



# REGIONAL STANDARD PATIENT TREATMENT GUIDELINES

Revised For  
September  
2023

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## **Forward**

The guidelines detailed in this document may be performed only by appropriately trained EMS providers who hold current Virginia Certification for their provider level and who are operating under the direction of an OMD for a licensed EMS agency in the BREMS region. EMS providers are permitted to perform patient care within their defined scope of practice, when following the appropriate protocol(s) or when following the order of a medical command physician. No provider may give medications or perform procedures for which he or she has not had the indicated training and approval. Every EMS provider is responsible for knowledge of current regional protocols so that they may provide the safest, highest quality and most effective care to patients.

Since written protocols and guidelines may not always address all patient care situations that may develop, it is expected that EMS providers will use their training and judgment regarding any protocol-driven care that would be harmful to a patient. When the EMS provider believes that following a protocol is not in the best interest of the patient, they should contact Medical Command if possible, but in any case should always strive to not cause harm. Cases where deviation from the protocol is justified are rare; the reason(s) for any deviation should be documented in the Patient Care Report. In all cases, EMS providers are expected to deliver care within the scope of practice for their level of certification.

### **Limited On-Scene Time**

Time is a very important consideration in the survival of seriously injured or ill patients. Research has long demonstrated that in some cases, patient survival rates increase dramatically as time from the trauma incident to the beginning of definitive care decreases. Providers should perform the initial and rapid assessments, patient stabilization, patient packaging and initiation of transport in less than 10 minutes. Transport of the patient should not be delayed for non-life saving interventions. When distance or traffic conditions present prolonged ground transport times for trauma, cardiac or stroke patients, air medical services may be a consideration in order to reduce transport time.

### **Early Receiving Facility Notification**

In order for the receiving facility to adequately prepare for the arrival of patients, EMS providers should provide notification as early as possible, especially in cases of multi-system trauma patients, cardiac emergencies, strokes and incidents involving multiple patients. Providing early notification allows the receiving facility time to prepare resources needed, including specialty staff needed to offer the best care.

### **Transporting with Lights and Sirens**

Ambulance crashes are one of many hazards faced by EMS personnel. There are a number of risk factors that increase the likelihood of ambulance crashes, including the use of lights and sirens during transports. The use of emergent transport of patients using lights and sirens is permitted when the patient being transported to the receiving facility will require the immediate attention of a physician for assessment and treatment.

### **Medical Control**

Physicians rendering treatment orders to field personnel should use this manual as a basis for such orders. It is understood that variations from these guidelines will sometimes be necessary, and that direct orders from the receiving physician may override guidance indicated herein.

Providers are not required to wait until they have completed all standing orders to contact on-line Medical Control; this contact should be made whenever advice, confirmation, consultation or direction is needed.

### **Protocol Review and Revision**

Protocols provide a best practice approach to common patient presentations, facilitating a consistent level of medical care and a standard approach for accountability. The BREMS Office staff and the Performance Improvement Team, which consists of individuals representing the localities across this region, have worked diligently along side of our Medical Direction Committee to present the most current curriculum, combined with evidenced-based guidelines for EMS providers to follow. This document is a working document, meaning that changes may occur frequently as times and medicine change. This document has been reviewed and approved by the Regional Medical Director as well as Agency OMDs, and by the Blue Ridge EMS Council Board of Directors, in order to consistently guide pre-hospital emergency care across the BREMS region.

## **Acknowledgments**

BREMS would like to recognize our Operational Medical Directors throughout the region who provide their expertise and guidance with this document, to ensure that this region's citizens receive the highest level of care and professionalism possible.

### **BREMS Region Operational Medical Directors:**

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BREMS would also like to extend a huge thank you to all members of the BREMS Performance Improvement Team who assisted in these revisions, corrections and new recommendations. We appreciate all of your hard work and dedication.

Comments regarding the contents of this manual should be directed in writing to:

**Blue Ridge EMS Council**

**Attn: Regional Medical Director**

**2412 Langhorne Rd**

**Lynchburg, Virginia 24501**



## Legend for Protocol Treatment Levels



Line indicates last EMT scope of treatment

Line indicates last AEMT scope of treatment

Line indicates last Intermediate scope of treatment

Line indicates last Paramedic scope of treatment.  
APP may extend here or stop, depending on  
protocol



## Administration of Immunizations

### GOALS

- Currently, AEMT, Intermediates, and Paramedics are authorized to administer vaccines pursuant to VA code sections:
  - § 32.1-46.02. Administration of influenza vaccine to minors.
  - § 54.1-3408: Professional use by practitioners.
- Ensure all levels of EMS providers are complying with all VDH/AOEMS standards regarding vaccine administration and can only administer vaccines while working on behalf of their respective, assigned department within the BREMS Region.
- Under this protocol, EMS providers must comply with all VDH/VAOEMS standards regarding vaccine administration and can only administer vaccines while working on behalf of their respective, assigned department within the BREMS Region.
- EMTs were previously authorized to administer vaccines under COVID-19 Emergency Declarations but this has been rescinded, and vaccination administration is not currently within the EMT scope.

### Clinical Management Options

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- Follow procedure for IM administration below
- Provide patient, parent or legal representative with a copy of the Vaccine Information Statements (VISs) to answer any questions.
- Screen for contraindications according to VDH/CDC standards.
- Always check the package insert or procedural instructions prior to administration of any vaccine. Follow insert or procedural instructions to prepare and draw up vaccine dose.
- Record the following: Date VIS provided, VIS edition date, Manufacturer, lot number, date of administration, name, address, and title of person administering
- Administer IM vaccines at a 90° angle with 22-25-gauge needle. The needle length for IM injections depends upon the age, gender, and/or weight of the vaccine recipient. (See Table attachment.). Administer IM, according to the recommended age-specific dose and schedule.
- Administer vaccine.
- Observe patient for an allergic reaction for 15-20 minutes after administering vaccine. If an anaphylactic/allergic reaction occurs, treat according to Allergic Reaction/Anaphylaxis protocol.
- Report clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at 1-800-822-7967 or <http://www.vaers.hhs.gov/>.

### Consult Online Medical Control as Needed



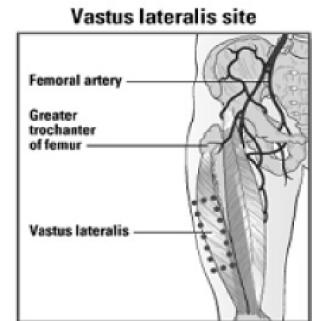
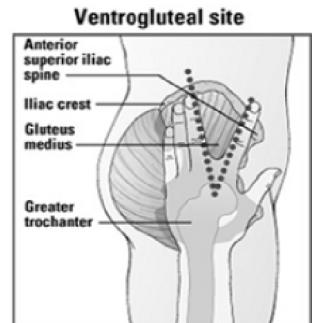
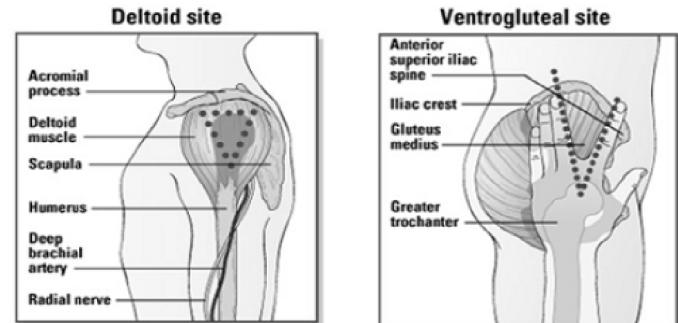
# Administration of Immunizations

## Special Considerations & Precautions:

1. Prepare appropriate equipment:
  - a. Needle size & length – ½ to 1 inch for deltoid, 1 to 1.5 inch for larger muscles
  - b. 25 g for aqueous medications, 21 gauge for oily or thicker medications.
  - c. Appropriately sized syringe to measure the administration volume.
  - d. Chlorohexidine wipe and band aids
2. Appropriate injection sites:
  - a. Posterior deltoid for injections of up to 2 mL in adults contingent upon muscle mass development.
  - b. Vastus Lateralis for injections of 2 mL or less in children and adults.
  - c. Ventrogluteal site for injections of 2 to 5 mL in adults, or 2 mL or less in children.

## Procedure:

1. Prepare equipment, inspect medication, perform medication cross check – Right: patient, drug, dose, route, indication, time
2. Locate appropriate injection site:
  - a. Deltoid: Identify the bony portion of the shoulder where the clavicle and scapula meet (acromioclavicular joint), then measure 3-4 fingers down the arm from the acromioclavicular joint, slide 1-2 fingers posteriorly on the arm.
  - b. Vastus Lateralis: Locate on the anterior and lateral aspects of the thigh, then divide the area into thirds between the greater trochanter of the femur and the lateral femoral condyle, injection is given into the middle third.
  - c. Ventrogluteal: Place heel of palm on patient's greater trochanter of the femur, then place index finger on the anterior superior iliac spine and spread other fingers posteriorly, injection is given in the V formed between the index finger and the second finger.
3. Cleanse site using an aseptic technique.
4. Stretch or flatten the skin over the selected site to allow for smoother entry of the needle.
5. Hold the syringe like a dart and quickly insert the needle into the tissue and muscle at a 90-degree angle.
6. Slowly inject the medication, once injected then quickly withdraw the syringe and properly dispose.
7. Gently massage the injection site to increase absorption and distribution.
8. Apply firm pressure and place band aid over site.





## Administration of Immunizations

### IM Vaccination Training

Any EMS provider who is administering any vaccination must receive training from their agency OMD, Regional OMD, or designee. TRAIN-VA education or similar equivalent is considered minimum education for vaccination administration. When partnering with local Health District, expect to have TRAIN-VA required.

Such training shall include:

1. Sterile technique
2. Familiarization with the equipment needed
3. How to choose needle and syringe
4. Familiarization with required consent and record keeping
5. Indications and contraindications to the vaccine in question
6. How to draw up vaccine safely and steriley
7. How to select and prep injection site
8. How to give the injection – follow attached CDC documents, listed under Reference, below
9. Post injection site care
10. Post injection patient observation
11. Familiarization with instructions to give patient after vaccination

Total expected time of instruction: 4 hours

Department and OMD must maintain records of such training and comply with all VDH standards regarding vaccination programs.

### References:

<https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html>

<https://www.vdh.virginia.gov/emergency-medical-services/other-ems-programs-and-links/ems-medical-directors/vaccine-administration-by-certain-ems-personnel/>

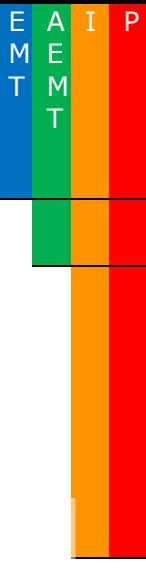


## Behavioral Emergencies

GOALS

- Determine if additional assistance is needed.
- Consider underlying etiologies for behavioral emergencies
  - Metabolic: Hypoxia, electrolyte abnormalities, hepatic encephalopathy, hypercarbia, hyper/hypoglycemia, thyrotoxicosis, uremia)
  - Neurologic (dementia, head injury, encephalitis, seizure/postictal state)
  - Psychiatric (acute psychosis, mania, medication withdrawal)
  - Infectious/Inflammatory (encephalitis, meningitis, sepsis)
  - Toxicologic (neuroleptic malignant syndrome, anticholinergic syndrome, polypharmacy, serotonin syndrome, use of drugs and/or alcohol)
- Always consider your team's safety; maintain an escape route
- All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene for hypoventilation or oversedation and should receive pulse oximetry (good) or EtCO<sub>2</sub> (better) monitoring. Cardiac monitoring is also desirable as possible.

### Clinical Management Options



- Oxygen supplementation as needed, target SpO<sub>2</sub> 92 – 96%.
- Blood glucose level assessment.
- Basic Airway Management as needed.
- Physical restraint if needed; Contact ALS for possible chemical restraint.
- Cooling measures if needed.
- Obtain 12-Lead ECG and transmit as indicated.
- Consider IV/IO access as indicated.
- Fluid therapy as needed with isotonic crystalloid.
- Continuous cardiac monitoring and monitor / interpretation of 12- lead ECG.
- For aggressive/combative patients requiring chemical sedation, consider:
  - Midazolam 2.5-5mg IN/IM/IV/IO; may repeat once (max 10mg)
  - For uncontrolled anxiety, consider Midazolam 0.5-2 mg IV
  - If sedating medications are given, continuous cardiac, ETCO<sub>2</sub> and SpO<sub>2</sub> monitors are required.
  - Any patient requiring chemical sedation must be transported to the ED for evaluation. Transport should be accomplished in a way that ensures patient safety.
  - Advanced Airway Management as needed.
- APP Sedation Options:
  - Ketamine 0.5-1mg/kg slow IV/IO (max 200mg) or 4-5mg/kg IM (max 500mg)
  - Haldol 5-10mg IM/IV/IO with caution

**Consult Online Medical Control as Needed**



## Behavioral Emergencies

- While the need for Pediatric sedation for behavioral emergencies is exceedingly rare, there are instances when it is indicated. Medication considerations could include:
  - Versed:** 0.05-0.1mg/kg IV, 0.1-0.15mg/kg IM or 0.3mg/kg IN (Max 5mg)
  - Benadryl** 1mg/kg IM/IV/PO (max dose 25mg); beware paradoxical reactions

### Key Performance Indicators:

- Continuous pulse oximetry and ETCO<sub>2</sub>
- Documentation of attempts at de-escalation and positioning other than prone

### Special Considerations:

- Consider environmental factors; if beneficial, move the patient to an area free of family and bystanders to ensure privacy/confidentiality. Be aware that in some cases, family/friends may be stabilizing influences.
- If a patient has capacity for decision making, consent is required before providing care. If a patient does not have capacity, consent is not required, but it still remains our obligation to act in the patient's best interest for health and safety. It is not appropriate, nor is it legal, for unsworn EMS to act as law officers.
- If EMS concern for patient safety and need for medical evaluation, consider contacting Medical Control for guidance in obtaining a Medical Emergency Custody Order (ECO), which would require involvement of the magistrate.
- SAVE Mnemonic for De-Escalation:
  - Support - "Let's work together..."
  - Acknowledge - "I see this has been hard for you..."
  - Validate - "I would probably be reacting the same way if I was in your shoes..."
  - Emotion naming - "You seem upset..."
- Any patient who is handcuffed, restrained or otherwise in the custody of Law Enforcement must be accompanied by a law enforcement officer during EMS transport.
- In instances in which it is determined according to agency protocol/procedure that medical care is not currently needed, and in which no medications have been administered, a patient may be released to law enforcement for transport to mental health evaluation.
- Physical restraint should be performed / assisted by Law Enforcement when available.
- When restraint is necessary, attempt to use one person per limb plus head (5 in total), and restrain in the supine or left lateral recumbent position. Ensure method of restraint does not affect breathing or circulation and verify adequate perfusion to extremities.
- If a locking device is used to restrain a patient, the key to the device must remain at the patient's bedside at all times.



## Behavioral Emergencies

- There should never be use of physical force that would create airway constriction or compromise in any way. No prone restraint positional technique is acceptable because of the mechanical breathing difficulties it may create.
- When possible, avoid confrontation and attempt de-escalation; utilize an empathetic approach.
- Do your best to ensure patient safety, dignity and comfort, including appropriate covering.
- While physical and chemical restraint are complex procedures, uncontrolled or poorly controlled patient agitation and physical violence can place the patient at risk for sudden cardiopulmonary arrest secondary to metabolic acidosis or positional asphyxia. As such, urgent de-escalation of patient agitation/ aggression is imperative in the interest of patient safety as well as for EMS providers and others on scene.
- The management of violent patients requires a constant re-evaluation of the risk/benefit balance for the patient, providers/responders and bystanders to provide the safest care possible. These are complex and high risk encounters, in which provider and patient safety must both be considered, as well as the obligation of EMS as an advocate for the patient. There is no one-size-fits-all solution for addressing these situations, and providers should never hesitate to call for assistance as necessary.

### References

1. Gonin P, Beysard N, Yersin B, Carron PN. Excited delirium: a systematic review. *Acad Emerg Med* 2018;25:552–65. [PMID: 28990246](#)
2. Battaglia J, Moss S, Rush J, et al. Haloperidol, lorazepam, or both for psychotic agitation? A multicenter, prospective, double-blind, emergency department study. *Am J Emerg Med* 1997;15(4):335–40. [PMID: 9217519](#)
3. Keseg D, Cortez E, Rund D, Caterino J. The use of prehospital ketamine for control of Agitation in a metropolitan firefighter-based EMS system. *Prehosp Emerg Care* 2015;19:110–5. [PMID: 25153713](#)
4. Cole JB, Klein LR, Nystrom PC, Moore JC, Driver BE, Fryza BJ, Harrington J, Ho JD. A prospective study of ketamine as primary therapy for prehospital profound agitation. *Am J Emerg Med*. 2018 May;36(5):789–796. [PMID: 29033344](#)



# Epistaxis

## GOALS

- Assess for increased risk of vomiting and airway compromise
- Assess for facial trauma and/or cervical spinal injuries

### Clinical Management Options

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- Ice packs to the area
- Compress bridge or base of the nose
- Tilt head forward to minimize posterior drainage
- Adult: Afrin (OTRIVIN) 2-4 sprays to bleeding nostril, followed by direct pressure.
- Peds: Afrin (OTRIVIN) 1-2 sprays to bleeding nostril, followed by direct pressure.
- Consider IV/IO access as indicated
- Consider Isotonic Crystalloid bolus as needed for hypotension
- See special consideration regarding TXA below.

### Consult Online Medical Control as Needed

#### Key Performance Indicators:

1. Documentation of anticoagulants and/or medical issues related to coagulation
2. Monitor blood pressure and GCS for signs of hypovolemia

#### Special Considerations:

- Consider other etiologies: trauma; infection (viral URI, sinusitis); allergic rhinitis; lesions (polyps, ulcers); systemic causes (hypertension)
- Bleeding may also occur posteriorly into the posterior oropharynx. Evaluate for posterior blood loss by visualizing the posterior pharynx. Note that these patients are at increased risk of vomiting and airway compromise.
- While topical TXA can be useful for epistaxis, it is usually reserved as a last resort for medical therapy. IV TXA is not typically indicated in epistaxis. If major epistaxis is not responding to other therapies already mentioned above (e.g. pressure, Afrin), soak a Kerlix with TXA and place inside the affected nostril along with holding direct pressure (Kerlix chosen to allow for part of the dressing to be hanging out of the nose, so that no foreign body is lost within the nostril).

#### • Reference:

Fataki A, Winters R, Amedee RG. Epistaxis: a common problem. *Ochsner J*. 2010;10(3):176-178.



## Fever / Infection

### GOALS

- Recognize general appearance of patient.
- Treat patient with age-appropriate body temperature assessment.
- Cooling measures as needed.
- Evaluate and determine environmental surroundings.
- Treat fever

Clinical Management Options				
E	A	I	P	A
M	E	P	P	<ul style="list-style-type: none"><li>• Oxygen PRN titrated to SpO<sub>2</sub> 92%-96%.</li><li>• 12-lead ECG as indicated.</li><li>• Place in a position of comfort.</li><li>• Ascertain temperature if equipped.</li></ul>
T	M	P	A	<ul style="list-style-type: none"><li>• If fever &gt; 100.4 F without an environmental cause:<ul style="list-style-type: none"><li>○ Adult – Acetaminophen – 1000mg PO</li><li>○ Pediatric – Acetaminophen - 15 mg/kg PO</li><li>○ If patient is &gt; 45kg, administer adult dose.</li></ul></li><li>• Consider IV/IO access as indicated.</li><li>• Isotonic Crystalloid 20cc/kg bolus as indicated</li></ul>
T				

### Consult Online Medical Control as Needed

#### Key Performance Indicators:

1. Ascertain actual weight for the pediatric population.



## Fever / Infection

### Special Considerations:

- Infections / Sepsis
- Neoplastic reactions
- Medication or drug reaction
- Connective tissue disease(s):
  - Arthritis
  - Vasculitis
- Hyperthyroidism
- Heat stroke
- Patients with a history of hepatic failure, allergy or other complication should not receive Acetaminophen.
- Appropriate provider and patient PPE are to be donned as soon as possible when signs of an infectious disease are recognized.
- If increased temperature, utilize passive cooling by removing excessive clothing or covers
- Droplet precautions include standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized with influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected. A patient with a potentially infectious rash should be treated with droplet precautions.
- Contact precautions include standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g. MRSA, scabies, or zoster (shingles)), or with other illnesses spread by contact are suspected.
- All-hazards precautions (Airborne Precautions) include standard PPE, contact precautions plus N-95 mask for providers. At minimum a surgical mask should be placed on the patient. This level of precautions is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g. SARS, TB).
- High Consequence Infectious Disease (HCID) is defined as: "An infectious disease that presents an immediate threat; poses a high risk of death or serious long-term disability to a large number of people; and creates a substantial risk of public exposure, due to the disease's high level of contagion or the method by which the disease is transmitted."



