ml fluid bolus or Dopamine IV drip infusion at 5 micrograms/kg/minute per MCP order.

b. Titrate Dopamine drip at 5 - 20 micrograms/kg per minute in an effort to improve perfusion per MCP order.

Note: Patients with distributive shock from infection may also have hypovolemia from vomiting, diarrhea, and poor fluid intake.
A patient experiencing a Cerebrovascular Accident (CVA or stroke) may have a variety of presentations. Most commonly, the patient will experience a new onset of unilateral weakness (hemiparesis), paralysis (hemiplegia), difficulty speaking (aphasia), or a combination of these. The pre-hospital goal is to recognize stroke symptoms, determine the severity of the stroke using a stroke severity screening tool and quickly notify medical command and receiving hospital in order to mobilize important time-sensitive intervention. Prior to hospital arrival, goals are to maintain stable vital signs, increase oxygen delivery if saturation is < 95%, protect the patient’s airway, and provide psychological support as well as immediate transport to the most appropriate stroke center.

A. Perform Initial Treatment / Universal Patient Care Protocol. If neurologic symptoms are evident, proceed with this protocol.

B. Check a serum glucose level with a glucometer. If the serum glucose is < 60 mg/dL, administer 50% dextrose IV. If after treatment, there is no resolution of the patient’s neurological symptoms, proceed with the remainder of this protocol.

C. Determine and document when the patient was Last Known Well (LKW) and the Time of Symptoms Onset (TSO) if known. Family or bystanders are often the best source of this information.

D. Determine the Cincinnati Pre-hospital Stroke Score (CPSS):
   1. Speech disturbances (abnormal speech).
   2. Facial weakness or paralysis (facial droop).
   3. Extremity weakness or paralysis (arm drift).

E. If the patient is positive for any of the items in D, the CPSS is positive and a pre-hospital stroke severity score should be performed. The FAST-ED® free mobile app (available under the JoinTriage® app for Apple iOS or Android devices - see Notes below) is recommended to help determine the possibility of a large vessel occlusion (LVO). LVOs are clots, in the neck or brain, which may be able to be removed at certain interventional facilities.

F. FAST-ED® is POSITIVE - If the FAST-ED® app indicates the potential for a LVO, the patient may benefit from being transferred directly to a Comprehensive Stroke Center (CSC) or a Primary Stroke Center with interventional capabilities (thrombectomy-capable or PSC-I are, in this protocol, interchangeable terms) rather than a Primary Stroke Center (PSC) or Acute Stroke Ready (ASR) facility. Contact Medical Command for possible diversion to a CSC or thrombectomy-capable PSC-I if the following criteria are met:
1. The LKW is < 24 hours.

2. Diversion to a CSC/PSC-I will add no more than 45 minutes transport time to the nearest PSC or ASR or will not preclude TPA administration, if applicable. That is, if transport to the CSC/PSC-I will take the patient out of the TPA window, transport to the nearest PSC or ASR where the patient can receive TPA prior to transfer to an interventional facility (the patient must receive that TPA within 4.5 hours of the LKW, a LKW > 3.5 hours makes it unlikely this will occur).

3. Establish Transport Mode (ground vs. air) and destination in consultation with Medical Command if transport time is > 30 minutes.

G. If the above criteria are not met or LVO is not likely according to FAST-ED®, transport directly to the nearest PSC or ASR. Notify Medical Command.

H. Initiate immediate transport with head elevated at least 30 degrees and on left side if there is a decreased level of consciousness.

I. Obtain 12 lead EKG while in transport as not to cause delay.

J. Initiate a second IV 0.9% NS KVO or saline lock, if time permits.

Notes:

1. If possible, transport a witness, family member, or caregiver with the patient to verify the time of onset or last know well. If this cannot be accomplished provide the receiving hospital with a cell phone number to reach such a witness.

2. It is preferred that you bring the patient’s medications to the receiving ED but if unable to do so, a list will suffice.

3. The priority of transfer facilities for patient’s determined to have a possible LVO (by FAST-ED®) should be CSC first, then a PSC-I, and lastly a PSC or ASR when no CSC or PSC-I meets the above criteria in F.

4. To acquire and access FAST-ED®:
   a. From the App Store of either Apple iOS or Android devices, download JoinTriage®
   b. Open JoinTriage®, create an account - email address is ID, choose a password
   c. Open JoinTriage® and choose FAST-ED® from the options in opening screen
   d. You may stay signed in to JoinTriage®. Subsequent opening of the app won’t require your email and password.
5. Regional Medical Command Centers with the consultation of the Regional Medical Directors in their areas of coverage will maintain a list of hospitals and their capabilities to treat stroke patients (whether or not specifically designated) in the interest of best directing pre-hospital care or destination decisions.
A. Perform Initial Treatment / Universal Patient Care Protocol.

B. Protect patient from injury. Place on left side if decreased level of consciousness.

C. Obtain history to help determine origin of seizure:
   1. Trauma
   2. Suspected overdose - refer to Ingestion/Poisoning/Overdose Protocol 4606.
   3. History of seizures and patient is taking anti-seizure medications.

D. If patient is actively seizing:
   1. Protect airway. Do Not attempt intubation during convulsions.
   2. Calm bystanders and family.
   3. Obtain key information and prepare for transport.
   4. Quickly assess serum glucose with a glucometer and attempt to establish IV normal saline KVO or saline lock.
   5. If glucose level is < 60 mg/dl:
      a. Administer D50W, 25 gm IV.
      b. If no IV available, administer Glucagon 1 mg IM.
   6. Expedite transport and contact Medical Command:
   7. If seizure lasts longer than five (5) minutes or two (2) or more episodes of seizure activity occur between which the patient does not regain consciousness, administer:
      a. Midazolam (Versed®) 2 mg IV/IO/IM or 5 mg (IN) via atomizer.

NOTE: Midazolam may not be tolerated well in patients over 55 years of age. Doses should be initiated low and repeated as needed. Administration of these medications in patients > 55 years of age shall be as follows:

Midazolam (Versed®) 1 mg IV/IO/IM or 5 mg (IN) via atomizer.
8. If seizure continues, further treatment as **ordered by MCP**.

E. If patient is not actively seizing:
   a. Monitor vital signs closely and be alert for recurrence of seizure.
      a. Transport.
      b. Perform remaining assessment as indicated.
      c. Notify **Medical Command**.
Diabetic patients may have various complaints and are at risk for a multitude of medical problems. Diabetic patients may also become ill from hyperglycemia which may lead to diabetic ketoacidosis.

A. Perform Initial Treatment / Universal Patient Care Protocol.

B. Assess level of consciousness and blood glucose level by glucometer.

C. Draw labs if time permits.

D. Hypoglycemia Treatment:
   1. If patient is awake and oriented with no signs of altered mental status or confusion and simply has a blood glucose reading <60 mg/dl which is abnormal for the patient: Administer 15 gm of oral glucose and recheck blood glucose level.
   2. If patient is malnourished, has HIV/AIDS, receives dialysis, is a known alcoholic, or has other grossly impaired nutritional status, administer:
      Thiamine 100 mg slow IVP over one (1) minute, prior to Oral Glucose, Dextrose, or Glucagon administration
   3. If blood glucose is < 60 mg/dl, Dextrose 50% in water (D50W) - 25 grams IVP may be repeated once after five (5) minutes if patient remains hypoglycemic.
   4. If unable to initiate an IV, and blood glucose is < 60 mg/dl, administer Glucagon 1mg IM (if over 25 kg) or 0.5 mg IM (if < 25 kg).

E. Hyperglycemia:
   1. If blood glucose is > 300 mg/dl and patient has signs and symptoms of diabetic ketoacidosis such as Kussmal respirations, acetone smell on breath, and/or history of not taking insulin administer 1 Liter bolus of Normal Saline; may repeat once if glucose remains > 300 mg/dl.
      a. Bolus gently with 250 ml at a time if patient has a history of end stage renal disease, is a dialysis patient, or has a history of congestive heart failure.
      b. After each bolus reassess patient for signs of fluid overload.

F. Reassess mental status and blood glucose level.
G. Consider cardiac monitoring looking for peaked “T” waves if time permits.

H. If blood glucose level remains < 60 mg/dl or > 300 mg/dl with associated signs and symptoms contact Medical Command for additional treatment.
To use this protocol, a patient must have a current Glasgow coma scale total < 12. This protocol is intended to guide the management of patients with a decreased level of consciousness who have no history of trauma.

A. Perform Initial Treatment / Universal Patient Care Protocol.

B. Maintain airway with the following special considerations in patients with decreased level of consciousness.

1. Reassess that there is no history of even remote trauma which could have resulted in a cervical spine injury. If in doubt, protect spine by performing Spinal Trauma Protocol 4103.

2. If a readily treatable cause is suspected such as hypoglycemia or narcotic overdose, and ventilation can be maintained without intubation, consider assisting ventilation without intubation until treatment is administered and condition reassessed.

3. Possible causes of unconsciousness or altered mental status (AEIOU-TIPS):

   A Acidosis, alcohol
   E Epilepsy
   I Infection
   O Overdose
   U Uremia (kidney failure)
   T Trauma, tumor
   I Insulin
   P Psychosis
   S Stroke

C. Assess blood glucose level by glucometer and draw labs if available.

D. If blood glucose level is ≤ 60 mg/dl, then:

1. Treat per Diabetic Emergencies Protocol 4604.

E. If blood glucose level is > 60, administer Naloxone (Narcan®) 0.4 mg/minute up to 2 mg IV titrated to restore the respiratory drive. If IV cannot be established, administer 2 mg intranasal (IN) via atomizer, or intramuscular (IM).

F. Expedite transport and notify Medical Command.
There are numerous agents and drugs which produce toxic effects in patients. This protocol is designed to provide the general guidelines for treatment. Specific treatments or antidote therapy may be appropriate as directed by the Medical Command Physician in consultation with the WV Poison Control Center. Providing as much information as possible to Medical Command will allow more accurate evaluation, treatment, and coordination of medical care.

A. Perform **Initial Treatment / Universal Patient Care Protocol**.

B. Routes:

1. **Ingested Poisons:**
   a. Protect airway.
   b. Do not induce vomiting.
   c. Transport the patient with all containers, bottles, and labels from the substance, if safe to do so.

2. **Inhaled Poisons:**
   a. Immediate removal from hazardous environment.
   b. Maintain airway and support respirations.
   c. Transport the patient with all containers, bottles, and labels from the substance, if safe to do so.

3. **Absorbed Poisons:**
   a. Remove the poison using procedures described in **Burn Protocol 4506**.
   b. Transport the patient with all containers, bottles, and labels from the substance, if safe to do so.

4. **Injected Poisons:**
   a. See treatment guidelines for specific substance.

C. After decontamination procedures have been completed, do not delay transport.

*Note:* Remember that a toxic exposure poses a significant risk to both the rescuer and patient; appropriate scene management and decontamination are critical.
D. Determine the following:

a. What?
b. When?
c. How much?
d. Over what period of time?
e. Were any actions taken by bystanders, family members, and/or patient prior to EMS arrival?

E. Overdose / Toxic Ingestion / Poisoning Emergencies

1. **Alcohol**:
   
a. Emergencies involving alcohol can range from acute intoxication to alcohol withdrawal and delirium tremens (DTs).

b. Assess the patient and follow the proper protocol for medical management based on clinical presentation.

   i. Consider hypoglycemia. Perform rapid glucose determination. If glucose < 60 mg/dL or clinical signs and symptoms indicate hypoglycemia, refer to the Diabetic Emergencies Protocol 4604.

   ii. For signs and symptoms of hypovolemic shock or dehydration, follow the Hypoperfusion Shock Protocol 4108.

   iii. For seizures due to alcohol withdrawal, refer to the Seizure Protocol 4603.

c. For alcohol withdrawal with severe agitation, tachycardia, hypertension, or hallucinations:

   i. **Midazolam** (Versed®) 2 mg IV/IO/IM or 5 mg (IN) via atomizer.

   **NOTE**: Midazolam may not be tolerated well in patients over 55 years of age. Doses should be initiated low and repeated as needed. Administration of these medications in patients > 55 years of age shall be as follows:

   **Midazolam** (Versed®) 1 mg IV/IO/IM or 5 mg (IN) via atomizer.
2. Narcotics / Opiates:
   a. Support respirations, as necessary, with a BVM and supplemental O2. Defer consideration of advanced airway management until after administration of Naloxone, if BVM ventilation is adequate based on SpO2 at 94 - 99%.
   b. Consider hypoglycemia. Perform rapid glucose determination. If glucose is < 60 mg/dL or clinical signs and symptoms indicate hypoglycemia, refer to the Diabetic Emergencies Protocol 4604.
   c. For a suspected narcotic overdose complicated by respiratory depression:
      i. Administer Naloxone (Narcan®) up to 2 mg IV titrated slowly at 0.4 mg/minute to restore the respiratory drive. If patient does not show signs of improvement (adequate respiratory response/increased LOC) administer up to an additional 2 mg IV titrated slowly at 0.4 mg/minute.
      ii. If unable to obtain IV access, give Naloxone (Narcan®) 2 mg IN. Medication should be administered equally in each nostril. If patient does not show signs of improvement (adequate respiratory response/increased LOC) administer an additional 2 mg IN.

3. Tricyclic Antidepressants:
   a. Support respirations, as necessary, with a BVM and supplemental O2.
   b. For serious signs and symptoms (altered mental status, sustained tachycardia < 120 bpm, widened QRS complex or hypotension):
      i. Infuse a 20 mL/kg bolus NS. If no improvement after two 20 mL/kg boluses NS, assess for fluid overload during administration, then:
      ii. Contact Medical Command for further treatment options.

   **Tricyclic Antidepressants include:** Amitriptyline (Elavil®), Doxepin (Sinequan®, Adepin®), Imipramine (Tofranil®).

4. Cholinergics:
   a. Support respirations, as necessary, with a BVM and supplemental O2.
   b. For serious signs and symptoms (respiratory distress, SLUDGE syndrome,
OVERDOSE / TOXIC INGESTION / POISONING

seizures, or HR < 60 bpm): Administer **Atropine** 2 mg IV. Repeat every five (5) minutes, if needed.

5. **Calcium Channel Blockers:**
   a. Support respirations, as necessary, with a BVM and supplemental O2.
   b. For serious signs and symptoms (altered mental status, HR < 60 bpm, conduction delays, SBP < 90 mm Hg, slurred speech, nausea/vomiting):
      i. Administer **Atropine** 1 mg IV.
      ii. If no response to the initial **Atropine** dose contact **Medical Command** for further treatment.

6. **Beta Blockers:**
   a. Support respirations, as necessary, with a BVM and supplemental O2.
   b. For serious signs and symptoms (altered mental status, HR < 60 bpm, conduction delays, SBP < 90 mm Hg, slurred speech, nausea/vomiting):
      i. Infuse a 20 mL/kg bolus NS. If no improvement after two (2) 20 mL/kg boluses NS, contact **Medical Command** for direction. If the patient develops signs and symptoms of fluid overload respiratory distress (dyspnea, crackles, rhonchi, decreasing SpO2), slow the IV to KVO.
      ii. Administer **Glucagon** 1 mg IV. If additional **Glucagon** is available, administer 2 mg IV as the initial dose repeated at 2 mg IV in 10 minutes.
      iii. If no response, consider transcutaneous pacing and contact **MCP**.

7. **Stimulants:**
   a. Assess the patient and follow the proper protocol for medical management

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Pesticides (Organophosphates, Carbamates) and nerve gas agents (Sarin, Soman) are the most common exposures.

- **S** – Salivation
- **L** – Lacrimation
- **U** – Urination
- **D** – Defecation
- **G** – Gastrointestinal cramping
- **E** – Emesis
based on clinical presentation.

b. Support respirations, as necessary, with a BVM and supplemental O2.

c. Serious signs and symptoms (seizures, tachydysrhythmias, etc.):

i. For tachydysrhythmias with HR > 120 bpm, **Midazolam** (Versed®) 2 mg slow IV push, titrated to effect.

ii. For patients that are severely agitated or combative, follow the **Behavioral Emergencies / Patient Restraint Protocol 4607**.

8. **Cyanide Exposure (Optional):**

a. Support respirations, as necessary, with a BVM and supplemental O2.

b. Serious signs and symptoms [altered mental status, confusion, disorientation, mydriasis (excessive pupil dilation), seizures, coma and cardiovascular collapse; see drug reference for additional signs and symptoms]

i. Administer Cyanokit® 5 g of Hydroxocobalamin, infused over 15 minutes. Note: Pediatric dose is 70 mg/kg.

ii. If signs and symptoms persist, contact **MCP** for additional treatment.

c. Signs and symptoms of Cyanide poisoning include headache, confusion, dyspnea, chest tightness, nausea, altered mental status, seizures, coma, mydriasis, hypertension (early), hypotension (late), tachypnea (early), cardiovascular collapse, and vomiting.

d. Reconstitute **Hydroxocobalamin** with Normal Saline per manufacturer’s directions.

e. Comprehensive treatment of acute Cyanide intoxication requires support of vital functions.
A. Assure scene safety. Do not engage patient unless risk of harm is minimized by law enforcement.

B. Implement SAFER mnemonic:
   - Stabilize the situation by containing and lowering the stimuli.
   - Assess and acknowledge the crisis.
   - Facilitate the identification and activation of resources.
   - Encourage patient to use resources and take actions in his/her best interest.
   - Recovery or referral – leave patient in care of responsible person or professional.

C. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

D. For altered mental status, perform rapid glucose determination.

E. Control environmental factors; attempt to move patient to a private area free of family and bystanders. MAINTAIN ESCAPE ROUTE.

F. Attempt de-escalation, utilize an empathetic approach. Ensure patient safety and comfort. AVOID CONFRONTATION.

G. Physical Restraint: (Commercially available soft restraints are acceptable.)

1. Consider restraining patient, as needed, to protect life or prevent injury per MCP order with the following considerations:
   a. Restrain patient in the supine position or left lateral recumbent position only.
   b. Ensure method of restraint does not affect breathing or circulation.
   c. Use the least restrictive or invasive method of restraint which will protect the patient and others. In many instances, full restraints will be appropriate to ensure patient and provider safety during transport.

2. Continually monitor the restrained patient’s airway, circulatory, respiratory, and mental status frequently.
H. Chemical Restraint - Behavioral:

1. If psychotic/behavioral agitation is suspected, administer **Midazolam (Versed®)** 5 mg IV, IM or IN.

   **NOTE:** Midazolam may not be tolerated well in patients over 55 years of age. Doses should be initiated low and repeated as needed. Administration of these medications in patients > 55 years of age shall be as follows:

   **Midazolam (Versed®)** 2 mg IV/IM or 5 mg (IN) via atomizer.

2. If patient remains agitated or aggressive in five (5) minutes, administer **Haloperidol (Haldol®)** 5 mg IM.

3. If dystonic reaction (dyskinesia) is noted secondary to **Haloperidol (Haldol®)** administer **Diphenhydramine (Benedryl®)** 25 mg IV or IM

I. Chemical Restraint – Excited Delirium:

1. **(OPTIONAL):** If psychotic/behavioral extreme excited delirium is suspected, administer **Ketamine 5 mg/kg IM** to a max single dose of 320 mg

   **-OR-** If IV/IO already in place, 2 mg/kg IV/IO to a max single dose of 200 mg.

   **NOTE:** If suspected or known presence of benzodiazepines in patient, consider half dose to minimize respiratory depression

II. Transport as soon as possible.

K. If patient is medically stable, in **consultation with Medical Command**, consider transporting to a facility with advanced psychiatric care capability.
Obtaining a detailed history can be very important in treating the pregnant or potentially pregnant patient. The following questions should be asked to the obstetric patient:

- Length of gestation?
- Number of prior pregnancies (gravidia)?
- Number of prior pregnancies carried to term (para)?
- Previous cesarean sections?
- History of gynecologic or obstetric complications?
- Is there pain or contractions?
- Does patient feel the urge to push or have a bowel movement?
- Is there vaginal bleeding or discharge?
- Prenatal care?
- Multiple births anticipated?

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. Transport pregnant patients on left side unless in active labor.

C. If vaginal bleeding is present, attempt to determine amount.

D. If patient is in late stages of pregnancy and shows signs of preeclampsia and/or eclampsia (toxemia) such as edema, hypertension, and hyper-reflexes:
   1. Transport, as smoothly and quietly as possible, and monitor closely for signs of seizure activity.
   2. If seizures occur, treat per **Seizure Protocol 4603**.

E. **Normal delivery:**
   1. Determine timing and duration of contractions, and observe for crowning.
   2. Transport on left side, if time permits.
   3. If delivery is imminent, proceed with delivery:
      a. Prevent explosive delivery by supporting head and perineum.
      b. Suction only if there is believed to be an airway obstruction while being cognizant of bradycardia and hypoxia.
      c. If cord is around neck and is loose, slip over head out of way. If cord is tight, place two clamps and cut in between and unwind.
d. Hold and support infant during delivery. Refer to Newborn Infant Care Protocol 4410.

4. APGAR score at one (1) and five (5) minutes (see chart in “I”).

5. When cord ceases pulsating, clamp at 6 and 8 inches from navel, cut cord between clamps.

6. Resume transport and continue treatment en route.

7. Notify Medical Command and prepare to deliver placenta.

8. Massage the fundus after placenta is delivered.

F. Breech Delivery:

1. Expedite transport and notify Medical Command.

2. Allow spontaneous delivery with support of presenting part at the perineum.

3. If head is not delivered within four (4) minutes, insert a gloved hand into the vagina to form a “V” airway around infant’s nose and mouth.

G. Prolapsed cord:

1. Place mother in knee-chest position or on hands and knees with knees to chest.

2. Ask mother to pant during contractions and Not bear down.

3. Insert gloved hand into vagina to push presenting part of baby off the cord to ensure continued circulation through the cord. Continue until relieved at hospital.

4. Expedite transport and notify Medical Command.

H. Limb presentation:

1. Rapid transport.

2. Notify Medical Command.
I. APGAR Scoring Chart:

<table>
<thead>
<tr>
<th>THE APGAR SCORE</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Body and extremities blue, pale</td>
<td>Body pink, extremities blue</td>
<td>Completely pink</td>
</tr>
<tr>
<td>(Skin color)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pulse rate</strong></td>
<td>Absent</td>
<td>Below 100/minute</td>
<td>100/minute or above</td>
</tr>
<tr>
<td><strong>Grimace</strong></td>
<td>No response</td>
<td>Grimace</td>
<td>Cough, sneeze, cry</td>
</tr>
<tr>
<td>(Irritability)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td>Limp</td>
<td>Some flexion of extremities</td>
<td>Active motion</td>
</tr>
<tr>
<td>(Muscle tone)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Respiratory effort</strong></td>
<td>Absent</td>
<td>Slow and irregular</td>
<td>Strong cry</td>
</tr>
</tbody>
</table>

**TOTAL SCORE =**
Paramedic Treatment Protocol

NAUSEA / VOMITING

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Presentation:
   1. Gastrointestinal symptoms
   2. Respiratory infection
   3. Heat-related illness
   4. Diabetes
   5. Cardiac-related signs and symptoms

C. Place patient in position of comfort.

D. Assess and treat for shock, if indicated.

E. Administer 20 ml/kg fluid bolus, as needed.

F. Cardiac monitor (12 lead EKG as indicated.)

G. Administer Ondansetron Hydrochloride (Zofran®) 4 mg ODT Tablet PO dissolved in mouth or 4 mg undiluted IVP over four (4) minutes or IM.

H. Administration of Ondansetron Hydrochloride (Zofran®) is contraindicated in pre-existing prolonged QT interval.

I. The administration of Ondansetron Hydrochloride (Zofran®) is contraindicated in the first trimester of pregnancy and requires MCP Order.
Children with Special Health Care Needs (CSHCN) can present unique challenges for providers. **Listen to the caregiver and respect their guidance regarding the child’s treatment.** The caregiver is your best source of information as they care for the child on a daily basis.

**Before leaving the scene, ask the caregiver if they have a “go bag” and carry it with you.** “Go Bags” or diaper bags contain supplies to use with the child’s medical technologies and additional equipment such as extra tracheostomy tubes, adapters for feeding tubes, suction catheters, etc. are often maintained by the caregivers of special needs children. **Treat a CSHCN as you would any other patient – ABC’s first.**

A. Perform **Initial Assessment / Universal Patient Care Protocol** as you would any patient.

1. General impression using **Pediatric Assessment Triangle (PAT).** Appearance, work of breathing, and circulation of skin. (Appendix C)

2. Hands on physical assessment using **Pediatric ABCDE’s.** Airway, breathing, circulation, disability, and exposure.

3. Suction through the nose, mouth, or tracheostomy tube, as needed.

4. Obtain a complete medical history for the patient, including history of the present illnesses and past medical history.

B. Bring all of the child’s medical charts or medical forms that the caregiver may have, the child’s “go bag” or other similar bag, and any supplies that the caregiver may have.

C. Transport to the nearest appropriate facility as soon as possible.

D. Perform additional assessment and treatments, as required, following general guidelines as outlined in the **Initial Treatment / Universal Patient Care Protocol** with the following special notes for the pediatric patient.

1. Do not use nasal cannula in infants and small children. Use blow-by oxygen or mask to keep SpO2 at 94 - 99 %.

2. Perform focused history, more detailed physical exam, and ongoing assessment at the appropriate time before and during transport.
3. Advanced Life Support (ALS) personnel treating a critically ill child who is unconscious, if unable to establish IV, then establish intraosseous route.

E. Reassess the child at least every 3 - 5 minutes, more frequently as necessary and possible.
Central venous lines and implanted vascular access ports are frequently utilized in children with complex or complicated medical issues. The devices allow for continuous or intermittent vascular access in order to administer intravenous fluids or medications. Central venous catheter tips generally terminate in the Superior/Inferior Vena Cava or within the Right Atrium. Common types are the traditional Central Venous Line (CVL), Peripherally Inserted Central Catheter (PICC), and Vascular Access Port (VAP).

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Determine the need for vascular access in the pre-hospital environment.
   1. Assess the insertion site and inspect the central venous device for damage, signs of local infection, or edema.

C. ALL EMS PROVIDERS
   1. If breathing is adequate, place the child in a position of comfort and administer high flow oxygen to maintain a SPO2 of at 94 to 99%.
   2. Monitor and maintain adequate airway and breathing during transport.
   3. Bring all of the child’s medical charts or medical forms that the caregiver may have, the child’s “go bag” or other similar bag, and any supplies that the caregiver may have.
   4. Transport to the nearest appropriate facility as soon as possible.
   5. Reassess the child at least every 3 - 5 minutes or more frequently as necessary and possible.
CSF (Cerebrospinal fluid) shunt is a special catheter to drain cerebrospinal fluid from the brain. It runs under the skin from the skull to the chest or abdomen or any tissue with enough epithelial cells to absorb the incoming CSF.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Provide immediate resuscitation, as needed, and make immediate transport decision.

C. Assess for signs and symptoms of shunt obstruction or shunt infection.
   1. Fever
   2. Bulging Fontanel
   3. Altered Glasgow Coma Scale

D. Initiate cardiac monitoring. Treat dysrhythmias with the appropriate algorithm.

E. Elevate the child’s head keeping it in the midline position.

F. Bring all of the child’s medical charts or medical forms that the caregiver may have, the child’s “go bag” or other similar bag, and any supplies that the caregiver may have.

G. Transport to the nearest appropriate facility, as soon as possible.

H. Reassess the child at least every 3 - 5 minutes, more frequently as necessary and possible.
Feeding tubes are used in the home care setting to provide feedings for children usually due to impaired or insufficient oral intake. They can be placed in the stomach or jejunum (upper part of the small intestine) through the nose, mouth, or abdomen. These tubes may be positioned through the nasal orifice, mouth, or percutaneously.

**Note:** Caregivers are the best resource for tube care and troubleshooting malfunctions. Some percutaneous tubes continue on into the jejunum, therefore, **DO NOT TRY TO REPLACE OR REMOVE TUBE.**

There can be many reasons for leaking catheters such as balloon deflation, coughing, constipation, bowel obstruction, and seizures. Treat any medical problem according to the appropriate protocol.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. Stabilize the tube in place.

C. If there are fluids infusing through the feeding tube:
   1. Stop all infusing fluids.
   2. Have family members flush the tube with water.
   3. Clamp the tube.