## Pain Management

### GOALS

- Assess and treat acute pain
- Use pain scale assessment 0-10, Wong-Baker faces for pediatrics, FLACC for infants

### Clinical Management Options

E	A	I	P	A	<ul style="list-style-type: none"><li>• Bleeding control</li><li>• Oxygen</li><li>• SMR Evaluation, Bandaging, Splinting as needed</li><li>• Bilateral BP measurements</li><li>• <b>Acetaminophen:</b> 500 - 1000mg PO once; <b>Pediatrics – 15mg/kg PO.</b> If patient is &gt; 45kg, administer adult dose</li><li>• Consider IV/IO access as indicated</li><li>• Isotonic Crystalloid as needed</li><li>• Monitoring and interpretation of ECG &amp; EtCO<sub>2</sub></li><li>• Administer pain medication as needed:<ul style="list-style-type: none"><li>◦ <b>Ketorolac (Toradol):</b> 30mg IV if under 65 years old and/or over 50kg 15mg IV if over 65 years old and/or under 50kg</li><li>◦ <b>Morphine:</b> 4mg slow IVP every 5-10 min PRN (max 10mg)</li></ul></li><li>• Administer <b>Morphine Sulfate:</b> 4mg slow IVP up to 10mg PRN. Max dose is 10mg; <b>Pediatrics – 0.1mg/kg slow IVP.</b> Max dose is 10mg.</li><li>• Consider <b>Diphenhydramine</b> 25-50mg IV/IM/PO <b>only if</b> the patient experiences allergic reaction</li><li>• Monitor vital signs closely post med administration.</li><li>• <b>Fentanyl</b> if MAP &gt;65 and no respiratory failure *See Med Index note regarding Fentanyl administration.</li><li>• <b>Ketamine</b> only if MAP &lt; 65 and/or respiratory failure</li></ul>
T	M	T	P	A	

### Consult Online Medical Control as Needed

#### Key Performance Indicators:

1. EtCO<sub>2</sub> and/or Pulse Oximeter assessment pre and post medication administration.
2. Post medication administration pain scale reassessment.
3. Pain Severity is a vital sign to be recorded pre and post medication and intervention administration.
4. Vital signs obtained pre and 5-minute post all medication administration.



## Pain Management

### **Special Considerations:**

- Kidney stone
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Monitor patient closely for over sedation, refer to Overdose COG if needed.
- Use pain medication with caution in patients with a head injury.
- Do not administer Acetaminophen to patients with history of liver disease or known to have consumed large amounts of ETOH.
- Do not administer Ketorolac to any of the following patients: Renal disease and/or renal failure, any stage of pregnancy, active labor or actively breast feeding, multi-systems trauma, patients who are currently taking anti-coagulants (for the exception of ASA), allergy to ASA or NSAIDs, Age <15 years old, GI bleeding or known active bleed.
- **Post morphine administration of Benadryl is a consideration, not required to be administered concurrently.**
- Controlled substances are discouraged for non-traumatic back pain.



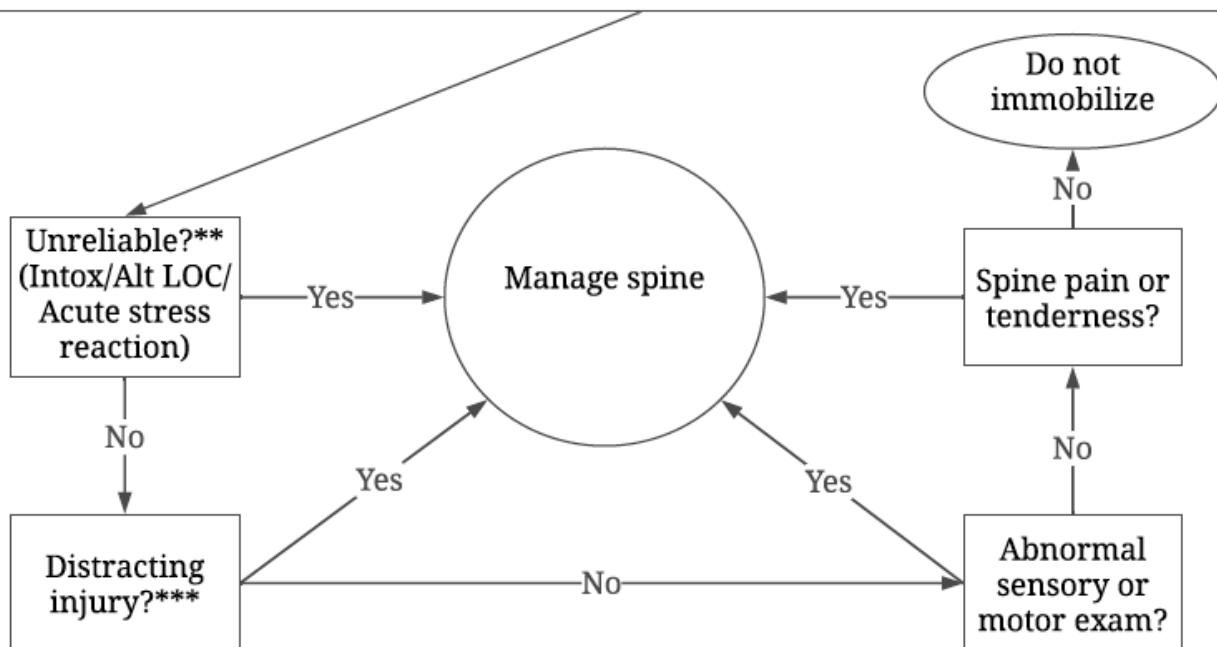
## Spinal Motion Restriction

### Clinical Indications:

1. All levels of care may initiate the potential need for Spinal Motion Restriction (SMR) as determined by patient presentation and assessment.

### Spinal Motion Restriction - Assessment

Suspected spinal injury - Based on complaint and mechanism of injury (\* For High Risk Mechanisms of Injury in Pediatrics, see below)



\*High risk mechanisms of injury in the pediatric population include, but are not limited to, the following: motor vehicle collisions, recreational vehicles (all-terrain vehicles and snowmobiles), axial loading, substantial torso injuries, and falls greater than 10 feet.

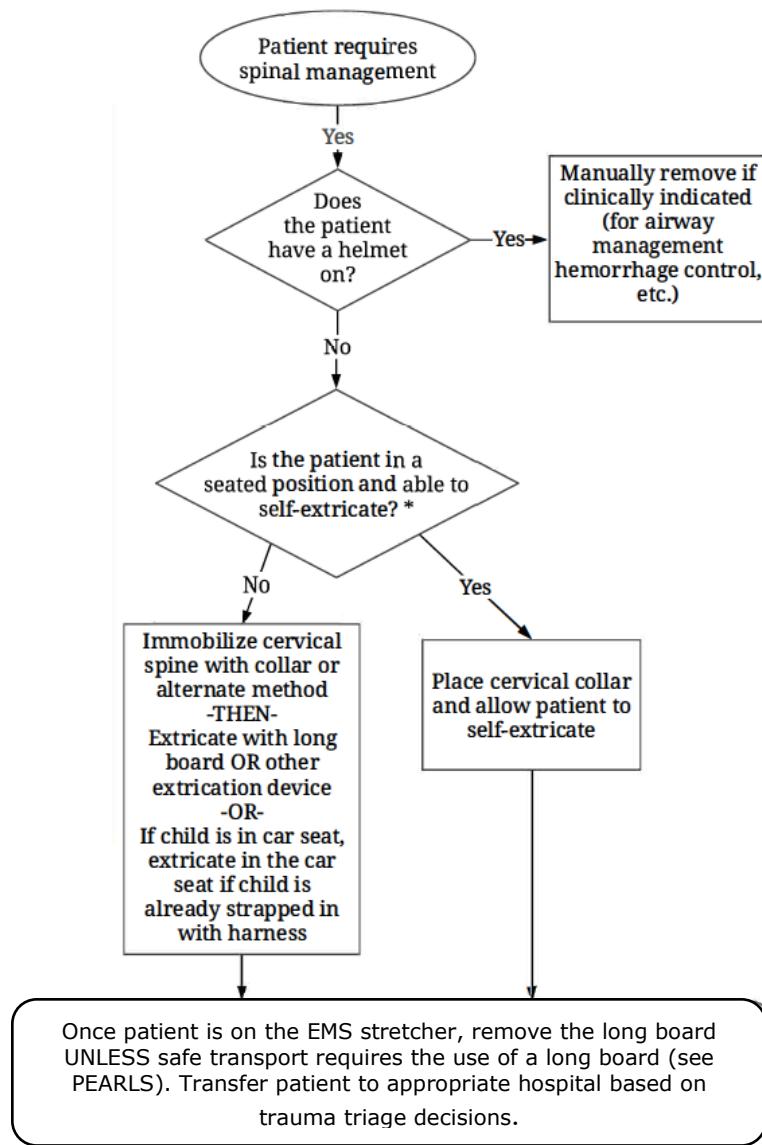
\*\*Clearance of the spine requires the patient to be calm, cooperative, sober, and alert. Note that the smell of alcohol on the breath is not necessarily the same thing as intoxication; a single beer can be detected on the breath, but does not necessarily cause significant intoxication. The real question is not about the presence or absence of any alcohol, etc.; it is whether or not the patient and the exam are reliable.

\*\*\*Distracting injury includes any injury that produces clinically apparent pain that might distract the patient from the pain of a spine injury. The real question is not about the presence or absence of any other injuries, it is whether or not the patient and the exam are reliable.



## Spinal Motion Restriction

### Spinal Motion Restriction – Management



\* Patients are able to self-extricate from a motor vehicle or seated position to an EMS stretcher when all of the following conditions are met:

1. Able to reliably follow commands including instructions to maintain neutral spine position.
2. Without injury that would preclude patient from ambulating.
3. The patient ambulates as little as possible. Ultimately the EMS stretcher should be in close proximity to the patient.



## Spinal Motion Restriction

Only patients in a seated position (i.e. a vehicle) are candidates for self-extrication. Proper methods of self-extrication limit patient movement as much as possible. For instance, patient movement should be limited to standing and pivoting to the stretcher. Please use caution when considering self-extrication and recognize that some vehicles are difficult to self-extricate from. Use judgment when considering self-extrication, recalling the goal of minimizing spine movement. If, in your judgment, self-extrication would lead to more spine motion than an alternate method of extrication, proceed with the alternate method.

### Key Performance Indicators:

1. Provider must use appropriately sized cervical collar and document such use.
2. Provider must obtain GCS prior to and after immobilization.
3. If the patient is age  $\geq 65$ , the provider cannot perform spinal clearance.

### Special Considerations/Precautions:

1. The purpose of this guideline is to assist in determining if SMR is to be used for the patient during transport. Remember that patients can fracture the spine at any level, not just the C-spine. If a fracture at another level of the spine is suspected, the entire spine must be immobilized, including the cervical spine. Patients with thoracic or lumbar fractures will commonly have associated cervical spine injuries.
2. Role of Backboards - Clinicians should recognize that there remain circumstances in which use of a backboard is appropriate. Backboards should be utilized to extricate patients from vehicles or other situations when they are unable to extricate themselves (critical patients, patients with lower extremity injuries, severe head injuries, etc.). In most instances, once on the EMS stretcher, the backboard is redundant and can be removed. However, in some settings, it may be appropriate for the backboard to remain. Those settings include, but are not limited to the following:
  - a. Cases in which the backboard is being utilized as an element of the splinting strategy (such as multiple long bone fractures) BATS Criteria
  - b. Cases in which the patient is at risk for vomiting but unable to protect their own airway (such as intoxication, head injury, etc.) and may need to be turned to the side for airway protection during transport.
  - c. Cases in which the patient is unresponsive or agitated (i.e. head injury)
  - d. Cases in which removal of the backboard would otherwise delay transport to definitive care in a critical patient.
3. Preferred Position - The preferred position for all patients with spine management is flat and supine. Under these circumstances, consider raising the head of the bed to no more than 30 degrees:
  - a. Patients in respiratory distress. Populations at risk for developing respiratory distress when lying flat include the elderly with underlying lung disease, patients with morbid obesity and late-term pregnant patients
  - b. Patient with suspected severe head trauma
4. Inter-Facility Transport - Long backboards do not have a role in the transport of patients between hospitals EVEN IF SPINE INJURY IS DIAGNOSED. Use of long boards during inter-facility transport is associated with increased pain and potential for pressure sores and ulcers. Patients should instead be managed with a cervical collar (if appropriate) and firmly secured to the EMS stretcher. If a sending facility has placed the patient on a long board or requests



## Spinal Motion Restriction

use of a long board, EMS clinicians should discuss the option of foregoing backboard use with the sending physician. If a back board is used, it must be padded adequately to maximize patient comfort.

5. **Penetrating Injury** - The incidence of incomplete, unstable spine injury in penetrating trauma is low. Spine immobilization on a backboard is associated with an increased risk of death in patients with penetrating injuries to the neck, especially gunshot wounds, due to unrecognized hemorrhage and airway compromise. Spine immobilization does not appear to prevent progression of neurologic injury in cases of penetrating cervical trauma and may negatively affect patients with vascular and airway injuries. Penetrating trauma such as a gunshot wound or stab wound should not be immobilized on a long board and should instead be secured firmly to the EMS stretcher. Emphasis should be on airway and breathing management, treatment of shock, and rapid transport to a Level 1 or 2 Trauma Center.
6. **Special Patient Populations:**
  - a. Caution should be exercised in older patients (i.e. 65 years and older) and in very young patients (i.e. less than 3 years of age), as spinal assessment may be less sensitive in discerning spinal fractures in these populations. However, age alone should not be a factor in decision-making for prehospital spinal care, rather the patient's ability to reliably provide a history should be considered.
  - b. In children using a booster seat or lap/shoulder belt during a motor vehicle collision, consider allowing the patient to self-extricate him/herself after applying a cervical collar, if needed. For the infant or toddler who is already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat.
  - c. Children who do not require spinal immobilization or lying flat may be safely transported when restrained in an age-appropriate car seat. Children who do require spinal immobilization or lying flat should be directly secured to the stretcher, or consideration of a pedi-board.
7. **Helmet Use** - Padding should be applied, if necessary, to maintain neutral cervical spine positioning depending on the type of sports helmet and presence or absence of shoulder pads.
  - a. **Management** - In patients who have suffered a potential spinal injury and need to be moved onto or off of a backboard, consider using the lift and slide technique rather than the log roll technique, when feasible.



## Universal Patient Care

### GOALS

- Use closed loop communication and crew resource management
- Ensure scene and crew safety

### Clinical Management Options

E	A	I	P	A
M	E			P
T	M			P
T				

- Ensure appropriate safety measures including high visibility gear, indicated personal protective equipment, defensive vehicle placement, etc.
- Perform an initial assessment and physical exam.
- Obtain vital signs: BP, HR, RR, SpO<sub>2</sub>, and possibly EtCO<sub>2</sub> or body temperature.
- Obtain blood glucose level as appropriate.
- Orthostatic vital signs if appropriate for patient condition.
- Supplemental oxygen if SpO<sub>2</sub> < 94% or as indicated to maintain SpO<sub>2</sub> 92-96%.
- Perform medication cross check for all medication administrations.
- Place and monitor EtCO<sub>2</sub> as indicated.
- Obtain 12-lead ECG and transmit as indicated.
- Consider IV/IO access as indicated.
- Monitor and interpretation of 12-lead ECG.
- Continued EtCO<sub>2</sub> monitoring as indicated.
- Use ultrasound for specific conditions as indicated, available, and trained.

### Consult Online Medical Control as Needed

### Special Considerations:

- Minimum exam for all patients includes vital signs, mental status including GCS, location of injury or complaint, and pain scale.
- EMTs may transport patients with IV fluids **not requiring titration or adjustment, and without additives including electrolytes (e.g. potassium, magnesium)**.
- EMTs may provide BLS care and transport for patients with a saline lock or other non-flowing vascular access that was previously placed by a sending facility or existed prior (e.g. saline lock placed at a doctor's office or pre-existing PICC line for a patient receiving home antibiotics, etc). EMTs **may not** provide BLS transport for a patient with IV fluids or medications infusing unless the IV fluids are isotonic fluids without additives and set on a device to prevent titration/adjustment (e.g. Dial-A-Flo device), typically limited to interfacility transports. EMTs **may not** assume care of an EMS patient with an IV started by an ALS provider earlier in the same response. If a special circumstance were to arise, please contact OLMC for further direction.



## Universal Patient Care

- In general, the prehospital IV fluid of choice is Lactated Ringer's Solution. There are some patient populations for which Normal Saline (NaCl 0.9%) is preferred, such as dialysis patients, those with suspected hyperkalemia, patients with a crush injury, and patients with a new brain injury.
- Maintain all appropriate medications and procedures that have been initiated at the referral agency or institution.
- Recognize that routine use of lights/sirens is not warranted and can increase risks to patients, providers, and bystanders. Even when lights and sirens are indicated, always limit speeds to levels that are safe for the vehicle and roadway.
- Be aware of legal issues and patient rights as they pertain to and impact patient care (e.g. patients with functional needs or children with special healthcare needs).
- Consider air medical transport options, if available, for patients with time critical conditions where ground transport time exceeds 45 minutes or as required by circumstances.



# Universal Patient Care

## Transmission-Based Precautions:

THE MAIN TYPES OF TRANSMISSION-BASED PRECAUTIONS RESULT FROM DIRECT OR INDIRECT PATIENT CONTACT, BLOODBORNE PRODUCTS, DROPLET, AND AIRBORNE. EACH KIND OF TRANSMISSION-BASED PRECAUTION IS DEPENDENT ON THE TYPE OF INFECTION OR PATHOGEN THE PATIENT OR SOURCE HAS, AS OUTLINED AS FOLLOWS:

### **Airborne precautions:**

Airborne precautions are required whenever entering a patient's environment who has been diagnosed with or is being tested for with high suspicion of anthrax, tuberculosis, measles, chickenpox, or disseminated herpes zoster or other pathogens that can be transmitted through airflow that are 5 micrometers or smaller in size and remain in the environment for long periods of time.

In addition to standard precautions of wearing gloves and a gown, additional PPE of an approved N95 respirator mask properly fitted for each person working in the health-care environment.

### **Bloodborne precautions:**

Blood-borne transmission of pathogens is largely due to percutaneous injuries, which can be prevented using changes in technique, experience, and safety devices.

According to the OSHA database, HIV, hepatitis B and C, tuberculosis, malaria, measles, herpes, chickenpox, and various other bacterial infections are known for being transmitted through blood-containing fluids and products.

Blood-borne precautions include wearing gloves, face-mask, protective eye-wear or goggles, and proper handling of sharp objects with appropriate disposal.

Sharps disposal should be in an approved puncture-proof "sharp-only" locked and secured bin, not broken or bent.

## Transmission Based Precautions

### **Contact precautions:**

Defined as direct or indirect contact with a patient and/or his or her environment including person's room or objects in contact with the person, that has infection with an organism transmitted fecally, such as *Clostridium difficile*, or wound and skin infections, or multi-drug resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA).

### **Droplet precautions:**

Droplet precautions are necessary when a patient infected with a pathogen, such as influenza, is within three to six feet of the patient.

Infections are transmittable through air droplets by coughing, sneezing, talking, and close contact with an infected patient's breathing. Droplets are about 30 to 50 micrometers in size.

In addition to standard precautions, personnel should wear protective surgical masks should always before interacting between an infected patient or his/her environment.



## Universal Patient Care

**Table 2.4.** Recommendations for application of standard precautions for the care of all patients in all healthcare settings<sup>7</sup>

Component	Recommendations
<b>Hand hygiene</b>	After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between patient contacts
<b>Personal protective equipment (PPE)</b>	
<b>Gloves</b>	For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and nonintact skin
<b>Gown</b>	During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated
<b>Mask, eye protection (goggles), face shield*</b>	During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions, especially suctioning, endotracheal intubation
<b>Soiled patient-care equipment</b>	Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene
<b>Environmental control</b>	Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces in patient-care areas
<b>Textiles and laundry</b>	Handle in a manner that prevents transfer of microorganisms to others and to the environment
<b>Needles and other sharps</b>	Do not recap, bend, break, or hand-manipulate used needles; if recapping is required, use a one-handed scoop technique only; use safety features when available; place used sharps in puncture-resistant container
<b>Patient resuscitation</b>	Use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions
<b>Patient placement</b>	Prioritize for single-patient room if patient is at increased risk of transmission, is likely to contaminate the environment, does not maintain appropriate hygiene, or is at increased risk of acquiring infection or developing adverse outcome following infection

### References:

Reviewed:

Updated: 09.19.2023

Clinical Guidelines

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Universal Patient Care



## Universal Patient Care

1. [Definitions and Assessment Approaches for Emergency Medical Services for Children](#)
2. Rock, Mark, and NRP. "Twenty-First Century Patient Assessment." JEMS, March 8, 2019. <https://www.jems.com/training/twenty-first-century-patient-assessment/>.
3. Bledsoe BE, Porter RS, Cherry RA. *Paramedic Care: Principles & Practice, Volume 3, 4th Ed.* Brady, 2012.
4. [Guide to Infection Prevention in Emergency Medical Services](#)
5. [Precautions, Bloodborne, Contact, and Droplet - StatPearls](#)



## Airway Management & Ventilation

Assessment				
Pediatric Pearls:		Difficult Airway Predictors:		Indications:
<ul style="list-style-type: none"><li>• &lt; 37 kg</li><li>• Avoid intubation of the pediatric patient if possible. OPA/NPA is preferred with BVM support</li><li>• Children compensate well initially but decompensate quickly and with little warning.</li><li>• Most pediatric cardiac arrests are due to respiratory compromise.</li></ul>		<ul style="list-style-type: none"><li>• Percentage of Glottic Opening</li><li>• Neck mobility</li><li>• Beard (may prevent mask seal)</li><li>• Facial trauma/instability</li><li>• Foreign material in airway</li><li>• Swelling/edema</li><li>• Respiratory effort</li><li>• Thyromental distance</li></ul>		<ul style="list-style-type: none"><li>• Hypoxia</li><li>• Hypercapnia</li><li>• Decreased mental status</li><li>• Respiratory distress</li><li>• Respiratory failure</li><li>• Trauma</li></ul>
Clinical Management Options				
E	A	I	P	<ul style="list-style-type: none"><li>• BLS foreign body evaluation/removal</li><li>• Nasopharyngeal/oropharyngeal airway and BVM ventilation</li><li>• Oxygen, PRN titrated to SpO2 92%-96% including passive apneic oxygenation</li><li>• EtCO2 (mandatory for supraglottic airway or endotracheal intubation)</li><li>• Supraglottic airway (SGA)</li><li>• 12 lead placement/acquisition and transmission for evaluation</li></ul>
M	E		P	<ul style="list-style-type: none"><li>• IV/IO as appropriate to patient condition</li><li>• Initial IV fluid bolus 10-15cc/kg 0.9%NS</li></ul>
T	M		T	<ul style="list-style-type: none"><li>• Direct Laryngoscopy foreign body airway evaluation/removal</li><li>• Gastric Tube as needed</li><li>• 12 lead placement/acquisition/evaluation</li><li>• Adult video or direct laryngoscopy intubation</li><li>• Sedatives including Midazolam</li><li>• Pediatric video or direct laryngoscopy intubation</li></ul>
				<ul style="list-style-type: none"><li>• Paralytics including Succinylcholine and Rocuronium</li><li>• Sedatives including Fentanyl and Etomidate</li><li>• Dissociatives including Ketamine</li><li>• Push dose IV vasopressors for peri-intubation hypotension</li><li>• In the setting of an unstable patient, SGA placement using Rapid Sequence medications may be most appropriate.</li><li>• Surgical cricothyrotomy (Patients &gt;12 years of age)</li></ul>

### Consult Online Medical Control As Needed

#### Key Performance Indicators:

- 1) Preoxygenation prior to intubation.
- 2) Continuous pulse oximetry and end tidal CO2 monitoring for all patients.

#### Clinical Guidelines



## Airway Management & Ventilation

### **Special Considerations:**

- Refer to Drug Formulary Charts/Handtevy for ALL Medication Dosing for Adult and Pediatric patients.
- Ask yourself if the patient needs an airway intervention right now, and if you are the right person to do it. Expect failure so you can prepare for it.
- Create a PACE plan (Primary, Alternate, Contingency, Emergency) and brief other members of the EMS crew before performing airway interventions. Have the tools available for your backup plans before the first intubation attempt.
- Either a bougie device or size-appropriate stylet should be used to provide tube rigidity and facilitate placement. When you using video laryngoscopy, the device-specific stylet may be necessary. A bougie may also be indicated for airway which are difficult to visualize.
- Patients showing fatigue, increasing ETCO<sub>2</sub>, slowing respirations, altered mental status, increased ventricular ectopy and/or hypoxia may have impending respiratory failure. Manage aggressively and preemptively.
- Adult BVM bag volume is 1700mL; Pediatric BVM bag volume is 470mL. Normal adult tidal volume is around 500 mL; do not over ventilate. Ventilator settings should generally reflect ARDS.net protocols.
- Passive oxygen: Nasal Cannula should be used with BVM, CPAP, or during SGA and intubation attempts. Once SGA or intubation is confirmed, nasal cannula oxygenation can be discontinued.
- If a pediatric airway can be effectively maintained by BLS maneuvers, avoid intubation.
- Positive pressure ventilation may worsen hypotension in the hemodynamically unstable patient. Avoid in trauma patients and consider push dose vasopressors in any peri-intubation patient who is hypotensive.
- Positive pressure ventilation may induce tension pneumothorax in the patient with simple pneumothorax. Difficulty ventilating or high airway pressures should lead you to suspect this.
- Elevating the head of the stretcher 15-30 degrees may improve intubation success and limit desaturation, particularly in obese patients.
- Patients with concern for cervical injury requiring an advanced airway should be intubated using video laryngoscopy or receive SGA placement. If direct laryngoscopy is the available option, remove cervical collar prior to attempting intubation, as the collar limits jaw movement. Make best attempts to maintain manual inline stabilization, but be aware this may decrease the likelihood of intubation success. If required for intubation success, prioritize the airway over cervical immobilization.
- No patient is to receive paralytics without receiving adequate sedation first, and this should be continued after the procedure as indicated.
- Consider matching patients' initial respiration rate if tachypnic prior to intubation, in order to support pathophysiology such as acidosis.
- End Tidal CO<sub>2</sub> monitoring should continue until after the patient has been transferred to the ED bed in order to monitor tube placement during patient transfer.

### **Related Procedures and Guidelines:**

RSI	SGA Placement
Bi-Level Ventilation	Endotracheal Intubation
CPAP	Pulse Oximetry
Oro/Nasogastric Tube Placement	Tracheostomy Care
Surgical Cricothyrotomy	Mechanical Ventilation
Needle Cricothyrotomy	End Tidal CO <sub>2</sub>



## Airway Management & Ventilation

### BLS Considerations

Look

- On first impression, does the patient look well?
- Note signs such as labored breathing, poor chest rise and fall, or an increased effort. Check for nasal flaring, accessory muscle use, pursedlips or changes in skin color or tone.

Listen

- Listen for air movement from the mouth and nose

Feel

- Feel for air movement from the mouth and nose
- Feel for symmetry of chest expansion

#### O2 Consideration

• The amount of oxygen administered should be based on clinical evaluation of the patient. Provide oxygen to maintain saturation levels of 92% - 96%, not higher.

#### Pulse Oximetry

- Regardless of the SaO<sub>2</sub> level, EMS providers should never withhold oxygen from a patient complaining difficulty breathing or chest pain.
- A pulse oximeter measures saturation of hemoglobin; oxygen may not always be the saturating

#### Delivery

##### Nasal Cannula

• 1 lpm = 24%	4 lpm = 36%
• 2 lpm = 28%	5 lpm = 40%
• 3 lpm = 32%	6 lpm = 44%

##### Non-rebreather

15 lpm = 100%



## Airway Management & Ventilation

Normal respiratory rates:

- Neonates: 30-40 bpm
- Toddlers: 25-30 bpm
- School Age: 15-25 bpm
- Adolescents: 12-15 bpm
- Adults: 12-20 bpm

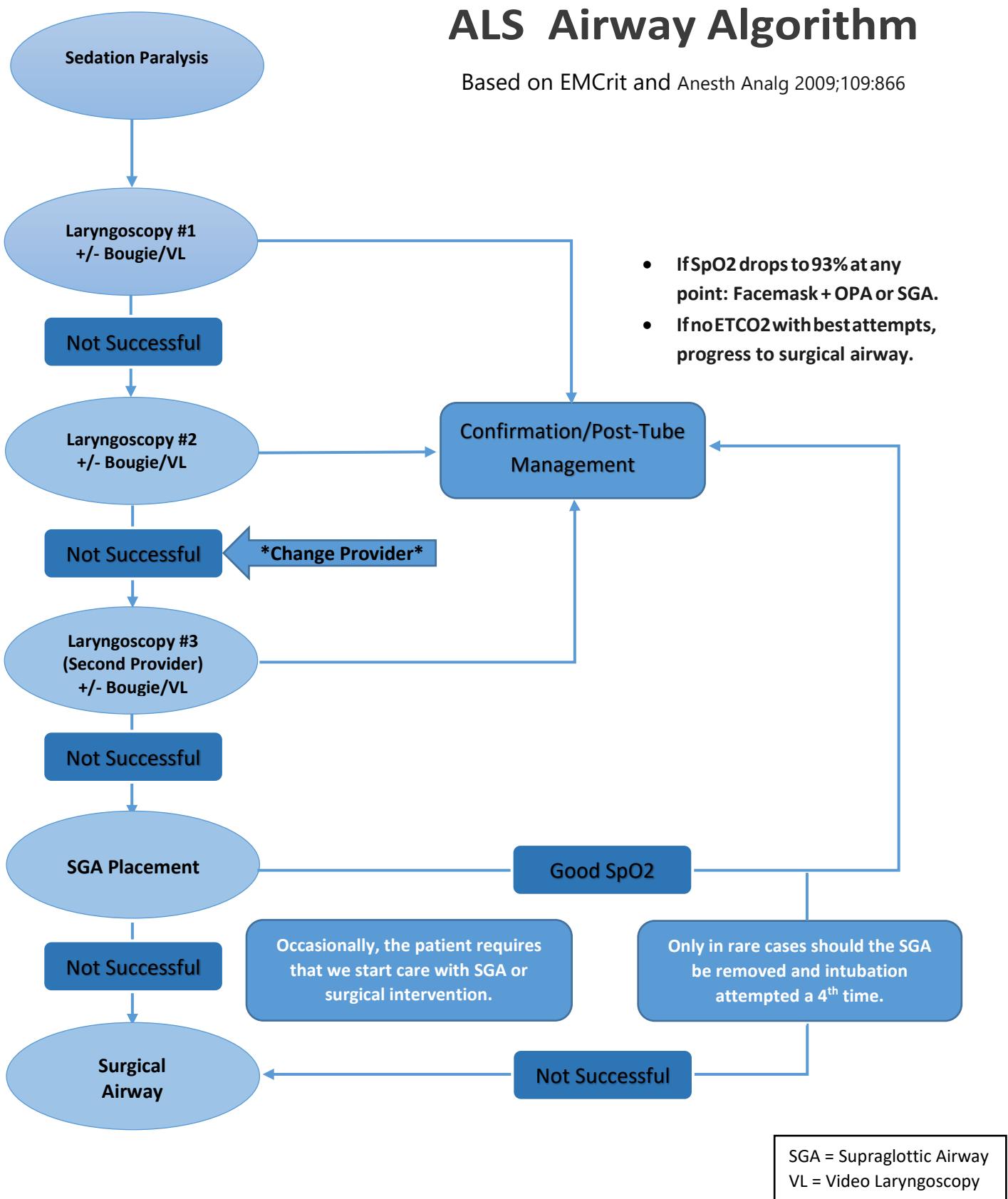
If the patient becomes significantly hypoxic, or loses adequate drive or effort, be prepared to initiate BVM ventilations accordingly.



# Airway Management & Ventilation

# ALS Airway Algorithm

Based on EMCrit and Anesth Analg 2009;109:866



SGA = Supraglottic Airway  
VL = Video Laryngoscopy



# Airway Management & Ventilation

## RSI Checklist

**RESUSCITATE then INTUBATE**  
**R - Risks (Hop)**  
**H - Hypotension**  
**O - Hypoxia**  
**pH – hypoventilation (ph metabolic acidosis)**

CRM  
ATTN GETTER  
CONCERN  
PROBLEM  
SOLUTION  
CLOSE LOOP

READY	SET	GO
<p>(Crew Brief – PACE Plan)</p> <p><b>Position:</b></p> <p>C-Spine PRN</p> <p>Ear2Notch, Face PRN</p> <p>Ramp Head of Bed up, 30 ° PRN</p> <p>360 ° Access</p> <p>Monitor Vitals (NIBP, SpO2, EtCO2)</p> <p>NC on patient</p> <p><b>Equipment:</b></p> <p><b>Suction</b> – Checked, verified working</p> <p>O2 Cylinder x 2 &gt; half full</p> <p><b>DL Handle/Blade</b> Chosen, tested</p> <p><b>VL Blade</b> chosen, tested</p> <p><b>ETT</b> size chosen, cuff/tested/lube +/- 1 size ETT ready</p> <p><b>EtCO2</b> reading confirmed</p> <p><b>Tube tamer</b> strap behind neck</p> <p><b>Bougie</b> at bedside</p> <p><b>Cric Kit</b> ready</p> <p><b>NIBP</b> cycle q 60 secs</p>	<p><b>Meds:</b></p> <p>Vascular access x 2, flow verified</p> <p>INDUCTION Agent drawn up, dose confirmed</p> <p>PARALYTIC Agent drawn up, dose confirmed</p> <p>PUSH DOSE PRESSOR drawn up, dose confirmed</p> <p><b>Administer INDUCTION Agent</b></p> <p><b>PreOx/DeN2ate/apOx</b></p> <p>NC 6LPM</p> <p>BVM/HME/Inline EtCO2/PEEP Valve</p> <p>Select PEEP pressure</p> <p>2 Person, 2 Hand technique</p> <p>Jaw Thrust/OPA/NPA PRN</p> <p><b>SpO2 ≥ 93%</b></p> <p><b>Crew Briefed – PACE Plan – Postintubation Plan</b></p> <p>If possible, confirm ability to BVM prior to paralysis</p> <p><b>Administer PARALYTIC Agent</b></p> <p><b>Begin 90 sec Countdown/await defasiculations</b></p>	<p>Place Advanced Airway</p> <p>Verify EtCO2 Waveform</p> <p>Verify Depth, +BBS</p> <p>Verify cuff pressure</p> <p>Gastric Tube?</p> <p>Secure Tube</p> <p><b>Optimize Hemodynamics</b></p> <p><b>Post Intubation -</b></p> <p>Sedation/Analgesia</p> <p>BVM mast on O2 tubing</p> <p><b>Titrate FiO2</b></p> <p>Ensure receiving facility aware of patient status.</p>



## Airway Management & Ventilation

### **References:**

1. EMCrit 233 - EMCrit Failed Airway Algorithm 2018 from ResusTo Sept 19, 2018 Scott Weingart
2. Michael Bernhard et al., "The First Shot Is Often the Best Shot," *Anesthesia & Analgesia* 121, no.5 (November 2015): 1389–93, <https://doi.org/10.1213/ane.0000000000000891>.
3. Jarvis, MD, Jeffrey. "The Perils of Peri-Intubation Hypoxia." *Hmpgloballearningnetwork.com*, 2021. <https://www.hmpgloballearningnetwork.com/site/emsworld/article/1221763/perils-peri-intubation-hypoxia>.



# Airway Obstruction

Assessment				
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>		
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by Handtevy or Broselow® Tape.</li><li>Avoid intubation of the pediatric patient when possible. OPA/NPA is preferred.</li><li>Children compensate well initially but decompensate quickly with little warning.</li><li>Most pediatric cardiac arrests are due to respiratory compromise.</li></ul>		<ul style="list-style-type: none"><li>Percentage of Glottic Opening</li><li>Neck mobility</li><li>Beard, may prevent mask seal</li><li>Facial trauma/instability</li><li>Foreign material in airway</li><li>Swelling/Edema</li><li>Respiratory effort</li><li>Thyromental distance</li></ul>		
Clinical Management Options				
E	A	I	P	A
M			P	P
T				
<ul style="list-style-type: none"><li>Attempt to ventilate with BVM or face shield.</li><li>Request ALS, if not already dispatched.</li><li>Suspect neck injury in all trauma patients who are unresponsive, complain of neck pain, have neck tenderness or deformity. If neck injury is suspected, perform a chin-lift or jaw-thrust with the neck in neutral position. Maintain neck stability at all times.</li><li>If no neck injury or trauma, perform a head-tilt.</li><li><b>Conscious Adult:</b> Perform abdominal thrusts (use chest thrusts in advanced pregnancy) until obstruction is relieved or patient becomes unresponsive. If patient becomes unresponsive, begin CPR.</li><li><b>If adult patient is unconscious:</b> Open the airway. Visually inspect the airway for foreign body. Remove if accessible. Do not perform a blind finger sweep. Begin CPR.</li><li><b>Conscious Infant (less than 1 year of age):</b> Perform 5 back blows and 5 chest thrusts until obstruction is relieved or the patient becomes unresponsive.</li><li><b>Conscious Child (1-8 years of age):</b> Perform abdominal thrusts until the obstruction is relieved or the patient becomes unresponsive.</li><li><b>If pediatric patient is unconscious and &lt; 1 year of age:</b> Visually inspect the airway for foreign body and remove if visible and accessible. DO NOT perform a blind finger sweep. Attempt ventilation. If unsuccessful, reposition the airway and reattempt ventilation once. If the airway is still obstructed, begin CPR.</li><li><b>If pediatric patient is unconscious and ages 1-8:</b> Open airway. Visually inspect the airway for foreign body and remove if visible and accessible. DO NOT perform a blind finger sweep. Begin CPR.</li><li>Apply monitor/AED as indicated.</li><li>Obtain vital signs as soon as feasible.</li><li>12-lead ECG placement and acquisition as soon as feasible.</li><li>IV / IO access as appropriate for patient condition.</li><li>Direct laryngoscopy Foreign Body Airway Obstruction evaluation / removal.</li><li>Use Magill forceps if foreign body is visualized.</li><li>Gastric tube as needed.</li><li>All advance airway procedures will include passive apneic oxygenation where possible.</li><li>Continuous ETCO<sub>2</sub> is mandatory for all intubations.</li><li>Video laryngoscopy for intubation (if available).</li><li>Direct laryngoscopy intubation with Bougie.</li><li>Consider RSI as indicated.</li><li>Post intubation medications as indicated.</li><li>Surgical cricothyroidotomy if patient &gt; 12 years of age</li></ul>				

Consult Online Medical Control As Needed



## Cardiac Arrest: Asystole & PEA

### Assessment

#### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape or Handtevy.
- Focus on rapid and early BLS airway and ventilation tools. Intubation may not be the best option for these patients.
- Pediatric pads should be used in children < 10 Kg or Broselow® Tape or Handtevy tape color purple.