D. Initiate cardiac monitoring:
   1. Treat any arrhythmias with appropriate protocol.

E. If signs and symptoms of shock, obtain IV access as age-appropriate and infuse a fluid bolus of 20 ml/kg of NS. If IV access cannot be readily accessed within 90 seconds or two (2) peripheral attempts an IO may be established per order of **Medical Command.**
   1. 20 ml/kg fluid bolus NS may be repeated per order of **MCP as necessary.**
   2. If peripheral perfusion is maintained, IV should be infused at a KVO rate.
F. Transport child in semi-fowlers sitting position with head of cot in 30 - 45 degree elevated position unless contraindicated, i.e., trauma, etc.

G. Bring all of the child’s medical charts or medical forms that the caregiver may have, the child’s “go bag” or other similar bag, and any supplies that the caregiver may have.
A. Perform Initial Treatment / Universal Patient Care Protocol

1. Suction through the nose, mouth, or tracheostomy tube, as needed.

B. Provide immediate resuscitation, as needed, and immediately make transport decision.

C. Leave Apnea monitor on.

D. Apnea monitors should be transported with the child to the hospital. Most monitors contain a computer chip that records information that can be downloaded into a computer at the home hospital to determine the origin of the monitor alarms (high or low heart rate, apnea, or artifact).

E. Bring all of the child’s medical charts or medical forms that the caregiver may have, the child’s “go bag” or other similar bag, and any supplies that the caregiver may have.

F. Transport to the nearest appropriate facility as soon as possible.

G. Perform additional assessment and treatments as required following Initial Treatment / Universal Patient Care Protocol.
An internal pacemaker is a medical device placed under the skin connected with wires to the heart to regulate the heart rate. An internal defibrillator is an electronic device implanted under the skin to monitor the heart rhythm and deliver shocks, as necessary, to treat extremely fast heart rates that originate in the ventricles.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Assess and maintain airway patency.

C. Check pulse:
   1. If no pulse is present, begin chest compressions and follow the appropriate algorithm.
   2. Determine if the child has a pacemaker or defibrillator:
      a. The internal pacemaker can easily be felt near the clavicle or in the abdomen in younger children.
   3. If defibrillation or pacing is needed, DO NOT place the treatment pads directly over the internal pacemaker or defibrillator generator.

D. Establish IV/IO access:
   1. Treat shock, as indicated.

E. Initiate cardiac monitoring.

F. Try to determine if the cause of the emergency is related to a malfunction of the pacemaker or defibrillator.

G. Contact Medical Command for additional instructions.

H. Bring all of the child’s medical charts or medical forms that the caregiver may have, the child’s “go bag” or other similar bag, and any supplies that the caregiver may have.
Ventilators and BiPAP are medical devices designed to assist with ventilation of the special needs patient. Symptoms of failure of the ventilator or BiPAP machine may include: apnea and/or cyanosis, medication or environmental reactions, nasal flaring, and altered levels of consciousness. BiPAP machines are used to augment patient breathing and do not ventilate them.

Patients with home medical devices have caregivers that are well-educated as to their usage. If they are calling EMS, it is usually because they are in trouble and have tried everything to get things back to normal, or they are having a problem with the equipment but the child is sick and they need help transporting the equipment and the child to the hospital.

A. Perform **Initial Treatment / Universal Patient Care Protocol** and follow the proper protocol for medical management based on clinical presentation.

B. If not breathing:
   1. Disconnect the ventilator tubing from the patient.
   2. Attach the bag-valve device to the patient and begin manual ventilation.
      a. If chest rise is shallow, adjust the patient’s airway position and check to see that the bag valve device is securely connected to the tracheostomy.
      b. Assess the airway for obstruction. Follow tracheostomy protocol to open the airway.
      c. Assess for equal chest rise and breath sounds bilaterally.
      d. Assist caregiver in trouble-shooting the equipment to check for problems.

C. Obtain a complete history of the present illness, past medical history, and interventions taken to correct the emergency before EMS arrival.
Airway management is an essential part of the care of all patients. It is an ongoing process which requires assessment of many different signs and symptoms. Evaluating and recognizing respiratory distress, respiratory failure, and respiratory arrest are critical in determining what level of intervention is required to properly treat the patient. The key areas to be assessed include: general impression, patency of airway, presence or absence of protective reflexes, and adequacy of breathing.

A. Assess airway for patency and protective reflexes.

B. Determine adequacy of breathing by assessing the rate, depth, effort, and adequacy of ventilation by inspection and auscultation.

C. If airway is patent and spontaneous breathing is adequate, and:
   1. No or mild to moderate distress: administer oxygen at 2 - 6 LPM nasal cannula to maintain SpO2 at 94 - 99 %.
   2. Severe distress: administer oxygen at 15 LPM non-rebreather mask to maintain SpO2 at 94 - 99 %.

D. If airway is not patent, then:
   1. Attempt to open airway by using head tilt/chin lift if no spinal trauma is suspected, or modified jaw thrust if spinal trauma is suspected.
   2. If foreign body obstruction of airway is suspected, then refer to Airway Obstruction Protocol 4305.
   3. If anatomical obstruction is occurring and airway cannot be maintained with positioning and the patient is unconscious, consider placing an oropharyngeal or nasopharyngeal airway adjunct.

E. If breathing is inadequate, ventilate with 100% oxygen.

F. If airway cannot be maintained by the above means, including attempts at assisted ventilations, prolonged assisted ventilation is anticipated:
   1. Perform endotracheal intubation.
   2. Confirm endotracheal tube placement using clinical assessment and end-tidal CO2 monitoring.
G. If endotracheal intubation is not possible, insert supra-glottic airway and confirm placement or consider **Rapid Sequence Intubation Protocol 4903**, if approved to do so.

H. Continue ventilation with 100% oxygen.

I. If unable to secure airway by any of the above methods and patient is in impending danger of cardio/respiratory arrest, consider **optional Percutaneous Cricothyrotomy - Protocol 8401** per MCP Order.

J. Post Intubation Management:

1. If patient is intubated and shows evidence of need for sedation/pain management to facilitate tolerating the endotracheal tube, administer:
   
   a. **Midazolam** (Versed®) 2 mg IV/IO every five (5) minutes to a maximum dose of 10 mg. Hold for systolic BP < 90 mmHg.

   AND/OR

   b. **Fentanyl** (Sublimaze®) 1 microgram/kilogram – up to 100 micrograms max single dose, slow IV. Additional doses require MCP order.

   **Note:** These medications may be given IM if IV/IO not available or becomes dislodged.

K. If patient is still restless and/or combative, contact **Medical Command** for further treatment considerations.

   **Note:**

   1. Do not use nasal route for airway if maxillofacial trauma is present.

   2. Any patient with suspected spinal trauma needs in-line stabilization with any airway procedure.

   3. Consider gastric tube placement if patient is intubated.
PATIENT COMFORT / PAIN MANAGEMENT

Pain management in the field may be indicated when a patient is experiencing severe pain. Except in rare circumstances, pain medication should not be administered to multi-system trauma patients with possible head, abdomen, or chest injuries. Nausea and/or vomiting can be a side-effect of narcotic pain medications or associated with many conditions including motion sickness while being transported.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Review patient’s allergies, current medications, and past medical history.

C. If severe pain:

   1. Administer Fentanyl (Sublimaze®) 1 microgram/kilogram – up to 100 micrograms max single dose, slow IV.

      If no pain relief after two (2) minutes, may repeat Fentanyl PER MEDICAL COMMAND PHYSICIAN at 1 microgram/kilogram up to 100 Micrograms max per dose.

      **DO NOT** administer Fentanyl (Sublimaze®) to children less than 12 years old without MCP order. Pediatric dose is 1 microgram/kg max dose of 50 micrograms per MCP order.

      -OR-

      Administer Morphine Sulfate 2 mg slow IV may repeat every five (5) minutes up to 10 mg unless pain is relieved.

      • If systolic BP drops below 90 mm/Hg discontinue analgesic administration and administer IV fluid bolus 250 mL Normal Saline and contact Medical Command.

      **DO NOT** administer Morphine Sulfate to children less than 12 years old without MCP order. Pediatric dose of Morphine Sulfate is 0.05 mg/kg per MCP order.

**NOTE:** Administration of pain medications may not be tolerated well in patients over 55 years of age. Doses should be initiated low and repeated as needed. Administration of these medications in patients > 55 years of age shall be as follows:
Administer **Fentanyl** (Sublimaze®) 0.5 microgram/kilogram—up to a max initial dose of 100 micrograms. Additional doses require **MCP order**.

-OR-

Administer **Morphine Sulfate** 1 mg slow IV; may repeat every five (5) minutes up to 10 mg unless pain is relieved.

- Use caution if hypotensive and/or bradycardic. Consider use of **Fentanyl** (Sublimaze®).
- If systolic BP drops below 90 mm/Hg during administration of Morphine Sulfate, discontinue analgesic administration and administer IV fluid bolus 250 mL Normal Saline and contact Medical Command.

**D. (OPTIONAL):** Non-Cardiac related pain that is not relieved post administration of Morphine or Fentanyl may be treated as follows:

Administer **Ketamine** (Ketelar) 0.2 mg/kg to a max single dose of 20 mg Slow IVP over 1 minute or 0.5 mg/kg IM. Subsequent doses require **MCP order**.

**E.** If discomfort persists, **Contact Medical Command Physician** to discuss further treatment and/or to request additional medication. Monitor blood pressure and respiratory effort.

**F.** To prevent or treat nausea and vomiting, consider administration of:

1. **Ondansetron** (Zofran®) 4 mg IV or IM slowly over 4 minutes (pediatric dose 0.15 mg/kg IV up to 4 mg max dose)

**G.** Expedite transport and monitor vital signs and mental status closely.
This protocol is ONLY for paramedics who have been specifically trained to perform this skill and have approval from the WVOEMS State Medical Director and corresponding Squad Medical Director.

Rapid Sequence Intubation (RSI) should only be performed if a rapid airway is indicated, and benefits outweigh potential risks. This guideline is for patients that require intubation but are awake, continue to have respiratory effort, and intact cough/gag reflex. Whenever possible, RSI should be performed prior to transport. This guideline is not intended for patients in cardiac arrest because they should be intubated without drugs per Airway Management Protocol 4901.

The EMS provider must have a backup/rescue airway plan (Supraglottic device or OPITIONAL Percutaneous Cricothyrotomy, etc.) in mind and immediately accessible for all patients under consideration for RSI prior to proceeding:

A. General Information:

1. Two (2) paramedics must be present, one (1) of which is an “RSI trained Paramedic.”

2. Patient must be on a cardiac monitor and pulse oximeter. Maintain patient on high flow supplemental oxygen either by mask or bag-valve-mask. Confirm or initiate two (2) IVs, if possible, preferably large bore. Have suction hooked up, turned on, and within reach. Have bag-valve-mask attached to oxygen regulator and immediately available.

3. Pre-oxygenate the patient using 100% oxygen. Assure that you can assist ventilations with a bag-valve-mask prior to proceeding. DO NOT BAG VENTILATE the patient unless necessary—this only causes increased gastric distention and the increased risk of aspiration.

B. Indications: Patients ≥ 12 years old whose airway cannot be controlled by any other means as outlined in the Airway Management Protocol 4901 and one (1) of the following:

1. Inability to maintain airway patency.

2. Inability to protect the airway against aspiration.

3. Ventilatory compromise.

4. Failure to adequately oxygenate pulmonary capillary blood.

5. Anticipation of a deteriorating course that will eventually lead to the inability to maintain airway patency or protection.
C. RSI Procedure:

1. If suspected closed head injury or other reason for high ICP, administer, **Lidocaine** - 1.0 mg/kg IV/IO at least three (3) minutes prior to intubation.

2. **Fentanyl (Sublimaze®)**: 1 microgram/kg IV/IO. Withhold if hypotensive.

3. Apply cricoid pressure (Sellick’s Maneuver).

4. Sedative agent:
   a. **Etomidate***(Amidate®)*: 0.3 mg/kg IV/IO **OR**
   b. (Optional): **Ketamine***(Ketalar®)*: 2 mg/kg IV/IO **OR**
   c. **Midazolam (Versed®)**: 0.1 mg/kg IV/IO (max. dose 10 mg)  
      *Do not use Midazolam in hypotensive patients.*

   **Note:** *Etomidate and Ketamine* are the preferred sedative, especially in patients with possible hemodynamic compromise. If Etomidate is used, Succinylcholine should already be drawn up and immediately follow Etomidate administration.

5. If not contraindicated, administer **Succinylcholine (Anectine®)**: 1.5 mg/kg IV push. When paralysis is achieved and muscle fasciculation have stopped (in about 30 - 45 seconds), orally intubate, inflate cuff, and confirm tube placement with bilateral breath sounds, appropriate end-tidal carbon dioxide waveform, etc.

   **Note:** Contraindications include high intraocular pressure, high potassium (K > 5.5), burns and spinal cord injuries > 24 hours old, pseudocholinesterase deficiency.

6. If there is no jaw relaxation or decreased resistance to ventilation within two (2) minutes, or if the patient begins to resist, repeat **Succinylcholine (Anectine®)** 1.5 mg/kg IVP

7. If unable to intubate, consider suctioning, jaw thrust, changing operators, using a different blade, etc.; monitor oxygen saturations and use BVM to ventilate between attempts, if needed.
8. Use rescue airway plan (Supraglottic device, video laryngoscopy (required), needle cricothyrotomy or OPTIONAL percutaneous cricothyrotomy, etc.) and/or bag-valve-mask if unable to intubate after three (3) attempts.

9. Once intubation is confirmed, if patient requires continued sedation, long term paralytics, or analgesics, consider the following drugs and repeat, as necessary, based upon patient response and drug duration of action:

   a. Sedation:
      i. (Optional): Ketamine (Ketalac®): 2 mg/kg IV/IO, OR
      ii. Midazolam (Versed®): 0.1 mg/kg IV/IO (if not hypotensive)

   b. Analgesia:
      i. Fentanyl (Sublimaze®): 1 microgram/kg slow IV/IO push, OR
      ii. Morphine: 0.1 mg/kg slow IV/IO push.

   c. Long-term paralytic:
      i. Vecuronium (Norcuron®): 0.1 mg/kg IV/IO
         -OR-
         Rocuronium (Zemuron®): 1.0 mg/kg IV/IO (OPTIONAL MEDICATION)

**Note:** An agent for long term paralysis MUST never be given until endotracheal tube placement is fully confirmed.

10. All patients given a long-term paralytic agent must also periodically be given sedation while they remain paralyzed.

D. **Contact Medical Command** once enroute to hospital with patient update for all patients requiring intubation.
• A Squad Medical Director (SMD) must apply in writing to the WVOEMS State Medical Director for a particular squad to be considered for the RSI program. A Memorandum of Understanding (MOU) shall be established between the Squad Director, Squad Medical Director, and WVOEMS State Medical Director.

• Each individual Squad Medical Director will choose candidates for the program.

• The Squad Medical Director will be responsible for establishing initial and continuing education, performance improvement, etc.

• Continuing education by the SMD will be held monthly for the first year. The Squad Medical Director should directly observe the RSI paramedic perform an intubation and RSI sequence once a quarter (this can be in a clinical or classroom setting).

• The RSI protocol is for adults only at this time (12 years old and up).

• The Squad must agree to purchase, store, and replace the necessary medications.

• Squads entering the program shall be required to have video assisted laryngoscopy equipment.

• Squads participating in this program shall be required to have waveform capnography available.

• Every RSI intubation is to be enrolled in the squad’s quality assurance program.

• A minimum of two (2) Paramedics is required throughout transport on any RSI call.

• At the 12 month point in the program, the SMD must reapply with the WVOEMS State Medical Director to continue the program.
• Candidates shall have at least three (3) years experience as an active and certified WVOEMS ALS EMS provider.

• All candidates shall be required to perform a minimum of ten (10) intubations at a WVOEMS accredited training facility utilizing simulation. These intubations must be directly observed by a WVOEMS approved instructor and/or the Squad Medical Director. These intubations may also be obtained in an operating room setting, if available.
RAPID SEQUENCE INTUBATION (RSI) - ALGORITHM

**Support Ventilations with BVM using OPA or NPA as necessary**

**If patient is lethargic, in respiratory distress, has a gag reflex, is combative, or otherwise unable to intubate:**
**Perform RSI**

**Obtain IV Access**

**Attempt Intubation**

**Confirm placement, maintain airway, and ventilate**

**Suspected Increased Intracranial Pressure**

**Consider Lidocaine 1mg/kg as adjunct medication when intubating patients with suspected ICP.**

**Administer Etomidate 0.3 mg/kg IV/IO**
**or Ketamine 2mg/kg**
**or Midazolam 0.1 mg/kg IV/IO**
*(Contraindicated in hypotensive patients)*

**Administer Succinylcholine 1.5 mg/kg IVP**
*(Unless patient is known or suspected to be hyperkalemic or have increased intraocular pressure)*

**If there is no jaw relaxation or decreased resistance to ventilation within two (2) minutes, or if the patient begins to resist:**
**Repeat Succinylcholine 1.5 mg/kg IVP**

**Administer Midazolam 0.1 mg/kg IV/IO**
*(Contraindicated in hypotensive patients)*

**Intubate after muscle relaxation**

**Administer Vecuronium 0.1 mg/kg IV/IO**
*-OR-
**OPTIONAL Rocuronium 1.0 mg/kg IV/IO**

**Contact Medical Command**
A. Purpose:
1. Provide irrigation to one eye.

B. Application:
1. Administer Tetracaine, 2 drops per eye being irrigated.
2. Attach mixed saline bag to IV tubing.
3. Attach Morgan Lens to IV tubing.
4. Run fluid to check that attachments are working properly, then pause fluid.
5. Instruct patient to look towards patient’s feet.
6. Retract upper eyelid and insert Morgan lens under upper lid.
7. Release upper lid and instruct patient to look up.
8. Retract lower lid and insert Morgan lens under lower lid.
10. Tape tubing to patient’s forehead to prevent accidental removal.

11. Irrigate eye(s).

**Note:** DO NOT RUN DRY; FLUIDS MUST ALWAYS BE RUNNING

C. Removal

1. Continue flow of fluids.

2. Instruct patient to look up and retract lower lid.


4. Terminate flow.

**NOTE:** Tetracaine is a single use medication. Repeated doses will predispose the cornea to ulceration and destruction of the superficial layer of the cornea.
Intraosseous placement is intended only for those patients needing immediate vascular access in those that peripheral access cannot be established. In rare cases, it may be considered prior to peripheral attempts, but only as outlined below. This procedure may only be used by personnel specifically trained and signed off by their agency’s Squad Medical Director.

A. Indications:

1. Immediate vascular access in life-threatening emergencies.

Note: IO insertion shall NOT be performed just for prophylactic access.

2. Intravenous fluids or medications are urgently needed and peripheral intravenous access cannot by established in a timely manner AND the patient exhibits one or more of the following:

   a. Altered mental status (GCS ≤ 8).

   b. Respiratory compromise (pulse oximeter ≤ 90% after appropriate O₂ therapy, or respiratory rate < 10 or > 40).

   c. Hemodynamic instability (systolic BP < 90).

3. Intraosseous may be considered prior to peripheral IV attempts where successful rapid peripheral IV placement is doubtful, as in the following situations:

   a. Cardiac arrest (medical or trauma).

   b. Profound hypovolemia with altered mental status.

   c. Patient in extremis with immediate need for medication or intravenous fluids (patient in status epilepticus, impending arrest, etc.).

B. Contraindications:

1. Fracture of the bone selected for IO infusion (consider alternate side).

2. Absence of anatomic landmarks at selected site.

3. Previous significant orthopedic procedure (prosthesis, recent surgery).

4. Infection at the selected site.
C. Procedure:

1. **ADULT:** Select insertion site in the following order, unless contraindicated: proximal humerus, proximal tibia, then distal tibia.

2. **PEDIATRIC:** Select insertion site in the following order, unless contraindicated: proximal tibia, distal tibia, then proximal humerus.

**Note:** Red arrows point to targeted insertion sites.

   a. Adult and Pediatric proximal humerus: greater tubercle just anterior to midline.
b. Adult proximal tibia: Measure one (1) fingerbreath \textit{medial} to the tibial tuberosity, along the flat aspect of the medial tibia as shown below.

c. Pediatric proximal tibia: one (1) finger width distal to tibial tuberosity OR if unable to palpate tibial tuberosity, two finger widths below the patella along the flat aspect of the medial tibia. Avoid growth plates.

d. Adult distal tibia: two (2) finger widths proximal to the medial malleolus and midline on the medial shaft.
3. Prepare the skin site with antiseptic.

4. Prepare IO drill and needle set, then load the appropriate sized needle onto the driver.

5. Hold the IO drill in one hand and stabilize the extremity near the insertion site with the opposite hand.

6. Position the drill at the insertion site with the needle at a 90 degree angle to the surface of the bone. Insert IO. Stabilize needle.

7. Analgesia. In the conscious/awake patient, slowly administer lidocaine 2% (cardiac lidocaine 100mg/5ml [20mg/ml] - preservative free) through the IO hub as follows. Ensure that the patient has no allergy to lidocaine.

   a. Adults: Lidocaine 40 mg (2 ml) slow IO.

   b. Pediatric: Lidocaine 0.5 mg/kg slow IO.

   Allow the lidocaine to work from 30 – 60 seconds before giving the flush.

8. Flush: To ensure proper infusion, administer a rapid syringe bolus flush as follows and repeat if necessary:

   a. Adults and Pediatric: 10 ml normal saline rapid IO bolus.

   b. Include any pediatric flushes into totals for IV fluids given and record the amounts.
8. If no soft tissue infiltration is seen, attach IV line and infuse fluids and/or medications as usual; for adults, the IV bag will need to be under pressure. If the flow through the intraosseous line decreases after initial success, consider repeating the flush.

9. Monitor the area for signs of soft tissue infiltration and stop all infusions if infiltration is suspected.

10. Notify the receiving facility of the presence of the IO device prior to moving to the hospital stretcher.

*Permission to use the anatomic photos in this protocol was provided by Vidacare Corporation.*
A Peripherally Inserted Central Line (PICC) is a common method of maintaining long-term venous access in select patients. PICC lines are typically inserted into the antecubital fossa, and then threaded into central circulation. PICC lines are frequently flushed with heparin to maintain patency and therefore it is imperative to aspirate 5 ml of blood from the line prior to use.

**Note:** PICC line access shall NOT be performed simply for prophylactic access.

**A. INDICATIONS:**

1. Immediate vascular access in life-threatening emergencies.

2. Intravenous fluids or medications are urgently needed and peripheral intravenous access cannot by established in a timely manner **AND** the patient exhibits one (1) or more of the following:
   
   a. Altered mental status (GCS ≤ 8).
   
   b. Respiratory compromise (pulse oximeter ≤ 90% after appropriate O2 therapy, or respiratory rate <10 or >40).
   
   c. Hemodynamic instability (systolic BP <90).

3. PICC line access may be considered **prior** to peripheral IV attempts where successful rapid peripheral IV placement is doubtful, as in the following situations:
   
   a. Cardiac arrest (medical or trauma).
   
   b. Profound hypovolemia with altered mental status.
   
   c. Patient in extremis with immediate need for medication or intravenous fluids (i.e. patient in status epilepticus, impending arrest, etc.).

4. Patient or patient’s caregiver requests use of PICC line and accepted risks of complications including infection, catheter damage and embolus.

**B. CONTRAINDICATIONS:**

1. Inability to aspirate or infuse through the catheter.

2. Catheter located in any place other than the patient’s upper arm.
PERIPHERALLY INSERTED CENTRAL CATHETER (PICC LINE) ACCESS

3. Need for rapid fluid resuscitation.

C. PROCEDURE:

1. Use clean gloves and maintain sterility as much as possible.

2. If there is a needleless type port on the distal end of the catheter, perform the following:
   a. Scrub the port with an alcohol pad for at least 15 seconds and allow drying for at least 5 seconds.
   b. Attach a 10 ml syringe (without saline) to the port.
   c. Unclamp if necessary (needleless ports may not have a clamp)
   d. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, remove the syringe and **DO NOT use the catheter** for access.
   e. If blood aspirates freely, remove the 10 ml syringe with blood and discard.
   f. Attach a 10 ml syringe with NS and gently flush the line. **Never** use a smaller syringe. If line does not flush, remove the syringe and **DO NOT** use the catheter for access.
   g. If line flushes, remove the syringe and attach the catheter to the end of the IV tubing and begin infusion of NS. Adjust the rate appropriate to the needs of the patient within the limits of the catheter.
   h. Administer medications though IV tubing port if indicated.
   i. IV maintenance fluids must be administered to keep line open during transport

3. If there is a capped needle-type port on the distal end of the catheter, perform the following:
   a. Scrub the cap with an alcohol pad for at least 15 seconds and allow drying for at least 5 seconds.
   b. Clamp the catheter tubing using ONLY the existing clamp on the catheter and then remove the cap. **Never allow a central line to be open to air.**
c. Attach a 10 ml syringe on the catheter end.

d. Unclamp the catheter.

e. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, re-clamp the line and remove the syringe. **DO NOT** use the catheter for access.

f. If blood aspirates freely, clamp the catheter again.

g. Remove the 10 ml syringe with blood and discard.

h. Attach a 10 ml syringe with NS.

i. Unclamp and gently flush the line. Never use a smaller syringe. If line does not flush, re-clamp the line and remove the syringe. **DO NOT** use the catheter for access.

j. If line flushes, re-clamp and remove the syringe.

k. Attach the catheter to the end of the IV tubing.

l. Unclamp the catheter and begin infusion of NS. Adjust the rate according to the needs of the patient within the limits of the catheter.

m. Administer medications though IV tubing port if indicated.

n. IV maintenance fluids must be administered to keep line open during transport.

D. **NOTES & PRECAUTIONS:**

1. **Do not** administer medications, flush or aspirate with less than a 10 ml syringe. Smaller size syringes generate too much pressure and can damage the catheter.

2. **Do not** attempt to re-inject aspirated blood as it may contain clots.

3. The maximum flow rate for a PICC line is 125 ml/hr for less than a size 2.0 French and 250 ml/hr for catheters over a size 2.0 French.
4. Keep patient’s arm straight to avoid kinking the PICC line and obstructing flow.

5. Ensure all line connections are secure.

6. PICC lines access the patient’s central circulation and the risk of infection is high. Avoid contamination to ports and connections while accessing.

7. **Cautions administering the following medications through a PICC line:**
   
a. **Adenosine** - The line may rupture during rapid infusion due to over pressurization.

   b. **Dextrose 50%** – The catheter can be damaged by due to the viscosity of the fluid and pressurization.

<table>
<thead>
<tr>
<th>Potential Complications of Peripherally Inserted Central Catheters</th>
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<tr>
<td><strong>Complication</strong></td>
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<td>Catheter malposition (can occur during insertion, or after insertion)</td>
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<td>Difficult removal of PICC</td>
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Continuous Positive Airway Pressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in certain patients who suffer respiratory distress from CHF, pulmonary edema, asthma, COPD, or pneumonia. In patients with CHF, CPAP can improve hemodynamics by reducing preload and afterload, however it may cause hypotension.

A. INDICATIONS: Any patient who is in respiratory distress and who has signs and symptoms consistent with at least one of the following: CHF, pulmonary edema, asthma, COPD, or pneumonia AND must meet all five (5) of the following criteria:

1. Is awake and oriented.
   a. Exception to this would be if you had the optional ability to continuously monitor and trend ETCO2 values and waveform and MUST remain with the patient at all times.
   b. If the patient has an altered LOC caused from hypercapnia then CPAP may be applied and patient continually reassessed for a decrease in the ETCO2 and improvement in oxygenation as evidenced by an increase in the SPO2, level of consciousness and decrease in the ETCO2.
   c. If after 3 to 5 minutes the patient does not respond or their condition worsens then the CPAP will be disconnected and patient will receive PPV or BVM and consider intubation to protect the airway. Refer to protocol 4901 (Airway Management)

2. Is over 12 years old and is able to fit the CPAP mask.

3. Has the ability to maintain an open airway (GCS >10).

4. Has a systolic blood pressure > 90 mm Hg.

5. Has at least two (2) or more of the following:
   a. Retractions or accessory muscle use.
   b. Respiratory > 24 per minute.
   c. Inability to speak in full sentences due to dyspnea.
B. CONTRAINDICATIONS (Do not use if any are present):

1. Respiratory arrest.
2. Hypotension (Blood pressure < 90 systolic).
3. Suspected pneumothorax.
4. Patient has a tracheostomy.
5. Foreign body airway obstruction.
6. Facial deformity or trauma causing inability to achieve mask seal.
7. Actively vomiting.
8. Recent facial, neurological, or gastric surgery.
9. Chest, head, or face trauma.

C. COMPLICATIONS:

1. Tension pneumothorax
2. Hypotension
3. Aspiration
4. Gastric distention
5. Severe anxiety / combativeness due to mask intolerance.

D. PROCEDURE:

1. Explain the procedure to the patient.
2. Continuously monitor patient.
   a. Check and document vital signs every five (5) minutes.
   b. Observe for decrease in level of consciousness.
   c. Observe for gastric distention.
3. Continuously monitor pulse oximeter.
4. Ensure adequate oxygen supply to the CPAP device.
5. Turn CPAP device on.
6. Have the patient sit up as much as possible.
7. Apply the device as per manufacturer’s directions.
8. Initially assist the patient in holding the mask tightly to their face and evaluate their tolerance of the mask.
9. Reevaluate patient’s condition and tolerance of the mask:
   a. Coach the patient to keep mask in place and readjust, as needed.
   b. If respiratory status or level of consciousness deteriorates, remove device, assist ventilations, and utilize appropriate airway management modality as per protocol.
   c. If patient tolerates mask and condition does not deteriorate, secure the mask with straps.
10. Check for air leaks.
11. Continue to monitor the patient during transport.
12. Contact Medical Command, as early as possible, so the receiving hospital can be prepared for the patient.

E. REMOVAL: CPAP should be continuous and should not be removed in the prehospital setting unless:
1. Patient cannot tolerate the mask.
2. Patient begins to vomit.
3. Patient’s mental or respiratory status deteriorates.
4. Patient becomes hypotensive (Systolic blood pressure < 90 or drops 20 mm/Hg).
Notes:

1. CPAP should continue upon arrival at the emergency department until patient care is transferred to the emergency department staff. Do not remove CPAP until hospital emergency therapy is ready to be placed on the patient.

2. This procedure may be performed on a patient with a *Do Not Resuscitate order*.

3. CPAP pressure should be started at 3 - 5 cm of H2O. Most patients will only require 5 cm H2O. Pressure may be slowly titrated upward depending on patient response, BUT NEVER ABOVE 10 cm H2O without MCP order.

4. CPAP should be used with caution with portable oxygen systems due to limited amounts of oxygen available to operate the device (if CPAP device is oxygen powered).

5. **DO NOT** delay other emergency interventions to establish CPAP. CPAP should be delivered as an adjunct to treatments indicated by the primary protocol.

6. Most patients will improve in 5 - 10 minutes. If no improvement within this time, consider additional treatment options per primary protocol.

7. **DO NOT** force CPAP use on patients who have failed at past attempts to utilize noninvasive ventilation techniques and request that it not be applied.
A. INDICATION:

1. Patient with a suspected tension pneumothorax.
   a. Closed or penetrating chest trauma with respiratory distress.
   b. Absent breath sounds on the side of the injury.
   c. SBP < 90 mm Hg in adults or SBP < 80 mm Hg in children, with signs of shock.

B. PROCEDURE:

1. Midclavicular
   a. Identify the second intercostal space on the side of the pneumothorax.
   b. Place a finger on the clavicle at its midpoint.
   c. Run this finger straight down the chest wall to locate the first palpable rib below the clavicle.
   d. The second intercostal space lies just below this rib, midway between the clavicle and the nipple line.
   e. Cleanse the area with an alcohol or Povidone-Iodine swab.

3. Select a 14 or 16 gauge, 3 ¼ inch IV catheter (Pediatric: 16 gauge, 1 ¼ inch). Remove the flash chamber cap. Do not use needle-safe IV catheters.

4. Advance the needle into the second intercostal space above the third rib. Assure you enter the thoracic cavity by passing the needle just over the top of the rib to avoid interference with the blood vessels and nerves that run along the underside of the rib.

5. As you enter the pleural space, you will feel a pop and note a rush of air expelling.

6. Advance the catheter into the chest and then withdraw the needle. Be careful not to kink the catheter.

7. Attach a one-way flutter valve to the catheter:
   a. Asherman Chest Seal, or similar device, over the barrel of the catheter.
b. Finger cut off of a latex or similar examination glove (secure to catheter hub prior to performing the chest decompression).

8. Secure the catheter in place with tape, being careful not to block the port or kink the catheter.

9. Monitor the patient’s vital signs and breath sounds for a recurring tension pneumothorax.

10. If signs and symptoms are not relieved by the initial chest decompression, or signs and symptoms recur, decompress the chest again by placing additional catheters adjacent to the original catheter.

C. CONSIDERATIONS:

1. For an open pneumothorax, immediately cover the open area with a gloved hand. Once materials are available, cover the area with an occlusive dressing.

2. An open pneumothorax that has been sealed with an occlusive dressing may result in a tension pneumothorax. In that instance, the increase in pleural pressure may be relieved by briefly removing the dressing. If that air release does not occur or the patient’s condition remains unchanged, gently spread the chest wound open with a gloved hand, allowing the trapped air to escape.
A. INDICATIONS:

1. Any clinical situation in which a definitive airway is necessary, and all other methods have failed or are otherwise not indicated:
   a. Complete airway obstruction.
   b. Foreign Body Airway Obstruction (FBAO) refractory to removal attempts.
   c. Complete airway occlusion (i.e. mass lesion).

2. Severe upper airway edema:
   a. Anaphylaxis
   b. Thermal/Inhalation injuries
   c. Caustic ingestions
   d. Angioedema

3. Epiglottitis complicated by severe respiratory compromise and/or respiratory arrest.

4. Inability to intubate:
   a. Hemorrhage
   b. Anatomic variants
   c. Massive regurgitation and/or aspiration
   d. Severe maxillofacial trauma

B. CONTRAINDICATIONS:

1. Absolute contraindications:
   a. Child < 12 years of age.
   b. Inability to locate landmarks required for procedure.
   c. Lack of training in surgical airway interventions.
PERCUTANEOUS CRICOTHYROTOMY - OPTIONAL

d. Tracheal transection.

2. Relative contraindications:
   a. Direct laryngeal injury.
   b. Known laryngeal pathology: Stricture or tumor

C. PREPARATION:

1. Prepare skin using aseptic solution.

2. Position the patient in a supine position, with in-line spinal immobilization, if indicated. If cervical spine injury not suspected, neck extension will improve anatomic view.

3. Perform cricothyrotomy according to manufacturer's instructions for selected device (example: Quick Trach I®, Quick Trach II®).

4. Confirm and document tube placement by:
   a. ETCO2
   b. Breath sounds
   c. Rising pulse oximetry
   d. Other means, as needed

5. Ventilate with BVM assessing adequacy of ventilation.

6. Observe for subcutaneous air, which may indicate tracheal injury or extratracheal tube position.

7. Secure tube with tube ties or device.

8. Continually reassess ventilation, oxygenation, tube placement, and waveform ETCO2.
D. **PRECAUTIONS:**

1. Success of procedure is dependent on correct identification of cricothyroid membrane.

2. Bleeding will occur, even with correct technique. Straying from the midline is dangerous and likely to cause hemorrhage.

E. **POST PROCEDURE MANAGEMENT:**

1. Assess the patient for increases in heart rate, BP, and restlessness as indicators for additional sedation and analgesia.

2. If procedure is successful and patient shows evidence of need for sedation and/or pain management to facilitate tolerating the procedure, administer:

   a. **Midazolam** - 2 mg IV/IO every five (5) minutes to a maximum dose of 10 mg. Hold for systolic BP < 90 mm/Hg.

      AND/OR

   b. **Fentanyl** - (Sublimaze®) 1 microgram/kilogram – up to 100 micrograms max single dose, slow IV. May repeat Fentanyl **PER MCP**.

   *Note: These medications may be given IM if IV/IO not available or becomes dislodged.*

3. If patient is still restless and/or combative, contact **Medical Command Physician** for further treatment considerations.
The majority of adults and children with tracheostomies are dependent on the tube as their primary airway. Cardio-respiratory arrest most commonly results from tracheostomy obstructions. Obstruction may be due to thick secretions, mucous plug, blood clot, foreign body, or kinking or dislodgement of the tube. Work expeditiously and deliberately to reestablish airway patency and support oxygenation/ventilation.

Early warning signs of obstruction include tachypnea, tachycardia, and desaturation. Cyanosis, bradycardia, and apnea are late signs. **DO NOT** wait for these to develop before intervening.

A. Complications:

- Airway obstruction
- Aspiration
- Blocked tube
- Bleeding
- Tracheal trauma
- Pneumothorax
- Subcutaneous and mediastinal emphysema
- Respiratory and cardiovascular collapse
- Dislodged tube
- Tracheo-esophageal fistula
- Infection

B. Endotracheal Suctioning:

1. Endotracheal suctioning is necessary to remove mucus, maintain a patent airway, and avoid tracheostomy tube blockages. Indications for suctioning include:
   a. Audible or visual signs of secretions in the tube.
   b. Signs of respiratory distress.
   c. Suspicion of blocked or partially blocked tube.
   d. Inability to clear the tube by coughing out the secretions.
   e. Increases in required ventilation pressures (in ventilated patients).
   f. Request by patient.

2. Tracheal suctioning should be carried out regularly for patients with a tracheostomy. The frequency varies between patients and is based on
individual assessment.

3. Tracheal damage may be caused by suctioning. This can be minimized by using the appropriate sized suction catheter and only suctioning within the tracheostomy tube.

<table>
<thead>
<tr>
<th>Tracheostomy tube size (in mm)</th>
<th>3.0 mm</th>
<th>3.5 mm</th>
<th>4.0 mm</th>
<th>4.5 mm</th>
<th>5.0 mm</th>
<th>6.0mm</th>
<th>7.0mm</th>
<th>7.5mm</th>
<th>8.0mm</th>
<th>9.0mm – 10mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended suction catheter size (Fr)</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>10-12</td>
<td>14</td>
<td>14-16</td>
<td>14-16</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

4. The suction depth is determined by the estimated length of the tracheostomy tube.

5. The depth of insertion of the suction catheter needs to be determined prior to suctioning to avoid trauma.

6. Using the patient’s spare tracheostomy tube of the same size (if available) to estimate needed depth of suctioning.

7. The pressure setting for tracheal suctioning (suction machine pressure for small children 50-100 mm/Hg; for older children/adults 100-120 mm/Hg) to avoid tracheal damage.

8. In most circumstances, it is best to limit the duration of suctioning (including passing the catheter and suctioning the tracheostomy tube) to 5 - 10 seconds.

9. Routine use of normal saline is not necessary although there is anecdotal evidence it may thin secretions. In situations where this may be of benefit, only 1 - 2 mL is usually needed.

C. Tracheal Suctioning Procedure:

1. Inform patient of intended action.

2. Maintain appropriate PPE throughout procedure.

3. Assemble needed suction equipment and power on suction device.

4. Instill small volume of sterile normal saline into the tracheostomy tube, if needed for thick or dry secretions. Excessive use of saline is not recommended. Use saline only if the mucus is very thick, hard to cough up, or difficult to suction.
5. Gently insert catheter into the tracheal tube without applying suction, passing to the previously estimated needed depth.

6. Put thumb over opening in catheter to create suction and use a circular motion (twirl catheter between thumb and index finger) while withdrawing the catheter so that the mucus is removed well from all areas. Avoid suctioning longer than 10 seconds because of oxygen loss. Suction normal saline from a container if needed to clear catheter.

7. For tracheostomy tubes with cuffs, it may be necessary to deflate the cuff periodically for suctioning to prevent pooling of secretions above tracheal cuff.

8. Let patient rest and breathe, then repeat suction, if needed, until clear (trying to allow about 30 seconds between suctioning).

9. Oxygenate/ventilate, as needed.
This protocol is designed to be used when EMS personnel encounter patients who are dead at the time of arrival in which resuscitation is medically inappropriate or for use immediately after the Cease-Effort Protocol 9102 has been performed.

A. Perform initial assessment as per any patient.

B. Determine history.

C. **Criteria:** The decision to not begin resuscitation may occur under the following circumstances if ordered in consultation with MCP.

   1. When there are changes to the body which indicate a prolonged postmortem interval (i.e. decomposition, rigor in normo-thermic body).
   2. Injuries incompatible with life such as decapitation or transection of torso.
   3. Pulseless, apneic patients in multiple casualty situations where resources are required to maintain living patients and those resources are unavailable.
   4. Proper “Do Not Resuscitate” documentation has been discovered or clarified by family, Medical Command Electronic Registry (End of Life Registry), or power of attorney.
   5. Resuscitation efforts pose a danger to the health and/or safety of the rescuers and/or the scene is judged unsafe for rescuers to continue providing care.

D. **Criteria:** The decision to not begin resuscitation may occur under the following circumstances by order of MCP.

   1. Victims of trauma who are pulseless and apneic at the time of arrival of first responders or EMS personnel.
   2. Blunt trauma patients, who become pulseless and apneic, cannot be extricated quickly, and the entrapment precludes medically effective resuscitation efforts.
   3. Circumstances where beginning or continuing resuscitation is not medically appropriate as determined by EMS personnel and direct contact with the Medical Command Physician.
   4. Proper “Do Not Resuscitate” documentation has been discovered or clarified by family, Medical Command Electronic Registry (End of Life Registry), or power of attorney.
E. Procedure:

1. Contact Medical Command immediately and consult with MCP as required in “C” and “D” above. Discuss situation and obtain confirmation that no resuscitation is indicated.

2. Protect and preserve the scene until jurisdictional authority has been determined as in #4 below.

3. Notify the Medical Examiner Authority (County or State) on all out-of-hospital deaths including those registered with and receiving hospice care.

4. If the county authority is unavailable or does not call back within 10 minutes, then contact the State Medical Examiner’s Office at 1-877-563-0426

5. Check with your county dispatch to ensure that Law Enforcement has been notified.

6. EMS personnel are not required to transport the body, but may do so if instructed and this is standard practice as a courtesy to the local community.

7. EMS personnel should document carefully the signs, symptoms, and vital signs which confirmed and allowed the declaration of death. These facts should be recorded in the patient care record.

8. For Medical Examiner cases, the hospital copy of the patient care record should be completed and given to the Medical Examiner Authority (County or State) if they are on-scene or left with the body at the morgue if transport is made.
This protocol is designed to be used when in direct consultation with the Medical Command Physician (MCP), the medical decision is made to discontinue resuscitation efforts in the field and proceed to the Death in the Field Protocol 9101.

A. Criteria: EMS personnel may request orders to cease resuscitation efforts on a patient in the field when any of the following are present:

1. Resuscitation initially started by first responders, family members, etc. is determined to have been medically inappropriate (i.e. terminal cancer or traumatic arrest).

2. A full cycle of ALS treatment has been unsuccessful and one (1) of the following criteria are met:
   - Patient remains in PEA or Asystole > 20 minutes with no rhythm change confirmed in two (2) leads.
   - EtCO2 < 10 mmHg with high quality CPR for greater than ten (10) minutes (if available).

3. Proper "Do Not Resuscitate" documentation has been discovered or clarified by family, Medical Command Electronic Registry (End of Life Registry), or power of attorney.

4. BLS resuscitation has proved unsuccessful and no ALS is available > thirty (30) minutes or the patient has been confirmed pulseless and apneic for > twenty (20) minutes with NO shocks delivered from an AED at any time during the resuscitation effort.

5. Physical exhaustion of available providers to provide care.

6. The scene environment is judged to be unsafe for rescuers to continue resuscitation.

7. Extremely remote areas where evacuation may require hours or days.

B. Procedure:

1. EMS personnel will contact Medical Command and speak directly to the MCP.

2. Specific history and details of care will be discussed and MCP will make final decision, give final order to cease resuscitation, and note exact date and
time.

3. Proceed immediately to **Death in the Field Protocol 9101.**

C. Exceptions: The following situations may necessitate transport of patients and continued resuscitation efforts **per direct MCP order:**

1. Volatile or potentially dangerous situations where movement of the patient and exit from the scene is required for the safety of the rescuers.

2. Hypothermic patients: Treat per **Cold Exposure Protocol 4503.**

3. Pediatric patients less than 12 years of age.

**Note:** If patient is removed from scene and resuscitation continued, the resuscitation efforts should be continued until arrival at the hospital.
Field triage of critically injured trauma patients and their transport to an appropriate level trauma center is often vital to their survival. Recognition of these patients should be assisted by the Priority 1 (P1) and Priority 2 (P2) criteria recommended by the State Trauma and Emergency Medical System. Patients meeting P1 or P2 criteria should generally be transported to the highest level trauma center within 30 minutes transport time using the algorithm below:

**En route to scene, consider aeromedical standby alert as per Field Aeromedical Protocol 9105**

**Immediate Transport Criteria**
Patient has an immediate life-threatening condition (lack of airway, uncontrollable massive hemorrhage, etc.)

**Category A. Assess for P1 Criteria**
1. Respiratory compromise or intubated
2. Blood Pressure < 90 at any time in adults, or age specific hypotension in children
3. GCS<9
4. GSW to neck, chest, abdomen or extremities proximal to the elbow/knee

**Category B. Assess for P2 (Physiologic or Anatomy) Criteria**
1. Respiratory Rate <10 and >29 Infants with RR<20 if <1 year old.
2. GCS ≥9 and <14
3. Penetrating injuries to head, neck, torso or extremities proximal to elbow or knee (other than GSW to neck, chest, abdomen or proximal to the elbow/knee)
4. Chest wall instability (e.g. flail chest)
5. Two (2) or more proximal long-bone fractures
6. Crush, degloved, or mangled extremity
7. Amputation proximal to wrist or ankle
8. Pelvic fracture
9. Open or depressed skull fracture
10. Paralysis
11. Time sensitive extremity injury

**Contact Medical Command:**
Consider immediate aeromedical evacuation, or transport the patient to the nearest facility capable of definitive resuscitation, regardless of trauma center designation status.

**Request Priority 1 Trauma Team activation.**

**Contact Medical Command:**
Consider immediate aeromedical evacuation, or transport the patient to the highest level trauma center within 30 minutes transport via ground or air. If time is >30 minutes to a designated trauma center, transport the patient to the nearest facility capable of resuscitation and stabilization.

**Request Priority 2 Trauma Team activation.**
Category C. **Assess for P2 (Mechanism) Criteria**

1. **Falls:**
   - Adults > 20 feet; Children >10 feet or 2-3 times the height of the child.

2. **High Risk Auto Crash:**
   - Ejection
   - Intrusion, including roof: >12 inches, occupant site >18 inches, any site
   - Death in same passenger compartment
   - Vehicle telemetry data (if available) consistent with high risk of injury

3. **Auto vs. Pedestrian/Bicyclist thrown, run over, or with significant impact (≥ 20 mph)**

4. **Motorcycle or ATV crash > 20 mph**

**Contact Medical Command:**
Transport the patient to the highest level trauma center within 30 minutes transport. If time is >30 minutes to a designated trauma center, transport the patient to the nearest facility capable of resuscitation and stabilization.

Request Priority 2 Trauma Team activation.
The purpose of this policy is to establish common, acceptable guidelines for Medical Command Centers, hospitals, and EMS personnel under which diversion of ground ambulances transporting patients from the field may occur. This policy DOES NOT supersede a hospital's or EMS personnel’s obligation to provide care should a patient require emergency stabilization or in the event that a patient desires to be transported to and treated at a specific facility. Any unstable patient should be transported to the closest appropriate facility regardless of the facility’s alert status. Additionally, ambulances should not bypass a hospital on red alert if transport time will be lengthened by more than 15 minutes.

A. Definitions of diversion alert status system:

1. **Red Alert Status**: Notification from a hospital to Medical Command that said hospital has identified a strain in operational ability due to any two (2) of the criteria listed below and that such hospital is requesting that affected EMS personnel make the condition known to all patients and/or patients’ families requesting transportation to said hospital.

2. **Yellow Alert Status**: Notification from a hospital to Medical Command that said hospital has identified a temporary lack of ability to provide a particular type of service or specialty support that they normally and routinely provide. Said hospital is requesting that affected EMS personnel make this condition known to all patients and/or patients’ families requesting transport to said hospital. Yellow alert status may place the facility on red alert if criteria #1 is also met and, in consultation with Medical Command, it is determined with reasonable certainty that the patient in question may require the services affected by the yellow alert.

3. **Mini-Disaster Alert**: Notification from a hospital that a physical incapacitation of a necessary functional component of the hospital has occurred making further patient care untenable (i.e. fire, flood, gas leak, bomb scare, etc). The facility has, in effect, suspended operation and can receive absolutely no patients. Unless the situation is isolated to the Emergency Department, all other means of patient admissions must be halted prior to a mini-disaster alert being implemented.

B. Diversion Criteria: The determination to place a hospital on red alert status and consider diversion of ambulances from any hospital emergency department can only be made when two (2) of the following criteria are met. **Criteria #1 must always be one of the two criteria prompting the red alert.**

1. The emergency department is overloaded (i.e. filled to capacity with patients whose conditions do not allow for extended delay in treatment); or, there is
already an overwhelming number of critical patients and any additional critical patients would exceed the care capability of the facility.

2. There are no monitored beds available in the emergency department.

3. There are no monitored beds available in the entire facility.

4. The entire facility is full to capacity with no beds available.

5. A particular service is on yellow alert and Medical Command has determined with reasonable certainty that the particular patient in question may require that specific service on an urgent basis.

C. **Override:** A red alert will be automatically disregarded if any of the following conditions occur:

1. A patient is unstable and requires immediate stabilization as determined by EMS personnel in consultation with Medical Command.

2. The diversion of the patient would add an additional 15 minutes to the transport time. This may frequently occur in the more rural areas.

3. The patient or patient’s family, after explanation of risks and consultation with the MCP, still insist on transport to the red alert facility, and the MCP has determined that this decision poses no immediate danger to the patient. Patient or legal guardian must sign refusal of appropriate care section of patient care record.

D. Each hospital will pre-determine a representative position which will be the sole communicator with Medical Command. The designated position must be provided in writing to Medical Command.

1. The designated hospital representative will notify Medical Command when requesting a particular diversion alert status. The representative will report to Medical Command the criteria met to qualify for the diversion alert status, first by phone and then by faxing the Diversion Alert Status Form (Appendix B) directly to Medical Command. The requesting hospital will maintain the information as contained in Section “F” below on file for one year following the request for diversion.

2. Medical Command will notify affected EMS agencies when a particular hospital is on a diversion alert. EMS personnel will inform the patient and/or patient’s family of possible extensive delays in treatment at the hospital.
which is on diversion status. However, the patient or patient’s family has the final destination decision unless there is a concern by the EMS personnel that the patient will be adversely affected by the requested destination. In the case of that concern, consultation with the Medical Command Physician should occur to determine the final destination of the patient.

3. It is the designated hospital representative’s responsibility to notify Medical Command when the diversion status changes. Red alert status will automatically terminate after two (2) hours unless the hospital notifies Medical Command and requests an additional 2 hour extension. If after four (4) hours the operational deficits have not been corrected, then the hospital may request an additional two (2) hour extension, but hospital administration must explain in writing within 24 hours what measures have been taken to assure that this situation does not reoccur. At no time may a facility be on red alert status for more than six (6) hours in a 24 hour period beginning at 12 midnight.

4. In the event that all hospitals within a catchment area meet criteria for red alert status, then Medical Command will notify those hospitals that red alert status is automatically suspended and patients are transported to the usual closest appropriate facility.

5. Yellow alert status must be updated by the hospital representative to Medical Command every six (6) hours.

E. Compliance Monitoring: Medical Command will maintain the data base on all alert status diversions and report them to the regional medical director for review.

1. In the event that non-compliance with this policy is identified, the Regional Medical Director will notify the hospital in question and request in writing an explanation for the variance.

2. If non-compliance continues to be an issue, then the Regional Medical Director will notify in writing the WVOEMS State EMS Medical Director for further action, including possible site visit by the Bureau for Public Health.

** Diversion Alert Status Form (Appendix B).
Field access to aeromedical transport may enhance the probability of survival of a select, small percentage of patients. The objective of a field response to the scene of injury by an EMS helicopter is to utilize the speed of the helicopter or the advanced skills of the medical crew to supplement patient care.

All requests for scene helicopter responses will come through Medical Command. Inappropriate requests for a helicopter subject the flight crew and the patient to needless risk. Medical Command shall deny inappropriate requests for a helicopter. EMS personnel considering the need for a helicopter are encouraged to discuss their situation with Medical Command. If the drive time to a designated Level I or II Trauma Center is less than 30 minutes and there is no extrication delay at the scene, aeromedical transport is rarely indicated. Appropriate requests for a helicopter include the following:

A. Trauma Criteria:
   1. Patient meets Field Trauma Triage Protocol 9103 Immediate Transport: OR
   2. Patient meets Field Trauma Triage Protocol 9103 A (P1 Criteria); OR

   Note: Patients meeting only Field Trauma Triage Protocol 9103 C. P2 (Mechanism Criteria) may need a helicopter, but require that you discuss the details with MCP for approval.

B. Medical Criteria:
   1. Some non-trauma patients with life-threatening medical conditions and far from definitive care, may benefit from air evacuation. Such circumstances may include:
      a. Acute stroke patients within the window of opportunity for thrombolytic or endovascular intervention at an appropriate hospital.
      b. Acute myocardial infarction patients needing thrombolytics or angioplasty.
      c. Major overdose patients with coma.
      d. Major burns > 20% TBSA (second or third degree) needing flown directly to a Burn Center.

C. Environmental Criteria:
   1. Patients in remote locations inaccessible by ground EMS.
2. Mass casualty incidents that totally overwhelm local agency capabilities (industrial accidents, multi-vehicle crashes, hazmat incidents, etc.)

D. Procedure:

1. **Contact Medical Command.** If radio communication or cell phone service is not available, contact your local dispatch or 911 communications center to contact Medical Command. Discuss clearly the need for the helicopter based on the above criteria with Medical Command. Saying “I need a helicopter” is inadequate.

2. Identify agency, unit number, incident location, description of incident, and any other information requested.

3. Request either response or standby alert. Request can be made for helicopter to be placed on standby alert even before arrival on scene, which may shorten the helicopter’s lift-off time if air transport is deemed necessary. Request response as soon as criteria is identified.

4. Give a brief description of incident and GPS coordinates if available, or an accurate location, including names of roadways, cross streets, and other pertinent landmarks. Names of nearby towns and your location in reference to them is helpful.

5. Advise Medical Command of the agency and radio frequency of the ground contact for the helicopter.

6. Remain in contact with Medical Command for information concerning availability of aircraft, estimated flight time, and/or other special landing zone or scene requirements.

7. Medical Command will coordinate dispatch of the closest appropriate helicopter based on location of incident and will coordinate destination notification.

8. Landing zone preparation:
   a. Secure a level 100' X 100' area clear of power lines, trees, debris, and other obstructions.
   b. Ensure all bystanders and personnel remain at least 100 feet from aircraft at all times.
9. Communications:
   a. Designate one (1) individual to monitor ground contact radio frequency
      and communicate with the aircraft. Do not change frequency unless
      instructed to do so by aircraft or Medical Command.
   b. Establish radio and visual contact with the aircraft and give a quick
      update of any LZ changes, hazards, and patient update information.
   c. When aircraft is making final approach to land, keep radio traffic to a
      minimum so as not to distract the pilot. Alert pilot immediately if new
      hazard or situation develops. Follow directions given by pilot.

10. Use of hospital based landing sites
    a. EMS shall be permitted to utilize hospital based landing sites in cases
       where it is more practical and safer to do so verses a field based landing
       site created at or near an incident scene.
    b. EMS shall develop an MOU with the facility prior to utilizing section 10 of
       this protocol.
    c. The hospital shall be contacted prior to use and permission granted by the
       facility to utilize the hospital based landing site. This shall assure that the
       landing site is clear and there are no other inbound flights due to arrive.
    d. EMS shall not be required to enter the emergency room when simply
       utilizing the landing site for EMS field operations subject to the following:
       1) Medical Command has been contacted and given a detailed
          patient assessment
       2) The Hospital has been contacted and permission granted to
          utilize the facility

   c. At night, use of flashing blue, green, or amber lights is encouraged to mark
      the landing area since they interfere less with night vision technology. Red
      lights of an emergency vehicle may be used; but use only the red lights on
      the vehicle (NO white lights or flood lights). Do not shine any lights at the
      aircraft either on approach or while on the ground. High intensity light sticks
      may be used but NO flares.
   d. After landing, do not approach the aircraft.
3) The patient has been determined to be stable for continued transport evidenced by:
   • An easily maintained, patent airway with or without an advanced airway adjunct
   • Vascular access via IV or IO
   • A perfusing cardiac rhythm

11. Should aeromedical not be at the landing site upon arrival of EMS, contact should be made with the flight team to verify an ETA. If communication with the flight team verifies an extensive delay in arrival of the aircraft; earnest consideration should be given to divert the patient to the Emergency Room.
The West Virginia OEMS protocols are designed to allow EMS personnel the ability to provide a wide variety of treatments to many types of patients by utilizing off-line protocols. However, since protocols cannot cover all situations, on-line medical direction is essential to a quality EMS system.