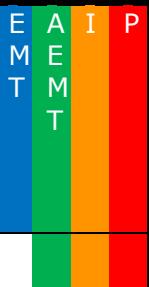
#### Signs & Symptoms:

- Unresponsive
- Abnormal breathing (gasps)
- Pulseless
- Absent heart sounds
- Obvious death

#### Differential:

- Respiratory failure
- Foreign body airway obstruction
- Hyperkalemia
- Infection (Croup, epiglottitis)
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxins or Overdose
- Hypoglycemia
- Acidosis
- Acute MI or PE

### Clinical Management Options



- Assess for unresponsiveness, absence of normal breathing, and pulselessness
- Assess for obvious death criteria
- Begin Pit Crew CPR procedure if staffing allows
- BLS Airway Management and BVM with Oxygen PRN titrated to SpO<sub>2</sub> 92%-96%
- Passive oxygenation with nasal cannula at 25 LPM
- Airway management with iGel as needed
- Monitor ETCO<sub>2</sub>
- Consider IV/IO access as indicated
- Fluid bolus with isotonic crystalloid as needed
- Epinephrine 1mg every 3-5 minutes per AHA Guidelines
- Monitor and interpret EKG
- Narrow PEA QRS  $\leq$  0.12 seconds:
  - Consider mechanical causes - Cardiac tamponade, Tension pneumo, Mechanical hyperinflation, PE, Hypovolemia, Acute MI, Pump failure
- Wide PEA QRS  $\geq$  0.12 seconds or Asystole:
  - Consider metabolic causes – Tricyclic OD, Severe hyperkalemia, Acidosis, Calcium Channel Blocker OD, Acute MI, Pump failure.
- Advance Airway Management as needed. Intubation is not required if iGel is functioning appropriately with continuous waveform capnography.
- Ultrasound to determine cardiac wall motion at pulse check; DO NOT interrupt compressions for ultrasound.
- Perform Needle Decompression for the asthmatic patient in arrest.
- **If ROSC then report a resuscitation alert to receiving facility and follow ROSC protocol .**

**Consult Online Medical Control As Needed**



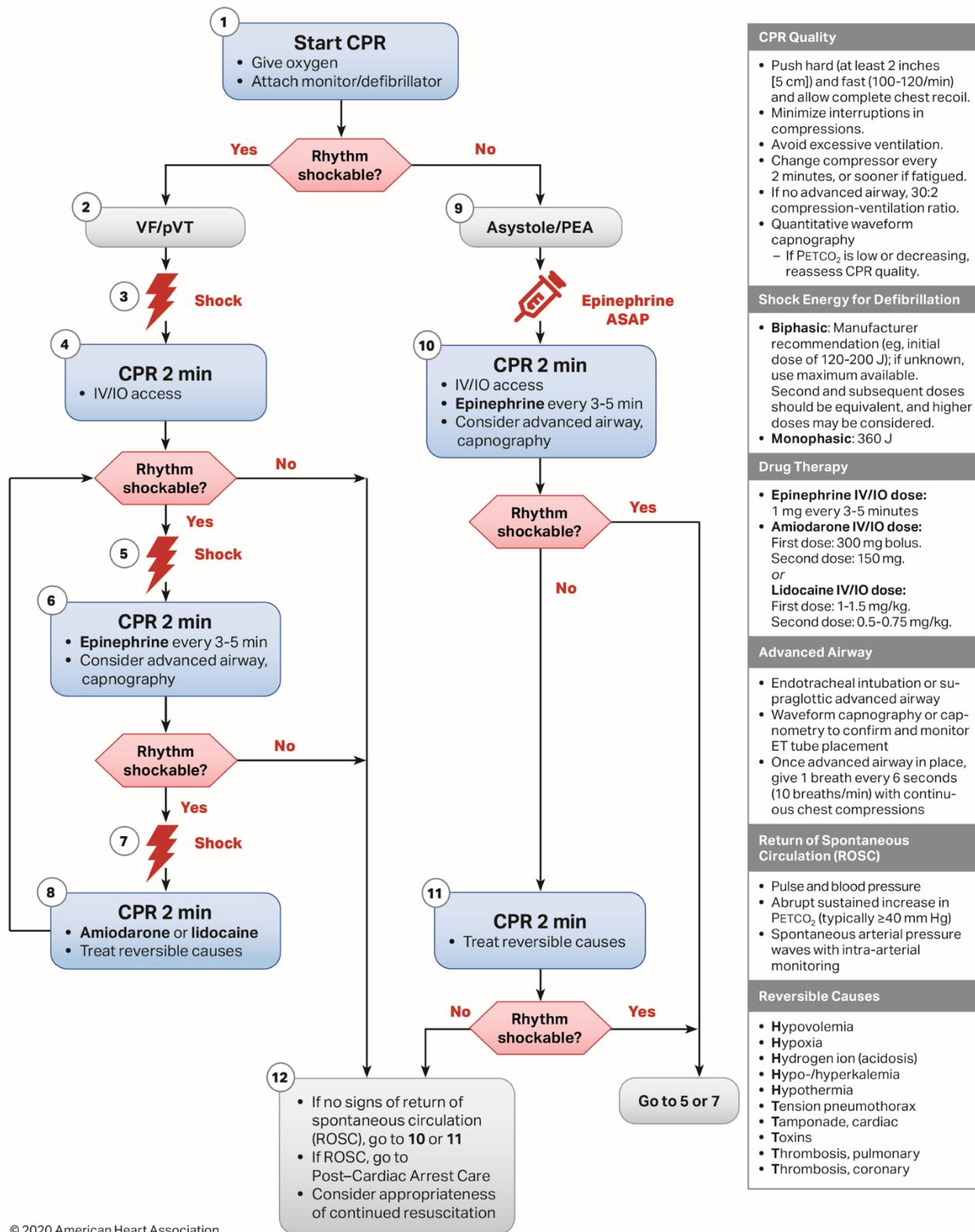
## Cardiac Arrest: Asystole & PEA

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- In order to be successful in adult or pediatric arrests, a cause must be identified early and corrected. Resuscitation should include targeted therapies to address the underlying cause of the arrest.
- Respiratory arrest is a common cause of pediatric cardiac arrest. Unlike adults early oxygen and ventilation is critical.
- In most cases pediatric airways can be managed by basic interventions.
- Effective CPR is critical: 1) Push hard and fast at appropriate rate 2) Ensure full chest recoil 3) Minimize interruptions in CPR. Pause CPR< 10 seconds only.
- Effective CPR and treatment of underlying causes are the keys to successful resuscitation.
- Prolonged cardiac arrests may lead to tired providers and decreased compression quality. Ensure compressor rotation, summon additional resources as needed, and ensure provider rest and rehab during and post-event.
- Always quickly confirm asystole in more than one lead and, trouble shoot for Equipment settings/problems
- Reassess and document ETT or other airway placement continuously after every move and at transfer of patient care.
- Continuous ETCO<sub>2</sub> should be initiated as soon as practicable.
- Continue to use primary monitor for all event recording and data capture.
- All monitor event data and recordings are uploaded into e-PCR.
- Ultrasound to determine cardiac wall motion at pulse check; DO NOT interrupt compressions for ultrasound.



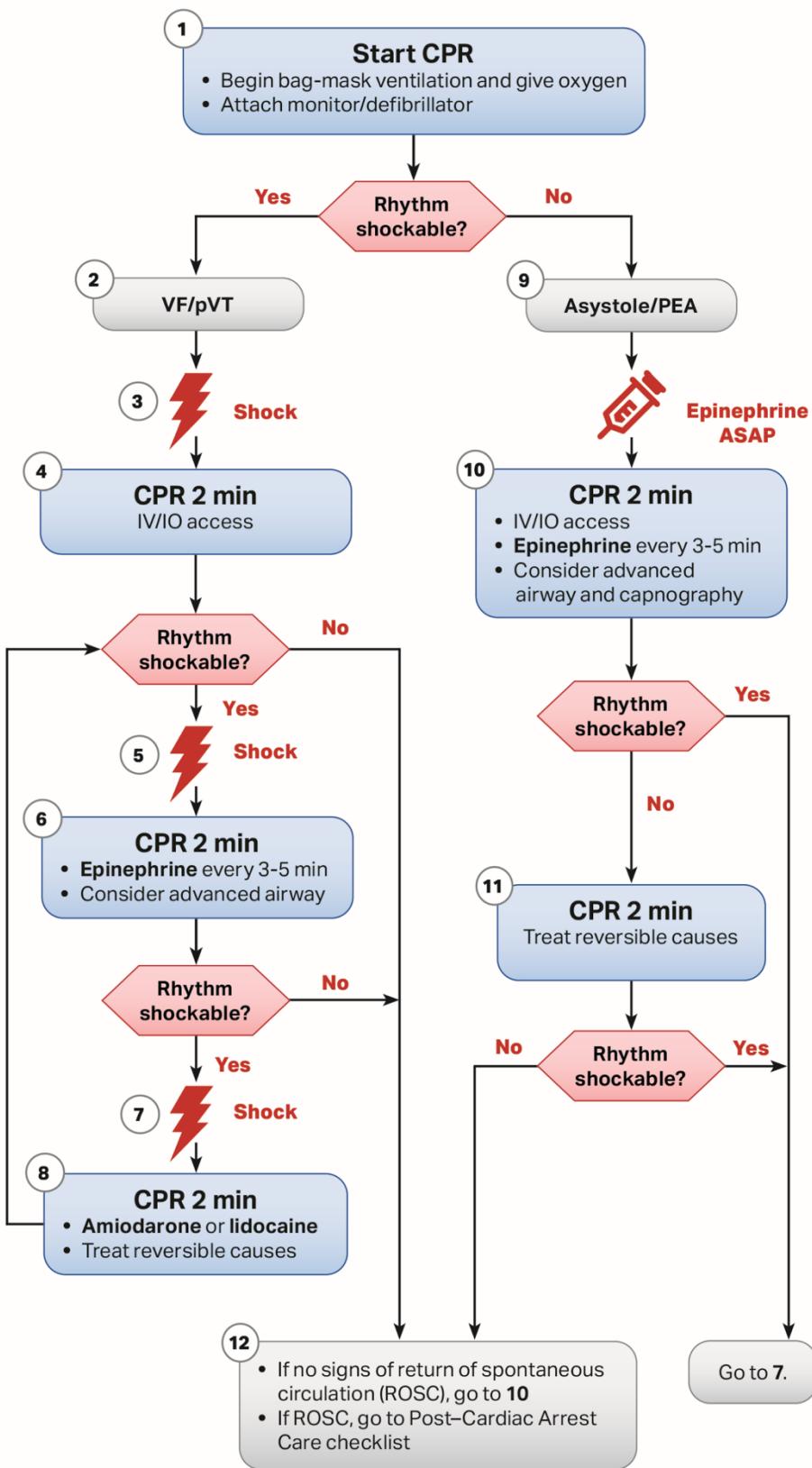
## Cardiac Arrest: Asystole & PEA



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## Cardiac Arrest: Asystole & PEA



### CPR Quality

- Push hard ( $\geq 1/3$  of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

### Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks  $\geq 4$  J/kg, maximum 10 J/kg or adult dose

### Drug Therapy

- Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- Amiodarone IV/IO dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT or
- Lidocaine IV/IO dose:** Initial: 1 mg/kg loading dose

### Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

### Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary



## Cardiac Arrest: Asystole & PEA

### References:

- 1) Adult & Pediatric Cardiac Arrest Algorithm - [https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/highlights\\_2020\\_ecc\\_guidelines\\_english.pdf](https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/highlights_2020_ecc_guidelines_english.pdf)



## Cardiac Arrest: pVTach & VFib

### Assessment

#### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape or Handtevy.
- Focus on rapid and early BLS airway and ventilation tools. Intubation may not be the best option for these patients.
- Pediatric pads should be used in children < 10 Kg or Broselow® Tape or Handtevy tape color purple.

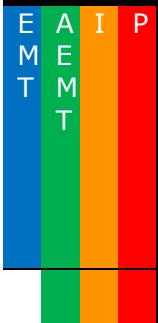
#### Signs & Symptoms:

- Unresponsive
- Abnormal breathing (gasps)
- Pulseless
- Absent heart sounds
- Obvious death

#### Differential:

- Respiratory failure
- Foreign body airway obstruction
- Hyperkalemia
- Infection (Croup, epiglottitis)
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxins or Overdose
- Hypoglycemia
- Acidosis
- Acute MI or PE

### Clinical Management Options



A	• Assess for unresponsiveness, absence of normal breathing, and pulselessness.
P	• Assess for obvious death criteria.
P	• Begin Pit Crew CPR procedure.
	• BLS Airway Management and BVM with Oxygen as available.
	• Passive oxygenation with nasal cannula at 25 LPM.
	• Airway management with iGel as needed.
	• Monitor ETCO <sub>2</sub> .
	<b>• If ROSC then issue a resuscitation alert to the receiving facility and utilize ROSC protocol.</b>
	• Consider IV/IO access as indicated.
	• Fluid bolus with isotonic crystalloid as needed.
	• Administer Epinephrine 1mg every 3-5 minutes per AHA Guidelines.
	• Monitor and interpret ECG.
	• Manual Defibrillation
	◦ Adult: Maximum Joules
	◦ Pediatric: Initial 2 joules/kg then repeat 4 joules/kg – Refer to Pediatric Dosing Chart
	• If pulseless VT/VF administer Lidocaine.
	• If Torsades de Points or polymorphic pulseless VT, then Magnesium Sulfate.
	• If treatable cause is identified, move that treatment up in priority.
	<b>• If ROSC then issue a resuscitation alert to the receiving facility and utilize ROSC protocol.</b>
	• Advance Airway Management as needed. Intubation is not required if iGel is functioning appropriately with continuous waveform capnography.
	• Double sequential defibrillation at maximum Joules for Adults Only.
	<b>• IF refractory to at least 2 shocks pads placed Anterior / Anterior (V1) AND</b>
	• Refractory to 1 additional shock pads placed Anterior / Posterior (V2) <b>AND</b> pVT / VF <b>NEVER</b> converted.
	<b>• If ROSC then issue a resuscitation alert to the receiving facility and utilize ROSC protocol.</b>
	• Amiodarone administration as indicated.
	• If pulseless VT/VF refractory to Amiodarone, then administer Lidocaine.
	• Ultrasound to determine cardiac wall motion at pulse check; DO NOT interrupt compressions for ultrasound.
	<b>• If ROSC then issue a resuscitation alert to the receiving facility and utilize ROSC protocol.</b>



## Cardiac Arrest: pVTach & VFib

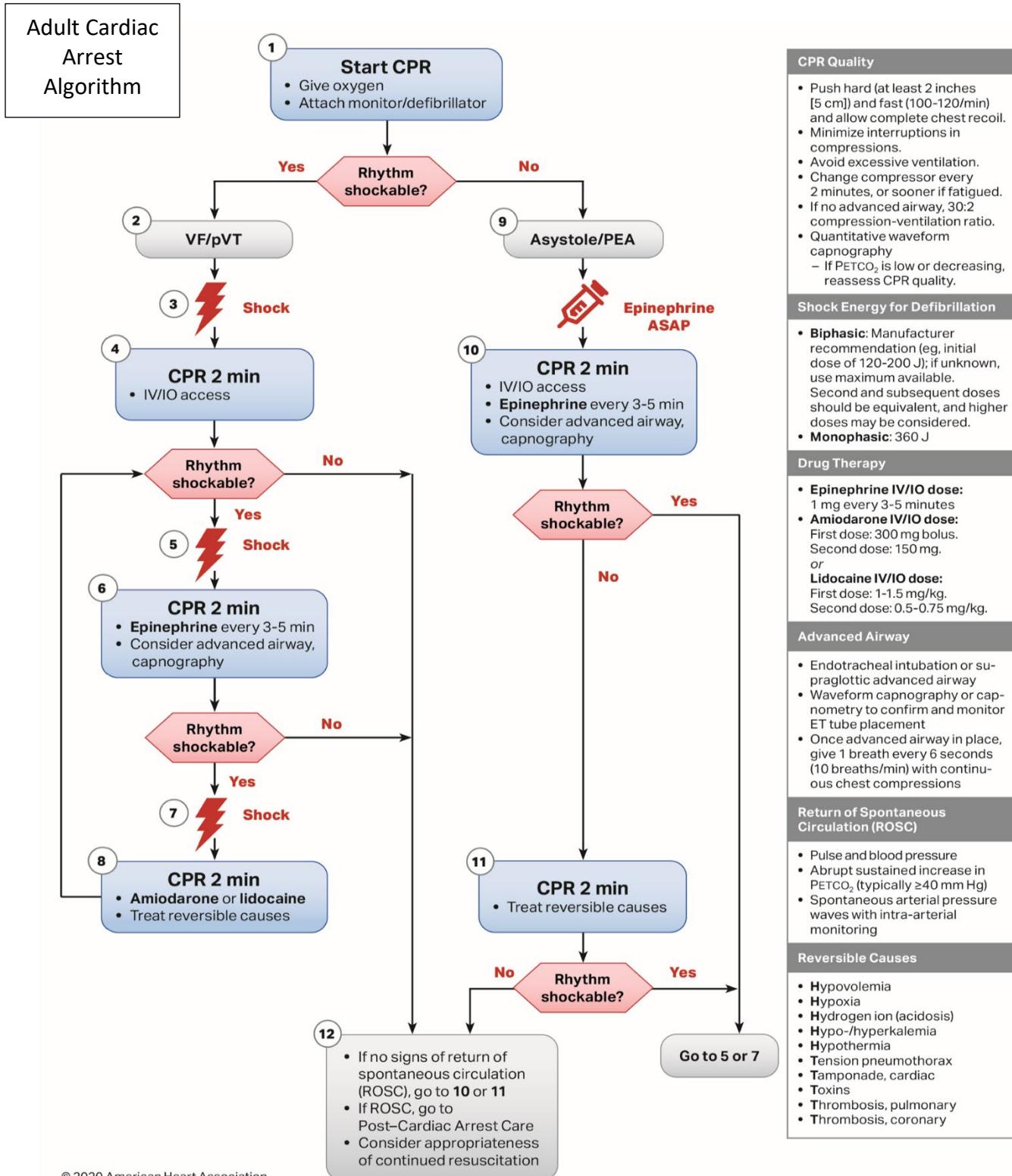
Consult Online Medical Control As Needed

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- In order to be successful in adult or pediatric arrests, a cause must be identified and corrected.
- Respiratory arrest is a common cause of pediatric cardiac arrest. Unlike adults early oxygenation and ventilation is critical.
- In most cases pediatric airways can be managed by basic interventions.
- Effective CPR is critical: 1) Push hard and fast at appropriate rate 2) Ensure full chest recoil 3) Minimize interruptions in CPR. Pause CPR< 10 seconds only.
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- Prolonged cardiac arrests may lead to tired providers and decreased compression quality. Ensure compressor rotation, summon additional resources as needed, and ensure provider rest and rehab during and post-event.
- Always quickly confirm asystole in more than one lead.
- Trouble shoot for Equipment settings/ problems
- PL1, PL2 and PL3 may only use automated defibrillation (AED).
- Reassess and document ETT or other airway device placement continuously after every move and at transfer of patient care.
- Continuous ETCO<sub>2</sub> should be initiated as soon as practicable.
- Adult treatment priorities: uninterrupted compressions, defibrillation, ventilation, then IV/IO and airway management if needed.
- Polymorphic VT (Torsades) may benefit from Magnesium Sulfate.
- Prior to any external shocks providers should verify that defibrillation pads are well-adhered to the patient and that they do not touch.
- Continue to use **primary monitor** for all event recording and data capture.
- All monitor event data and recordings are uploaded into e-PCR.
- Ultrasound to determine cardiac wall motion at pulse check; DO NOT interrupt compressions for ultrasound.