EMS personnel are expected to contact Medical Command for on-line or off-line medical direction as outlined in the protocols, transporting to an emergency department, or anytime additional consultation is needed by the provider. This provides hospital’s early notification, provider’s legal protection, and protocol guidance if needed. Additionally, EMS personnel should notify Medical Command on inter-facility transports being transferred to the ED not less than fifteen (15) minutes prior to arrival. In order to provide for the most efficient and accurate communication between the provider and the Medical Command Operator, the following procedures will be used when communicating with Medical Command.

A. **Patient Hand Off / Transfer of Care:** Formal exchange of information between receiving healthcare providers/facilities and EMS providers pertaining to the overall scene, patient presentation, care rendered, and response to care rendered prior to arrival has proven to alleviate repeated services, confusion, and medication errors. EMS shall adhere to following for all patients:

1. **EMS Time Out Report** – This report constitutes a verbal exchange of information to provide continuity of patient care. WVOEMS recognizes the “MIST” format to meet this need.

   a. **M - Mechanism of injury/Medical Complaint**
      - Name, Age, and Sex
      - Location of patient when found (Home, nursing home, assisted living facility, road, freeway, rural area)
      - Onset of injury/symptoms (For Stroke last time known normal)
      - Description of cause of injury (MVC, Fall, Weapon, Assault)
      - Details of injury (Vehicle’s involved, Speed, Position in/on vehicle, Pertinent damage to the vehicle, Restraint use, Helmet use, Height)

   b. **I - Injuries or illness**
      - Pain, deformities, Injury patterns, new disabilities (Loss of Airway, Movement, Sensory, Speech, Sight)
      - Results of tests ECG, Stroke neuro assessment, Blood glucose (BG)

   c. **S - Signs and Symptoms**
      - Duration of symptoms, Location of symptoms, Any modifiers of the symptoms (movement, eating, medications taken).
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- Age of patient. Pertinent Medical History.
- Vital Signs - First set, Lowest BP, Current Set (Include HR, BP, RR, SPO2, ETCO2, BG, ECG Monitor rhythm and Normal and current responsiveness - GCS or AVPU)
  
  d. T – Treatment
  - Tubes, Lines (Location and size), Fluids (type and amount), Oxygen delivery description
  - Medications administered, stabilization applied Dressings applied, Tourniquet applied (when was it applied)
  - Defibrillation, Pacing, and other treatments.
  - Response to treatments: Symptoms resolved, improved, worse, or no change.

2. Hand Off Report – The patient hand off report shall be written documentation of a minimal set of data and shall be provided to the receiving facility prior to EMS departure. This does NOT take the place of an EPCR which may be required by the receiving facility at a later time. The minimal data that must be provided is as follows:

  a. Agency name and name of care providers
  b. Patient’s name
  c. Chief complaint and history of the chief complaint
  d. Vital signs, level of consciousness, and pertinent physical findings
  e. Pertinent past medical history, medications, and allergies
  f. Treatment rendered

B. Initial Call-in Procedure: In order to quickly and effectively identify the level of interaction required to properly manage the patient, the following procedure will be used:

1. Initial Call Requirements: Call 9 and Channel “C” Charlie are the initial call frequencies.

  a. Squad and Unit Number

  b. Destination and ETA

  c. Situation: (What you have/What you need)
     - BLS
     - ALS
     - Trauma
     - Stroke
     - STEMI
     - Aeromedical request
     - MCP orders request
MEDICAL COMMUNICATION POLICY

- MCP conference request

2. Communication Example:
   a. *Cabell County unit 41 contacting Huntington MedCom on call 9 with a BLS report, ETA 10 min to Cabell Huntington Hospital.*
   b. *Berkeley County Medic 971 contacting WVU MedCom on C with an ALS STEMI, ETA 12 minutes to Berkeley Medical Center.*

C. Methods for contacting Medical Command: There are two (2) general methods for contacting Medical Command:

1. UHF, VHF, or IRP Radio: Direct radio contact with Medical Command is the preferred method of contact while responding to a call, transporting a patient, or on the scene of an MVC or other non-residential incident. Depending on the area of the state, this may best be accomplished by UHF, VHF, or IRP Radio frequencies. Call 9 and Channel “C” Charlie are the initial call frequencies.

2. Phone (landline or cellular): Should be used whenever the patient’s location and condition permit. Phones, both landline and cellular, provide a great amount of security for discussion of sensitive patient information. However, when in a mobile unit, phones are not a substitute for radio contact if the coverage is available. Providers may use the local number of the Medical Command Center or the toll free 800 number of the specific center.

D. Detail Call Requirements: When providing a detailed report to Medical Command the following procedures should be followed:

1. After Medical Command has answered the EMS initial call and assigned a frequency to take a full report, provide the following information:
   a. Age and sex of patient
   b. Chief Complaint/ Mechanism of Injury
   c. Brief history of present illness
   d. Pertinent past medical history
   e. Pertinent medications
   f. Allergies (only if requesting medications)
   g. Vital signs
   h. GCS (if applicable)
   i. Stroke score (if applicable)
   j. ECG findings
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k. Assessment
l. Treatment administered
m. Orders requested (if applicable)
n. Updated ETA and destination (if it has changed since initial call)

2. If the patient’s condition changes or new complaints develop, Medical Command shall be contacted with updated findings and treatment.

3. It is understood that not all information listed in D-1 is required for every patient. Providers shall make every effort to provide a complete and thorough report reflective of patient presentation.

E. Performance Improvement: EMS field providers and Medical Command operators shall have the ability to identify performance improvement opportunities. These may manifest in recognition of a job well done or as an opportunity to improve.

1. EMS providers may, at any time, request a call to be flagged for review. The MedCom operator will do so and follow up will be provided to the EMS provider and administrator.

2. Anytime a requested order is denied, the call will be automatically flagged for review and follow up will be provided to the EMS provider and administrator.

3. The MedCom operator may, at any time, flag a call for review. Follow up will be provided to the EMS provider and administrator.

F. Inability to contact Medical Command: If the provider is unable to contact Medical Command by any of the above means, properly authorized EMS personnel may continue to follow the appropriate protocol(s) in the best interest of the patient. However, the provider must then:

1. Immediately upon arrival at the receiving facility, contact Medical Command by phone and provide a full patient report and the method, time, and location of the unsuccessful efforts to reach Medical Command.

2. If this report is made prior to leaving the receiving facility, no further reporting is required by the provider.

3. If Medical Command is not contacted prior to leaving the receiving facility, by law, the provider must submit a report (Appendix H) to the State Office of Emergency Medical Services on the appropriate form within 48 hours. Failure to do so may be grounds for suspension or even legal action.
The “hand-off” or transfer of patients, between EMS providers, (Emergency Medical Responders, EMT-Basic, and Paramedic) represents one of the most important elements of successful pre-hospital patient care.

Transferring patient care involves the transfer of patient rights and duty to provide care, from one person, or one team, to another. This transfer of care may be from a higher level provider to a lower level provider, from a lower level provider to a higher level, or between the same levels of provider. The term Provider, refers to the level of Certification. The importance of transferring patient information including history and plan of treatment cannot be overemphasized. The providers must communicate events, treatments, and ongoing plan of care during the “transfer of care” process. This provides a smooth transition for continued continuity of treatment.

This protocol addresses transfer of care involving any level of EMS provider.

A. Care involving Emergency Medical Responders (EMR):

1. Any provider with a higher level of certification may not transfer care (handoff) to an EMR.

2. An EMR shall provide a verbal transfer of care report when handing off a patient to a higher level provider.

3. An EMR may continue to assist in the care of the patient during transport to a medical facility, but may not function as the primary care provider in the patient compartment of an ambulance.

4. This protocol addresses, but is not limited to:

   a. CCT Squad to CCT Aeromedical Unit.

   b. ALS Squad to ALS or CCT Aeromedical Unit.

   c. ALS Squad transferring care to a different ALS Squad.

   d. Situations when ALS and BLS squads are on scene and it is determined the BLS Squad is appropriate to transport.

   e. ALS Squad intercepts a BLS squad and determines the patient is appropriate for BLS transport.

   f. An ALS crew consisting of an ALS level provider and EMT determine the patient is appropriate for BLS transport and the EMT
serves as the primary attendant in the patient compartment.

B. When a higher level provider (certification), transfers care to a lower level provider (certification), the following criteria must be met:

1. The lower level provider must agree to the transfer of care.

2. In the event the higher level provider chooses to drive, there must be another EVOC certified crew member present on the vehicle to drive in case the higher level provider needs to resume patient care.

3. The higher certified provider must evaluate and, if needed, provide initial treatment prior to handoff.

4. Anticipated additional treatment may not exceed the scope of practice of the level of certification assuming the patient care, or the level of licensure of the EMS vehicle and EMS Agency.

5. Prior to the transfer of care, a history and physical examination (H&P) must be performed by the higher level provider. This H&P must be documented and the higher level provider must affix their signature to the report. This H&P may be documented on the patient care record of the transporting unit, or on a separate PCR. If documented on a separate PCR, the H&P must be forwarded to the receiving medical facility.

6. With any transfer of care, the provider transferring care must interface directly with the receiving provider and ensure all pertinent information is conveyed.

7. Any transfer of care between EMS providers must be documented in the patient care record.

8. Any level of provider accepting transfer of patient care must be continuously alert for changes in patient condition and be prepared to provide immediate medical intervention and potentially call for a higher level intercept.

C. Transfer of care decision should be a joint decision reached by all involved providers. If transfer to lower provider (certification) the higher level provider will determine who remains in the patient compartment, drives, or allow a lower certified crew to transport the patient.
D. If the Lower Certified provider is not comfortable accepting responsibility for primary care, and the providers cannot agree, contact Medical Command for further direction and resolution.
Nerve agents are very toxic organophosphorus compounds that have biological activity similar to that of many insecticides. They cause biological effects by inhibiting acetylcholinesterase and, thereby, allowing acetylcholine to accumulate. Initial effects from small amounts of a nerve agent differ, depending on the route of exposure. There is usually an asymptomatic interval of minutes after liquid exposure before these occur. Effects from vapor occur almost immediately.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocols for medical management based on clinical presentation.

B. The patient should be removed from the environment.
   1. Never attempt rescue unless trained, certified, and properly equipped.
   2. Never place yourself or your crew in danger.

C. Mild to moderate signs and symptoms (including dyspnea and nausea/vomiting):
   1. Administer one (1) MARK I Kit IM or Atropine 2 mg IM or IV (Adult: 2 mg / Peds: 0.02mg/kg) and Pralidoxime 600 mg IM or IV (Peds 25 - 50 mg/kg). Atropine should be repeated every five (5) minutes until improvement is noted.
   2. Oxygen should be administered at 15 LPM via non-rebreather.
   3. Do not treat for isolated miosis (unless eye pain is severe) or rhinorrhea (unless severe).

D. Severe signs and symptoms (including loss of consciousness, seizures, or apnea):
   1. Administer three (3) MARK I Kits IM or Atropine 6 mg IM or IV and Pralidoxime (if available) 1800 mg IM or 2 grams slow IV drip over 20 minutes. Repeat Atropine 2 mg IM or IV every five (5) minutes until:
      a. secretions diminish; or
      b. airway resistance is less or is normal.
   3. In patients with seizure activity administer Midazolam 2 mg IV/IO/IM or 5 mg (IN) via atomizer.
E. Monitor patient via pulse oximeter and cardiac monitor.

F. Decisions regarding the transportation of patients should be made in consultation with Medical Command and the on-scene incident management system.

Note: EMT-Bs may administer MARK I Kits [up to total of three (3) kits] to symptomatic public safety personnel or when directed to do so by an ALS provider based on signs and symptoms in a mass casualty incident (MCI) or on-site chemical testing, confirming nerve or organophosphate agent presence in a mass casualty incident. Medical Command consultation is not required in these situations.
A. Assessing and Treating an LVAD Patient:

1. Recognize that you have a patient with an LVAD.
2. Determine if your patient has an LVAD problem, an unrelated illness, or injury.
3. A completely stable patient may have NO palpable pulse or measurable blood pressure.
4. Mental status and skin color must be used to determine patient stability.
5. CPR should rarely be performed on an LVAD patient.
6. Patients with an LVAD should almost never be pronounced dead at the scene.
7. Call the Emergency Contact Number located on the LVAD control unit.

B. Overview of an LVAD:

The LVAD or Left Ventricular Assist Device is a mechanical device that takes over some or all of the pumping function of the heart's left ventricle. This device is used for patients of any age or gender with advanced heart failure who would not otherwise survive without this device.

Some LVAD patients will have an LVAD while they are waiting for a heart transplant (called Bridge-to-Transplant). Other LVAD patients, who are not eligible for a heart transplant for some reason, will live with the device for the rest of their lives (called Destination Therapy or Lifetime use).

1. How the Heart Works versus How LVADs Work:

The normal pumping function of the heart is achieved by the contraction of the left ventricular muscle which pushes a bolus of blood forward in the cardiovascular system with each contraction. This contraction is what we feel when checking a pulse, and what we hear when taking a blood pressure.

If the heart is not contracting, blood is not moving forward in the system, and we do not feel or hear a pulse. The LVAD, in contrast, flows constantly and, therefore, creates no "pulse" to feel or hear.

The LVAD is a tube that is about one (1) inch in diameter with a pump in the middle. One end of the tube (inflow) is surgically inserted into the left ventricle,
and the other end (outflow) is sewn into the aorta, just above where it exits the heart.

The pump on the LVAD spins constantly. The right side of the heart still pushes blood through the lungs and back to the left ventricle, but then the LVAD pump pulls the blood out of the left ventricle and pumps it out to the body, taking over most or all of the failed pumping action of the left ventricle.

NOTE: The important part to EMS providers is that the pump is a constant flow pump. There is no rhythmic pumping as there is with the ventricle, and therefore there is little to no pulse. This means you can have a perfectly stable and healthy looking person who has no palpable pulse and whom you may or may not be able to take a blood pressure.

C. Assessing the LVAD Patient:

1. Recognize you have an LVAD patient.
   a. The LVAD patient has a control unit attached to their waist or in a shoulder bag.
   b. The control unit will be attached to batteries mounted to the belt, in shoulder holsters, or in a shoulder bag. At home, it could be attached to a long cord that connects to a large power unit.

2. Decide if you have a patient with an LVAD problem or a patient with a medical problem who just happens to have an LVAD. Patients with LVADS will have all the same illnesses and injuries as any other patient you see. Their LVAD may have nothing to do with the reason you were called.

3. LOOK:
   a. Alarms on the control unit will most likely indicate an LVAD problem. Follow resource guides with the patient to trouble shoot.
   b. Skin color and mental status are the most reliable indicators of patient stability for the LVAD patient.

4. LISTEN:
   a. Listen over the LVAD pump location to make sure you can hear it running. This will be just to the left of the epigastrium, immediately below the base of the heart.
b. The patient and their family are experts on this device. Listen to what they have to say about any problems with the LVAD.

5. FEEL:
   a. Feel the control unit. A hot control unit indicates the pump is working harder than it should and often indicates a pump problem such as a thrombosis (clot) in the pump.
   b. The use of pulse and blood pressure to assess stability can be unreliable in an LVAD patient, even if they are very stable.

6. VITALS:
   a. Pulse: Generally you will be unable to feel a pulse.
   b. Blood Pressure: You may or may not be able to obtain a BP. Standard readings are unreliable and may vary from attempt to attempt.
   c. Pulse Oximetry: Readings seem to be fairly accurate and consistent, according to data, despite the manufacturer stating that pulse oximetry often does not work.
   d. Quantitative Continuous Waveform Capnography: This should remain accurate as it relies on respiration, not pulse.
   e. Temperature: Infection and sepsis are common. Check temperature!

**NOTE:** LVAD patients can remain stable and experience a range of ECG rhythms that could be dangerous or fatal in another patient. Remember blood sugar and stroke assessment, particularly for an altered mental status.

D. Treating the LVAD Patient:

1. Generally, treatments for an LVAD patient will follow the current WVOEMS Protocols. However, there are a few special considerations to keep in mind. Do not let the LVAD distract you from treating the patient!

2. The best medical resource available to you for LVAD related problems is the patient's VAD coordinator. The patient will have a contact sheet for the VAD coordinator with them at all times. **Contact the VAD coordinator as soon as possible.**
3. If you are assisting patient to change batteries or power source, **never** remove both batteries at the same time. This will cause the LVAD pump to immediately stop.

4. Sepsis and stroke are leading causes of death for LVAD patients.

5. Treating ECG changes:
   a. Many LVAD patients already have an implanted defibrillator and/or a pacemaker in place.
   b. The continuous flow of the LVAD means changes in ECG rhythms, including atrial fibrillation, SVT, ventricular tachycardia, and even ventricular fibrillation may have minimal to no short-term effect on the cardiac output and stability. Treat ECG changes according to protocol.
   c. Use of external pacing or defibrillation is unchanged for LVAD patients.
   d. Use of ACLS education is unchanged for LVAD patients. Follow standard AHA and protocol guidelines, as appropriate.

6. LVAD patients are always on anticoagulant medications. Even minor appearing chest or abdominal trauma, such as a seatbelt mark, could be hiding a very serious injury.

7. LVAD manufacturers currently recommend against CPR, especially if there is any evidence the pump is still functioning. There currently are no published studies or published consensus statements regarding whether and under what circumstances to perform CPR on a deceased LVAD patient. LVAD devices are not all the same and, if at all possible, clinical decisions regarding LVADs should be made in consultation with the patient's VAD coordinator. The decision to perform CPR should be made based upon best clinical judgment of the provider in consultation with the patient's family and the **VAD coordinators or Medical Command**. In any event, CPR should be initiated only where:
   a. You have confirmed the pump has stopped (by listening for pump sounds) AND all trouble shooting efforts to restart it (connect wires, batteries, new control unit, etc.) have failed, AND;
   b. The patient is unconscious, unresponsive, and has no detectable signs of life (no pulse, no blood pressure, no pulse oximetry reading or wave form capnography reading, AND;
c. The patient does not have a valid DNR in place.

8. Patients should not be pronounced dead if LVAD continues to function, unless they have obvious factors of death such as decapitation, rigor mortis, or dependent lividity.

E. Transporting the LVAD Patient:

1. Patients without an LVAD problem should be transported to the closest appropriate hospital for their condition.

2. When in doubt, transport to the closest hospital to access more transport resources and support.

3. Always bring the patient’s resource bag with you. It should have spare batteries, possibly a spare control unit, contact sheets for the VAD coordinator, and directions for equipment and system alarms.

4. Always bring spare batteries for the LVAD with the patient, even if it is not an LVAD problem. Fresh batteries generally last 3 - 5 hours. Dead batteries mean a dead patient.

5. If you have a long transport or expect that the patient may be away from home for more than 4 - 5 hours, then try and bring the patient’s power base unit.

6. Use your patient and their family as a resource. They are experts about this device and can help you assist the patient.

Recommended Unit Resource: Print EMS Guide for Mechanical Circulatory Support and place in all ambulances (20 pages). This guide has excellent information and "trouble shooting" guidance for the five (5) LVAD devices that EMS providers may encounter. Access the resource guide at: http://www.mylvad.com/assets/
EtCO2 monitoring is evaluated in a numerical reading and waveform reading. This protocol uses the understanding of the tool, physiology, and interpretation of EtCO2 to help the provider assess and treat patients appropriately. This tool gives the provider the ability to support a physical exam and confirm the ventilation process. Normal EtCO2 is 35 - 45 mm/hg.

A. Perform Initial Treatment / Universal Patient Care Protocol and follow the proper protocols for medical management based on clinical presentation.

B. If EtCO2 is available it may evaluated in a moving vehicle.

C. Waveform EtCO2 numerical readings can be utilized to assess the following:
   1. Confirm breathing is present
   2. Confirm the airway is open and patent
   3. Confirm the physiology of ventilation is normal or abnormal

D. Non-Intubated patients; EtCO2 readings can be utilized to assess the following:
   1. Rapid assessment of the patients respiratory status
   2. Monitor critically ill patients to alert providers to impending respiratory arrest
   3. Assist in managing patients with ICP by verifying and maintaining levels of EtCO2 at 30 - 35 mm/hg

E. Intubated patients; EtCO2 readings can be utilized to assess the following:
   1. Verification of Tube placement
   2. Proper titration of respiratory assistance to maintain proper EtCO2.
   3. Evaluate cardiac output during CPR. (perfusion efforts and early detection of ROSC)
   4. Assist in managing patients with ICP by verifying and maintaining levels of EtCO2 at 30 - 35 mm/hg
### End Tidal CO2 (EtCO2) - OPTIONAL

<table>
<thead>
<tr>
<th>EVENT</th>
<th>EVIDENCE</th>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apnea</td>
<td>No EtCO2 number. No waveform, No RR</td>
<td>O2, Ventilate</td>
</tr>
<tr>
<td>Obstruction</td>
<td>No waveform, No or decreased LS, impedance</td>
<td>O2, alignment maneuvers, remove obstruction</td>
</tr>
<tr>
<td>Laryngospasm</td>
<td>No waveform, No LS, Impedance, does not respond to alignment maneuvers</td>
<td>O2, Ventilate</td>
</tr>
<tr>
<td>Bronchospasm</td>
<td>Waveform abnormality</td>
<td>O2, breathing tx, CPAP</td>
</tr>
<tr>
<td>COPD</td>
<td>Abnormal EtCO2 level</td>
<td>O2, possibly Nitro / possibly breathing tx, CPAP</td>
</tr>
<tr>
<td>Hypoventilation</td>
<td>Low EtCO2, short wave form</td>
<td>O2, Ventilate</td>
</tr>
<tr>
<td>Tube Displacement</td>
<td>Short or no waveform, low or no EtCO2 number</td>
<td>Intubate</td>
</tr>
<tr>
<td>ROSC</td>
<td>Increase EtCO2 number, waveform, impedance</td>
<td>O2, Assist Ventilations</td>
</tr>
<tr>
<td>ICP</td>
<td>If signs of ICP</td>
<td>Maintain EtCO2 at 30 - 35 mm/hg</td>
</tr>
</tbody>
</table>
High school sporting venues are high profile community events with an inherent risk of sports trauma or spectator illness or injury. Emergency Medical Services (EMS) coverage of West Virginia inter-scholastic Friday night football has been documented to occur in over 94% of contests. Similar to other rural states, physician and certified athletic trainers (NATA) are present in less than 50% of events. The Medical Time Out protocol promotes pre-game organization for response to athlete and spectator injury.

These guidelines provide a rationale and structure for EMS entry to the sports trauma arena with the focus on pre-game preparation and communication with medical staff for participating schools. The guidelines in this protocol provide procedures for catastrophic injury recognition and response. This encourages direct participation and venue awareness with EMS positioning to promote precision of response. EMS event coverage is a valued community service with a component of unique high visibility "fish-bowl arena" and deserves a component of protection for adverse outcomes.

EMS Squad education and implementation for a Medical Time Out prior to providing coverage for scholastic sporting events is consistent with new legislation for sports concussion in all 50 states.

Medical Time Out education and checklist should be monitored by the Squad Training Officer and Squad Medical Director.

A. The pre-game checklist should be initiated 15-30 minutes prior to the event and should document cell phone contacts for all participants - Team Medical Staff, EMS, Police, and School Officials.

B. The checklist should include hand signals for EMS response to the field of play with need for sport concussion, backboard, ACLS support, and spectator response. Event sideline and press box radio communication is recommended but optional.

C. AED locations in the venue should be recorded with documentation of Sentinel Seizure awareness in athlete sudden cardiac arrest.

D. Procedures for head and neck injury should be reviewed with the captain assigned for C-spine control, face mask removal equipment, and agreed technique for boarding (log roll or 8 person lift).
E. Additional information included in the checklist depending on the sport venue may include **cheerleading injury response** and in geographically isolated locations designated **aero-medical landing zone coordinates**, and back-up EMS when game coverage is limited to a single unit.

F. **Check List Items:**

1. Phone Contacts
2. Hand Signals
3. AED Locations
4. Head and Neck Injury
5. Technique for Boarding
6. Cheerleading Injury Response
7. Aero-medical Landing Zone Coordinates

G. **Sports Concussion**

1. West Virginia 2013 legislation on sports concussion return to play requires mandatory removal from contest in all cases of suspected head injury identified by sideline physician, athletic trainer or coach. Return to play guidelines require a 5 day progression after symptom resolution and neuropsychological testing with physician involvement.

2. EMS intervention is typically requested in cases with loss of consciousness or worsening symptoms. During transport a symptom checklist should be recorded and provided to the receiving Emergency Department. (Sports Concussion Checklist Tools can be found online).
H. Heat Illness

1. Heat stress is common in high school football. Exertion Heat Stroke with rectal temperature above 104 F and altered mental status requires rapid cooling with ice bath immersion prior to transport. Heat exhaustion with temp above 100 F should include IVF with normal saline bolus (1 liter). Athletes with known or suspected sickle cell trait (SCT) are at increased risk for heat stress and may progress to explosive rhabdomyolysis and deterioration to PEA cardiac arrest from acute renal failure induced hyperkalemia. SCT athletes with heat stress require cardiac monitoring for development of peaked T waves or QRS prolongation.

I. Athlete Sudden Cardiac Arrest (SCA)

1. Intense exercise is a trigger for Sudden Cardiac Arrest in athletes with unrecognized Hypertrophic Cardiac Myopathy (HCM), Coronary Artery Anomalies, Arrhythmogenic Right Ventricular Dysplasia (ARVD), and Long QT Syndrome.

2. **Sudden collapse during sports play should be considered cardiac in origin.** Athlete collapse with seizure (Sentinel Seizure) and/or agonal respirations require chest exposure for AED placement or cardiac monitor with high index of suspicion for cardiac etiology.
This protocol applies specifically to BLS providers who are transporting patients with pre-established treatment modalities to home or extended care facilities. This protocol DOES NOT apply to interfacility transports. BLS pre-established treatment monitoring is limited to Jackson-Pratt (JP) drain tubes, chest tubes, and IV therapy.

A. Perform Initial Treatment/Universal Patient Care Protocol and follow the proper protocol for medical management based on clinical presentation.

B. Make sure the patient has been provided discharge information that details how to utilize the device when they are home.

C. Jackson Pratt (JP) drains

1. Jackson Pratt drains are most often used after surgery to remove drainage from the surgical site.

2. Jackson Pratt drains are often used before surgery to drain infected areas.

3. Jackson Pratt drains are round or grenade in shape and made of flexible plastic that is attached to a tube that remains in the patient.

4. BLS Monitoring:
   a. Note the length of exposed tubing outside the patient. Take caution not to manipulate the patient in a manner to pull on this device. The length noted initially should **NOT** change during transport.

   b. Monitor any patient complaint that is related to the area the JP drain is located. This should not change during the transport.

   c. If new discomfort occurs, the normal discomfort increases, the tube becomes dislodged contact **Medical Command**.

   ![Jackson-Pratt drain](image)
D. Chest Tubes

1. Chest tubes vary in diameter and are plastic tubes that have been inserted through the chest wall.

2. Chest tubes remove air, fluid, or pus from the intrathoracic space.

3. BLS Monitoring:

   a. Note the length of the exposed chest tube outside the patient. Take caution not to manipulate the patient in a manner to pull on this device. The length noted initially should **NOT** change during transport.

   b. The attached drainage tubing should never be placed above the insertion site at any time.

   c. Monitor the patient's breathing and note if it remains normal and any changes during the transport.

   d. If the patient's breathing becomes labored or the chest tube becomes dislodged contact **Medical Command** and transport the patient to the nearest emergency department.

E. IV Fluids

1. BLS monitoring of IV therapy patients is intended for IVs that have been established and running but whose medical condition is not dependent on fluid resuscitation. It not intended to be an interfacility transport protocol for the patient needing IV fluids as a medical treatment to prevent deterioration of their condition.