## Cardiac Arrest: pVTach & VFib

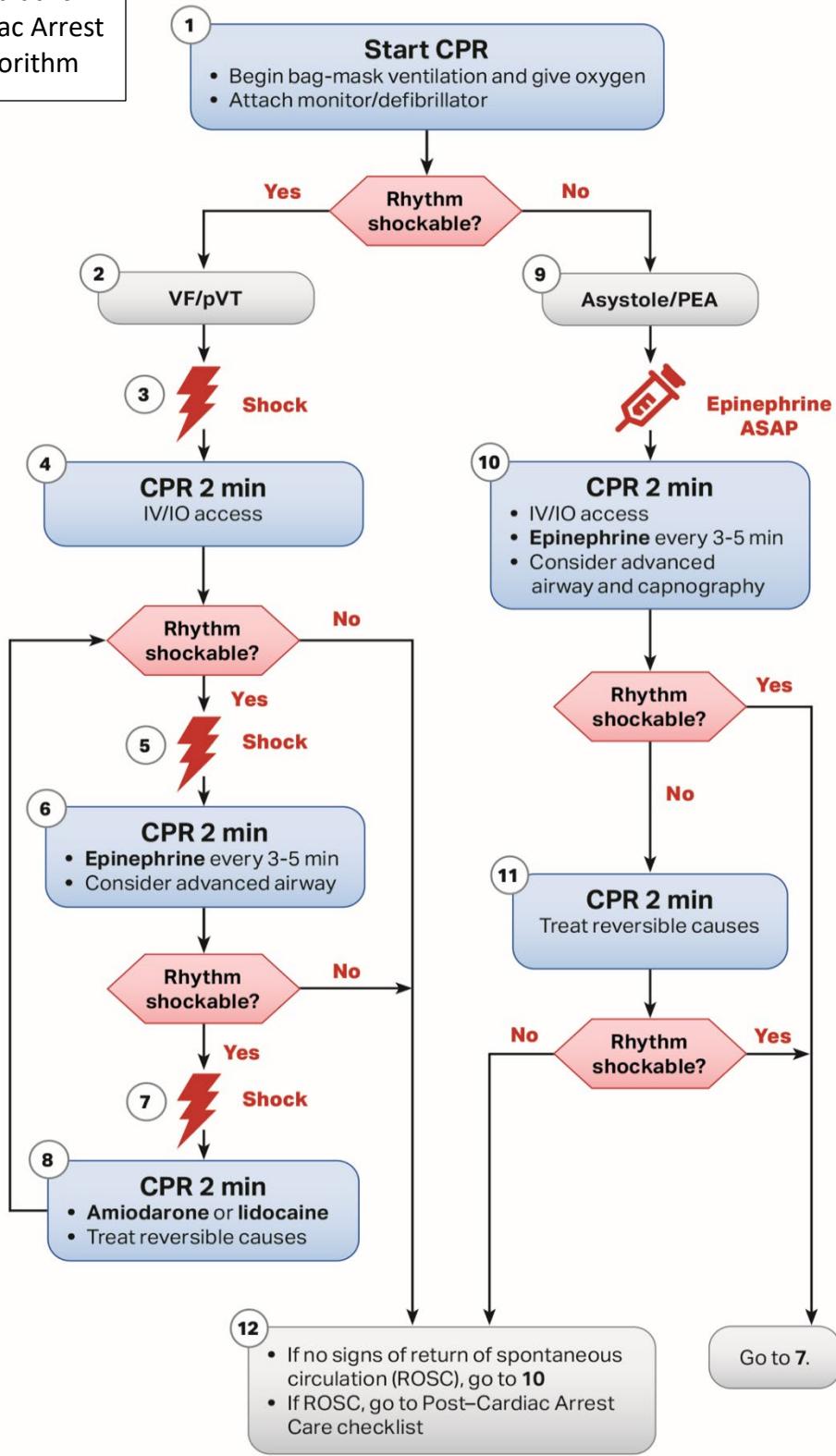


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# Cardiac Arrest: pVTach & VFib

## Pediatric Cardiac Arrest Algorithm



## CPR Quality

- Push hard ( $\geq 1/3$  of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

## Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks  $\geq 4$  J/kg, maximum 10 J/kg or adult dose

## Drug Therapy

- Epinephrine IV/IO dose:**  
0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- Amiodarone IV/IO dose:**  
5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT or
- Lidocaine IV/IO dose:**  
Initial: 1 mg/kg loading dose

## Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

## Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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## Cardiac Arrest: pVTach & VFib

### References:

- 1) Adult & Pediatric Cardiac Arrest Algorithm - [https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/highlights\\_2020\\_ecc\\_guidelines\\_english.pdf](https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/highlights/highlights_2020_ecc_guidelines_english.pdf)



## Cardiac Arrest: Trauma

### Assessment

#### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape or Handtevy.
- Focus on rapid and early BLS airway and ventilation tools. Intubation may not be the best option for these patients.
- Pediatric pads should be used in children < 10 Kg or Broselow® Tape or Handtevy tape color purple.

#### Signs & Symptoms:

- Traumatic Mechanism
- Apnea
- Pulseless
- PEA

#### Differential:

- Medical Cardiac Arrest
- Exsanguination
- Tension Pneumothorax
- Pelvic fracture(s)
- Hypoventilation
- Hypovolemia
- Hemorrhage
- Toxins
- Tamponade

### Clinical Management Options

E	A	I	P	A	<ul style="list-style-type: none"><li>• Place tourniquets prior to or concurrent with CPR for major hemorrhagic injuries as indicated.</li><li>• Pelvic Binder if blunt trauma involving the abdomen/pelvis.</li><li>• Perform Pit Crew CPR if staffing allows for Trauma with basic airway management until ALS arrives, then pause CPR as necessary for correctable traumatic causes of death.</li><li>• Co-manage with Trauma Care Guideline &amp; Cardiac Arrest Guidelines.</li><li>• Extend all extremities out to anatomical length/position.</li></ul>
M	E		P		<ul style="list-style-type: none"><li>• ECG placement</li><li>• EtCO<sub>2</sub></li></ul>
T	M				<ul style="list-style-type: none"><li>• Consider IV/IO access as indicated with Isotonic Crystalloid bolus until ROSC or up to 1 liter</li><li>• Needle Decompression</li></ul>
	T				<ul style="list-style-type: none"><li>• Ultrasound: EFAST and/or Cardiac Motion</li><li>• <b>If ROSC then issue a resuscitation alert to the receiving facility and utilize ROSC protocol.</b></li></ul>

**Consult Online Medical Control As Needed**



## Cardiac Arrest: Trauma

### **Special Considerations:**

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Emphasis is to be placed on correcting traumatic causes of death (hemorrhage control, application of pelvic binder, ventilation, decompression of the chest, reduction of grossly deformed extremities, volume resuscitation, etc.) prior to or concurrent with initiating CPR.
- Chest decompression should not be delayed for any other medical procedure or intervention to be accomplished, including CPR.
- Traumatic arrest patients with short downtime and close proximity to an appropriate trauma facility can be considered for transport after reasonable life saving interventions are first performed.
- In multi-patient events, traumatic arrests should not receive intervention until there are sufficient responders present to meet the needs of the living patients.
  - Except for lightning strikes, then perform reverse triage by giving higher priority to cardiac/respiratory arrests.



## Cardiac Arrest: ROSC Care

### Assessment

#### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Broselow® Tape or Handtevy.
- Focus on rapid and early BLS airway and ventilation tools. Intubation may not be the best option for these patients.

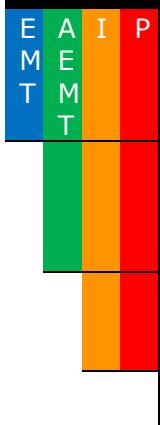
#### Signs & Symptoms:

- Return of pulse from a Non-Traumatic Cardiac Arrest

#### Differential:

- Continue to address specific differentials associated with original dysrhythmia.

### Clinical Management Options



- Continue Oxygenation, target SpO<sub>2</sub> 92% - 96%
- Use Post Resuscitation Checklist as indicated.
- Obtain 12-lead ECG
- Isotonic Crystalloid bolus 20 mL/kg to max of 2 liters, infused at 100 mL/min, titrated to a MAP of  $\geq 65$
- Resuscitation Alert if not already done so
- STEMI activation if appropriate and transmit 12 lead ECG
- Advance Airway Management as needed
- Consider Norepinephrine (or other pressor as indicated) infusion titrated to MAP  $\geq 65$
- Consider sedation if needed as indicated
- Midazolam or Ketamine for sedation as needed
- Rocuronium only after advance airway placement

### Consult Online Medical Control As Needed

#### Key Performance Indicators:

- 1) Provider must make early notification to the receiving facility and document such notification.
- 2) Immediate Post-ROSC 12-Lead ECG.
- 3) Documentation of continuous ETCO<sub>2</sub> monitoring.
- 4) Documentation of GCS monitoring.

# **Cardiac Arrest: ROSC Care**

## **Special Considerations:**

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- If patient is hypotensive do not administer sedative/paralytic.
- When exposing patient for purpose of cooling undergarments may remain in place to preserve the patient's modesty.
- Reassess airway frequently and with every patient move.
- Do not hyperventilate.
- Notify destination ASAP when this Guideline is utilized so that the receiving unit can prepare to receive patient.
- Providers should have a controlled urgency to begin transport due to the possibility of re-arrest soon after ROSC.



## Environmental Hyperthermia

		Assessment	
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
• Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® tape and/or Handtevy.	• Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg	• Weakness • Nausea & vomiting • Cramping • Syncope • Diaphoresis & anhidrosis • Altered Mental Status • Bizarre behavior • Hypotension • Tachycardia	• CVA • Dehydration • Encephalopathy • Meningitis / Sepsis • Head Trauma • Overdose / Toxin • Hypoglycemia • Delirium • Alcohol withdrawal
Clinical Management Options			
E M T A M T A P P	A P P	<ul style="list-style-type: none"><li>• Age appropriate core body temperature assessment</li><li>• Oxygen PRN titrated to SpO<sub>2</sub> 92-96%</li><li>• Move to shaded/cool environment, discontinue physical activity, PO fluids if tolerated</li><li>• If Altered Mental Status, assess blood glucose</li><li>• If body temperature &gt; 102.2 F, then active cooling measures such as ice packs to neck, axilla and groin, wet patient, and increased airflow</li><li>• If body temperature ≥ 105.8 F, then cold water immersion if immediately available</li><li>• ODT Ondansetron (Zofran) as indicated for nausea/vomiting</li><li>• Consider IV/IO access as indicated.</li><li>• Isotonic Crystalloid IV fluid bolus 20 - 30cc/kg, preferably cold</li><li>• IV Ondansetron (Zofran) 4mg, if nauseated – (Max total dosage 8mg)</li><li>• If shivering develops, Midazolam for sedation</li></ul>	

### Consult Online Medical Control As Needed

#### CRITICAL BENCHMARKS:

1. Hydration (oral or IV) as indicated.
2. Vital signs recordings at minimum every 5 minutes.
3. GCS monitoring every 5 minutes.

#### Notes:



## Environmental Hyperthermia

- Refer to drug formulary charts/Handtevy for all medication dosing for both adults and pediatric patients.
- If increased temperature, utilize passive cooling by removing excessive clothing or covers.
- NSAIDS should not be used in the setting of environmental heat emergencies.
- Exertional heat stroke should be suspected in anyone with a history of recent exertion and bizarre behavior, seizure, or syncope.
- Any Altered Mental Status patient should have blood glucose performed. Severe heat emergencies may lead to liver dysfunction and hypoglycemia.
- Cold water immersion is the most effective means of cooling, but convection cooling is often the most available and is also very effective.
- Active cooling should be removed when body temperature reaches 102.2 F.

### References:

- 1) Wasserman DD, Thurman J, Healy M. EMS Methods To Cool A Patient In The Field. [Updated 2021 Jul 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459303/>
- 2) Rauker et al., "Identification and Treatment of Exertional Heat Stroke in the Prehospital Setting", 2017. <https://www.jems.com/patient-care/identification-and-treatment-of-exertional-heat-stroke-in-the-prehospital-setting/>



# Environmental Hypothermia

Assessment					
Pediatric Pearls:			Signs & Symptoms:		Differential:
• Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® tape and/or Handtevy.	• Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg		• Cold, clammy	• Shivering	• Metabolic disorder (hypoglycemia, hypothyroidism)
			• Mental status changes	• Extremity pain or sensory abnormality	• Toxins
			• Bradycardia	• Hypotension or shock	• Environmental exposure
					• Shock
					• Sepsis
Clinical Management Options					
E	A	I	P	A	<ul style="list-style-type: none"><li>• Oxygen PRN titrated to SpO<sub>2</sub> 92-96%</li><li>• Temperature less than 95 F (&lt; 35 C): Remove wet clothing, blankets as needed</li><li>• Handle very gently if &lt; 88 F (&lt; 30 C)</li><li>• BGL assessment</li><li>• 12-lead ECG assessment</li><li>• Use strategically placed heat packs, while avoiding direct contact to the skin</li><li>• Increase temperature of transport compartment</li></ul>
M	E		P	P	<ul style="list-style-type: none"><li>• Consider IV/IO access as indicated</li><li>• Isotonic Crystalloid PRN titrated to SBP <math>\geq</math> 100 mmHg or MAP <math>\geq</math> 65</li><li>• Warm IV Isotonic Crystalloid if available</li></ul>
T	M		T		

## Consult Online Medical Control As Needed

### Key Performance Indicators:

1. 12-lead ECG acquisition and assessment.
2. Assess patient's BGL.
3. Ensure careful handling of patient.
4. Documentation of passive warming techniques.



# Environmental Hypothermia

## Special Considerations:

- Refer to drug formulary charts/Handtevy for all medication dosing for both adults and pediatric patients.
- Extremes of age are more susceptible (young and old)
- < 34 C (93.2 F), shivering may diminish at < 31 C (87.8 F) shivering may stop.
- With temperature less than 30 C (88 F) ventricular fibrillation is common cause of death. Handle patients gently to reduce this risk. Transport immediately for re-warming.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe physiologic bradycardia. Do not treat with medications unless profoundly hypotensive and unresponsive to fluids.
  - Hypothermia:
    - Mild: 89.6 – 95 F (32 – 35 C)
    - Moderate: 82.4 – 89.6 F (28 – 32 C)
    - Severe: < 82.4 F (< 28 C)
- During warming, cold blood may re-enter central circulation causing a subsequent decrease in body temperature.

- **HYPOTHERMIA CARDIAC ARREST:**
  - Confirm pulselessness
  - Begin CPR: C-A-B
  - Use caution when administering defibrillation or medication until the patient is rewarmed.
  - Resume CPR immediately.

## References:

- 1) "Part 8: Advanced Challenges in Resuscitation," *Circulation* 102, no. suppl\_1 (August 22, 2000), [https://www.ahajournals.org/doi/full/10.1161/circ.102.suppl\\_1.I-229](https://www.ahajournals.org/doi/full/10.1161/circ.102.suppl_1.I-229)



## Paramedic Protocol for Antibiotic Use in the Setting of Open Fracture

### Criteria:

- 1) Patients 16 years or older with apparent open fractures – deformity to the bone or crepitus, with laceration over the fracture site and/or exposed bone

### Exclusion criteria:

- 1) History of allergic reaction to antibiotics in cephalosporin class (ceftriaxone, cefalexin, etc)
- 2) History of allergic reaction to antibiotics in penicillin class

### Procedure:

- 1) Provide appropriate trauma care per protocol.
- 2) After establishing IV/IO access as indicated, administer 2g cefazolin (Ancef).
  - a. Verify allergies as possible
  - b. Using a 10ml syringe, withdraw 10ml sterile NaCl 0.9% from the vial. Alternately, use a prefilled flush syringe.
  - c. Add 5ml to each of the Cefazolin 1gm vials.
  - d. Withdraw the contents of each vial into the syringe and inject into 100ml 0.9% NaCl.
  - e. Infuse over 30 min.
- 3) Monitor for allergic reaction; if this occurs, follow Allergic Reaction treatment protocols including stopping any remaining infusion.
- 4) Ensure that the receiving ED team is notified of antibiotic administration including time, medication and dose.

### References:

- 1) Lack W, Seymour R, Bickers A, Studnek J, Karunakar M. Prehospital Antibiotic Prophylaxis for Open Fractures: Practicality and Safety. *Prehosp Emerg Care.* 2019 May-Jun;23(3):385-388. doi: 10.1080/10903127.2018.1514089. Epub 2018 Sep 14. PMID: 30141716.
- 2) Eccles et al., Standards for the Management of Open Fractures: Prehospital and Emergency Department Care, Including Prophylactic Antibiotics. <https://oxfordmedicine.com/view/10.1093/med/9780198849360.001.0001/med-9780198849360-chapter-1>



## Bites and Envenomation

Assessment				
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>		<b>Differential:</b>
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by Handtevy and/or Broselow® Tape.</li></ul>		<ul style="list-style-type: none"><li>Rash, skin break, wound</li><li>Pain, soft tissue swelling, redness</li><li>Blood oozing from the bite wound</li><li>Evidence of infection</li><li>Shortness of breath, wheezing</li><li>Allergic reaction, hives, itching</li><li>Hypotension or shock</li></ul>		<ul style="list-style-type: none"><li>Animal bite</li><li>Human bite</li><li>Snake bite (poisonous)</li><li>Spider bite (poisonous)</li><li>Insect sting / bite (bee, wasp, ant, tick)</li><li>Infection risk</li><li>Rabies risk</li><li>Tetanus risk</li></ul>
Clinical Management Options				
E	A	I	P	A
M	E		P	P
T	M			
T				
<ul style="list-style-type: none"><li>Locate bite/fang marks and irrigate the site. Do not cause manipulation of site by scrubbing or rubbing. There may be multiple marks.</li><li>Keep injured extremity at approximately heart level.</li><li>Do not apply suction, ice, cold packs, tourniquets, or constricting bands to the wound.</li><li>If the patient has applied a tourniquet, remove it.</li><li>Immobilize extremity if there is deformity.</li><li>Minimize patient activity. If the bite is to the leg, do not allow the patient to walk.</li><li>Identify and dress open wound with sterile dressings.</li><li>12-lead ECG obtain and transmit.</li></ul>				
<ul style="list-style-type: none"><li>If arrhythmias are present, treat as per protocol and or notify additional ALS/assistance.</li><li>Consider IV/IO as indicated.</li><li>Administer isotonic crystalloid as per protocol and indicated.</li><li>Pain Management Guideline as needed.</li><li>Consider pressors as per protocol and indicated.</li></ul>				

### Consult Online Medical Control As Needed

#### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Human bites have a very high risk of infection due to oral bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may rapidly progress to infection due to a specific bacteria (*Pasteurella multocida*).
- Venomous snakes in this area are generally of the pit viper family: rattlesnake, copperhead, and water moccasin.
  - Coral snake bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
  - It is **NOT** necessary to take the snake to the ED with the patient. Take Picture if possible.
- Black Widow spider bites have minimal pain initially but may develop muscular pain and severe abdominal pain (spider is black with red hourglass on belly).



## Bites and Envenomation

- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back). OK to use ice pack for this bite. Most are uncomplicated.
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Immunocompromised patients are at an increased risk for infection e.g., diabetes, chemotherapy, transplant patients.



# Bleeding and Hemorrhage Control

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy and/or Broselow® Tape.

### Signs & Symptoms:

- Skin break, presence of a wound
- Extensive hemorrhaging
- Pain, soft tissue swelling, redness
- Evidence of infection
- Shortness of breath, wheezing
- Hypotension or shock

## Clinical Management Options



- Ensure scene safety.
- Request ALS if anticipated.
- If abdominal wounds are exposed:
  - DO NOT touch or try to replace the exposed organ(s).
  - Consider Hemostatic Agent- Quikclot Gauze
  - Apply a sterile dressing moistened with saline over wound site.
  - Apply an occlusive dressing over the sterile dressing.
  - Cover the dressed wound to maintain warmth.
- If extremity wound is present:
  - Dress wound as appropriate.
  - Control external hemorrhage.
  - Consider Hemostatic Agent- Quikclot Gauze
  - Splinting as required.
- Use the traction splint for suspected mid-thigh femoral fractures UNLESS:
  - The apparent injury is close to the hip, knee or below the knee.
  - A nearly complete amputation exists.
  - There is an unstable pelvis.
- If hemorrhage cannot be controlled by direct pressure and is life threatening, consider the use of a tourniquet.
- Treat for shock as indicated.
- Consider IV/IO as indicated.
- Administer isotonic crystalloid as per protocol and indicated.
- Pain Management Guideline as needed.
- Consider pressors as per protocol and indicated.
- TXA as indicated per protocol.

## Consult Online Medical Control As Needed



## Bleeding and Hemorrhage Control – Hemostatic Agents/QuikClot Gauze

(This protocol to be used in conjunction with Bleeding/Hemorrhage Control.)

### Assessment

#### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy and/or Broselow® Tape.

#### Signs & Symptoms:

- Skin break, presence of a wound
- Extensive hemorrhaging
- Pain, soft tissue swelling, redness
- Evidence of infection
- Shortness of breath, wheezing
- Hypotension or shock

### Clinical Management Options

E	A	I	P	A
M	E			P
T	M			P
	T			

- Ensure scene safety.
- Request ALS if anticipated.
- Bleeding control- if extremity wound and tourniquet indicated, treat per protocol.
- Advise direct pressure on bleeding wound- manual and/or via pressure dressing.
- If direct pressure insufficient and bleeding is arterial/brisk, pack QuikClot Gauze.
- Once QuikClot Gauze is packed, continue to apply pressure for 3 minutes or until bleeding stops.
- Wrap and tie bandage to maintain pressure.
- Advise receiving facility if QuikClot Gauze has been used.
- Treat for shock as indicated.
- Consider IV/IO as indicated.
- Administer isotonic crystalloid as per protocol and indicated.
- Pain Management Guideline as needed.
- Consider pressors as per protocol and indicated.

### Consult Online Medical Control As Needed

#### Special Considerations:

##### Exclusion Criteria:

- Vaginal Bleeding
- Open Abdominal Wounds
- Chest Wounds

Hemostatic agents are most likely going to be indicated for wounds involving the scalp, face, neck, torso, axilla, groin or buttocks.

Hemostatic agents are NOT appropriate to control minor bleeding, bleeding that can be controlled by direct pressure, bleeding that can be controlled by the application of a tourniquet, or bleeding from open abdominal wounds or chest wounds.

#### References:

- 1) [QuikClot](#)



# Burns

		Assessment	
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by the Broselow® Tape or Handtevy.</li><li>Pediatric hypotension is defined as SBP &lt; 70 + (age in years x 2) mmHg</li></ul>		<ul style="list-style-type: none"><li>Burns, pain, swelling</li><li>Dizziness</li><li>Loss of consciousness</li><li>Hypotension / shock</li><li>Airway compromise / distress, singed facial or nasal hair, hoarseness / wheezing / stridor</li></ul>	<ul style="list-style-type: none"><li>Superficial 1° - red and painful</li><li>Partial thickness 2° - blistering</li><li>Full thickness 3° - painless and charred or leathery skin</li><li>Chemical</li><li>Thermal</li><li>Electrical</li><li>Radiation</li></ul>
E M T  A E M  I T  P  A  P	<b>Clinical Management Options</b>	<ul style="list-style-type: none"><li>Assure crew safety: Power/Gas off, Electrical lines secure, no secondary devices, HAZMAT determinations as appropriate</li><li>Provide supplemental Oxygen with target SpO<sub>2</sub> 92 – 96%; all CO exposure patients should be considered for high flow oxygen</li><li>Provide basic Airway Management as needed</li><li>Perform a visual inspection of the nasopharynx/oropharynx without physical contact by tongue depressor, laryngoscopy, etc.</li><li>Remove rings, bracelets, or other constricting items as possible.</li><li><u>If thermal burn</u> &lt; 10% body surface area then cool the wound with isotonic crystalloid or sterile water. After cooling, cover burn with a dry sheet or dressings to prevent hypothermia.</li><li><u>If chemical burn</u>, remove clothing or expose area, brush off any dry chemicals or powder, then flush area with large amount of water or isotonic crystalloid</li><li>Establish BSA, location(s), and type of burn.</li><li>Continuous ETCO<sub>2</sub> and ECG monitoring.</li><li>Prevent systemic heat loss, and keep the patient warm</li></ul> <ul style="list-style-type: none"><li>Consider IV/IO access as indicated</li><li>If 2<sup>nd</sup> or 3<sup>rd</sup> degree burn area is &gt; 10% BSA, then administer Isotonic Crystalloid per Parkland Burn Formula. See below Page 3 of this protocol.</li></ul> <ul style="list-style-type: none"><li>If airway burn: In the absence of Advanced Paramedic resources, consider Nebulized Epinephrine</li><li>Pain Management Guideline as indicated.</li><li>Calcium Chloride for hydrofluoric acid burns with unstable vital signs, such as hypotension, tachy/bradycardia, ectopic beats, and/or ECG changes.</li><li>Utilize RSI airway protocol as indicated; see Special Considerations below.</li></ul>	<b>Consult Online Medical Control As Needed</b>

## Key Performance Indicators:

- Documentation of estimated weight
- Early pain assessment and management
- Transport to Trauma or Burn specialty centers as indicated



## Burns

### **Special Considerations:**

- Refer to drug formulary charts/Handtevy for all medication dosing for both adults and pediatric patients.
- Evaluate BSA: Use chart or use palm side of patients hand = 1% BSA
  - Critical Burn Criteria:
    - >20% 2° and 3° body surface area (BSA) age > 10;
    - >10% BSA age < 10 or > 50;
    - 3° burns >5% BSA;
    - 2° and 3° burns to face, eyes, hands or feet or genitalia; electrical burns; respiratory burns; deep chemical burns;
    - Burns with extremes of age or chronic disease; and burns with associated major traumatic injury.
- Any burned area, charring, redness or swelling to the airway noticed upon visual inspection should be an ominous sign for potential impending airway compromise. RSI protocols should be an early consideration in these cases. Supraglottic airway placement should be avoided as development of edema may render it ineffective. A large bore endotracheal tube (size 8.0 or larger for adults) is preferred, and particular care should be paid to securing the tube placement.
- Non-critical burns (< 5% BSA 2nd and 3rd) not complicated by airway compromise or trauma do not require immediate transport to a trauma center.
- Prioritize transport to an appropriate trauma center in the setting of airway or respiratory involvement, or when significant trauma or blast injury is suspected. Consider the possibility of abuse in the setting of burn injuries.
- Consider transport directly to a burn center if there are partial or full thickness burns (TBSA) greater than 10%, involvement of hands/feet, genitalia, face, and/or circumferential burns to extremities which place the patient at risk for vascular compromise secondary to soft tissue swelling.
- Consider early management of pain and nausea/vomiting.
- Air transportation may be more appropriate for long transport distances or airway management needs beyond the scope of the responding ground providers.
- Burn patients are prone to hypothermia; never apply ice or cool burns that involve >10% body surface area, and work to prevent systemic heat loss and keep patient warm.
- Hydrofluoric acid burns of 3% BSA may be fatal and may have little to no external signs. Notify receiving facility immediately in the setting of a known or suspected exposure.
- Have a high index of suspicion for cyanide poisoning in a patient with depressed GCS, respiratory difficulty and cardiovascular collapse in the setting of an enclosed-space fire. Consider hydroxocobalamin if available.
- Particularly in enclosed-space fires, carbon monoxide toxicity is a consideration; note that pulse oximetry may not be accurate [see Carbon Monoxide/Smoke Inhalation guideline]. Potential CO exposure should be treated with 100% oxygen.
- Lactated Ringer's is the initial crystalloid of choice unless contraindicated by other patient injuries or comorbidities. If the patient presents with signs of shock, consider other causes such as trauma or cyanide toxicity.



# Burns

## Parkland Formula

Amount of isotonic crystalloid in mL to be infused over 1<sup>st</sup> hour

Patient Wt (kg)	3	5	7	9	11	13	15	17	18	21	23	25	27	
% BSA	10	8	13	18	23	28	33	38	43	45	53	58	63	68
	20	15	25	35	45	55	65	75	85	90	105	115	125	135
	30	23	38	53	68	83	98	113	128	135	158	173	188	203
	40	30	50	70	90	110	130	150	170	180	210	230	250	270
	50	38	63	88	113	138	163	188	213	225	263	288	313	338
	60	45	75	105	135	165	195	225	255	270	315	345	375	405
	70	53	88	123	158	193	228	263	298	315	368	403	438	473
	80	60	100	140	180	220	260	300	340	360	420	460	500	540
	90	68	113	158	203	248	293	338	383	405	473	518	563	608
	100	75	125	175	225	275	325	375	425	450	525	575	625	675

Patient Wt (kg)	30	35	40	45	50	55	60	70	80	90	100	110	120	
% BSA	10	75	88	100	113	125	138	150	175	200	225	250	275	300
	20	150	175	200	225	250	275	300	350	400	450	500	550	600
	30	225	263	300	338	375	413	450	525	600	675	750	825	900
	40	300	350	400	450	500	550	600	700	800	900	1000	1100	1200
	50	375	438	500	563	625	688	750	875	1000	1125	1250	1375	1500
	60	450	525	600	675	750	825	900	1050	1200	1350	1500	1650	1800
	70	525	613	700	788	875	963	1050	1225	1400	1575	1750	1925	2100
	80	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2200	2400
	90	675	788	900	1013	1125	1238	1350	1575	1800	2025	2250	2475	2700
	100	750	875	1000	1125	1250	1375	1500	1750	2000	2250	2500	2750	3000

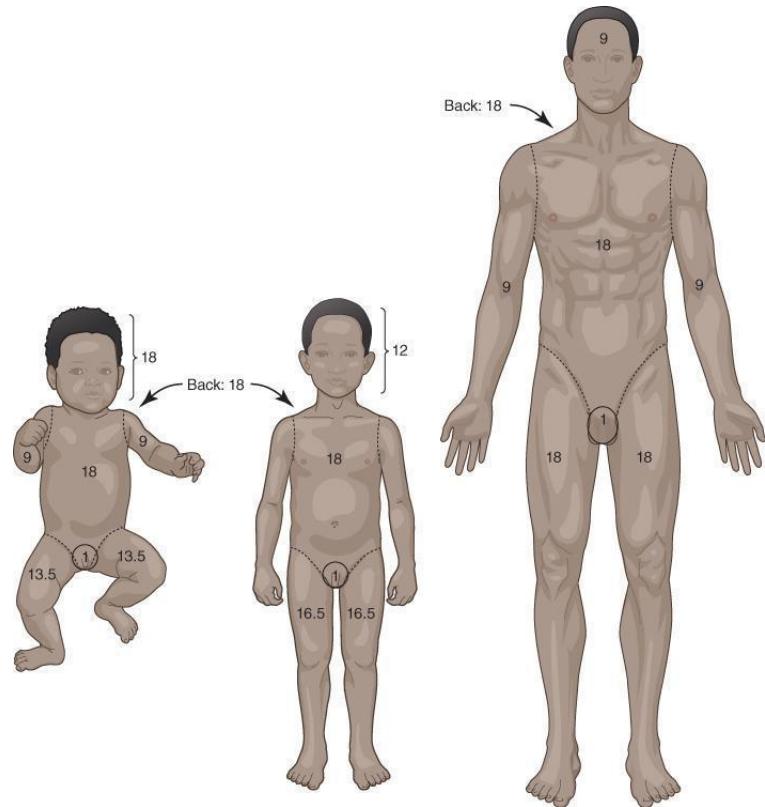
## References:

1. "Burn Care", Joint Trauma System Clinical Practice Guideline. [https://jts.amedd.army.mil/index.cfm/pi\\_cpgs/cpgs](https://jts.amedd.army.mil/index.cfm/pi_cpgs/cpgs)
2. Advanced Burn Life Support Course Provider Manual. <http://ameriburn.org/wp-content/uploads/2019/08/2018-abls-providermanual.pdf>



# Burns

## Rule of 9s



### Rule of Palm:

For any patient (adult, child, or infant), the area of the patient's palm equals about 1% BSA.



# Crush Injury

				<b>Assessment</b>	
E	A	I	P	<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
M	E	E	A	<ul style="list-style-type: none"><li>• Compartment Syndrome</li><li>◦ Pain on passive stretch</li><li>◦ Paresthesia</li><li>◦ Paralysis</li><li>◦ Pallor</li><li>◦ Pulselessness</li><li>• Hypoperfusion</li><li>• Hypotension</li><li>• Altered Mental Status</li></ul>	<ul style="list-style-type: none"><li>• Skin irritant exposure</li><li>• Dust concentrations in airway</li><li>• Hypo/Hyperthermia</li><li>• Hyperkalemia</li><li>• Dehydration</li><li>• Additional trauma</li></ul>
<b>Clinical Management Options</b>					
T	M	T	P	<ul style="list-style-type: none"><li>• Treatment in a confined space should be performed only by appropriately trained personnel.</li><li>• Air quality monitoring should be conducted and documented prior to entry into confined space. Continuous air quality monitoring must be maintained once contact is made with the victim and when any rescuer is in a confined space. Document air quality measurement at patient location on PCR.</li><li>• Consider activation of local/regional technical rescue assets</li><li>• Apply N95 mask to patient as needed for dusty or contaminated environment</li><li>• Oxygen/BVM as needed for sPO2 92% - 96%</li><li>• Place but do not tighten tourniquet around an entrapped limb prior to extrication<ul style="list-style-type: none"><li>◦ Consider tightening tourniquet prior to extrication if extremity was ischemic or entrapment was prolonged</li><li>◦ Tighten tourniquet as needed for hemorrhage</li></ul></li><li>• Nebulized Albuterol or saline PRN for patients with dust concentrations in airway.</li><li>• Obtain ECG/maintain cardiac monitoring to identify signs of hyperkalemia (see Special Considerations)</li></ul>	
				<ul style="list-style-type: none"><li>• Consider IV/IO access as indicated; 2 IV sites preferred.</li><li>• Initial IV fluid bolus 10-15cc/kg 0.9%NS</li><li>• Post extrication, <u>continue aggressive IV fluids (0.5-1L/hr adults, 10cc/kg/hr peds)</u></li><li>• Sodium bicarbonate (1mEq/kg max 50mEq) IV bolus over 5 minutes prior to extrication</li><li>• If ECG is suggestive of Hyperkalemia (see Special Considerations):<ul style="list-style-type: none"><li>◦ Calcium chloride 1g IV/IO over 5 minutes, ensuring line patency</li><li>◦ Sodium bicarbonate 1mEq/kg max 50mEq</li><li>◦ Continued aggressive IV hydration</li></ul></li></ul>	
				<ul style="list-style-type: none"><li>• If cardiac arrest occurs, treat for hyperkalemia with both Calcium Chloride and Sodium Bicarbonate in conjunction with cardiac arrest guidelines.</li></ul>	
				<ul style="list-style-type: none"><li>• If MAP <math>\geq</math> 65 and no respiratory failure, then Fentanyl for pain and Ketamine for refractory pain</li><li>• If MAP &lt; 65 and/or respiratory failure, then Ketamine for pain</li></ul>	

**Consult Online Medical Control As Needed**



# Crush Injury

## Key Performance Indicators:

- 1) Air quality monitoring of all confined spaces
- 2) Continuous cardiac and EtCO<sub>2</sub> monitoring
- 3) Initiation of fluid resuscitation prior to extrication

## Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Hydration should begin prior to extrication whenever possible. Large volume resuscitation prior to removal of the crush object and extrication is critical to preventing secondary renal failure and death.
- Crush injury is usually seen with compression of 4-6 hrs. but may occur in as little as 20 min.
- If possible, monitor patient for signs of compartment syndrome.
- Elderly patients should be monitored closely for volume overload but do NOT withhold fluids unless clinical signs/symptoms of volume overload are present.
- The larger the mass crushed (ie more limbs) the greater the likelihood of severe rhabdomyolysis and renal failure.
- Crush injury may cause profound electrolyte disturbances resulting in dysrhythmias. Monitor as soon as practically possible. ECG changes in the setting of Hyperkalemia include peaked T waves, widened QRS, lengthening QT interval, and loss of P wave.
- Do not overlook treatment of additional injuries, airway compromise, hypothermia/ hyperthermia.
- ETCO<sub>2</sub> should be used if narcotic medication is administered.
- 0.9% Normal Saline is the isotonic fluid of choice for Crush injury patients



# Diving Emergencies

Assessment					
Pediatric Pearls:		Signs & Symptoms:		Differential:	
<ul style="list-style-type: none"> <li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by Handtevy and/or Broselow® Tape.</li> <li>Pediatric hypotension is defined as SBP &lt; 70 + (age in years x 2) mmHg+</li> </ul>		<ul style="list-style-type: none"> <li>Unresponsive</li> <li>Mental status changes</li> <li>Neurogenic shock</li> <li>Head trauma</li> <li>Spinal Trauma</li> <li>Decreased or absent vital signs</li> <li>Vomiting</li> <li>Coughing</li> </ul>		<ul style="list-style-type: none"> <li>Trauma</li> <li>Pre-existing medical problem</li> <li>Pressure injury</li> <li>Decompression sickness</li> <li>Barotrauma</li> <li>Duration of immersion</li> <li>Temperature of water</li> </ul>	
Clinical Management Options					
E	A	I	P	A	<ul style="list-style-type: none"> <li>Scene safety &amp; decontaminate patient as needed</li> <li>Evaluate for Cardiac Arrest</li> <li>Oxygen, Target SpO<sub>2</sub>: 92-96%</li> <li>BLS airway management as needed</li> <li>Evaluate for spinal motion restriction</li> <li>Keep patient warm</li> <li>12-lead ECG obtain and transmit as soon as reasonably possible.</li> </ul>
M	E			P	<ul style="list-style-type: none"> <li>If conscious and with wheezing, Albuterol nebulizer</li> <li>If conscious and with rales/rhonchi, CPAP</li> </ul>
T	M				<ul style="list-style-type: none"> <li>IV/IO access as indicated</li> </ul>
T					<ul style="list-style-type: none"> <li>Re-evaluate ECG as indicated. Treat arrhythmias per protocol.</li> </ul>
					<ul style="list-style-type: none"> <li>Advance airway maneuvers and management as needed</li> </ul>

## Consult Online Medical Control As Needed

## Considerations:

- Length of time patient submerged (total dive time).
- Number of dives made.
- Duration of and time since descent/ascent (total surface interval).
- Were decompression dives made and at what intervals?
- Depth of deepest submersion and depth of last dive.
- Any loss of consciousness.
- Temperature of the water.
- Mechanism of injury suggestive of head/neck injury.
- Did the diver perform an emergency ascent? If so, from what depth?
- Was the dive made with compressed air or mixed gases?
- Was there any air flight in the last 24 hours?
- Any drugs, ETOH, or strenuous activity.



## Diving Emergencies

### **Special Considerations:**

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- SMR should be used when a suspected or known traumatic mechanism preceded the drowning.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- Drowning is a leading cause of death among would-be rescuers. Allow appropriately trained rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), if possible, transport dive computer and/or dive logs with patient.
- Consider CPAP early if respiratory distress for any age if adequate mask seal can be established.
- Assess water temperature ( $< 10^\circ \text{ C}$  /  $< 50^\circ \text{ F}$ ) defines cold water. Resuscitate all cold-water drowning patients.



# Drowning / Submersion

Assessment						
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>				
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by Handtevy and/or Broselow® Tape.</li><li>Pediatric hypotension is defined as SBP &lt; 70 + (age in years x 2) mmHg</li></ul>		<ul style="list-style-type: none"><li>Unresponsive</li><li>Mental status changes</li><li>Decreased or absent vital signs</li><li>Vomiting</li><li>Coughing</li></ul>				
Clinical Management Options						
E	A	I	P	<ul style="list-style-type: none"><li>Scene safety &amp; decontaminate patient as needed</li><li>Evaluate for Cardiac Arrest</li><li>Oxygen, Target SpO<sub>2</sub>: 92-96%</li><li>BLS airway management as needed</li><li>Evaluate for spinal motion restriction</li><li>Keep patient warm</li><li>12-lead ECG obtain and transmit as soon as reasonably possible</li></ul>		
M	E		P	<ul style="list-style-type: none"><li>If conscious and with wheezing, Albuterol nebulizer</li><li>If conscious and with rales/rhonchi, CPAP</li></ul>		
T	M		P	<ul style="list-style-type: none"><li>IV/IO access as indicated</li></ul>		
	T			<ul style="list-style-type: none"><li>Re-evaluate ECG as indicated. Treat arrhythmias per protocol.</li></ul>		
				<ul style="list-style-type: none"><li>Advance airway maneuvers and management as needed</li></ul>		

## Consult Online Medical Control As Needed

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- SMR should be used when a suspected or known traumatic mechanism preceded the drowning.
- All victims should be transported for evaluation due to potential for worsening over the next several hours.
- Drowning is a leading cause of death among would-be rescuers. Allow appropriately trained rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), if possible, transport dive computer and/or dive logs with patient.
- Consider CPAP early if respiratory distress for any age if adequate mask seal can be established.
- Assess water temperature (< 10° C / < 50° F) defines cold water. Resuscitate all cold-water drowning patients.



# Electrical Injuries

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Handtevy and/or Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

### Signs & Symptoms:

- Changes in mental status
- Headache
- Issues with hearing, vision and or airway swelling
- Arrhythmias
- Muscle pain or spasms
- Numbness/tingling

## Clinical Management Options



- Perform scene safety. Ensure the electricity has been turned off.
- Perform initial assessment and treat priority conditions.
- Assess patient for associated injuries that may be a higher priority.
- If patient is pulseless and apneic, proceed to appropriate Cardiac Arrest Protocol.
- Obtain history of events:
  - Type of current
  - Voltage
  - Length of shock
  - Entrance/exit wounds+
- Follow Spinal Immobilization Protocol. Record Glasgow Coma Scale.
- 12-lead ECG obtain and transmit.
- IV/IO access as indicated.
- Re-evaluate 12-lead ECG. Treat arrhythmias per protocol.
- Follow pain protocol if needed and indicated.

## Consult Online Medical Control As Needed

### Special Considerations:

- Lightning injuries may present with many patients. After a lightning strike treat patients appearing lifeless first.
- Crew safety should remain a priority. Do not attempt to remove patient from the electrical source unless trained to do so.



# Eye Injury / Complaint

Assessment					
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>			
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by the Handtevy and/or Broselow Tape.</li><li>Pediatric hypotension is defined as SBP &lt; 70 + (age in years x 2) mmHg</li></ul>		<ul style="list-style-type: none"><li>Pain, swelling, blood</li><li>Deformity, contusion</li><li>Visual deficit / loss of vision</li><li>Leaky aqueous / vitreous humor</li><li>Upwardly fixed eye</li><li>Shooting or streaking light</li><li>Visual contaminants</li><li>Rust ring</li><li>Lacrimation</li></ul>			
Clinical Management Options					
<b>E</b> <b>M</b> <b>T</b>	<b>A</b> <b>E</b> <b>M</b>	<b>I</b> <b>P</b> <b>P</b>	<b>A</b> <b>P</b> <b>P</b>	<ul style="list-style-type: none"><li>Evaluate pupils</li><li>Complete neurological exam</li><li>Screen for unrecognized chemical and/or agent exposure</li><li>Cover both eyes</li><li>If out of socket, then cover with sterile water or isotonic crystalloid soaked gauze</li><li>If impaled object, then stabilize the object then cover both eyes</li><li>If chemical exposure or burn, then irrigate with copious amounts of sterile water or isotonic crystalloid<ul style="list-style-type: none"><li>Perform an initial and repeat respiratory assessments.</li></ul></li><li>IV/IO access as indicated</li><li>Follow pain protocol if needed and indicated</li></ul>	

## Consult Online Medical Control As Needed

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Normal visual acuity can present even with severe injury.
- Remove contact lens when possible. If adherent to globe, then do not force. Irrigation may assist with removal.
- Any chemical or thermal burns to the face/eyes should raise concern for respiratory insult.
- Orbital fracture raises concern for globe or nerve injury, or compartment syndrome. This requires repeat assessments.
- Always cover both eyes to prevent further insult.
- Use shield not pads for physical trauma to the eye. Pads are acceptable for the uninjured eye.
- DO NOT remove impaled objects
- Suspected globe rupture or compartment syndrome requires emergent evaluation.