2. IV Monitoring applies to **ADULTS ONLY**.

3. BLS Monitoring:

   a. IV fluids **MUST** be clear non-medicated Normal Saline 0.9%; however, Lactated Ringers may be utilized due to the Normal Saline shortage.

   b. IV fluid must be gravity fed ONLY. IV pumps are not allowed.

   c. The IV must be established by the initiating facility staff - **venous peripheral only- arm only**.
Cardiac Thrombolytic Therapy Screening:

Person filling out form: _______________________________

Patient Name: ___________________________   Age: ______

Duration of symptoms: ___ / ___ hrs./mins.  Yes  No

1. S-T segment elevated or depressed at least 0.1 mv?  ___  ___
2. History of bleeding problems, i.e. nose, gums, etc?  ___  ___
3. History of bleeding ulcers?  ___  ___
4. History of bleeding hemorrhoids?  ___  ___
5. Any surgery in last 6 months?  ___  ___
6. Any dental procedures in last 6 months?  ___  ___
7. History of stroke (including family)?  ___  ___
8. History of sudden/temporary weakness/numbness of face or extremities, dizziness or unsteadiness?  ___  ___
9. History of difficulty with speech or visions?  ___  ___
10. History of headaches or mental status changes?  ___  ___
11. Any recent falls or injuries?  ___  ___
12. History of high blood pressure?  ___  ___
13. History of diabetes?  ___  ___
14. History of hemorrhagic retinopathy?  ___  ___
15. Pregnant?  ___  ___
16. Receiving oral anticoagulants?  ___  ___
17. CPR performed recently?  ___  ___
18. IM injections recently?  ___  ___
19. Known cardiac arrhythmias?  ___  ___
20. Liver dysfunctions?  ___  ___
**Appendix B**

**Diversion Alert Status Form**: To be completed by designated hospital representative and faxed to Medical Command immediately after phone notification.

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<th>Date:</th>
<th>Hospital:</th>
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<table>
<thead>
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<th>Time Initiated:</th>
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<table>
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<th>Charge Physician:</th>
<th>Charge Nurse:</th>
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<table>
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<tr>
<th>Representative Requesting Diversion:</th>
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<table>
<thead>
<tr>
<th>Alert Status Requested and Criteria: (i.e. Red Alert, Yellow Alert, Criteria 1-5)</th>
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<table>
<thead>
<tr>
<th>Medical Command Operator:</th>
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<table>
<thead>
<tr>
<th>Number of Patients in ED:</th>
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<table>
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<tr>
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<th>Number in Use:</th>
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<th>Number in Use:</th>
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<table>
<thead>
<tr>
<th>Signature of Designated Representative:</th>
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### Pediatric Vital Signs

<table>
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<tr>
<th>Age</th>
<th>Heart Rate</th>
<th>Respiratory Rate</th>
<th>Minimum Systolic BP</th>
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<tbody>
<tr>
<td>Infant (less than 1 year)</td>
<td>100 – 160</td>
<td>30 – 60</td>
<td>greater than 60</td>
</tr>
<tr>
<td>Toddler (1 to 2 years)</td>
<td>90 – 150</td>
<td>24 – 40</td>
<td>greater than 70</td>
</tr>
<tr>
<td>Preschooler (3 to 5 years)</td>
<td>80 – 140</td>
<td>22 – 34</td>
<td>greater than 75</td>
</tr>
<tr>
<td>School-aged child (6 to 10 years)</td>
<td>70 – 120</td>
<td>18 – 30</td>
<td>greater than 80</td>
</tr>
<tr>
<td>Adolescent (11 to 18 years)</td>
<td>60 – 100</td>
<td>12 – 16</td>
<td>greater than 90</td>
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### Pediatric Airway Management Supplies

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<thead>
<tr>
<th>Weight (kg)</th>
<th>Laryngoscope Blade</th>
<th>ET Tube</th>
<th>ET Tube Length</th>
<th>Stylet</th>
<th>Suction Catheter</th>
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<tbody>
<tr>
<td>Newborn 3-5 kg</td>
<td>0-1 straight</td>
<td>3.0-3.5 uncuffed</td>
<td>10-10.5</td>
<td>6 Fr</td>
<td>6-8 Fr</td>
</tr>
<tr>
<td>Infant 6-9 kg</td>
<td>1 straight</td>
<td>3.5 uncuffed</td>
<td>10-10.5</td>
<td>6 Fr</td>
<td>8 Fr</td>
</tr>
<tr>
<td>Toddler 10-11 kg</td>
<td>1 straight</td>
<td>4.0 uncuffed</td>
<td>11-12</td>
<td>6 Fr</td>
<td>8-10 Fr</td>
</tr>
<tr>
<td>Small Child 12-14 kg</td>
<td>2 straight</td>
<td>4.5 uncuffed</td>
<td>12.5-13.5</td>
<td>6 Fr</td>
<td>10 Fr</td>
</tr>
<tr>
<td>Child 15-18 kg</td>
<td>2 straight or curved</td>
<td>5.0 uncuffed</td>
<td>14-15</td>
<td>6 Fr</td>
<td>10 Fr</td>
</tr>
<tr>
<td>Child 19-22 kg</td>
<td>2 straight or curved</td>
<td>5.5 uncuffed</td>
<td>15.5-16.5</td>
<td>14 Fr</td>
<td>10 Fr</td>
</tr>
<tr>
<td>Large Child 24-30 kg</td>
<td>2-3 straight or curved</td>
<td>6.0 cuffed</td>
<td>17-18</td>
<td>14 Fr</td>
<td>10 Fr</td>
</tr>
<tr>
<td>“Adult” greater than or equal to 32 kg</td>
<td>3 straight or curved</td>
<td>6.5 cuffed</td>
<td>18.5-19.5</td>
<td>14 Fr</td>
<td>12 Fr</td>
</tr>
</tbody>
</table>
Wong-Baker FACES Pain Rating Scale

Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. Face 0 is very happy because he doesn’t hurt at all. Face 1 hurts just a little bit. Face 2 hurts a little more. Face 3 hurts even more. Face 4 hurts a whole lot. Face 5 hurts as much as you can imagine, although you don’t have to be crying to feel this bad. Ask the person to choose the face that best describes how he is feeling.

Rating scale is recommended for persons age 3 years and older.
ASSESSMENT MNEMONICS

**ENAME**
A checklist for first tasks on scene of a motor vehicle collision.
- Environmental hazards
- Number of patients
- Additional resources
- Mechanism of injury
- Extrication?

**PENMAN**
A different checklist for first tasks at an MVC.
- Personal Protective Equipment
- Equipment needed
- Number of injured
- Mechanism of injury
- Additional resources needed
- Need for immobilization?

**MI ST**
A checklist for handover of a trauma patient.
- Mechanism of injury - describe it
- Injuries - describe them
- Signs - vital signs, abnormal s/s
- Treatment - what have you done?

**CHATT**
Elements of a Patient Contact/Care Report or Patient Report Form
- Chief complaint
- History - recent & relevant long term
- Assessment - your conclusions
- Treatment - include patient reactions
- Transport - note changes en route

**SOAP**
This is the general order for treating a patient.
- Subjective information (What is the patient telling you?)
- Objective information (What are your observations and tools telling you?)
- Assessment of the patient (What do you think is happening?)
- Plan of action (What are you going to do about it?)

**CHEATED**
This is a summary of a patient contact, from start to finish.
- Chief Complaint
- History
- Examination
- Assessment
- Treatment
- Evaluation (Did the treatment help?)
- Disposition (What was the final outcome?)
OPQRST
*Used to assess PAIN.*

- Onset (this event)
- Provoked, Palpation
- Quality
- Radiates (Does it spread out?)
- Severity
- Time (history)

SAMPLE
*SAMPLE is the acronym covering the details we need to get about any patient.*

- Signs & Symptoms
- Allergies
- Medications
- Past pertinent history
- Last oral intake, liquid & solid
- Events leading to the incident

AVPU
*This is the mnemonic to establish level of responsiveness.*

- Alert
- Verbal (Instructions are mostly followed. Answers are delayed or inappropriate.)
- Pain (Sternal rub. Thumb web pinch.)
- Unresponsive

START & RPM
*START is an acronym for a copyrighted system for triage. RPM is the list of specific actions taken in this system.*

- Simple
- Triage
- And
- Rapid
- Transport and
- Respirations
- Perfusion
- Mentation

PERRLA
*I can’t believe I never included this list for evaluating the eyes during a field exam.*

- Pupils are
- Equal,
- Round, and
- Reactive to
- Light
- Accommodation

SLUDGE
*These are the symptoms of excessive stimulation of body functions due to organophosphate poisoning.*

- Salivation (Drool)
- Lacrimation (Tears)
- Urination
- Defecation
- Gastric juices (Heartburn)
- Emesis (Vomiting)
## GLASGOW COMA SCALE

<table>
<thead>
<tr>
<th>Response</th>
<th>Scale</th>
<th>Score</th>
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<tbody>
<tr>
<td><strong>Eye Opening Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyes open spontaneously</td>
<td></td>
<td>4 Points</td>
</tr>
<tr>
<td>Eyes open to verbal command, speech, or shout</td>
<td></td>
<td>3 Points</td>
</tr>
<tr>
<td>Eyes open to pain (not applied to face)</td>
<td></td>
<td>2 Points</td>
</tr>
<tr>
<td>No eye opening</td>
<td></td>
<td>1 Point</td>
</tr>
<tr>
<td><strong>Verbal Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oriented</td>
<td></td>
<td>5 Points</td>
</tr>
<tr>
<td>Confused conversation, but able to answer questions</td>
<td></td>
<td>4 Points</td>
</tr>
<tr>
<td>Inappropriate responses, words discernible</td>
<td></td>
<td>3 Points</td>
</tr>
<tr>
<td>Incomprehensible sounds or speech</td>
<td></td>
<td>2 Points</td>
</tr>
<tr>
<td>No verbal response</td>
<td></td>
<td>1 Point</td>
</tr>
<tr>
<td><strong>Motor Response</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obey commands for movement</td>
<td></td>
<td>6 Points</td>
</tr>
<tr>
<td>Purposeful movement to painful stimulus</td>
<td></td>
<td>5 Points</td>
</tr>
<tr>
<td>Withdraws from pain</td>
<td></td>
<td>4 Points</td>
</tr>
<tr>
<td>Abnormal (spastic) flexion, decorticate posture</td>
<td></td>
<td>3 Points</td>
</tr>
<tr>
<td>Extensor (rigid) response, decerebrate posture</td>
<td></td>
<td>2 Points</td>
</tr>
<tr>
<td>No motor response</td>
<td></td>
<td>1 Point</td>
</tr>
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</table>

*Minor Brain Injury = 13-15 points; Moderate Brain Injury = 9-12 points; Severe Brain Injury = 3-8 points*
<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>MEANING</th>
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<tr>
<td>á</td>
<td>before</td>
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<tr>
<td>Ab</td>
<td>abortion</td>
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<tr>
<td>abd</td>
<td>abdomen</td>
</tr>
<tr>
<td>adm</td>
<td>admission</td>
</tr>
<tr>
<td>AED</td>
<td>automatic external defibrillator</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immune deficiency syndrome</td>
</tr>
<tr>
<td>AKA</td>
<td>above the knee amputation</td>
</tr>
<tr>
<td>ALOC</td>
<td>altered level of consciousness</td>
</tr>
<tr>
<td>ALS</td>
<td>advanced life support</td>
</tr>
<tr>
<td>am</td>
<td>morning</td>
</tr>
<tr>
<td>AMA</td>
<td>against medical advice</td>
</tr>
<tr>
<td>Amb</td>
<td>ambulation/ambulance</td>
</tr>
<tr>
<td>amt</td>
<td>amount</td>
</tr>
<tr>
<td>ant</td>
<td>anterior</td>
</tr>
<tr>
<td>a/o x3</td>
<td>alert and oriented to person, place, and time</td>
</tr>
<tr>
<td>approx</td>
<td>approximately</td>
</tr>
<tr>
<td>ASC</td>
<td>Approved Stroke Center</td>
</tr>
<tr>
<td>appt</td>
<td>appointment</td>
</tr>
<tr>
<td>ARDS</td>
<td>adult respiratory distress syndrome</td>
</tr>
<tr>
<td>ASA</td>
<td>aspirin</td>
</tr>
<tr>
<td>ASAP</td>
<td>as soon as possible</td>
</tr>
<tr>
<td>ASHD</td>
<td>atherosclerotic heart disease</td>
</tr>
<tr>
<td>BCP</td>
<td>birth control pills</td>
</tr>
<tr>
<td>BIB</td>
<td>brought in by</td>
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<tr>
<td>BKA</td>
<td>below the knee amputation</td>
</tr>
<tr>
<td>BLS</td>
<td>basic life support</td>
</tr>
<tr>
<td>BM</td>
<td>bowel movement</td>
</tr>
<tr>
<td>BOA</td>
<td>born out of asepsis</td>
</tr>
<tr>
<td>BOW</td>
<td>bag of waters</td>
</tr>
<tr>
<td>BP</td>
<td>blood pressure</td>
</tr>
<tr>
<td>BS</td>
<td>breath sounds</td>
</tr>
<tr>
<td>BSA</td>
<td>body surface area</td>
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### APPROVED ABBREVIATIONS

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<td>c</td>
<td>with</td>
</tr>
<tr>
<td>C</td>
<td>centigrade</td>
</tr>
<tr>
<td>CA</td>
<td>cancer</td>
</tr>
<tr>
<td>CAD</td>
<td>coronary artery disease</td>
</tr>
<tr>
<td>cc</td>
<td>cubic centimeter</td>
</tr>
<tr>
<td>CC or c/c</td>
<td>chief complaint</td>
</tr>
<tr>
<td>CHF</td>
<td>congestive heart failure</td>
</tr>
<tr>
<td>cm</td>
<td>centimeter</td>
</tr>
<tr>
<td>C/O</td>
<td>complains of</td>
</tr>
<tr>
<td>CO2</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td>COA</td>
<td>condition on arrival</td>
</tr>
<tr>
<td>COPD</td>
<td>chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>CP</td>
<td>chest pain</td>
</tr>
<tr>
<td>CPAP</td>
<td>continuous positive airway pressure</td>
</tr>
<tr>
<td>CPR</td>
<td>cardiopulmonary resuscitation</td>
</tr>
<tr>
<td>CRF</td>
<td>chronic renal failure</td>
</tr>
<tr>
<td>CSF</td>
<td>cerebrospinal fluid</td>
</tr>
<tr>
<td>CSM</td>
<td>circulation, sensation, movement</td>
</tr>
<tr>
<td>CVA</td>
<td>cerebral vascular accident</td>
</tr>
<tr>
<td>CXR</td>
<td>chest x-ray</td>
</tr>
<tr>
<td>D&amp;C</td>
<td>dilation and curettage</td>
</tr>
<tr>
<td>dc</td>
<td>discharge/discontinue</td>
</tr>
<tr>
<td>DM</td>
<td>diabetes mellitus</td>
</tr>
<tr>
<td>DNR</td>
<td>do not resuscitate</td>
</tr>
<tr>
<td>DOA</td>
<td>dead on arrival</td>
</tr>
<tr>
<td>DOB</td>
<td>date of birth</td>
</tr>
<tr>
<td>DOE</td>
<td>dyspnea on exertion</td>
</tr>
<tr>
<td>DT’s</td>
<td>delirium tremors</td>
</tr>
<tr>
<td>DVT</td>
<td>deep vein thrombosis</td>
</tr>
<tr>
<td>DX</td>
<td>diagnosis</td>
</tr>
<tr>
<td>EBL</td>
<td>estimated blood loss</td>
</tr>
<tr>
<td>ECG</td>
<td>electrocardiogram</td>
</tr>
<tr>
<td>ED/ER</td>
<td>emergency dept. / emergency room</td>
</tr>
<tr>
<td>EDAP</td>
<td>emergency dept. approved for pediatrics</td>
</tr>
<tr>
<td>ABBREVIATION</td>
<td>MEANING</td>
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<tr>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>EMS</td>
<td>emergency medical services</td>
</tr>
<tr>
<td>EMT</td>
<td>emergency medical technician</td>
</tr>
<tr>
<td>EMT-P</td>
<td>emergency medical technician-paramedic</td>
</tr>
<tr>
<td>ET</td>
<td>endotracheal</td>
</tr>
<tr>
<td>ETA</td>
<td>estimated time of arrival</td>
</tr>
<tr>
<td>ETOH</td>
<td>ethanol (alcohol)</td>
</tr>
<tr>
<td>FB</td>
<td>foreign body</td>
</tr>
<tr>
<td>f/u</td>
<td>follow up</td>
</tr>
<tr>
<td>fx</td>
<td>fracture</td>
</tr>
<tr>
<td>G</td>
<td>gravida</td>
</tr>
<tr>
<td>GB</td>
<td>gallbladder</td>
</tr>
<tr>
<td>GI</td>
<td>gastrointestinal</td>
</tr>
<tr>
<td>gm</td>
<td>gram</td>
</tr>
<tr>
<td>GSW</td>
<td>gunshot wound</td>
</tr>
<tr>
<td>gtt</td>
<td>drop</td>
</tr>
<tr>
<td>GU</td>
<td>genitourinary</td>
</tr>
<tr>
<td>HMO</td>
<td>health maintenance organization</td>
</tr>
<tr>
<td>hosp</td>
<td>hospital</td>
</tr>
<tr>
<td>hr(s)</td>
<td>hour(s)</td>
</tr>
<tr>
<td>hs</td>
<td>at night</td>
</tr>
<tr>
<td>ht</td>
<td>height</td>
</tr>
<tr>
<td>HTN</td>
<td>hypertension</td>
</tr>
<tr>
<td>Hx</td>
<td>history</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>IUD</td>
<td>intrauterine device</td>
</tr>
<tr>
<td>IUP</td>
<td>intrauterine pregnancy</td>
</tr>
<tr>
<td>IV</td>
<td>intravenous</td>
</tr>
<tr>
<td>IVP</td>
<td>Intravenous push</td>
</tr>
<tr>
<td>JVD</td>
<td>jugular vein distention</td>
</tr>
<tr>
<td>KCL</td>
<td>potassium chloride</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
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<td>ABBREVIATION</td>
<td>MEANING</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
</tr>
<tr>
<td>KO</td>
<td>knocked out (loss of consciousness)</td>
</tr>
<tr>
<td>KVO</td>
<td>keep vein open</td>
</tr>
<tr>
<td>L</td>
<td>liter</td>
</tr>
<tr>
<td>lab</td>
<td>laboratory</td>
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<tr>
<td>lac</td>
<td>laceration</td>
</tr>
<tr>
<td>lb</td>
<td>pound</td>
</tr>
<tr>
<td>LLE</td>
<td>left lower extremity</td>
</tr>
<tr>
<td>LLL</td>
<td>left lower lobe (lung)</td>
</tr>
<tr>
<td>LLQ</td>
<td>left lower quadrant (abdomen)</td>
</tr>
<tr>
<td>LMP</td>
<td>last menstrual period</td>
</tr>
<tr>
<td>LOC</td>
<td>level of consciousness/loss of consciousness</td>
</tr>
<tr>
<td>LUE</td>
<td>left upper extremity</td>
</tr>
<tr>
<td>LUL</td>
<td>left upper lobe (lung)</td>
</tr>
<tr>
<td>LUQ</td>
<td>left upper quadrant</td>
</tr>
<tr>
<td>MAR</td>
<td>most accessible receiving facility</td>
</tr>
<tr>
<td>max</td>
<td>maximum</td>
</tr>
<tr>
<td>MCL</td>
<td>mid clavicular line</td>
</tr>
<tr>
<td>MD/PMD</td>
<td>medical doctor/private medical doctor</td>
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<tr>
<td>mEq</td>
<td>milliequivalent</td>
</tr>
<tr>
<td>mg</td>
<td>milligram</td>
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<tr>
<td>MI</td>
<td>myocardial infarction</td>
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<tr>
<td>MICN</td>
<td>mobile intensive care nurse</td>
</tr>
<tr>
<td>min</td>
<td>minutes/minimum</td>
</tr>
<tr>
<td>ml</td>
<td>milliliter</td>
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<tr>
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<td>multiple sclerosis/morphine sulfate</td>
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<td>MVA</td>
<td>motor vehicle accident</td>
</tr>
<tr>
<td>NA</td>
<td>not applicable/not available</td>
</tr>
<tr>
<td>NAD</td>
<td>no apparent distress</td>
</tr>
<tr>
<td>narc</td>
<td>narcotic</td>
</tr>
<tr>
<td>NB</td>
<td>newborn</td>
</tr>
<tr>
<td>neg</td>
<td>negative</td>
</tr>
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<td>ABBREVIATION</td>
<td>MEANING</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NKA</td>
<td>no known allergies</td>
</tr>
<tr>
<td>NP</td>
<td>nurse practitioner</td>
</tr>
<tr>
<td>npo</td>
<td>nothing per mouth</td>
</tr>
<tr>
<td>NSR</td>
<td>normal sinus rhythm</td>
</tr>
<tr>
<td>NTG</td>
<td>nitroglycerin</td>
</tr>
<tr>
<td>nv</td>
<td>nausea/vomiting</td>
</tr>
<tr>
<td>n/v/d</td>
<td>nausea/vomiting/diarrhea</td>
</tr>
<tr>
<td>O2</td>
<td>oxygen</td>
</tr>
<tr>
<td>O2 sat</td>
<td>oxygen saturation</td>
</tr>
<tr>
<td>OB/GYN</td>
<td>obstetrical/gynecological</td>
</tr>
<tr>
<td>OD</td>
<td>overdose/right eye</td>
</tr>
<tr>
<td>OS</td>
<td>left eye</td>
</tr>
<tr>
<td>OU</td>
<td>both eyes</td>
</tr>
<tr>
<td>p̄</td>
<td>after</td>
</tr>
<tr>
<td>P</td>
<td>para</td>
</tr>
<tr>
<td>PE</td>
<td>physical exam/pedal edema/pulmonary embolus</td>
</tr>
<tr>
<td>Peds</td>
<td>pediatric/pedestrians</td>
</tr>
<tr>
<td>perf</td>
<td>perforation</td>
</tr>
<tr>
<td>PERL</td>
<td>pupils equal, react to light</td>
</tr>
<tr>
<td>PIH</td>
<td>pregnancy induced hypertension</td>
</tr>
<tr>
<td>pm</td>
<td>evening</td>
</tr>
<tr>
<td>PMH</td>
<td>past medical history</td>
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<tr>
<td>po</td>
<td>by mouth</td>
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<tr>
<td>post</td>
<td>posterior/after</td>
</tr>
<tr>
<td>PPD</td>
<td>purified protein derivative (TB skin test)</td>
</tr>
<tr>
<td>pr</td>
<td>per rectum</td>
</tr>
<tr>
<td>prn</td>
<td>as needed</td>
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<td>Psych</td>
<td>psychiatric</td>
</tr>
<tr>
<td>pt</td>
<td>patient</td>
</tr>
<tr>
<td>PTA</td>
<td>prior to arrival</td>
</tr>
<tr>
<td>PVC</td>
<td>premature ventricular contraction</td>
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</table>
# APPENDIX

## APPROVED ABBREVIATIONS

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<thead>
<tr>
<th>ABBREVIATION</th>
<th>MEANING</th>
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<td>q</td>
<td>every</td>
</tr>
<tr>
<td>rehab</td>
<td>rehabilitation</td>
</tr>
<tr>
<td>RLE</td>
<td>right lower extremity</td>
</tr>
<tr>
<td>RLL</td>
<td>right lower lobe (lung)</td>
</tr>
<tr>
<td>RLQ</td>
<td>right lower quadrant (abdomen)</td>
</tr>
<tr>
<td>RML</td>
<td>right middle lobe (lung)</td>
</tr>
<tr>
<td>RN</td>
<td>registered nurse</td>
</tr>
<tr>
<td>r/o</td>
<td>rule out</td>
</tr>
<tr>
<td>RUE</td>
<td>right upper extremity</td>
</tr>
<tr>
<td>RUL</td>
<td>right upper lobe (lung)</td>
</tr>
<tr>
<td>RUQ</td>
<td>right upper quadrant (abdomen)</td>
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<tr>
<td>Rx</td>
<td>prescription</td>
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<td>s</td>
<td>without</td>
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<td>SC</td>
<td>specialty center</td>
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<td>sec</td>
<td>second</td>
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<td>SIDS</td>
<td>sudden infant death syndrome</td>
</tr>
<tr>
<td>SL</td>
<td>saline lock/sublingual</td>
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<tr>
<td>SOB</td>
<td>shortness of breath</td>
</tr>
<tr>
<td>sq</td>
<td>square</td>
</tr>
<tr>
<td>SQ</td>
<td>subcutaneous</td>
</tr>
<tr>
<td>SRC</td>
<td>STEMI Receiving Center</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TBC</td>
<td>total body check</td>
</tr>
<tr>
<td>Tbsp</td>
<td>tablespoon</td>
</tr>
<tr>
<td>TIA</td>
<td>transient ischemic attack</td>
</tr>
<tr>
<td>TKO</td>
<td>to keep open (IV rate)</td>
</tr>
<tr>
<td>TK</td>
<td>tourniquet</td>
</tr>
<tr>
<td>tsp</td>
<td>teaspoon</td>
</tr>
<tr>
<td>TV</td>
<td>tidal volume</td>
</tr>
<tr>
<td>UTI</td>
<td>urinary tract infection</td>
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<tr>
<td>vs</td>
<td>versus</td>
</tr>
<tr>
<td>ABBREVIATION</td>
<td>MEANING</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>VS</td>
<td>vital signs</td>
</tr>
<tr>
<td>wk</td>
<td>weak</td>
</tr>
<tr>
<td>WNL</td>
<td>within normal limits</td>
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<td>wt</td>
<td>weight</td>
</tr>
<tr>
<td>y/o</td>
<td>year old</td>
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<td>yr</td>
<td>year</td>
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<td>↑</td>
<td>increase/positive</td>
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<td>↓</td>
<td>decrease/negative</td>
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<td>%</td>
<td>percent</td>
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<tr>
<td>2°</td>
<td>secondary to/ second degree</td>
</tr>
<tr>
<td>Δ</td>
<td>change</td>
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<td>=</td>
<td>equal</td>
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<tr>
<td>♀</td>
<td>female</td>
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<tr>
<td>♂</td>
<td>male</td>
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<td>#</td>
<td>number</td>
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<tr>
<td>&gt;</td>
<td>greater than</td>
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<tr>
<td>&lt;</td>
<td>less than</td>
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<tr>
<td>+</td>
<td>plus/positive</td>
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<tr>
<td>-</td>
<td>minus/negative</td>
</tr>
</tbody>
</table>
## CINCINNATI PREHOSPITAL STROKE SCALE

<table>
<thead>
<tr>
<th>SIGN OF STROKE</th>
<th>PATIENT ACTIVITY</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Droop</td>
<td>Have the patient look up at you, smile, and show his teeth</td>
<td>Normal: Symmetry to both sides.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abnormal: One side of the face droops or does not move symmetrically.</td>
</tr>
<tr>
<td>Arm Drift</td>
<td>Have patient lift arms up and hold them out with eyes closed for 10 seconds</td>
<td>Normal: Symmetrical movement in both arms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abnormal: One arm drifts down or asymmetrical movement of the arms.</td>
</tr>
<tr>
<td>Abnormal Speech</td>
<td>Have the patient say, “You can’t teach an old dog new tricks”</td>
<td>Normal: The correct words are used and no slurring of words is noted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abnormal: The words are slurred, the wrong words are used, the patient is aphasic.</td>
</tr>
</tbody>
</table>
WEST VIRGINIA OFFICE OF EMERGENCY MEDICAL SERVICES – STATEWIDE PROTOCOLS

APPENDIX H

REPORT OF EMS PATIENT CARE WITHOUT TELECOMMUNICATIONS

Report of EMS Patient Care Without Telecommunications

This report is for the purpose of documenting to the Medical Director of the Office of EMS the circumstances surrounding the administration of drugs or fluids or the application of advanced life support techniques to a patient or patients without direct voice contact with a medical command physician or designee or written order of a medical command physician or designee in accordance with Section 16, Article 4C, Chapter 16 of the Code of West Virginia as amended.

Date of Incident: __________________________

Pre-hospital Care Record Form Number (attach copy): __________________________

Patient Name(s): __________________________

________________________

________________________

EMS services provided (use additional sheets if necessary): __________________________

________________________

________________________

Justification for providing services (radio failure, multiple patients, etc. - use additional sheets if necessary): __________________________

________________________

________________________

EMS Agency: __________________________ County: __________________________

Person reporting incident: __________________________ (Last) __________________________ (First) __________________________ (MI)

EMSP Number: __________________________ Date of Expiration: __________________________

Signature: __________________________ Date: __________________________

Return to:
State EMS Medical Director
Office of EMS
350 Capitol Street, Room 425
Charleston, WV 25301-3714

EMS Without Telecommunications
1-01-2015

2021 EDITION

West Virginia Office of Emergency Medical Services – Statewide Protocols
### Acetaminophen

<table>
<thead>
<tr>
<th>Generic Name:</th>
<th>Acetaminophen (a-seet-a-min-oh-fen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Name:</td>
<td>Tylenol</td>
</tr>
<tr>
<td>Chemical Class:</td>
<td>N/A</td>
</tr>
<tr>
<td>Therapeutic Class:</td>
<td>Antipyretics, non-opioid analgesics</td>
</tr>
<tr>
<td>Actions:</td>
<td>Inhibits the synthesis of prostaglandins that may serve as mediators of pain and fever, primarily in the CNS. Has no significant anti-inflammatory properties or GI toxicity.</td>
</tr>
<tr>
<td>Pharmacokinetics:</td>
<td>Absorption: Well absorbed following oral administration. Rectal absorption is variable. Distribution: Widely distributed. Crosses the placenta; enters breast milk in low concentrations. Metabolism and Excretion: 85–95% metabolized by the liver (CYP2E1 enzyme system). Metabolites may be toxic in overdose situation. Metabolites excreted by the kidneys. Half-life: Neonates: 7 hr; Infants and Children: 3–4 hr; Adults: 1–3 hr.</td>
</tr>
<tr>
<td>Indications:</td>
<td>Treatment of fever in pediatrics</td>
</tr>
<tr>
<td>Contraindications:</td>
<td>Previous hypersensitivity; Products containing alcohol, aspartame, saccharin, sugar, or tartrazine (FDC yellow dye #5) should be avoided in patients who have hypersensitivity or intolerance to these compounds; Severe hepatic impairment/active liver disease.</td>
</tr>
<tr>
<td>Precautions:</td>
<td>Hepatic disease/renal disease (lower chronic doses recommended); Alcoholism, chronic malnutrition, severe hypovolemia or severe renal impairment; Chronic alcohol use/abuse; Malnutrition; OB: Use in pregnancy only if clearly needed</td>
</tr>
<tr>
<td>Pregnancy Cat. B</td>
<td>Lactation: Use cautiously Pedi: Neonates (safety and effectiveness not established).</td>
</tr>
<tr>
<td>Interactions:</td>
<td>Chronic high-dose acetaminophen (2 g/day) may increase risk of bleeding with warfarin (INR should not exceed 4). Hepatotoxicity is additive with other hepatotoxic substances, including alcohol</td>
</tr>
<tr>
<td>Administration:</td>
<td>Pediatric Administer 15 mg/kg oral with temperature &gt; 102° F</td>
</tr>
<tr>
<td>Supply:</td>
<td>160 mg in 5 mL UD solution 160 mg in 5 ml elixer</td>
</tr>
<tr>
<td>Notes:</td>
<td></td>
</tr>
</tbody>
</table>
**Generic Name:** Adenosine (ah-den’oh-seen)

**Trade Name:** Adenocard®

**Chemical Class:** Endogenous nucleoside

**Therapeutic Class:** Antiarrhythmic

**Actions:** Adenosine is a naturally occurring substance that is present in all body cells. Adenosine decreases conduction of the electrical impulse through the AV node and interrupts AV reentry pathways in paroxysmal supraventricular tachycardia (PSVT). It can effectively terminate rapid supraventricular tachycardia such as PSVT. Because of its rapid onset and very short half-life, the administration of Adenosine is sometimes referred to as chemical cardioversion. A single bolus of the drug was effective in converting PSVT to a normal sinus rhythm in a significant number (90%) of patients in initial drug studies.

**Pharmacokinetics:** Cleared from plasma in less than 30 seconds; $t_1/2 = 10$ seconds

**Indications:**
- Unstable narrow QRS tachycardia refractory to vagal maneuvers.
- Stable, regular, monomorphic wide-complex tachycardia.

**Contraindications:**
- Second- or third-degree heart block.
- Sick sinus syndrome.
- Hypersensitivity to the drug.
- Bradycardia.
- Broncho-constrictive lung disease (i.e. asthma).
- Irregular wide-complex tachycardias

**Precautions:** Adenosine typically causes dysrhythmias at the time of cardioversion. These generally last a few seconds or less and may include PVCs, PACs, sinus bradycardia, sinus tachycardia, and various degrees of AV block. In extreme cases, transient asystole may occur. If this occurs, appropriate therapy should be initiated.

**Side Effects:**
- **CNS:** dizziness, headache
- **CV:** dysrhythmia outlined under precautions, chest pain, facial flushing, palpitations, diaphoresis
- **GI:** nausea
- **RESP:** chest pressure, dyspnea

**Administration:**

- **Adult**
  - Administer 6 mg IV over 1 to 3 seconds. If not effective after 2 minutes, give 12 mg IV over 1 to 3 seconds.

- **Pediatric**
  - Administer 0.1 mg/kg IV over 1 to 3 seconds (maximum first dose 6 mg)
  - [per MCP]. If not effective after 2 minutes, administer 0.2 mg/kg IV over 1 to 3 seconds (maximum second dose 12 mg).

**Supply:** Vials or prefilled syringes containing 6 mg in 2 mL and/or 12 mg in 2 mL

**Notes:**
- Give Adenosine rapidly over 1 to 3 seconds, into the medication administration port closest to the patient, through a large (e.g., antecubital) vein followed by a 10 mL Normal Saline flush and elevation of the arm.
- Higher doses than usual may be needed for patients receiving Theophylline preparations or consuming large quantities of Caffeine.
- Dipyridamole (Persantine) can potentiate the effects of Adenosine. The dosage of Adenosine may need to be reduced in patients receiving Dipyridamole.
- Use of Adenosine for irregular wide-complex tachycardias may cause degeneration of the rhythm to VF.
### ALBUTEROL (Proventil®)

| **Generic Name:** | Albuterol (al-byoo'ter-ole) |
| **Trade Name:** | Airet®, Proventil®, Repetabs®, Respirol®, Ventolin®, Volmax®, Combivent® (combined with Ipratropium Bromide) |
| **Chemical Class:** | Sympathomimetic amine; β₂-adrenergic agonist |
| **Therapeutic Class:** | Antiasthmatic; bronchodilator |
| **Actions:** | Albuterol is a selective β₂-adrenergic agonist with a minimal number of side effects. It causes prompt bronchodilation and has a duration of action of approximately 5 hours. |
| **Pharmacokinetics:** | Onset 5 to 15 minutes. Peak 1 to 1½ hours. Duration 4 to 6 hours. t½ = 2½ to 4 hours. |
| **Indications:** | • Bronchial asthma.  
• Reversible bronchospasm associated with chronic bronchitis and emphysema.  
• Anaphylactic respiratory distress.  
• Crush syndrome [per MCP]. |
| **Contraindications:** | • Hypertension  
• Tachycardia (HR greater than 130 adult, HR greater than 150 child).  
• Severe cardiac disease.  
• Hypersensitivity to the drug. |
| **Precautions:** | • Hyperthyroidism.  
• Diabetes mellitus.  
• Convulsive disorders. |
| **Pregnancy Cat. C** |  |
| **Side Effects:** | CNS: dizziness, headache, stimulation, tremors  
CV: chest pain, dysrhythmias, hypertension, palpitations, tachycardia  
GI: nausea, vomiting |
| **Administration:** | Using a small volume nebulizer, adjust the oxygen flowmeter to 8 to 10 L/minute to produce a steady, visible mist. |
| **Supply:** | Unit dose vials containing 2.5 mg in 3 mL, 5 mg in 0.5mL, or 5mg in 3 mL. |
| **Notes:** | • The possibility of developing unpleasant side effects increases when Albuterol is administered with other sympathetic agonists.  
• β-blockers may blunt the pharmacological effects of Albuterol.  
• Albuterol is also supplied in metered-dose inhalers (MDI) that deliver 90 mcg per inhalation. Be sure to obtain a complete medication history detailing administration times and frequency of use of home inhalation therapy. Overdoses of inhalers cause bronchial constriction and possibly death. |

| Adult | Give 2.5 mg (3 mL of 0.083% solution) with a mouthpiece, facemask, or CPAP. |
| Pediatric | Give 2.5 mg (3 mL of 0.083% solution) with a mouthpiece, blow-by, or CPAP. |
| Adult Bronchospasm | Give 5 mg with a mouthpiece, blow-by, or CPAP. |
AMIODARONE (Cordarone®)

Scope: AEMT PARAMEDIC

Generic Name: Amiodarone (a-mee’oh-da-rone)
Trade Name: Cordarone®, Pacerone®
Chemical Class: Iodinated benzofuran derivative
Therapeutic Class: Antiarrhythmic

Actions: Amiodarone prolongs myocardial action potential and effective refractory period and causes noncompetitive α- and β-adrenergic inhibition. Amiodarone suppresses atrial and ventricular ectopy (PSVT, AF, ATach, VT, VF, etc.) and slows conduction through the AV node (ventricular rate control; useful in WPW). Amiodarone also causes vasodilation resulting in reduced cardiac work.

Pharmacokinetics: \( t_{1/2} = 20 \) to 47 days

Indications:
- Shock refractory ventricular fibrillation and pulseless ventricular tachycardia
- Ventricular tachycardia
- Wide-complex tachycardia of unknown type (regular rhythm)

Contraindications:
- Cardiogenic shock (SBP <90 mm Hg)
- Marked sinus bradycardia
- Second- or third-degree heart block
- Hypersensitivity to the drug
- Torsades de pointes

Precautions:
- May worsen existing or precipitate new dysrhythmias, including torsades de pointes and VF.
- Use with beta-blocking agents could increase risk of hypotension and bradycardia. Amiodarone inhibits atrioventricular conduction and decreases myocardial contractility, increasing the risk of AV block with Verapamil or Diltiazem or of hypotension with any calcium channel blocker.
- Use with caution in pregnancy and with nursing mothers.

Pregnancy Cat. D

Side Effects:
- CNS: dizziness, headache
- CV: bradycardia, cardiac conduction abnormalities, CHF, dysrhythmias, hypotension, SA node dysfunction, sinus arrest
- RESP: dyspnea, pulmonary inflammation

VF and pulseless VT: Give 300 mg IV/IO. Give additional 150 mg IV push in 3 to 5 minutes for refractory or recurrent VF/VT.

VT with pulse: Give a slow infusion of 150 mg over 10 minutes. Mix in 100 mL of NS and infuse at 150 gtts/minute (15 drop set).

Administration:

VF and pulseless VT: Give 5 mg/kg IV/IO. May repeat up to 2 times for refractory VT/pulseless VT. Maximum single dose 300 mg.

VT with pulse: Give an infusion of 5 mg/kg. Mix in 100 mL of NS and infuse at 75 gtts/minute (15 drop set). Maximum dosage is 300 mg.

Slow Infusion 1 mg/minute. Mix 150 mg in 250 mL NS and infuse at 100 gtts/minute (60 drop set).

Supply: Vial containing 150 mg in 3 mL.

Notes:
### ASPIRIN

<table>
<thead>
<tr>
<th>Generic Name:</th>
<th>Aspirin (as'pir-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Name:</td>
<td>Bayer®, Bufferin®, Ecotrin®</td>
</tr>
<tr>
<td>Chemical Class:</td>
<td>Salicylate derivative</td>
</tr>
<tr>
<td>Therapeutic Class:</td>
<td>Antiplatelet agent</td>
</tr>
<tr>
<td>Actions:</td>
<td>Aspirin blocks the formation of the substance thromboxane $A_2$, which causes platelets to aggregate and arteries to constrict. This results in an overall reduction in mortality associated with myocardial infarction. It also appears to reduce the rate of nonfatal reinfarction and nonfatal stroke.</td>
</tr>
<tr>
<td>Pharmacokinetics:</td>
<td>Onset 15 to 30 minutes. Peak 1 to 2 hours. Duration 4 to 6 hours. $t_\frac{1}{2} = 3$ hours at low doses.</td>
</tr>
<tr>
<td>Indications:</td>
<td>Chest pain suggestive of an acute myocardial infarction.</td>
</tr>
</tbody>
</table>
| Contraindications: | • Hypersensitivity to the drug, NSAIDS, and Tartrazine (FDC yellow dye #5).  
• Bleeding disorders including GI hemorrhage and hemophilia.  
• Hemorrhagic states. |
| Precautions: | Children or teenagers with flu-like symptoms (may be associated with the development of Reye’s syndrome). |
| Pregnancy Cat. C | |
| Side Effects: | GI: GI bleeding, heartburn, nausea  
HEME: prolonged bleeding time |
| Interactions: | When administered together, Aspirin and other anti-inflammatory agents may cause an increased incidence of side effects and increased blood levels of both drugs. Administration of aspirin with antacids may reduce the blood levels of the drug by decreasing absorption. |
| Administration: | Administer four (4) 81 mg chewable tablets (324 mg total dose) PO as soon as possible after the onset of chest pain. |
| Supply: | 81 mg low dose chewable tablets or 81 mg quick absorbing powder |
| Notes: | |
Generic Name: Atropine (a’troe-peen)
Trade Name: Atropine Care®, Atropen Autoinjector®, Atropisol®, Atrosulf-1®
Chemical Class: Belladonna alkaloid
Therapeutic Class: Anticholinergic

Actions: Atropine is a potent parasympatholytic that increases cardiac output and heart rate. Atropine acts by blocking acetylcholine receptors, thus inhibiting parasympathetic stimulation. Although it has positive chronotropic properties, it has little or no inotropic effect.

Pharmacokinetics: Peak 2 to 4 minutes. Duration 4 to 6 hours.

Indications:
- **[Adult]** Hemodynamically significant bradycardia (HR less than 50):
  - Acute altered mental status, Hypotension, ongoing chest pain, acute heart failure, or other signs of shock.
  - Bradycardia associated with “escape” ventricular ectopy (i.e., PVCs attributed to the underlying slow heart rate).
- **[Pediatric]** Hemodynamically significant bradycardia [HR less than 60 (neonate less than 80/minute)] due to increased vagal tone or primary AV block.
- Severe organophosphate poisonings (insecticides).

Contraindication: Hypersensitivity to the drug

Precautions:
- Use Atropine cautiously in the presence of acute coronary ischemia or myocardial infarction; increased heart rate may worsen ischemia or increase the zone of infarction.
- Avoid relying on Atropine in type II second-degree or third-degree AV block or in patients with third-degree AV block with a new wide-QRS complex. These patients require immediate pacing.

Side Effects:
- **CNS:** drowsiness, confusion
- **CV:** angina, PVCs, tachycardia
- **EENT:** blurred vision, dilated pupils
- **GI:** dry mouth

Administration:
- **Bradycardia:** Administer 0.5 mg IV. May repeat every 5 minutes to a total dose of 3 mg if needed.
- **Cholinergic Toxicity:** Give 2 mg IV. Repeat every 5 minutes if needed.
- **Bradycardia:** Administer 0.02 mg/kg IV/IO. May repeat once in 3 to 5 minutes if needed. (Minimum dose = 0.1 mg, maximum dose = 0.5 mg for child and 1mg for adolescent)

Supply: Prefilled syringe containing 1 mg in 10 mL.

Notes:
## DEXAMETHOSONE (Decadron®)

<table>
<thead>
<tr>
<th>Scope</th>
<th>AEMT</th>
<th>PARAMEDIC</th>
</tr>
</thead>
</table>

**Generic Name:** Decadron, Solurex, Baycadron  
**Trade Name:** Decadron®  
**Chemical Class:** Corticosteroid, Anti-Inflammatory  
**Therapeutic Class:** Endocrine-Metabolic Agent

**Actions:** Dexamethasone provides relief for inflamed areas of the body. It is used to treat a number of different conditions, such as inflammation (swelling), severe allergies, adrenal problems, arthritis, asthma, blood or bone marrow problems, kidney problems, skin conditions, and flare-ups of multiple sclerosis. Dexamethasone is a corticosteroid (cortisone-like medicine or steroid). It works on the immune system to help relieve swelling, redness, itching, and allergic reactions.

**Pharmacokinetics:** Biological half-life about 190 minutes. Duration of 4 – 6 hours.

**Indication:** Bronchospasm secondary to administration of Albuterol and Ipratropium Bromide.

**Contraindications:** Peptic ulcers  
Osteoporosis  
Psychoses  
Infectious diseases (e.g. herpes simplex, keratitis)  
Diabetes  
Hypertension  
Hypersensitivity to the drug.

**Side Effects:**  
**CNS:** Convulsions, headache, increased intracranial pressure with papilledema  
**CV:** Bradycardia, cardiac arrest, cardiac arrhythmias, cardiac enlargement, circulatory collapse, congestive heart failure, hypertension, myocardial rupture following recent myocardial infarction, syncope, tachycardia, thromboembolism, thrombophlebitis, vasculitis, edema  
**EENT:** blurred or diplopia, tinnitus  
**Other:** nausea, vomiting

**Administration**  
**Adult:** 10 mg IV/IO/IM  
**Pediatric** 0.6 mg/kg up to a max dose of 10 mg IV/IO/IM

**Supply:** 1 mL in 4 mg, 5 mL in 20 mg, 10 mg/mL-1 mL vial
**Generic Name:** Dextrose (dex’trose)

**Trade Name:** Glucose®, Glutose®, Insta-Glucose®

**Chemical Class:** Carbohydrate

**Therapeutic Class:** Nutrient, caloric

**Actions:** Dextrose supplies supplemental glucose in cases of hypoglycemia and restores blood sugar level to normal (80 to 120 mg/dL).

**Pharmacokinetics:** N/A

**Indications:**
- Altered mental status of unknown etiology (GCS less than or equal to 12).
- Hypoglycemia (less than 60 mg/dL) based on rapid glucose determination or clinical judgment.
- Status epilepticus.
- Oral hypoglycemic agent overdose.
- Neonatal resuscitation not responsive to ventilation and chest compressions.

**Contraindications:** No contraindications for a patient with suspected hypoglycemia.

**Precautions:**
- Use with caution in patients with increased intracranial pressure because the Dextrose load may worsen cerebral edema.
- Localized venous irritation may occur when smaller veins are used.
- Infiltration may result in tissue necrosis.
- Dextrose is only administered via the IV or IO route.

**Side Effects:** Tissue necrosis and phlebitis at the injection site.

**Administration:**
- **Patient 2 years of age or older** – If blood glucose is < 60 mg/dl, administer D50W 1 ml/kg IV/IO. Maximum dose is 25 grams.
- **Patient older than 1 month but younger than 2 years old** – If blood glucose is < 60 mg/dl, administer 2 ml/kg of D25 IV/IO; (D25 Is prepared by mixing 25 ml NS with 25 ml D50W).
- **Patient 1 month of age or younger** – If blood glucose is < 60 mg/dl, administer 5 ml/kg Dextrose 10% IV/IO (D10 is prepared by mixing 40 ml of NS with 10 ml of D50W).

**Supply:**
- Prefilled syringe containing 25 g in 50 mL (50% solution)
- Prefilled syringe containing 2.5 g in 10 mL (25% solution)

**Notes:**
- Establish a free flowing IV of Normal Saline in a large vein. Aspirate blood before and during administration of Dextrose to ensure IV patency.
- Hypoglycemic states require immediate intervention. Prolonged hypoglycemia can result in permanent brain damage.
Generic Name: Diltiazem (dil-tye-a-zem)
Trade Name: Cardizem, CardizemCD, CardizemLA, Cartia XT, Dilacor XR, Taztia XT, Tiazac
Chemical Class: Calcium channel blockers
Therapeutic Class: Therapeutic: antianginals, antiarrhythmics (class IV), antihypertensives
Actions: Inhibits transport of calcium into myocardial and vascular smooth muscle cells, resulting in inhibition of excitation-contraction coupling and subsequent contraction.
Pharmacokinetics: Absorption: Well absorbed, but rapidly metabolized after oral administration.
Distribution: Unknown.
Protein Binding: 70–80%.
Metabolism and Excretion: Mostly metabolized by the liver (CYP3A4 enzyme system).
Half-life: 3.5–9 hr.
Indications: Supraventricular tachyarrhythmias and rapid ventricular rates in atrial flutter or fibrillation.
Contraindication: Hypersensitivity; Sick sinus syndrome; 2nd- or 3rd-degree AV block (unless an artificial pacemaker is in place); Systolic BP< 90mmHg; Recent MI or pulmonary congestion; Concurrent use of rifampin.
Precautions: Severe hepatic impairment, consider age related decrease in body mass, Severe renal impairment; Serious ventricular arrhythmias or heart failure.
Pregnancy Cat. C Severe renal impairment, consider age related decrease in body mass, Severe hepatic impairment.
Side Effects: CNS: anxiety, confusion, dizziness, drowsiness, headache, nervousness, psychiatric disturbances, weakness.
EENT: blurred vision, disturbed equilibrium, epistaxis, tinnitus.
Resp: cough, dyspnea.
CV: ARRHYTHMIAS, HF, peripheral edema, bradycardia, chest pain, hypotension, palpitations, syncope, tachycardia.
GI: constipation, diarrhea, dry mouth, dyspepsia, nausea, vomiting.
GU: dysuria, nocturia, polyuria, sexual dysfunction, urinary frequency.
Derm: erythema, flushing, sweating, photosensitivity, pruritus/urticaria, rash.
Endo: gynecomastia, hyperglycemia
MS: joint stiffness, muscle cramps.
Neuro: paresthesia, tremor.
Administration: Adult: Administer 0.25 mg/kg slow IVP. Repeat dose in 15 minutes if needed at 0.35 mg/kg slow IVP. [per MCP]
Supply: • 100 mg vial requiring reconstitution with 0.9% NS diluent
• 50 mg per 10 mg vial (requires refrigeration)
Notes:
### DIPHENHYDRAMINE (Benadryl®)

<table>
<thead>
<tr>
<th>Generic Name:</th>
<th>Diphenhydramine (dye-fen-hye’dra-meen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Name:</td>
<td>Benadryl®</td>
</tr>
<tr>
<td>Chemical Class:</td>
<td>Ethanolamine derivative</td>
</tr>
<tr>
<td>Therapeutic Class:</td>
<td>Antihistamine, antianaphylactic (adjunct)</td>
</tr>
<tr>
<td>Actions:</td>
<td>Diphenhydramine is an antihistamine with anticholinergic (drying) and sedative side effects. Diphenhydramine decreases the allergic response by blocking Histamine at H₁ receptor sites.</td>
</tr>
<tr>
<td>Pharmacokinetics:</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| Indications:  | • Anaphylaxis, as an adjunct to Epinephrine.  
• To treat dystonic reactions and extrapyramidal reactions caused by phenothiazines. |
| Contraindications: | • Bronchial asthma.  
• Nursing mothers.  
• Children less than 10 kg.  
• Glaucoma.  
• Hypersensitivity to the drug or other antihistamines. |
| Precautions:  | Use with caution in patients with a history of hyperthyroidism, cardiovascular disease, and hypertension. |
| Pregnancy Cat. B | CNS: dizziness, drowsiness, sedation, sleepiness  
CV: headache, palpitations  
GI: dryness of mouth, nose and throat  
RESP: thickening of bronchial secretions, wheezing |
| Side Effects: | • Diphenhydramine has additive effects with alcohol and other CNS depressants (hypnotics, sedatives, tranquilizers, etc).  
• MAO inhibitors prolong and intensify the anticholinergic (drying) effects of antihistamines. |
| Administration: | Adult  Give 25 mg IM or slow IVP  
Pediatric  Give 1 mg/kg up to 25 mg IM or slow IVP |
| Supply:       | Vial containing 50 mg in 1 mL         |
| Notes:        | The IV route is preferred for the patient in severe shock. If an IV cannot be readily established, give Diphenhydramine via the IM route.  
Administer deep IM into large muscle mass. |
Generic Name: Dopamine (doo'pa-meen)

Trade Name: Intropin®

Chemical Class: Catecholamine

Therapeutic Class: Vasopressor, α- and β-adrenergic sympathomimetic

Actions: Dopamine stimulates both adrenergic and dopaminergic receptors in a dose-dependent manner. Low doses (1-5 mcg/kg/minute) stimulate mainly dopaminergic receptors producing renal and mesenteric vasodilation. Intermediate doses (5-10 mcg/kg/minute) stimulate both dopaminergic and β1-adrenergic receptors producing cardiac stimulation and renal dilation. Large doses (10-20 mcg/kg/minute) stimulate α1-adrenergic receptors producing vasoconstriction and increases in peripheral vascular resistance and blood pressure.

Pharmacokinetics: Onset 5 minutes. Duration less than 10 minutes. \( t_\frac{1}{2} = 2 \) minutes.

Indications: • Hemodynamically significant bradycardia that does not respond to Atropine and/or transcutaneous pacing.
• Hemodynamically significant hypotension associated with cardiogenic shock.

Contraindications: • Hypovolemic shock; volume replacement must be accomplished prior to using Dopamine.
• Pheochromocytoma (tumor of the adrenal gland).

Precautions: • Dopamine increases heart rate and can induce or worsen supraventricular and ventricular dysrhythmias.
• Dopamine should not be administered in the presence of tachydysrhythmias or ventricular fibrillation.

Pregnancy Cat. C

Side Effects: CNS: headache, nervousness
CV: anginal pain, ectopic beats, hypertension, palpitation, tachycardia, vasoconstriction
GI: nausea, vomiting
RESP: dyspnea

Administration: IV infusion at 5 to 10 mcg/kg/minute. Piggyback the Dopamine infusion into an already established IV infusion.

ROSC: IV infusion at 5 to 20 mcg/kg/minute. Piggyback the Dopamine infusion into an already established IV infusion.

Supply: Premixed Bag containing 800 mg in 250 mL (3,200 mcg/mL).

Notes: • To prepare a Dopamine infusion, mix 200 mg Dopamine in a 250 mL bag of NS and mix well. Resultant concentration is 800 mcg/mL. Infuse using a 60 drop administration set. Use the formula below to calculate the drip rate.
• Tissue sloughing may occur with extravasation. Antecubital veins are preferable sites. Monitor closely for leakage and/or infiltration.

Dopamine Infusion Formula

\[
\text{Dose x weight in kg x 60 drops/min} \div \text{Concentration of drug in 1 mL} = \text{gtts/minute}
\]
**Generic Name:** Epinephrine 1:1,000  
**Trade Name:** Adrenalin®  
**Chemical Class:** Catecholamine  
**Therapeutic Class:** Bronchodilator, vasopressor  

**Actions:** Epinephrine is a naturally occurring catecholamine. It acts directly on $\alpha$- and $\beta$-adrenergic receptors. Its effect on $\beta$-receptors is much more profound that its effect on $\alpha$-receptors. The effects of Epinephrine on $\beta_1$-adrenergic receptors include a positive chronotropic effect (increased heart rate) and a positive inotropic effect (cardiac contractile force). The effects of Epinephrine on $\alpha$-adrenergic receptor sites include increased systemic vascular resistance. The effects on these receptors sites together cause an increased blood pressure. Epinephrine also causes bronchodilation due to its effects on $\beta_2$-adrenergic receptors.

**Pharmacokinetics:**  
**IM:** Onset variable; Peak unknown; Duration 1 to 4 hours  
**SC:** Onset 5 to 10 minutes; Peak 30 minutes; Duration 1 to 4 hours  

**Indications:**  
- Anaphylaxis.  
- Bronchial asthma.  
- Respiratory distress due to epiglottitis or croup [per MCP].

**Contraindications:** Epinephrine should be avoided in the following patients unless signs and symptoms are severe:  
- Hypertension  
- Tachycardia  
- Cardiovascular disease.  
- Elderly  
- Angle closure glaucoma.  

**Precautions:**  
- Hyperthyroidism.  
- Diabetes Mellitus.  
- Give Epinephrine cautiously in geriatric and cardiac patients.