# Head Injury

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy and/or Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

### Signs & Symptoms:

- Headache
- Pressure in the head
- Dizziness, blurry vision
- Feeling of groggy, sluggish
- Altered mental status
- Confusion, lack of concentration
- Nausea, vomiting
- Visual injury, bleeding, bruising

## Clinical Management Options



A	<ul style="list-style-type: none"><li>• Perform scene safety. Perform initial assessment and treat priority conditions.</li><li>• Consider ALS request.</li></ul>
P	<ul style="list-style-type: none"><li>• Follow Spinal Immobilization Protocol as indicated.</li><li>• Monitoring of O2 saturation.</li><li>• Monitor EtCO2.</li><li>• O2 administration as indicated.</li><li>• Consider BLS airway maneuvers with BVM - 10 breaths/min.</li><li>• Obtain 12-lead ECG and transmit as indicated.</li><li>• Pay attention for early signs of shock:<ul style="list-style-type: none"><li>• Tachycardia</li><li>• Hypertension</li></ul></li><li>• IV/IO access as indicated.</li><li>• Isotonic Crystalloid as indicated 20ml/kg titrated to a MAP of &gt;65.</li></ul>
P	<ul style="list-style-type: none"><li>• Re-evaluate 12-lead ECG and treat any arrhythmias as indicated per protocol.</li><li>• Consider advanced airway measures as indicated.</li><li>• Follow pain protocol if needed and indicated.</li></ul>

## Consult Online Medical Control As Needed

### Special Considerations:

- Use the jaw-thrust maneuver when there is a suspected head injury.
- Closely monitor blood pressure. A single episode of hypotension has been shown to double mortality from head injuries.
- Trauma to the head is a leading cause of traumatic injury and/or death. This can be prevented by vigilant recognition and treatment. Rapid assessment and transport are essential for survival of the patient.
- Identifying Hypotension in Children:
  - Ventilation Rates:
  - 0-9 yrs: 70+ (age X 2)
  - > 10 yrs. <90mmHg
- Adequate Ventilation Rates:
  - Infants: (0-24 mos) – 25 breaths/min.
  - Children: (2-14 yrs.) – 20 breaths/min.
  - Adolescents: (15-17 yrs.) – 10 breaths/min.
- Rule of thumb:
  - Newborn: < 70mmHg
  - 5 yr. old: < 80mmHg
  - 10 & older: < 90mmHg



# Impaled Object

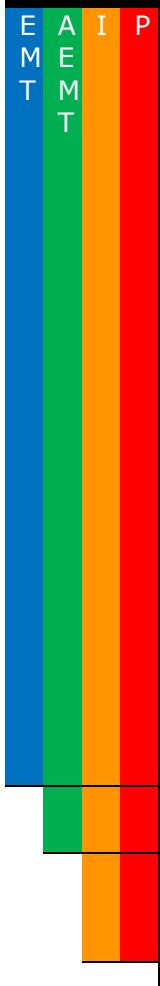
## Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy and/or Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

## Signs & Symptoms:

- Punctured soft tissue/injury
- Hemorrhage at site
- Pain, local and/or referred
- Altered mental status
- Pale, cool, clammy
- Weak, thready and/or rapid pulse
- Hypotension (late)

## Clinical Management Options



- Perform scene safety. Perform initial assessment and treat priority conditions.
- Consider ALS request.
- Follow Spinal Immobilization Protocol as indicated.
- Monitoring of O2 saturation.
- Monitor EtCO2.
- O2 administration as indicated.
- Consider BLS airway maneuvers with BVM - 10 breaths/min.
- Obtain 12-lead ECG and transmit as indicated.
- If the impaled object is in the cheek and is causing complications with airway management:
  - Remove the object carefully.
  - Place a sterile dressing on the cheek.
  - Transport with special attention to airway status, monitoring bleeding from wound.
- If the impaled object is not in the cheek:
  - Stabilize with bulky dressing and secure.
  - **Do not attempt to remove object.**
- If the patient is impaled on a fixed object:
  - Contact Medical Control.
  - Attempt to transport the object with the patient.
  - Consider specialty resources, such as a technical rescue team for extrication assistance/expertise.
- Pay attention for early signs of shock:
  - Tachycardia
  - Hypertension
- IV/IO access as indicated.
- Isotonic Crystalloid as indicated 20ml/kg titrated to a MAP of >65.
- Re-evaluate 12-lead ECG and treat any arrhythmias as indicated per protocol.
- Consider advanced airway measures as indicated.
- Follow pain protocol if needed and indicated.
- TXA as indicated.

**Consult Online Medical Control As Needed**



# Multisystem Trauma

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy and/or Broselow® Tape.
- Fluids and Medication titrated to maintain a SBP  $> 70 + (\text{age in years} \times 2)$  mmHg
- Hypotension: (SBP  $< 70 + 2 \times \text{Age in years}$ )

### Signs & Symptoms:

- **D** – Deformities
- **C** – Contusions
- **A** – Abrasions
- **P** – Punctures/Penetrations
- **B** – Burns
- **T** – Tenderness
- **L** – Lacerations
- **S** – Swelling

### Differential:

- Respiratory failure
- Foreign body airway obstruction
- Hypovolemia
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxins or Overdose
- Hypoglycemia
- Acidosis
- Acute MI or PE

## Clinical Management Options

E	A	I	P	A	<ul style="list-style-type: none"><li>• Control external hemorrhage and apply tourniquet(s) as necessary.</li><li>• Wound packing with pressure dressing as appropriate and apply Quick Clot Combat Gauze if available.</li><li>• BLS airway management.</li><li>• Place occlusive dressing/chest seal over open pneumothorax.</li><li>• Evaluate for spinal motion restriction.</li><li>• Assess GCS score.</li><li>• Apply pelvic binder if appropriate.</li><li>• Keep patient supine and warm.</li><li>• Administer oxygen PRN titrated to SpO<sub>2</sub> 92%-96%</li><li>• Bandage/splint injuries as appropriate for patient condition.</li><li>• Notification to the receiving facility as soon as reasonably possible.</li><li>• Obtain 12-lead ECG and transmit if indicated.</li><li>• ETCO<sub>2</sub> assessment</li></ul>
M	E		P	P	<ul style="list-style-type: none"><li>• IV/IO access as indicated.</li><li>• Adult: Isotonic Crystalloid IV bolus 250 mL if patient shows signs of shock.</li><li>• Adult: Fluid bolus with isotonic crystalloid as needed.</li><li>• Pediatric 20 mL/kg as needed.</li></ul>
T	M				<ul style="list-style-type: none"><li>• Needle decompression of the chest as indicated.</li><li>• Advance airway management as indicated.</li><li>• <u>If Adult Spinal Shock, consider pressors as indicated per protocol.</u></li><li>• Pain management – Fentanyl and/or Ketamine as indicated.</li><li>• Consider Tranexamic Acid (TXA).</li><li>• Consider Ultrasound for EFAST exam.</li></ul>

**Consult Online Medical Control As Needed**



## Multisystem Trauma

### GCS

<b>Eyes Open</b>	<b>Best Verbal</b>	<b>Best Motor</b>
4 - Eyes Open	5 - Oriented	6 - Obeys Commands
3 - To Voice	4 - Confused	5 - Localizes Pain
2 - To Pain	3 - Inappropriate	4 - Withdraws from Pain
1 - None	2 - Incomprehensible	3 - Pain-Flexion
	1 - None	2 - Pain-Extended
		1 - None

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Consider Chest Decompression with signs of shock and diminished/absent breath sounds. If patient arrests, then immediately perform bilateral decompression.
- Minimize Scene time. If patient meets Trauma Alert criteria, then interventions should be performed enroute.
- Severe bleeding from an extremity not rapidly controlled by direct pressure may necessitate the application of a tourniquet.
- Permissive hypotension (target fluid resuscitation to MAP 55-65) should be used in the absence of neurologic injury, pregnancy, hypertensive history, and age  $\leq$  45 years old. If suspected neurologic injury maintain Adult SBP  $\geq$  90mmHg.
- MAP calculation  $[(2 \times \text{diastolic}) + \text{systolic}] \div 3$
- Hypotension is devastating to neurologic injury and should be aggressively treated.
- Peripheral neurovascular status should be document on all extremity injuries and before and after splinting procedures. Same for neuro status before and after extrication, placement for LSB and before/after transport.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of neuro-vascular compromise.
- Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations should be evaluated for repair as soon as possible after injury.
- If evidence of brain herniation (blown pupil, Cushing's reflex, rapid decline in GCS, or bradycardia) and in absence of capnometer, hyperventilate the patient 20 – 24 breaths per minute. If available titrate to: Adult and Pediatric ETCO<sub>2</sub> 30 - 35 mmHg. ETCO<sub>2</sub> < 30 is associated with poor neurologic outcomes.
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- If hypotension consider spinal shock or additional occult injury as source.
- Consider Altered Mental Status guideline.
- The most important item to monitor and document is a change in the level of consciousness and GCS.
- Any document loss of consciousness, prolonged confusion or mental status abnormality should be evaluated by a physician ASAP.



## Sexual Assault

### Assessment

#### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy or Broselow Tape.

#### Signs & Symptoms:

- Physical trauma; hemorrhage
- Emotional and mental trauma
- Recurring injuries – wounds, bruising, etc. in various stages of healing
- Withdrawal
- Possible hostility
- Hypotension or shock

### Clinical Management Options

E	A	I	P	A	<ul style="list-style-type: none"><li>• Ensure scene safety.</li><li>• Assess for unresponsiveness, absence of normal breathing, and pulselessness.</li><li>• Spinal precautions per protocol.</li><li>• Bite wounds should be covered with dry sterile gauze. Do not wash wounds with saline nor water, do not place ointments over wounds. Evidence may be collected during the forensic exam if the wound is undisturbed.</li></ul>
M	E		P	P	<ul style="list-style-type: none"><li>• Vascular access as indicated.</li><li>• Isotonic crystalloid as indicated 20ml/kg.</li></ul>
T	M				<ul style="list-style-type: none"><li>• Pain Management Guideline as needed.</li></ul>
	T				<ul style="list-style-type: none"><li>• Advanced airway as indicated.</li></ul>

**Consult Online Medical Control As Needed**



## Sexual Assault

### **Special Considerations:**

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Evidence preservation is vital. Use paper bags for all clothing and blood-stained articles, if available. If the patient's clothing is removed after leaving the scene, bag and label each item separately.
- Do not ask questions about the patient's sexual history or practices, or questions that might make the patient feel guilty.
- Do not examine the patient's genitalia unless there is severe injury, and then do so only with the patient's permission.
- Maintain the crime scene and chain of evidence by turning over any transported items to forensic nursing staff at receiving facility, if available.
- The receiving facility should be contacted prior to transport to notify of patient complaint and ascertain if forensic nursing is available. EMS may be diverted due to lack of forensic capabilities.
- Consider mandated reporting for minor sexual abuse or assault.
- Elicit the patient's trust. Under no circumstances should you be judgmental.
- Document injuries with great detail and accuracy, and double-check to make certain there are no errors. Right/left errors are common; be sure to document injuries in reference to the patient's right or left side. Details should include the location of soft tissue injuries, size, shape, and type of injury such as abrasion, laceration or incision.

### **References:**

- 1) Journal of Emergency Medical Services
  - a. <https://www.jems.com/patient-care/provide-emotional-first-aid-when-responding-to-sexually-assaulted-patients/>
- 2) Nevada Coalition to END Domestic and Sexual Violence
  - a. <https://www.nsvrc.org/sites/default/files/2019-08/Sexual%20Violence%20EMS%20Providers.pdf>



# Abdominal Emergencies

Assessment			
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by the Broselow® Tape/Handtevy or similar.</li><li>Diabetic Ketoacidosis (DKA) often presents with abdominal pain, nausea, and vomiting.</li></ul>		<ul style="list-style-type: none"><li>Pain</li><li>Nausea</li><li>Vomiting</li><li>Diarrhea</li><li>Dysuria</li><li>Constipation</li><li>Vaginal bleeding / discharge</li><li>Pregnancy</li><li>Fever</li></ul>	
<b>Differential:</b>			
<ul style="list-style-type: none"><li>Pneumonia or P.E.</li><li>Hepatitis or Pancreatitis</li><li>Gastroenteritis</li><li>Peptic Ulcer Disease</li><li>Myocardial Infarction or CHF</li><li>Kidney Stone</li><li>Aortic Aneurysms</li><li>Appendicitis</li><li>Bladder/Prostate Disorder</li><li>Pelvic – Pregnancy, Ectopic, STI, PID, Ovarian Cyst</li><li>Diverticulitis</li><li>Bowel Obstruction</li></ul>			
Clinical Management Options			
<b>E</b> <b>M</b> <b>T</b>	<b>A</b> <b>P</b>	<ul style="list-style-type: none"><li>Initial assessment including physical exam</li><li>Vital signs including SpO<sub>2</sub> and ETCO<sub>2</sub> as indicated</li><li>Oxygen therapy as indicated with goal SpO<sub>2</sub> &gt;92-96%</li><li>ECG Assessment as indicated</li><li>Odansetron (Adult 4mg; Ped 0.1mg/kg max 4mg IV/IM/IO) as indicated for nausea</li><li>Pain Management Protocol as indicated</li></ul>	
<b>I</b> <b>M</b> <b>T</b>	<b>I</b> <b>P</b>	<ul style="list-style-type: none"><li>Consider IV/IO access as indicated</li><li>IV fluid bolus with isotonic crystalloid as needed for dehydration or hypotension</li><li>Odansetron (Adult 4mg; Ped 0.1mg/kg max 4mg SL/PO/IV/IO/IM/IN) as indicated for nausea</li></ul>	
<b>P</b>	<b>A</b>	<ul style="list-style-type: none"><li>Pain Management Protocol as indicated</li><li>Ultrasound assessment as indicated</li></ul>	

## Consult Online Medical Control As Needed

### Key Performance Indicators:

- Assessment for life threatening etiology
- Pain management as indicated

### Special Considerations:

- Refer to medication index or Handtevy for all medication dosing.
- Consider the possibility of pregnancy in all those of childbearing age and reproductive capacity. In these patients, ectopic pregnancy should be considered until proven otherwise.
- Abdominal aneurysm should be considered with abdominal pain in patients over 50 Y/O.
- Epigastric pain can be difficult to differentiate; consider the possibility of atypical chest pain.
- Consider mesenteric ischemia in the setting of severe pain with limited exam findings. Risk factors include age > 60, atrial fibrillation, CHF and atherosclerosis.
- Ultrasound as indicated to identify free fluid in abdominal cavity



## Abdominal Emergencies

### References:

1. Ranji SR, Goldman LE, Simel DL, Shojania KG. Do opiates affect the clinical evaluation of patients with acute abdominal pain? *JAMA*. 2006;296(14):1764-74.
2. Isenberg DO, Raymond, and Alexis M. LaPietra DO. "Abdominal Pain." [www.emra.org](http://www.emra.org). Accessed October 6, 2021. <https://www.emra.org/books/pain-management/abdominal-pain/>.



# Allergic Reaction and Anaphylaxis

<b>Assessment</b>			
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by the Broselow® Tape/Handtevy.</li><li>Fluids and medications titrated to maintain SBP &gt; 70 + (age x 2) mmHg</li></ul>		<ul style="list-style-type: none"><li>Edema / Voice Changes</li><li>Itching or Hives</li><li>Coughing / Wheezing or Respiratory Distress</li><li>Chest or Throat Constriction / Tightness</li><li>Difficulty Swallowing</li><li>Hypotension or Shock</li><li>Vomiting / Diarrhea</li><li>Sense of Impending Doom</li></ul>	<ul style="list-style-type: none"><li>Urticaria (rash only)</li><li>Anaphylaxis (systemic effect)</li><li>Shock (vascular effect)</li><li>Angioedema</li><li>Aspiration / Airway Obstruction</li><li>Vasovagal event</li><li>CHF</li><li>Asthma or COPD</li><li>Anxiety</li></ul>
<b>Clinical Management Options</b>			
E M T  A E M  I I  P A P	<ul style="list-style-type: none"><li>Assessment with particular focus on angioedema, or circulatory/respiratory issues</li><li>Remove or discontinue any suspected or known offending agent</li><li>Assist with patient's Epinephrine delivery device if signs/symptoms suggest Anaphylaxis (Anterolateral thigh is preferred site)</li><li>Epinephrine 1:1000 IM in lieu of patient delivery device (EMT must use CertaDose/procedure) (0.3mg adult / 0.01mg/kg ped up to 0.3mg max.)</li><li>May repeat IM Epi 1:1000 0.3mg adult / 0.01mg/kg ped every 5-15 minutes as needed for persistent or recurrent signs of anaphylaxis</li><li>Oxygen to target SpO<sub>2</sub> 92 – 96%</li><li>Cold pack to insect bite or sting site; remove bee stinger if present</li><li>Basic airway management as needed</li><li>Albuterol via nebulizer as needed for wheezing</li><li>Diphenhydramine (50mg PO for adults, 1mg/kg PO for peds max 25mg)</li><li>CPAP, if refractory to albuterol</li><li>Monitor ETCO<sub>2</sub></li><li>Cardiac monitor and EKG</li></ul>	<ul style="list-style-type: none"><li>Consider IV/IO access as indicated</li><li>IV fluid bolus with isotonic crystalloids for signs of hypoperfusion (initial bolus 20cc/kg)</li><li>If stridor is present, consider Epinephrine 1mg/ml, 5ml nebulized</li><li>Diphenhydramine PO/IV/IO/IM if not already given (Adults 25mg IV/IO, 50mg PO/IM – Peds IM/IV/IO 1mg/kg, over 8yo PO 25mg)</li><li>Methylprednisolone IV/IO/IM (125mg adult / 2mg/kg peds)</li><li>In anaphylaxis, consider Glucagon 1mg IV over 2 min as a reversal agent for patients taking daily beta blockers such as metoprolol</li><li>Epinephrine infusion (0.5mcg/kg/min) when cardiovascular collapse is present despite repeated IM Epi and at least 60cc/kg isotonic bolus.</li><li>Push dose Epinephrine for severe hypotension or impending arrest</li><li>Advanced airway management as indicated</li></ul>	

**Consult Online Medical Control As Needed**



# Allergic Reaction and Anaphylaxis

## Key Performance Indicators:

1. Use of epinephrine for patients with signs/symptoms of anaphylaxis
2. Patients requiring airway management in the prehospital setting

## Special Considerations:

- Refer to drug formulary charts/Handtevy for all medication dosing for both adults and pediatric patients.
- Non-anaphylactic allergic reaction generally involves only one organ system (e.g. localized angioedema without airway compromise, or not associated with vomiting; hives alone)
- Anaphylaxis is more severe and is characterized by an acute onset involving one of the following:
  - The skin (urticaria) and/or mucosa with either respiratory compromise or decreased blood pressure or signs of end-organ dysfunction
  - Hypotension after exposure to a known antigen
  - Two or more of the following occurring rapidly after exposure:
    - Skin and/or mucosal involvement ( urticaria, hives, swollen tongue/lips)
    - Respiratory compromise (dyspnea, wheezing, stridor, hypoxemia)
    - Persistent gastrointestinal symptoms (vomiting, abdominal pain, diarrhea)
    - Hypotension or associated symptoms (syncope, hypotonia, incontinence)
- The shorter the onset from exposure to symptoms, the worse the reaction.
- Epinephrine is the single most important intervention in this setting and has small risk for high benefit.
- When anaphylaxis is suspected, providers should always consider epinephrine as a first-line treatment.
- Cardiovascular collapse may occur suddenly, without prior development of skin or respiratory symptoms.
- Continue reassessment after stabilization for rebound reaction with need for additional epinephrine.
- Any patient with respiratory symptoms or extensive reaction should receive IV/IO/IM diphenhydramine as well as steroids.
- In general, epinephrine should not be used as prophylaxis after exposure to a known allergen in an asymptomatic patient, even with a history of prior anaphylaxis.