**Side Effects:**  
- **CNS:** anxiety, dizziness, restlessness, tremulousness, headache  
- **CV:** anginal pain, dysrhythmias, hypertension, palpitations  
- **GI:** nausea, vomiting  
- **SKIN:** pallor

**Interactions:** Cyclic antidepressants and antihistamines may potentiate the effects of Epinephrine.

**Administration:**  
**PARAMEDIC/AEMT**  
**Anaphylaxis:**  
- **Adult** Administer 0.3 mg IM/IM/IO. Repeat dose per MCP.  
- **Pediatric** Administer 0.15 mg for patients <30 kg.  
- **Pediatric Cardiac Arrest:** Administer 0.1 mg/kg ET

**EMT**  
**Anaphylaxis:**  
- **Adult** Administer 0.3 mg IM/IM/IO. Repeat dose per MCP

**Supply:** Ampule containing 1 mg in 1 mL.  
Multidose Vial containing 30 mg in 30 mL.

**Notes:** The IM route is preferred for the patient in severe shock.
**Generic Name:** Epinephrine 1:10,000  
**Trade Name:** Adrenalin®  
**Chemical Class:** Catecholamine  
**Therapeutic Class:** Bronchodilator, vasopressor  

**Actions:** Epinephrine is a naturally occurring catecholamine. It acts directly on $\alpha$- and $\beta$-adrenergic receptors. Its effect on $\beta$-receptors is much more profound than its effect on $\alpha$-receptors. The effects of Epinephrine on $\beta_1$-adrenergic receptors include a positive chronotropic effect (increased heart rate) and a positive inotropic effect (cardiac contractile force). The effects of Epinephrine on $\alpha$-adrenergic receptor sites include increased systemic vascular resistance. The effects of these receptors sites together cause an increased blood pressure. Epinephrine also causes bronchodilation due to its effects on $\beta_2$-adrenergic receptors.

**Pharmacokinetics:** IV: Onset immediate; Peak 5 minutes; Duration short  

**Indications:**  
- Cardiac arrest.  
- Anaphylaxis and asthma patients in severe distress.

**Contraindications:** No contraindications when used for indicated conditions.  

**Precautions:** No precautions when used for indicated conditions.

**Pregnancy Cat. C**  

**Side Effects:**  
- CNS: anxiety, dizziness, restlessness, tremulousness, headache  
- CV: anginal pain, dysrhythmias, hypertension, palpitations  
- GI: nausea, vomiting  
- SKIN: pallor  

<table>
<thead>
<tr>
<th>Adult</th>
<th>Give 1 mg (10 mL) IV/IO. Repeat every 3 to 5 minutes if needed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric</td>
<td>Give 0.01 mg/kg (0.1 mL/kg) IV/IO. Repeat every 3 to 5 minutes if needed.</td>
</tr>
</tbody>
</table>

**Anaphylaxis**  
0.5 – 1 mg slow IVP [per MCP]

**Supply:** Prefilled syringe containing 1 mg in 10 mL  

**Notes:**
Drug Names: Epinephrine (EpiPen®, EpiPen Jr.®)  
Overview: Epinephrine auto-injector (EpiPen®) is a life-saving self-administered medication that is prescribed by a physician to a specific patient. Epinephrine dilates the bronchioles and constricts blood vessels to treat anaphylactic shock.  
Indications: Patient exhibiting the assessment findings of an allergic reaction (shock and/or respiratory distress).  
Contraindications: No contraindications when used in a life-threatening situation.  
Precautions: Give Epinephrine cautiously in geriatric and cardiac patients.  
Side Effects: Increased pulse rate, tremors, nervousness.  
Administration:  
- Assure right medication, right patient, right route, and right dose.  
- Ensure medication is not discolored (liquid may not be visible inside all types of devices).  
- Remove safety cap from the auto-injector.  
- Place tip of auto-injector against the thigh and press firmly until the injector activates.  
- Hold injector firmly against thigh for a minimum of 10 seconds to allow for full dose delivery.  
- Record activity and time.  
- Dispose of injector in biohazard container.  
- If patient condition continues to worsen:  
  - Decreasing mental status, increasing breathing difficulty, decreasing blood pressure.  
  - Give an additional dose of Epinephrine using a second EpiPen®.  
Supply:  
- EpiPen® contains 0.3 mg of Epinephrine  
- EpiPen Jr.® contains 0.15 mg of Epinephrine  
Notes:
### FENTANYL (Sublimaze®)

<table>
<thead>
<tr>
<th>Scope</th>
<th>PARAMEDIC</th>
</tr>
</thead>
</table>

**Generic Name:** Fentanyl (fen'-ta-nil)  
**Trade Name:** Sublimaze®, Duragesic®, Fentora®  
**Chemical Class:** Opiate derivative  
**Therapeutic Class:** Narcotic analgesic

**Actions:** Fentanyl is a powerful synthetic opiate with mechanism of action similar to Morphine. It is considered both faster acting and of shorter duration than Morphine. Interacts with opiate receptors decreasing pain impulse transmission.

**Pharmacokinetics:**
- **IV:** Onset immediate. Peak effect several minutes. Duration of action 30 to 60 minutes.
- **IM:** Onset of action 7 – 8 minutes. Duration of action 1 – 2 hours.

**Indication:** Moderate to severe pain.

**Contraindications:**
- Known hypersensitivity
- Respiratory depression

**Precautions:**
- Use with caution with suspected traumatic brain injury.
- Use with caution in patients with COPD.
- Use with caution in patients with cardiac bradyarrhythmias.

**Side Effects:**
- **CNS:** dizziness
- **CV:** hypotension, hypertension, bradycardia
- **EENT:** blurred vision
- **GI:** nausea, vomiting
- **RESP:** respiratory depression, apnea, laryngospasm
- **SKIN:** diaphoresis

**Administration:**
- **Pain Adult**
  - 1 mcg/kg up to 100 mcg IM, IV, IO, IN over 1 to 2 minutes. Repeat doses require MCP order.
- **Pain Pediatric**
  - 1 mcg/kg up to 50 mcg IM, IV, IO, IN over 1 to 2 minutes. MCP order required for pediatric patients less than 12 years of age.
- **Pain >55 years**
  - 0.5 mcg/kg up to 100 mcg IM or IV over 1 to 2 minutes.
- **Chest pain**
  - 50 mcg IV q 5 minutes (up to 150 mcg)

**Supply:** 100 mcg in 2 mL

**Notes:** If a subsequent dose is given prior to the peak effect of the initial dose, there is a risk of dose stacking and potential overdose.
Generic Name: Furosemide (fur-oh-se-mide)
Trade Name: Lasix®
Chemical Class: Loop diuretics
Therapeutic Class: Diuretic

Actions: Inhibits the reabsorption of sodium and chloride from the loop of Henle and distal renal tubule. Increases renal excretion of water, sodium, chloride, magnesium, potassium, and calcium. Effectiveness persists in impaired renal function.
Therapeutic Effects: Diuresis and subsequent mobilization of excess fluid (edema, pleural effusions). Decreased BP.

Pharmacokinetics:
Absorption: 60–67% absorbed after oral administration
Distribution: Crosses placenta, enters breast milk.
Protein Binding: 91–99%.
Metabolism and Excretion: Minimally metabolized by liver, some non-hepatic metabolism, some renal excretion as unchanged drug.
Half-life: 30–60 min

Indications: Edema due to heart failure, hepatic impairment or renal disease. Hypertension.
Contraindications: Hypersensitivity; Cross-sensitivity with thiazides and sulfonamides may occur; Hepatic coma or anuria; Some liquid products may contain alcohol, avoid in patients with alcohol intolerance.

Precautions: Severe liver disease (may precipitate hepatic coma; concurrent use with potassium-sparing diuretics may be necessary); Electrolyte depletion; Diabetes mellitus; Hypoproteinemia; Severe renal impairment; OB, Lactation: Safety not established; Pedi: increased risk for renal calculi and patent ductus arteriosis in premature neonates; Geri: May have increased risk of side effects, especially hypotension and electrolyte imbalance, at usual doses.

Side Effects:
CNS: blurred vision, dizziness, headache, vertigo.
EENT: hearing loss, tinnitus.
CV: hypotension.
GI: anorexia, constipation, diarrhea, dry mouth, dyspepsia, increased liver enzymes, nausea, pancreatitis, vomiting.
GU: increased BUN, excessive urination, nephrocalcinosis.
Derm: photosensitivity, rash, urticaria.
Endo: hypercholesterolemia, hyperglycemia, hypertriglyceridemia, hyperuricemia.
Hemat: hemolytic anemia, leukopenia, thrombocytopenia.
MS: muscle cramps.
Neuro: paresthesia.
Misc: fever.

Interactions: Increased risk of hypotension with antihypertensives, nitrates, or acute ingestion of alcohol. Increased risk of hypokalemia with other diuretics, amphotericin B, stimulant laxatives, and corticosteroids.

Administer 40 mg if the patient is not currently prescribed furosemide and SBP ≥ 100 mmHg.
Administer 80 mg if the patient is currently prescribed furosemide and SBP ≥ 100 mmHg.

Supply:
• Vial containing 40 mg in 4 mL.
• Prefilled Syringe containing 40 mg in 4 mL.
Generic Name: Glucagon (gloo'ka-gon)
Trade Name: Glucagen®
Chemical Class: Polypeptide hormone
Therapeutic Class: Antihypoglycemic

Actions: Glucagon is a protein secreted by the α cells of the pancreas. When released, it causes the breakdown of glycogen, stored in the liver, to glucose. It also inhibits the synthesis of glycogen from glucose. Both actions tend to cause an increase in circulating blood glucose. A return to consciousness following the administration of glucagon usually takes 5 to 20 minutes. Glucagon is only effective if there are sufficient stores of glycogen in the liver.

Pharmacokinetics: Onset within 15 minutes. t½ = 3 to 6 minutes.

Indications: When unable to obtain IV access and give Dextrose, and:
- Altered mental status of unknown etiology (GCS less than or equal to 12).
- Hypoglycemia (less than 60 mg/dL) based on rapid glucose determination or clinical judgment.
- Status epilepticus.
- Oral hypoglycemic agent overdose.

Contraindications: Hypersensitivity to the drug.

Precautions: Glucagon is only effective if there are sufficient stores of glycogen with the liver. In an emergency situation, intravenous Dextrose is the agent of choice.

Pregnancy Cat. C

Side Effects: CNS: dizziness, headache
CV: hypotension
GI: nausea, vomiting

Administration:
- Adult 1 mg IM
- Pediatric 1 mg IM

Supply: Glucagon must be reconstituted before administration. It is supplied in rubber-stoppered vials containing 1 mg of powder and 1 mL of diluting solution.

Notes: Glucagon may be given to reverse effects of beta-blocker drug overdoses. A significant dose is needed to be effective, usually 3 to 10 mg IV bolus followed by a 2 to 5 mg/hour infusion).
HALOPERIDOL (Haldol®)

**Generic Name:** Haloperidol (ha-loe-per’idole)

**Trade Name:** Haldol®

**Chemical Class:** Butyrophenone derivative

**Therapeutic Class:** Antipsychotic

**Actions:** Haloperidol is a major tranquilizer that has provided effective in the management of acute psychotic episodes. Haloperidol appears to block Dopamine receptors in the brain associated with mood and behavior. Haloperidol has weak anticholinergic properties.

**Pharmacokinetics:**
- **IM:** Peak 10-20 minutes, $t_{1/2} = 17$ hours
- **IV:** N/A

**Indications:** Combative patients secondary to acute psychotic episodes.

**Contraindications:**
- Severe toxic central nervous system depression or comatose states from any cause.
- Hypersensitivity to the drug.
- Patients suffering from Delirium Tremens (DTs) from long-term alcohol abuse as it reduces seizure threshold.
- Parkinson's disease.
- Age less than 8 years. [per MCP]

**Precautions:** Haloperidol may impair mental and physical abilities. Occasionally, orthostatic hypotension may be seen in conjunction with Haloperidol use. Caution should be used when administering Haloperidol to patients on anticoagulants.
- Extrapyramidal reactions have been known to occur following the administration of Haloperidol, especially in children. Diphenhydramine should be available.

**Pregnancy Cat. C**

**Side Effects:**
- **CNS:** extrapyramidal symptoms, drowsiness, headache, insomnia, restlessness, seizures, vertigo
- **CV:** hypertension, hypotension, tachycardia
- **EENT:** blurred vision
- **GI:** nausea, vomiting, dry mouth, constipation

**Administration:**
- **Adult**
  - Give 5 mg IM/IV/IO. Contact [per MCP] for repeat dosing.
- **Pediatric**
  - Contact Medical Command Physician

**Supply:** Ampule containing 5 mg in 1 mL.

**Note:** If dystonic reaction (dyskinesia) is noted secondary to Haloperidol (Haldol®) administer Diphenhydramine (Benedryl®) 25 mg IV or IM.
<table>
<thead>
<tr>
<th>Generic Name:</th>
<th>Hydroxocobalamin (hye-drox-oh-koe-bal’-a-min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Name:</td>
<td>Cyanokit®</td>
</tr>
<tr>
<td>Chemical Class:</td>
<td>Vitamin B complex</td>
</tr>
<tr>
<td>Therapeutic Class:</td>
<td>Hematinic; vitamin</td>
</tr>
<tr>
<td>Actions:</td>
<td>Cyanide is an extremely toxic poison. In the absence of rapid and adequate treatment, exposure to a high dose of Cyanide can result in death within minutes due to inhibition of cytochrome oxidase resulting in arrest of cellular respiration. Specifically, Cyanide binds rapidly with cytochrome a3, a component of the cytochrome c oxidase complex in mitochondria. Inhibition of cytochrome a3 prevents the cell from using oxygen and forces anaerobic metabolism, resulting in lactate production, cellular hypoxia and metabolic acidosis. The action of Cyanokit® in the treatment of cyanide poisoning is based on its ability to bind cyanide ions to form Cyanocobalamin, which is then secreted in the urine.</td>
</tr>
<tr>
<td>Pharmacokinetics:</td>
<td>N/A</td>
</tr>
<tr>
<td>Indications:</td>
<td>Known or suspected cyanide poisoning.</td>
</tr>
<tr>
<td>Contraindications:</td>
<td>Hypersensitivity to Hydroxocobalamin or Cyanocobalamin</td>
</tr>
</tbody>
</table>
| Precautions: | • Allergic reactions may include anaphylaxis, chest tightness, edema, urticaria, pruritus, dyspnea, and rash.  
• Hypertension. |
| Pregnancy Cat. C |                                               |
| Side Effects: | CNS: headache  
CV: increased blood pressure  
GI: transient chromoaturia (abnormal coloration of the urine), nausea  
SKIN: erythema, rash, injection site reactions |
| Administration: | Give 5 g IV infused over 15 minutes. If signs and symptoms persist, a repeat dose can be administered [per MCP]. The infusion rate for second dose is usually between 15 minutes and 2 hours.  
Adult Give 5 g IV infused over 15 minutes. If signs and symptoms persist, a repeat dose can be administered [per MCP]. The infusion rate for second dose is usually between 15 minutes and 2 hours.  
Pediatric Give 70 mg/kg, up to 5 g IV infused over 15 minutes. If signs and symptoms persist, a repeat dose can be administered [per MCP]. The infusion rate for second dose is usually between 15 minutes and 2 hours. |
| Supply: | Each 5 g vial needs to be reconstituted with 200 mL of Normal Saline. Total volume prior to administration is 200 mL and contains 5 g of drug. |
| Notes: | • The drug substance is the hydroxylated active form of Vitamin B12.  
• Cyanide poisoning may result from inhalation, ingestion, or dermal exposure to various cyanide-containing compounds, including smoke from closed-space fires. The presence and extent of Cyanide poisoning are often initially unknown. There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. If clinical suspicion of Cyanide poisoning is high, Cyanokit® should be administered without delay.  
• Incompatible with Diazepam, Dobutamine, Dopamine, Fentanyl, Nitroglycerin, Pentobarbital, Propofol, Thiopental, blood products, Sodium Thiosulfate, Sodium Nitrite, and ascorbic acid. Use separate IV lines.  
• The standard administration drip set that comes with the Cyanokit is 20 drops/mL. |
IPRATROPIUM (Atrovent®)

**Generic Name:** Ipratropium (eye-pra-troep’ee-um) Bromide

**Trade Name:** Atrovent®

**Chemical Class:** Quaternary ammonium compound

**Therapeutic Class:** Bronchodilator

**Actions:** Ipratropium Bromide is an anticholinergic bronchodilator that is chemically related to Atropine. Ipratropium acts by inhibiting the action of acetylcholine at receptor sites on bronchial smooth muscle, thus inhibiting parasympathetic stimulation and causing bronchodilation. Ipratropium has antisecretory properties when applied locally.

**Pharmacokinetics:** Onset 5 to 15 minutes. Peak effect 1 to 2 hours. Duration of action 3 to 6 hours.

**Indications:**
- Bronchoconstriction in COPD, including chronic bronchitis and emphysema as an adjunct to Albuterol.
- Bronchial asthma as an adjunct to Albuterol.

**Contraindications:** Hypersensitivity to the drug, or to Atropine and its derivatives. Pediatric patients < 1 year old

**Precautions:** Ipratropium should be used with caution in patients with narrow-angle glaucoma, prostatic hypertrophy, or bladder-neck obstruction.

**Pregnancy Cat. B**

**Side Effects:**
- **CNS:** anxiety, dizziness, headache, nervousness
- **CV:** palpitations
- **EENT:** blurred vision, dry mouth
- **GI:** nausea, vomiting
- **RESP:** bronchospasm, cough

**Administration:**
Using a small volume nebulizer, adjust the oxygen flowmeter to 8 to 10 L/minute to produce a steady, visible mist.

<table>
<thead>
<tr>
<th>Age</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>Give 0.5 mg in 2.5 mL with a mouthpiece or facemask. Repeat doses per Medical Command.</td>
</tr>
<tr>
<td>Pediatric</td>
<td>Not Administered in patients &lt; 1 years of age.</td>
</tr>
<tr>
<td>Pediatric</td>
<td>0.5 mg for children 6 – 12 years of age</td>
</tr>
<tr>
<td>Bronchospasm</td>
<td>0.25 mg for children &lt; 6 years of age</td>
</tr>
</tbody>
</table>

**Supply:** Unit dose vials containing 0.5 mg in 2.5 mL

**Notes:** Give only one dose of Ipratropium with the initial Albuterol treatment. Ipratropium is not used as a standalone drug.
KETAMINE (Ketalar®) (Optional)

Generic Name: Ketamine (ket’a-meen)
Trade Name: Ketalar®
Chemical Class: Analgesic
Therapeutic Class: General anesthetic

Actions: Ketamine attaches to NMDA receptors which disassociates the portion of the brain that controls consciousness from the portion of the brain that controls vital bodily functions. The result is, when given in sufficient doses, anesthesia that provides pain control and amnesia while not causing hypotension or prolonged apnea.

Pharmacokinetics: IV: Onset 30-40 seconds. t½ = 5 minutes.

Indications: 1. Excited Delirium
2. Non Cardiac related pain secondary to administration of Morphine and/or Fentanyl

Contraindications: 1. Hypersensitivity to the drug.
2. Marked hypertension with potential for increased intracranial pressure (ICP).
3. Patients less than twelve (12) years of age.

Precautions: In patients with cardiac diseases/syndromes, Ketamine might worsen such conditions; NOT indicated as sedation prior to cardioversion or transcutaneous pacing.

Pregnancy Cat. B: CNS: confusion, delirium, vivid dreams
CV: hypertension, tachycardia
GI: nausea, vomiting, hypersalivation
RESP: respiratory depression

Side Effects: CNS: confusion, delirium, vivid dreams
CV: hypertension, tachycardia
GI: nausea, vomiting, hypersalivation
RESP: respiratory depression

Administration

Adult: Pain Augmentation (if pain persists after initial dose of first line analgesic is given): Administer 0.2 mg/kg IV to a maximum single dose of 20 mg. Alternatively may administer 0.5 mg/kg IM

Excited Delirium: Administer 5 mg/kg IM or 2 mg/kg IV/IO

Pediatric: Do not administer Ketamine in patients under the age of 12 years and/or 50 kg.

Supply: Vial contains 500 mg in 10 mL.

Notes: 1. Ketamine (in lower doses) is much more effective in relieving pain when given following a dose of an opiate analgesic. It is effective in relieving pain when combined with another opioid.
Generic Name: Labetalol (la-bet-a-loe)  
Trade Name: Trandate®  
Chemical Class: Beta Blockers  
Therapeutic Class: Antianginals, Anti-hypertensive  

Actions: Blocks stimulation of beta1 (myocardial)- and beta2 (pulmonary, vascular, and uterine)-adrenergic receptor sites. Also has alpha1-adrenergic blocking activity, which may result in more orthostatic hypotension.

Pharmacokinetics: Absorption: Well absorbed but rapidly undergoes extensive first-pass hepatic metabolism, resulting in 25% bioavailability.  
Distribution: Some CNS penetration; crosses the placenta.  
Protein Binding: 50%.  
Metabolism and Excretion: Undergoes extensive hepatic metabolism.  
Half-life: 3–8 hr.

Indications: Management of hypertension

Contraindications:  
- Hypersensitivity to the drug  
- Uncompensated HF  
- Pulmonary edema  
- Cardiogenic shock  
- Bradycardia or heart block

Precautions: Renal impairment; Hepatic impairment; Pulmonary disease (including asthma); Diabetes mellitus (may mask signs of hypoglycemia); Thyrotoxicosis (may mask symptoms); Patients with a history of severe allergic reactions (intensity of reactions may be elevated); OB: May cause fetal/neonatal bradycardia, hypotension, hypoglycemia, or respiratory depression; Lactation: Usually compatible with breast feeding (AAP); Pedi: Limited data available; Geri: Elevated sensitivity to beta blockers (risk of orthostatic hypotension); lowered initial dosage recommended.

Side Effects: CNS: fatigue, weakness, anxiety, depression, dizziness, drowsiness, insomnia, memory loss, mental status changes, nightmares.  
EENT: blurred vision, dry eyes, intraoperative floppy iris syndrome, nasal stuffiness.  
Resp: bronchospasm, wheezing.  
CV: ARRHYTHMIAS, BRADYCARDIA, CHF, PULMONARY EDEMA, orthostatic hypotension.  
GI: constipation, diarrhea, nausea.  
GU: erectile dysfunction, libido.  
Derm: itching, rashes.  
Endo: hyperglycemia, hypoglycemia.  
MS: arthralgia, back pain, muscle cramps.  
Neuro: paresthesia.

Interactions: Since injection may be administered to patients already being treated with other medications, including other antihypertensive agents, careful monitoring of these patients is necessary to detect and treat promptly any undesired effect from concomitant administration.

Labetalol HCL blunts the reflex tachycardia produced by nitroglycerin without preventing its hypotensive effect. If labetalol HCL is used with nitroglycerin in patients with angina pectoris, additional antihypertensive effects may occur.

Administration:  
- Adult: Administer 10 mg slow IVP over 2 minutes [per MCP]. Repeat dose in 10 minutes at 20 mg if BP remains > 180/120 and symptoms remain  
- Pediatric: N/A

Supply: Prefilled syringe or vials containing 20 mg in 4 mL

Notes:
<table>
<thead>
<tr>
<th><strong>Generic Name:</strong></th>
<th>Lidocaine (lye’doe-kane) Hydrochloride 1% or 2%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trade Name:</strong></td>
<td>Xylocaine®</td>
</tr>
<tr>
<td><strong>Chemical Class:</strong></td>
<td>Amide derivative</td>
</tr>
<tr>
<td><strong>Therapeutic Class:</strong></td>
<td>Anesthetic, local</td>
</tr>
<tr>
<td><strong>Actions:</strong></td>
<td>Lidocaine stabilizes the neuronal membrane by inhibiting the ionic fluxes required for the initiation and conduction of nerve impulses, thereby effecting local anesthetic action.</td>
</tr>
<tr>
<td><strong>Pharmacokinetics:</strong></td>
<td>Onset of anesthesia: 15-30 seconds. Duration 30-60 minutes.</td>
</tr>
<tr>
<td><strong>Indication:</strong></td>
<td>Pain associated with infusing fluid under pressure via the EZ-IO system.</td>
</tr>
<tr>
<td><strong>Contraindications:</strong></td>
<td>Hypersensitivity to the drug. Stokes-Adams syndrome. Wolff-Parkinson-White syndrome. Severe degrees of sinoatrial, atrioventricular, or intraventricular block in the absence of an artificial pacemaker.</td>
</tr>
<tr>
<td><strong>Precautions:</strong></td>
<td>Use cautiously in patients with severe liver or kidney disease, hypovolemia, severe congestive heart failure, and shock.</td>
</tr>
<tr>
<td><strong>Pregnancy Cat. B</strong></td>
<td>Use cautiously in patients with severe liver or kidney disease, hypovolemia, severe congestive heart failure, and shock.</td>
</tr>
<tr>
<td><strong>Side Effects:</strong></td>
<td>CNS: seizures, tremors, twitching, dizziness, unconsciousness CV: bradycardia, edema, heart block, hypotension EENT: blurred or diplopia, tinnitus Other: respiratory depression, nausea, vomiting</td>
</tr>
<tr>
<td></td>
<td><strong>Adult:</strong> 40 mg IO. Give slowly</td>
</tr>
<tr>
<td><strong>Administration IO Analgesia:</strong></td>
<td>Pediatric 0.5 mg/kg up to 40 mg IO.</td>
</tr>
<tr>
<td><strong>Administration Cardiac Arrest:</strong></td>
<td>Adult 1 – 1.5 mg/kg repeated at 0.5-0.75 mg/kg IV/IO to a maximum dose of 3 mg/kg</td>
</tr>
<tr>
<td><strong>Administration Wide Complex Tachycardia:</strong></td>
<td>Pediatric 1 mg/kg repeated at 1mg/kg IV/IO</td>
</tr>
<tr>
<td><strong>Administration ROSC:</strong></td>
<td>Adult 0.5-0.75 mg/kg IV/IO to a maximum dose of 3 mg/kg</td>
</tr>
<tr>
<td><strong>Administration Wide Complex Tachycardia:</strong></td>
<td>Pediatric 1 mg/kg repeated at 1mg/kg IV/IO [per MCP].</td>
</tr>
<tr>
<td><strong>Administration ROSC:</strong></td>
<td>Adult 1 g / 250 mL titrated at 1 – 4 mg/min.</td>
</tr>
<tr>
<td><strong>Supply:</strong></td>
<td>• 100mg / 5ml prefilled syringe</td>
</tr>
<tr>
<td></td>
<td>• 1g in 250 mL</td>
</tr>
</tbody>
</table>
**MAGNESIUM SULFATE**

**Scope**

**PARAMEDIC**

**Generic Name:** Magnesium Sulfate (mag-nee' see-um sul'fate)

**Trade Name:** Magnesium Sulfate Inj. 50%

**Chemical Class:** Divalent cation

**Therapeutic Class:** Antiarrhythmic, electrolyte

**Actions:** Magnesium Sulfate is a salt that dissociates into the Magnesium cation (Mg²⁺) and the Sulfate anion when administered. Magnesium is an essential element in many of the biochemical processes that occur in the body. It acts as a physiological calcium channel blocker and blocks neuromuscular transmission by decreasing acetylcholine release at the neuromuscular junction. Magnesium slows the rate of SA node impulse formation and prolongs conduction time.

**Pharmacokinetics:** Onset immediate. Duration 30 minutes.

**Indications:**
- Torsades de pointes.
- Eclampsia.
- Tricyclic antidepressant toxicity.
- Status asthmaticus non-responsive to standard medications.

**Contraindications:**
- Third-degree AV block.

**Precautions:**
- If reflexes disappear in the eclamptic patient, do not repeat the dose.
- Magnesium Sulfate should be administered slowly to minimize side effects.
- Any patient receiving intravenous Magnesium Sulfate should have continuous cardiac monitoring and frequent monitoring of vital signs.
- Magnesium Sulfate should be given very cautiously in the presence of serious impairment of renal function since it is excreted almost entirely by the kidneys.

**Side Effects:**
- CNS: coma, depressed reflexes, lethargy, weakness
- CV: heart block, hypotension, bradycardia
- RESP: respiratory depression
- SKIN: flushing, sweating

**Interactions:** Magnesium Sulfate can cause cardiac conduction abnormalities if administered in conjunction with Digitalis.

**Administration:**
- **Adult**
  - **Torsades** administer Magnesium Sulfate 1 gram diluted in 10 ml NS over 5 – 20 min
  - **Eclampsia:** 4 g (20% solution) IV over 5 minutes. Repeat dose (if available) in 5 minutes if seizure persists [per MCP].

**Supply:** Vial containing 1 g in 2 mL

**Notes:**
**MIDAZOLAM (Versed®)**

| Scope | PARAMEDIC |

**Generic Name:** Midazolam (mid-az’zoe-lam)  
**DEA Class:** Schedule IV

**Trade Name:** Versed®

**Chemical Class:** Benzodiazepine

**Therapeutic Class:** Sedative/hypnotic

**Actions:** Midazolam causes central nervous systems depression via facilitation of inhibitory GABA1 at benzodiazepine receptor sites (BZ1 – associated with sleep; BZ2 – associated with memory, motor, sensory, and cognitive function). Midazolam is a short-acting benzodiazepine that is three to four times more potent than Diazepam. Midazolam has important amnestic properties.

**Pharmacokinetics:**

- **IM:** Onset 15 minutes. Peak 30 to 60 minutes.
- **IV:** Onset 3 to 5 minutes. \( t_{1/2} = 1.2 \) to 12.3 hours.

**Indications:**

- Pre-medication sedation for transcutaneous pacing.
- Sedation for endotracheal intubation only after the ET tube is inserted.
- Seizures not caused by hypoglycemia
- Severe agitation, tachycardia, or hallucinations caused by alcohol withdrawal
- Behavioral or alcohol related agitation as an adjunct to Haloperidol.

**Contraindications:**

- Hypersensitivity to the drug.
- Hypotension (SBP less than 90 mm Hg).
- Acute angle closure glaucoma.

**Precautions:**

- Administer cautiously when alcohol intoxication is suspected. Emergency resuscitative equipment must be available prior to the administration of Midazolam. Vital signs must be continuously monitored during and after drug administration. Midazolam has more potential than the other benzodiazepines to cause respiratory depression and respiratory arrest.

**Side Effects:**

- CNS: drowsiness, amnesia, altered mental status
- CV: hypotension, tachycardia, PVCs
- RESP: bronchospasm, coughing, laryngospasm, respiratory depression, and arrest

**Interactions:**

- The effects of Midazolam can be accentuated by CNS depressants such as narcotics and alcohol.

**Administration:**

**Seizures:**

- **Adult**
  - Administer 2 mg slow IV/IO/IM. Repeated per MCP order
  - Midazolam may also be administered 5 mg IN if unable to readily establish IV access.
  - Patients age 55 or older administer 1 mg slow IV/IO/IM (IN dose remains 5 mg)
  - Give 0.1 mg/kg slow IV/IO/IM [per MCP].

- **Pediatric**
  - Midazolam may also be administered 0.2 mg/kg IN if unable to readily establish IV access [per MCP].

**Behavioral:**

- **Adult**
  - Administer 5 mg IV/IO/IM/IN. Repeated per MCP order.
  - Patients age 55 or older administer 2 mg slow IV/IO/IM (IN dose remains 5 mg)

**Post Intubation Management:**

- **Adult**
  - Administer 2 mg slow IV/IO q 5 minutes to a maximum dose of 10 mg. Repeated doses per MCP order

**Pre-Medication:**

- **Adult**
  - Administer 2 mg slow IV/IO/IM.

**Supply:** Vial containing 5 mg in 1 mL.

**Notes:**
**Generic Name:** Morphine (mor’feen) Sulfate  
**Trade Name:** Astramorph®, Duramorph®, MS Contin®, Roxanol®  
**Chemical Class:** Natural opium alkaloid, phenanthrene derivative  
**Therapeutic Class:** Narcotic analgesic

**Actions:** Morphine is a central nervous system depressant that acts on opiate receptors in the brain, providing both analgesia and sedation. It increases peripheral venous capacitance and decreases venous return. Morphine also reduces myocardial oxygen demand due to both the decreased systemic vascular resistance and the sedative effects of the drug.

**Pharmacokinetics:**  
**IM:** Onset 10 to 30 minutes. Peak analgesia 30 to 60 minutes. Duration 4.5 hours.  
**IV:** Peak analgesia 20 minutes. \( t_{1/2} = 2.5 \) to 3 hours.

**Indications:**  
- Pain associated with acute myocardial infarction unresponsive to nitrates.  
- Pain management unspecified

**Contraindications:**  
- Hypotension (SBP < 90 mmHg)  
- Respiratory depression.  
- Hypersensitivity to the drug.  
- Multi-system trauma.  
- Head injury.  
- Altered mental status from any cause.

**Precautions:** Morphine causes severe respiratory distress in high doses, especially in patients who already have some form of respiratory impairment. Naloxone should be readily available whenever morphine is administered.

**Pregnancy Cat. B**

**Side Effects:**  
- CNS: dizziness, drowsiness, headache, sedation  
- CV: hypotension  
- EENT: blurred vision, constricted pupils, diplopia  
- GI: abdominal cramps, constipation, nausea, vomiting  
- RESP: respiratory depression

**Interactions:** The CNS depression associated with Morphine can be enhanced when administered with antihistamines, antiemetics, sedatives, hypnotics, barbiturates, and alcohol.  
- Administer 2 mg IV/IM/OI q 5 minutes to a maximum dose of 10 mg. Additional doses per MCP order.

**Administration:**  
- **Adult** Patients age 55 or older administer 1 mg slow IV/OI/IM q 5 minutes to a maximum dose of 10 mg. Additional doses per MCP order.

- **Pediatric** Administer 0.05 mg/kg IV/OI/IM [per MCP].

**Supply:**  
- Vial containing 10 mg in 1 mL.  
- 10mg in 1 mL carpuject

**Notes:** Discontinue the IV injection if the pain is relieved or a contraindication develops.
NALOXONE (Narcan®)

Scope | EMT | AEMT | PARAMEDIC

Generic Name: Naloxone (nal-oks'one)
Trade Name: Narcan®
Chemical Class: Thebaine derivative
Therapeutic Class: Antidote, opiate

Actions: Naloxone is chemically similar to the narcotics. However, it has only antagonistic properties. Naloxone competes for opiate receptors in the brain. It also displaces narcotic molecules from opiate receptors. It can reverse respiratory depression associated with narcotic overdose.

Pharmacokinetics: IV: Onset 2 minutes. t\textsubscript{1/2} = 64 minutes.

Indications: • Respiratory depression caused by narcotics.
• Coma unknown etiology.

Contraindications: Hypersensitivity to the drug.

Precautions: Naloxone should be administered cautiously to patients who are known or suspected to be physically dependent on narcotics. Abrupt and complete reversal by Naloxone can cause withdrawal-type effects (this includes newborns of mothers with known or suspected narcotic dependence).

Pregnancy Cat. B

Side Effects: CNS: seizures, tremulousness
CV: hypertension, hypotension, tachycardia, ventricular dysrhythmia
GI: nausea, vomiting

Interactions: Naloxone may cause narcotic withdrawal in the narcotic-dependent patient. In cases of suspected narcotic dependence, only enough drug to reverse respiratory depression should be administered.

Administration:

Paramedic / AEMT

Adult

IV: Administer 0.4 mg/minute to restore respiratory drive.
IN: Administer 2 mg IN (1 mL in each nostril).

EMT

Adult

IN: Administer 2 mg IN (1 mL in each nostril).

Supply: Vial containing 4 mg in 10 mL.

Notes:
• Unless necessary, avoid insertion of an advanced airway prior to administration of Naloxone.
• Administer Naloxone by a slow IV push (0.4 mg/minute).
• Reversal of the effects of narcotics may be only temporary. Titrate administration of Naloxone to respiratory rate.
• Common narcotic agents include Codeine, Darvon®, Demerol®, Dilaudid®, Fentanyl, Heroin, Methadone, Morphine, Nubain®, Paregoric, Percodan®, Stadol® and Talwin®.
**NITROGLYCERIN (Nitrostat®)**

<table>
<thead>
<tr>
<th>Scope</th>
<th>EMT</th>
<th>AEMT</th>
<th>PARAMEDIC</th>
</tr>
</thead>
</table>

**Generic Name:** Nitroglycerin *(nye-troe-gli’ser-in)*  
**Trade Name:** Nitrolingual®, Nitroquick®, Nitrostat®, Nitr-bid®, Nitrol®  
**Chemical Class:** Nitrate, organic  
**Therapeutic Class:** Antianginal, vasodilator  
**Actions:** Nitroglycerin is a rapid smooth muscle relaxant that causes vasodilation and, to a lesser degree, dilates the coronary arteries. This results in increased coronary blood flow and improved perfusion of the ischemic myocardium. Relief of ischemia causes reduction and alleviation of chest pain. Vasodilation decreases preload and leads to decreased cardiac work that can help reverse the effects of angina pectoris. Additionally, decreased preload results in decreased pulmonary capillary hydrostatic pressure and reduction of fluid passing into the pulmonary interstitium and alveoli in cardiogenic pulmonary edema.  
**Pharmacokinetics:**  
**SL:** Onset 1 to 3 minutes. Peak 5 minutes. Duration at least 25 minutes. $t_{1/2} = 2$ to 3 minutes.  
**TOP:** Onset 15 to 60 minutes. Peak 30 to 120 minutes. Duration 2 to 12 hours.  
**Indications:**  
- Chest pain suspected to be cardiac in origin.  
- Severe Hypertension  
- Cardiogenic pulmonary edema.  
**Contraindications:**  
- Hypotension (SBP less than 90 mm Hg).  
- Bradycardia (HR less than 60).  
- Increased intracranial pressure (i.e., CVA, head injury).  
- Hypersensitivity to the drug.  
- Patients who are using anti-impotence agents (Cialis®, Levitra®, Viagra®).  
**Precautions:**  
- Administer nitrates with extreme caution if at all to patients with suspected inferior wall MI with possible right ventricular (RV) involvement because these patients require adequate RV preload.  
- Patients taking the drug routinely may develop a tolerance and require an increased dose.  
- Postural syncope sometimes occurs following the administration of Nitroglycerin; it should be anticipated and the patient kept supine when possible.  
- Careful clinical or hemodynamic monitoring must be used because of the possibility of hypotension and tachycardia.  
**Side Effects:**  
- CNS: dizziness, headache, weakness  
- CV: dysrhythmias, palpitations, postural hypotension, tachycardia  
- GI: nausea, vomiting  
- SKIN: diaphoresis, flushing, pallor, rash  
**Interactions:**  
- Severe hypotension is possible when administered to patients who have recently ingested alcohol.  
- Orthostatic hypotension is possible when used in conjunction with β-adrenergic antagonists.  
- Administration of Nitroglycerin is contraindicated in patients who are using anti-impotence agents such as Sildenafil (Viagra®) since these agents have been shown to potentiate the hypotensive effects of organic nitrates.  

*CONTINUED ON NEXT PAGE*
| Administration |  | Adult | | Administer 0.4 mg SL. Repeat q 5 minutes, if needed, to a maximum of 3 doses. | | Adult | (SBP ≥ 110 mmHg): Administer 0.4 mg SL. Repeated q 5 minutes to a maximum of 3 doses if needed. | | Adult | Administer 0.4 mg SL. Repeat q 5 minutes, if needed, to a maximum of 3 doses. | | Supply | Tablet: Bottle containing 0.4 mg (1/150 grain) tablets. Liquid: 400mcg metered dose spray | | Notes | Nitroglycerin should be kept in the original glass container, tightly capped. |
Generic Name: Ondansetron (on-dan-she'tron)
Trade Name: Zofran®
Chemical Class: Carbazole derivative
Therapeutic Class: Antiemetic

Actions: Ondansetron is a selective 5-HT₃ antagonist which is an effective anti-nausea and anti-emetic medication with minimal reported significant side effects. Nausea and vomiting are strongly associated with serotonin receptors of the 5-HT₃ type, present both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone of the area postrema.

Pharmacokinetics: IV: Peak immediate. IM: N/A

Indications: 1. Severe vomiting or nausea.
2. Vertigo.

Contraindications: 1. Hypersensitivity to the drug.
2. Pregnancy (all trimesters).
3. Prolonged QT interval

Precautions: Rarely, transient ECG changes including QT interval prolongation have been reported.

Pregnancy Cat. B

Side Effects: CNS: headache, lightheadedness, seizures
CV: angina, bradycardia, syncope, tachycardia
EENT: blurred vision
GI: constipation, diarrhea
RESP: bronchospasm
SKIN: rash

Interactions: N/A

Administration:
Paramedic / AEMT • Administer 4 mg IV/IM over 4 minutes. Repeat dose requires MCP order.
• Administer 4 mg ODT. Place tablet on patient’s tongue. The tablet dissolves quickly and can be swallowed with saliva. Repeat dose requires MCP order.

EMT • Administer 4 mg ODT. Place tablet on patient’s tongue. The tablet dissolves quickly and can be swallowed with saliva. Repeat dose requires MCP order.

Supply: Vial containing 4 mg in 2 mL
Single dose tablets
Drug Names: Dextrose (Glutose®, Insta-Glucose®)

Overview: Oral glucose is used to treat patients with a history of diabetes exhibiting an altered mental status and the ability to swallow. Oral glucose is a form of glucose that can reverse a diabetic's hypoglycemic condition. Time of administration can make a critical difference. The preparation comes in a tube.

Indications: Patient with altered mental status and a known history of diabetes controlled by medication.

Contraindications: • Unresponsive.
• Unable to swallow.

Side Effects: None when given properly. May be aspirated by the patient without a gag reflex.

Administration: • Assure signs and symptoms of altered mental status with a known history of diabetes.
• Assure patient is conscious and can swallow and protect the airway.
• Administer glucose:
  o Between cheek and gum.
  o Place on tongue depressor between cheek and gum.

Supply: Tube contains 12.5 g, 15 g, or 25 g (varies per manufacturer).
<table>
<thead>
<tr>
<th><strong>Generic Name:</strong> Sodium Bicarbonate (so'dee-um bye-kar'boe-nate)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trade Name:</strong> N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Chemical Class:</strong> Monosodium salt of carbonic acid</td>
<td></td>
</tr>
<tr>
<td><strong>Therapeutic Class:</strong> Alkalizing agent; electrolyte supplement</td>
<td></td>
</tr>
<tr>
<td><strong>Actions:</strong> Sodium Bicarbonate is an alkalizing agent used to buffer acids present in the body during and after severe hypoxia. Sodium Bicarbonate combines with excess acids (usually lactic acid) present in the body to form a weak, volatile acid. This acid is broken down into CO₂ and H₂O. Sodium Bicarbonate is effective only when administered with adequate ventilation and oxygenation. Sodium Bicarbonate may be administered to alkalinize the urine to speed excretion of tricyclic antidepressants.</td>
<td></td>
</tr>
<tr>
<td><strong>Pharmacokinetics:</strong> Onset in seconds. Peak 1 to 2 minutes. Duration 10 minutes.</td>
<td></td>
</tr>
<tr>
<td><strong>Indications:</strong> • Prolonged cardiac arrest. • Known metabolic acidosis. • Cardiac arrest in a dialysis patient (hyperkalemia). Should be an early treatment consideration. • Tricyclic antidepressant (TCA) overdose. • Crush syndrome</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications:</strong> Hypokalemia.</td>
<td></td>
</tr>
<tr>
<td><strong>Precautions:</strong> Sodium Bicarbonate can cause metabolic alkalosis when administered in large quantities. It is important to calculate the dosage based on patient weight and size.</td>
<td></td>
</tr>
<tr>
<td><strong>Pregnancy Cat. C</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects:</strong> • Metabolic alkalosis. • Hypernatremia. • Hypokalemia.</td>
<td></td>
</tr>
<tr>
<td><strong>Interactions:</strong> • Most catecholamines and vasopressor (e.g., Dopamine and Epinephrine) can be deactivated by alkaline solutions such as Sodium Bicarbonate; assure these drugs are not administered simultaneously. • Sodium Bicarbonate should not be administered in conjunction with Calcium Chloride. A precipitate can form and block the IV line.</td>
<td></td>
</tr>
<tr>
<td><strong>Administration:</strong> • Adult Cardiac arrest: Administer 50 mEq IV/IO</td>
<td></td>
</tr>
<tr>
<td>• Pediatric Contact [Medical Control].</td>
<td></td>
</tr>
<tr>
<td><strong>Supply:</strong> Prefilled syringe containing 50 mEq in 50 mL (8.4% solution).</td>
<td></td>
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<tr>
<td><strong>Notes:</strong></td>
<td></td>
</tr>
</tbody>
</table>
**Generic Name:** Tetracaine Hydrochloride Ophthalmic Solution  (te-truh-keyn)

**Trade Name:** Cepacol Viractin, Pontocaine

**Chemical Class:** Topical anesthetics

**Therapeutic Class:** Ophthalmic drops

**Actions:** Tetracaine is a topical local anesthetic for the eyes. Tetracaine works by interfering with entry of sodium ions into nerve cells. This reduces the ability of nerves to generate an impulse and send pain sensations.

**Pharmacokinetics:** The systemic exposure to tetracaine following topical ocular administration of Tetracaine Hydrochloride Ophthalmic Solution 0.5% has not been studied. Tetracaine hydrochloride is metabolized by plasma pseudocholinesterases and nonspecific esterases in ocular tissues.

**Indications:** Tetracaine Hydrochloride Ophthalmic Solution 0.5%, an ester local anesthetic, is indicated for procedures requiring a rapid and short-acting topical ophthalmic anesthetic.

**Contraindications:** Hypersensitivity; Thromboembolic disorders (current, history of, or at risk for); Acquired defective color vision (IV); Subarachnoid hemorrhage; Concurrent use of combination hormonal contraception (PO).

**Precautions:**
- Corneal injury with Intracameral Use. Not for injection or intraocular use. Do not use intracameraly because use of Tetracaine Hydrochloride Ophthalmic Solution 0.5% may lead to damage of the corneal endothelial cells.
- Corneal Toxicity Prolonged use or abuse may lead to corneal epithelial toxicity and may manifest as epithelial defects which may progress to permanent corneal damage.
- Corneal Injury due to Insensitivity Patients should not touch the eye for at least 10-20 minutes after using anesthetic as accidental injuries can occur due to insensitivity of the eye.

**Side Effects:**
- Severe burning, stinging, or sensitivity where the medicine is applied;
- Swelling, warmth, or redness;
- Oozing, blistering, or any signs of infection; or.
- Eye irritation, watering, or increased sensitivity to light.

**Interactions:** Tetracaine hydrochloride should not be used if the patient is being treated with a sulfonamide because aminobenzoic acid inhibits the action of sulfonamides.

**Administration:**
- **Adult** One drop topically in the eye(s) as needed in conjunction with Morgan Lens insertion. Discard unused portion.

**Supply:**

**Notes:**
<table>
<thead>
<tr>
<th><strong>Generic Name:</strong></th>
<th>Betaxin, Vitamin B1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemical Class:</strong></td>
<td>Ethanolamine derivative</td>
</tr>
<tr>
<td><strong>Therapeutic Class:</strong></td>
<td>Vitamin</td>
</tr>
<tr>
<td><strong>Actions:</strong></td>
<td>Required for carbohydrate metabolism. Therapeutic Effects: Replacement in deficiency states.</td>
</tr>
<tr>
<td><strong>Pharmacokinetics:</strong></td>
<td>Absorption: Well absorbed from the GI tract by an active process. Excessive amounts are not absorbed completely. Also well absorbed from IM sites. Distribution: Widely distributed. Enters breastmilk. Metabolism and Excretion: Metabolized by the liver. Excess amounts are excreted unchanged by the kidneys. Half-life: Unknown.</td>
</tr>
<tr>
<td><strong>Indications:</strong></td>
<td>Treatment of thiamine deficiencies. Prevention of Wernicke’s encephalopathy. Dietary supplement in patients with GI disease, alcoholism, or cirrhosis.</td>
</tr>
<tr>
<td><strong>Contraindications:</strong></td>
<td>Hypersensitivity Known alcohol intolerance or bisulfite hypersensitivity</td>
</tr>
<tr>
<td><strong>Precautions:</strong></td>
<td>Wernicke’s encephalopathy (condition may be worsened unless thiamine is administered before glucose).</td>
</tr>
<tr>
<td><strong>Interactions:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Administration:</strong></td>
<td>Adult Administer 100 mg IV/IM/IO</td>
</tr>
<tr>
<td><strong>Supply:</strong></td>
<td>Vial containing 100 mg in 2 mL vial</td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td>Administer prior to Glucose or Glucagon administration</td>
</tr>
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</table>
**TRANEXAMIC ACID (OPTIONAL)**

<table>
<thead>
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<th>Scope</th>
<th>PARAMEDIC</th>
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</thead>
</table>

**Generic Name:** Tranexamic Acid (tran-ex-am'-ik as-id)  
**Trade Name:** Cyklokapron®  
**Chemical Class:** Amino acid derivative  
**Therapeutic Class:** Antifibrinolytic

**Actions:** Inhibits plasminogen activation and plasmin activity.

**Pharmacokinetics:** *IV:* Onset 5-15 minutes. $t_1/2 = 2$ hours. Duration of action: approximately 3 hours.

**Indications:**
- Any trauma patient, 14 years of age or older, who is at high risk for ongoing internal hemorrhage meeting one or more of the following criteria:
  - Systolic blood pressure less than 90 mm Hg.
  - Patients over 65 years of age with systolic blood pressure less than 110 mm Hg.
  - Tachycardia with heart rate greater than 120 beats per minute with signs of hypoperfusion present (confusion, altered mental status, cool extremities, etc.).
  - Contact [Medical Control] as needed if the patient does not meet the above criteria.

**Contraindications:**
- Injuries greater than 3 hours old.
- Evidence of disseminated intravascular coagulation (DIC).
- Hypersensitivity to the drug.

**Precautions:**
- Excreted in breast milk.
- Caution in patients with history of deep vein thrombosis (DVT), pulmonary embolus, other blood clots, or severe renal failure.
- Can cause worsened coagulopathy in some patients.

**Pregnancy Cat. B**
- Excreted in breast milk.
- Caution in patients with history of deep vein thrombosis (DVT), pulmonary embolus, other blood clots, or severe renal failure.
- Can cause worsened coagulopathy in some patients.

**Side Effects:**
- **CNS:** anxiety, blurred vision, confusion
- **CV:** hypotension, chest pain, tachycardia
- **GI:** nausea, vomiting, diarrhea
- **RESP:** shortness of breath, cough

**Interactions:** Female patients taking or using any form of birth control containing estrogen and progestin are at an increased risk for blood clots and this medication increases that risk significantly.

**Administration:**
- **Loading Dose:** IV infusion of 1 gram Tranexamic Acid (TXA) infused over 10 minutes. Piggyback the TXA infusion into an already established IV infusion.
- **Maintenance Dose:** IV infusion of 1 gram Tranexamic Acid (TXA) infused over 8 hours. Piggyback the TXA infusion into an already established IV infusion.

**Supply:** Vial containing 1,000 mg in 10 mL.

**Notes:**
- To prepare loading dose, mix 1 gram TXA in 100 mL or 250 ML NS. Attach a 15 drop administration set and infuse over 10 minutes.
- To prepare maintenance infusion, mix 1 gram TXA in 100 mL or 250 ML NS. Attach a 60 drop administration set and infuse over 8 hours.
- Major external bleeding MUST be controlled by direct pressure, hemostatic dressings, and tourniquets; TXA administration does NOT control external hemorrhage.
- Be sure to CLEARLY document the mechanism of injury, the time of injury/incident, and the time that the TXA bolus was administered (as well as when the maintenance infusion was started, if applicable).
APPENDIX

WVOEMS PROTOCOL SUBMISSION POLICY

West Virginia Office of Emergency Medical Services – Statewide Protocols
PURPOSE: To establish standards for the submission and approval or modification and approval of West Virginia State-wide EMS protocols.

RATIONAL: Deciding to develop a new protocol or evaluate an existing one should be based on a rational process. Questions that should be asked and answered when considering a new drug therapy or procedure are as follows:

Key Questions for any New Protocol

- Is the drug therapy or procedure medically indicated and safe?
- Is it within the scope of practice for the provider?
- How specifically will this protocol benefit patient care?
- What specifically is needed to implement this protocol (education/training, medical director protocol development/authorization, equipment needs, etc.)?
- How will this protocol impact operation?
- What is the opinion of providers concerning this protocol?
- Does the medical community support this protocol change?
- What are all the costs versus benefits associated with implementation and maintenance?
- What are the medical-legal implications?
- What ongoing provider involvement such as skills maintenance and continuous quality improvement is necessary?
- How will success be measured?

Rational Protocol Development Process to Make the Right Protocol Decision

- Study the issue thoroughly
- Identify key questions
- Compare with goals
- Assess fit with system
- Cost benefit analysis
- Identify measuring tools

Stakeholders in this process are recognized to include, but not be limited to:

- Medical direction (on-line and off-line)
- Educators/training programs
- WVOEMS, MPCC, EMSAC
- Service directors
- Service providers
- Consumers
- Third party payers
POLICY: West Virginia State-wide protocol additions, deletions, and/or modifications shall be submitted utilizing the content outlined in this policy with heavy consideration given to the content listed in the Rational section. Submissions may come from any healthcare provider or interested party.

A. Complete the attached "Protocol Submission Template."

B. Each application will need a sponsoring "System Medical Director" (someone from the following groups: Squad Medical Directors, State EMS Medical Director, Regional Medical Directors, or Educational Institute Medical Directors.

C. The Protocol Submission Template will be sent to the State EMS Medical Director.

ESSENTIAL CRITERIA:

A. Clearly defined indication(s) for the proposed protocol

B. An explanation providing the advantages and disadvantages that the Proposed Protocol will have on patients encountered by EMS and how it will impact the delivery of EMS within West Virginia

C. Strong evidence supporting the implementation of the Proposed Protocol (as noted on the template)

D. Fiscal impact statement

E. A System Medical Director sponsor

EVALUATION:

A. The Protocol Submission Template will be evaluated by the State EMS Medical Director with input from subject matter experts.

B. Once the Protocol submission has been appropriately formatted and reviewed, it will be forwarded to the WV EMS Advisory Council (EMSAC) for peer review within the Policy, Procedure, and Protocol Committee.

C. The State EMS Advisory Council will vote to forward the protocol submission to the Medical Policy Care Committee (MPCC) for further consideration.
D. MPCC may choose one of the following:
   a. Request more information/research on the proposal
   b. Request a pilot study be performed and base a decision on the results of that study
   c. Disapprove the submission
   d. Approve the submission as is or with modifications.

E. Once approved by MPCC the protocol submission will be published for 30 days of public comment unless such an immediate response is warranted under exigent circumstances.
This document shall be completed as part of the requirements for submission to modify, delete, or add a new protocol the WV State-wide EMS protocols. Complete the cover sheet and attach all supporting documentation per policy to this form.

NAME of submitter:

Certification Number (if applicable): WV

Expiration Date:

Agency Affiliation: Not Affiliated

Phone Number:

Email:

Sponsoring Medical Director (Print):

Phone Number:

Email:

Both signatures below are required for this submission to be reviewed.

Agency Medical Director:

______________________________
Signature

Submitter:

______________________________
Signature

Submit to:

WVOEMS Medical Director
West Virginia Office of Emergency Medical Services
350 Capitol Street
Room 425
Charleston WV, 25301

Official Use Only:

Date received by State Medical Director:

Date Reviewed by EMSAC:

Date Reviewed By MPCC:

Decision: ☐ Approved ☐ Denied ☐ Pilot Project ☐ Requested additional Information

Posted to 30 day comment period:

WVOEMS Medical Director Signature:

______________________________
A. EXPLANATION

B. INDICATION

C. SUPPORTING EVIDENCE AND LITERATURE

D. SUPPORTING WEST VIRGINIA and/or NATIONAL DATA

E. DEFINE AREA OF PROTOCOL CONTENT
   1. Patient Care Presentation
   2. Treatment
      i. Basic Life Support
      ii. Advanced Life Support
      iii. Adult
      iv. Pediatric
      v. Geriatric
      vi. Medical Command
      vii. Algorithm
      viii. Alerts
   3. Procedure/ Skill
      i. Purpose
      ii. Indication
      iii. Contraindications
      iv. Potential Adverse Effects/Complications Precautions
      v. Procedure
   4. Medication
      i. Indication
      ii. Pharmacokinetics
      iii. Adverse Effects
      iv. Precautions
      v. Contraindications
      vi. Preparations
      vii. Dosage
         a. Adult
         b. Pediatric
         c. Geriatric
         d. Medical Consultation

F. FISCAL IMPACT STATEMENT COVERING THE START-UP AND MAINTENANCE COST OF THE MEDICATION, DEVICE, REPLACEMENT PARTS, AND ANY UNIQUE REQUIREMENTS TO IMPLEMENT THE PROTOCOL.

G. IMPACT ON THE EXISTING WEST VIRGINIA STATE-WIDE EMS PROTOCOLS