## References:

1. Dodd A, Hughes A, Sargant N, Whyte AF, Soar J, Turner PJ. Evidence update for the treatment of anaphylaxis [published online ahead of print, 2021 Apr 23]. *Resuscitation*. 2021;163:86-96. doi:10.1016/j.resuscitation.2021.04.010
2. Andrew E, Nehme Z, Bernard S, Smith K. Pediatric Anaphylaxis in the Prehospital Setting: Incidence, Characteristics, and Management. *Prehosp Emerg Care*. 2018 Jul-Aug;22(4):445-451. doi: 10.1080/10903127.2017.1402110. Epub 2018 Jan 19. PMID: 29351501.
3. Jacobsen RC, Gratton MC. A case of unrecognized prehospital anaphylactic shock. *Prehosp Emerg Care*. 2011 Jan-Mar;15(1):61-6. doi: 10.3109/10903127.2010.519823. Epub 2010 Oct 18. PMID: 20954971.
4. Brasted ID, Dailey MW. Basic Life Support Access to Injectable Epinephrine across the United States. *Prehosp Emerg Care*. 2017 Jul-Aug;21(4):442-447. doi: 10.1080/10903127.2017.1294224. Epub 2017 Mar 24. PMID: 28339320.



## Altered Mental Status

<b>Assessment</b>			
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	
• Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape/Handtevy or similar.		<ul style="list-style-type: none"><li>Decreased alertness</li><li>Change in baseline mental status.</li><li>Bizarre behavior</li><li>Skin temperature or color changes</li><li>Fruity breath</li><li>Kussmaul respirations</li><li>Dry mucous membranes</li><li>Slurred speech</li><li>Facial droop</li><li>Extremity weakness</li></ul>	
<b>Clinical Management Options</b>			
E	A	I	P
M	E		A
T	M		P
	T		P
<ul style="list-style-type: none"><li>Provide supplemental oxygen as needed with target SpO<sub>2</sub> 92 – 96%</li><li>Blood glucose assessment; if BGL &lt; 50 and intact gag reflex then Oral Glucose</li><li>Disconnect or disable insulin pump if present</li><li>If BGL &lt; 50 and no IV access, then administer Glucagon 1mg IM</li><li>Basic Airway Management as needed</li><li>If narcotic overdose is suspected, administer NALOXONE (NARCAN) 2 mg IN, titrated only to respiratory effort. Max 8mg total via any route and including doses given prior to EMS arrival.</li><li>If positive Stroke Screen &amp; Glucose &gt; 50 and Last known well &lt; 24 hours, then declare Stroke Alert. See Stroke Protocol; goal &lt; 15 minute on-scene time.</li><li>Monitor SpO<sub>2</sub> and ETCO<sub>2</sub></li><li>Obtain 12-lead ECG</li></ul>			
<ul style="list-style-type: none"><li>Consider IV/IO access as indicated</li><li>If narcotic overdose is suspected, administer NALOXONE (NARCAN) 0.4mg up to 4 mg IV/IO/IN over 3-5 minutes, titrate to positive respiratory improvement. Max 8mg total via any route and including doses given prior to EMS arrival.</li><li>If BGL &lt; 50 then Dextrose Infusion titrated to patient condition and response; Repeat BGL every 5 minutes and consider additional dosing as needed</li><li>If BGL &gt; 300 in adults or &gt; 200 in pediatrics or signs of dehydration, then isotonic crystalloid IV fluid bolus 20 cc/kg</li></ul>			
<ul style="list-style-type: none"><li>Advanced Airway Management as needed</li></ul>			

### Consult Online Medical Control As Needed

#### Key Performance Indicators:

- 1) BGL assessment documented
- 2) Appropriate dosing of Narcan
- 3) Stroke assessment performed



# Altered Mental Status

## Special Considerations:

- Refer to medication index for all medication dosing for both adults and pediatric patients.
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon.
- In malnourished or neonatal patients, consider that the gluconeogenesis process may not be functional and Glucagon may not be effective.
- Do not let a patient's intoxication confuse your clinical practice; intoxication is frequently associated with hypoglycemia, trauma and other life threats.
- Hyperglycemia is initially treated with fluids since these patients are volume depleted.
- Any patient found to be hypoglycemic on oral agents without insulin use should be evaluated by the ED; oral agents typically have 24 hour dosing and the patient will likely experience recurrent hypoglycemia despite food intake or dextrose administration. Some long acting insulins may have similar effects.
- If hypoglycemic patients have returned to baseline and wish to refuse, try to make sure that the patient eats and that there is someone to observe them for repeat hypoglycemic episodes.
- When measuring blood glucose, the collection method recommended for the device in question (venous vs capillary) is likely to be most accurate. However, use of the alternate method (ie venous sampling for a capillary-intended device) should generally provide an assessment sufficiently accurate to identify blood glucose derangements in need of treatment, and in some instances may be more feasible in a limited-resource clinical environment.

## References:

1. Alvarez MD, Al'ai. "Approach to Altered Mental Status." Default, September 2019.  
<https://www.saem.org/about-saem/academies-interest-groups-affiliates2/cdem/for-students/online-education/m4-curriculum/group-m4-approach-to/approach-to-altered-mental-status>.
2. Lacara T, Domagtoy C, Lickliter D, Quattrocchi K, Snipes L, Kuszaj J, Prasnikar M. Comparison of point-of-care and laboratory glucose analysis in critically ill patients. Am J Crit Care. 2007 Jul;16(4):336-46; quiz 347. PMID: 17595363.  
<https://pubmed.ncbi.nlm.nih.gov/17595363/>



# Bradycardia with Pulse

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape/Handtevy or similar.
- Focus on rapid and early BLS airway and ventilation tools. Intubation is often not the best option for these patients.
- Pediatric pads should be used in children < 10 Kg or Broselow® tape color purple.

### Signs & Symptoms:

- HR < 60 min with hypotension
- Acute altered LOC
- CHF
- Seizure, syncope, or shock secondary to bradycardia.
- Altered LOC
- Shock / Hypotension
- Syncope

### Differential:

- Respiratory distress
- Respiratory obstruction
- Beta blocker / Digoxin
- Calcium Channel Blocker
- Organophosphate
- Hypovolemia
- Hypothermia
- Hypoxia
- Infection / Sepsis
- Medication or Toxin
- Trauma
- Arrhythmia / Acute MI

## Clinical Management Options

E	A	I	P	A
M	E		P	
T	M		P	
	T			

- Assessment with consideration of reversible causes such as hypoxia / toxicology
- Oxygen/ventilation as needed to support SpO<sub>2</sub> 94%-99% and EtCO<sub>2</sub> 35-45mmHg
- Basic airway management as indicated
- If pediatric with HR < 60 and poor perfusion despite oxygenation & ventilation, begin Pit Crew CPR
- 12 lead EKG placement and acquisition; receiving facility notification as indicated
- Consider IV/IO access as indicated
- Isotonic Crystalloid 20ml/kg titrated to SBP  $\geq$  100 mmHg or MAP  $\geq$  65
- Monitor and interpret EKG; consider electrolyte abnormality or toxicologic causes
- Consider Glucagon 1mg IV over 2 min as a reversal agent for patients taking daily beta blockers such as metoprolol
- Pediatric: consider epinephrine 0.01mg/kg IV/IO; May repeat every 3-5 mins
- Consider Atropine: Adult 1 mg IV/IO every 3-5 min up to 3mg; Pediatric 0.02 mg/kg IV/IO with min dose 0.1mg and max 0.5mg, may repeat in 3-5 min only once.
- Consider Transcutaneous Cardiac Pacing with sedation/pain control as situation indicates - Midazolam is preferred sedation agent
- Adult: Consider Norepinephrine (Levophed) infusion 0.5mcg to 30mcg/min or Epinephrine infusion 2-10 mcg/min, titrated to MAP  $\geq$  65
- Push dose Epinephrine titrated to MAP  $\geq$  65; Adult 10-20 mcg boluses q2min; Pediatric 0.01mg/kg every 3-5 min with max single dose 10mcg
- Advanced airway management as needed

**Consult Online Medical Control As Needed**

### Critical Benchmarks:

1. Blood sugar measurement
2. Consideration of reversible underlying causes



# Bradycardia with Pulse

## Notes:

- Refer to the medication index charts for all medication dosing for both adults and pediatric patients.
- Bradycardia should be managed via the least invasive manner possible, escalating care as needed. Treatment of bradycardia is based on the presence of symptoms. If asymptomatic, monitor only.
- Monitor carefully for decompensation, including progression to pulseless electrical activity.
- Third-degree heart block or the denervated heart (as in cardiac transplant) may not respond to atropine and in these cases, proceed quickly to chronotropic agents (such as epinephrine), or transcutaneous pacing
- In cases of impending hemodynamic collapse, proceed directly to transcutaneous pacing
- Be aware of acute coronary syndrome as a cause of bradycardia in adult patients; the use of atropine for bradycardia in the presence of an MI may worsen ischemia.
- The use of lidocaine or amiodarone in heart block, or in rhythms with escape beats, can worsen bradycardia and lead to asystole and death.
- Many toxicologic causes for bradycardia can be found in common prescriptions, such as beta-blockers, and calcium channel blockers. A toxic response may be a result of purposeful ingestion, but can also be situational, such as normal medication dosing in the setting of dehydration.
- Pediatric bradycardia is often related to hypoxia.
- When presented with a bizarre/wide complex bradycardic cardiac complex, always consider hyperkalemia.
- Glucagon use may cause emesis.
- Medication dosing for pediatric patients should be based on ideal body weight.
- While research suggests that patients in cardiogenic or septic shock treated with norepinephrine have a lower mortality than when treated with other vasopressors, be aware that norepinephrine can in theory cause bradycardia.

## References:

1. "Adult Bradycardia Algorithm" American Heart Association. [https://cpr.heart.org/-/media/CPR-Files/CPR-Guidelines-Files/Algorithms/AlgorithmACLS\\_Bradycardia\\_200612.pdf](https://cpr.heart.org/-/media/CPR-Files/CPR-Guidelines-Files/Algorithms/AlgorithmACLS_Bradycardia_200612.pdf)
2. "Pediatric Bradycardia with a Pulse Algorithm", American Heart Association. [https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/algorithms/algorithmpals Bradycardia\\_200707.pdf?la=en](https://cpr.heart.org/-/media/cpr-files/cpr-guidelines-files/algorithms/algorithmpals Bradycardia_200707.pdf?la=en)
3. Weingart S. *EMCrit Podcast 6 – Push-Dose Pressors*. July 10, 2009. <http://emcrit.org/podcasts/bolus-dose-pressors/>. Accessed Nov 29, 2021.
4. Weingart S. *Emcrit Podcast 205 - Push-Dose Pressors Update*. August 7, 2017 <https://emcrit.org/emcrit/push-dose-pressor-update/> . Accessed Nov 29, 2021



## Chest Pain / Suspected ACS / STEMI

<b>Assessment</b>				
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>	
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by the Broselow® tape or Handtevy.</li><li>Focus on rapid and early BLS airway and ventilation tools. Pediatric intubation is rarely indicated.</li></ul>		<ul style="list-style-type: none"><li>Pain or pressure between navel and jaw</li><li>“Heart racing”, “palpitations”, or “heart too slow”</li><li>CHF signs of symptoms</li><li>Syncope</li><li>Severe weakness</li><li>Difficulty breathing (no obvious respiratory cause)</li></ul>	<ul style="list-style-type: none"><li>Angina vs Myocardial infarction</li><li>Pericarditis</li><li>Pulmonary embolism</li><li>Asthma / COPD</li><li>Pneumothorax</li><li>Aortic dissection</li><li>GI reflux / Hiatal hernia / PUD</li><li>Esophageal spasm</li><li>Chest wall injury or pain</li><li>Pleuritic pain</li></ul>	
<b>Clinical Management Options</b>				
E M T T	A E M T	I P P	A P P	<ul style="list-style-type: none"><li>Oxygen PRN titrated to <math>\text{SpO}_2</math> 92-96%; Basic airway management</li><li>Continuous vital sign monitoring; mandatory vital signs every 5 min during and after administration of medications.</li><li>12-lead ECG placement and acquisition ASAP; transmit immediately to the receiving facility. If machine interpretation states “Acute MI”, see Notes below for guidance.</li><li>Perform bilateral blood pressures; if difference between R &amp; L arm SBP is <math>\geq</math> 20mmHg then consider aortic dissection and withhold Aspirin and Nitro.</li><li>Aspirin PO up to 325mg. It’s acceptable to “top off” home smaller doses (ie 81mg), but do not exceed 325 mg in a 24 hour period.</li><li>DO NOT WALK the patient to the unit. Transport and notify the hospital as soon as possible with goal scene time &lt;15 minutes.</li><li>Nitroglycerin if reporting chest pain or pressure with SBP <math>\geq</math> 140 mmHg; may repeat up to a total of three (3) doses each 5 min apart, regardless of the number of doses administered prior to EMS arrival. Do not give additional nitro if the patient’s systolic BP is less than 120 mmHg. If fluids have been given to the patient in order to increase their BP, do not give Nitroglycerin.</li><li>Consider IV/IO access as indicated.</li><li>Isotonic Crystalloid bolus as needed titrated to SBP <math>\geq</math> 100 mmHg or MAP <math>\geq</math> 65.</li><li>Obtain and interpret ECG within 5 minutes of patient contact. Transmission is required in the setting of STEMI, with a repeat every 15 min and changes transmitted. In general, transmission is not required at other times unless it is pertinent to patient care, such as in the setting of cardiac arrhythmias or indeterminate findings. If cardiac arrhythmias are present, follow the appropriate protocol(s) and notify the receiving facility immediately. Consider early placement of defib pads as indicated.</li><li>Declaration of “STEMI Alert” and goal scene time &lt; 10 minutes; see Notes below for STEMI ALERT guidance.</li><li>Consider Crystalloid IV Fluid bolus for Inferior Wall MI.</li><li>If Hypersympathetic state (e.g. sustained tachycardias and hypertension) from stimulant abuse, consider Midazolam.</li><li>Fentanyl is the preferred pain management medication if medication beyond nitroglycerin is indicated.</li></ul>



# Chest Pain / Suspected ACS / STEMI

## Consult Online Medical Control As Needed

### Key Performance Indicators:

1. Initial 12-lead ECG within 5 minutes of initial patient contact.
2. Transmission of ECG to receiving PCI facility or closest facility <5 minutes after obtaining initial ECG.
3. Direct transport to PCI facility if possible.

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Avoid Nitroglycerin use in the following situations:
  - Any patient with Viagra (sildenafil) or Levitra (vardenafil) use in the past 24 hours, Cialis (tadalafil) use in the past 48 hours or use of other phosphodiesterase inhibitor (PDE) medications.
  - Patients receiving IV epoprostenol (Flolan) or treprostienil (Remodulin), often due to a diagnosis of Pulmonary Hypertension.
  - Patients with ECG changes suggesting inferior wall / right ventricular involvement
- If the patient meets STEMI ALERT criteria, attempt to establish a second IV but do not delay transport.
- Monitor for hypotension and respiratory distress after administration of nitroglycerin, or narcotic medications. EtCO<sub>2</sub> monitoring is indicated if narcotics are administered.
- Female, diabetic and geriatric patients are more likely to have atypical pain, or generalized complaints. Anginal equivalents may include but are not limited to back pain, arm heaviness, shortness of breath or orthopnea, unusual fatigue and epigastric pain.
- While direct transport to a PCI-capable facility is preferred for STEMI or suspected ACS patients even when it involves bypassing a non-PCI capable facility, it is always acceptable to divert to the nearest ED for stabilization. Provide notification as early as possible, including the suspected differential diagnoses.
- BLS: When machine read states "Acute MI", or you have clinical suspicion as such, follow STEMI ALERT direction as listed below.
- ALS: When ECG demonstrates STEMI criteria or you have clinical suspicion as such, follow STEMI ALERT direction as listed below.
- STEMI ALERT: Transmit ECG immediately to receiving facility. For Centra Lynchburg General, use email: [carepoint-lynchburg@centrahealth.gdcarepoint.com](mailto:carepoint-lynchburg@centrahealth.gdcarepoint.com) or fax (434-200-1508). Contact Med Comm (LGH Based) at (434)200-3262 with agency name and crew level of training, patient name, date of birth, and patient report including vital signs, ECG findings and presence or absence of pain. MedComm will not alert the Cath Lab until there has been radio/phone contact from the EMS crew.

If the agency is unable to transmit for any reason, EMT/AEMT should contact Med Comm and report ECG machine readout. I/P/APP should contact Med Comm and report ECG interpretation including STEMI criteria findings. Per the Interventional Cardiology program, it is acceptable for the Catheterization Lab to be activated based solely on verbal report of ECG findings if transmission cannot occur.

A copy of the initial concerning ECG and also the most recent ECG should be provided on patient care turnover. A copy should also be included with any paper PCR provided to the receiving facility.



## Chest Pain / Suspected ACS / STEMI

### References:

1. Bosson KN, Kaji AH, Niemann JT, et al. The utility of prehospital ECG transmission in a large EMS system. *Prehosp Emerg Care*. 2015;19(4):496-503.
2. Akbar H, Foth C, Kahloon RA, et al. Acute ST Elevation Myocardial Infarction. [Updated 2021 Aug 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532281/>
3. Mechanic OJ, Gavin M, Grossman SA. Acute Myocardial Infarction. [Updated 2021 Aug 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459269/>
4. Cheong, V.-Lin, Hadar Zaman, and Saima Annette Corresponding author V.-Lin Cheong. "Pharmacotherapy of STEMI: A Review of International Guidelines." *The Pharmaceutical Journal*, June 2, 2021. <https://pharmaceutical-journal.com/article/research/pharmacotherapy-of-st-elevation-myocardial-infarction>.
5. "STEMI." Default, n.d. [https://www.saem.org/about-saem/academies-interest-groups-affiliates2/cdem/for-students/online-education/m3-curriculum/group-electrocardiogram-\(ecg\)-rhythm-recognition/stemi](https://www.saem.org/about-saem/academies-interest-groups-affiliates2/cdem/for-students/online-education/m3-curriculum/group-electrocardiogram-(ecg)-rhythm-recognition/stemi).

# Narrow Complex Tachycardia with Pulse

<b>Assessment</b>			
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by the Broselow® Tape/Handtevy or similar.</li><li>Focus on rapid and early BLS airway and ventilation tools. Intubation is rarely indicated for these patients.</li><li>Pediatric pads should be used in children &lt; 10 Kg or Broselow tape color purple.</li></ul>		<ul style="list-style-type: none"><li>QRS <math>\leq</math> 0.12 sec</li><li>Pale or Cyanosis</li><li>Diaphoresis</li><li>Tachypnea</li><li>Vomiting</li><li>Hypotension</li><li>Altered Level of Consciousness</li><li>Pulmonary Congestion</li><li>Syncope</li></ul>	
<b>Differential:</b>			
<ul style="list-style-type: none"><li>Structure abnormalities (WPW, Valvular)</li><li>Sick sinus syndrome</li><li>Myocardial infarction</li><li>Electrolyte imbalance</li><li>Exertion, pain, emotional stress</li><li>Fever</li><li>Hypoxia or Anemia</li><li>Hypovolemia</li><li>Drug effect / Overdose</li><li>Hyperthyroidism</li><li>Pulmonary embolus</li><li>Alcohol withdrawal</li></ul>			
<b>Clinical Management Options</b>			
<b>E</b> <b>M</b> <b>T</b>  <b>A</b> <b>E</b> <b>M</b>  <b>I</b> <b>P</b> <b>P</b>  <b>P</b>	<ul style="list-style-type: none"><li>Oxygen PRN titrated to SpO<sub>2</sub> 94%-99%</li><li>Basic airway management</li><li>4 lead and 12 lead ECG placement and acquisition</li><li>Apply waveform EtCO<sub>2</sub></li></ul>		
	<ul style="list-style-type: none"><li>Consider IV/IO access as indicated</li><li>Isotonic Crystalloid PRN titrated to SBP <math>\geq</math> 100 mmHg or MAP <math>\geq</math> 65</li><li>Monitor and interpret of ECG</li><li>Valsalva Maneuver (Adults only)</li><li>Adenosine IV as indicated (Adults 6mg then 12mg / Peds 0.1mg/kg then 0.2mg/kg, not to exceed adult doses)</li><li>Continuous 12-lead ECG during Adenosine administration, if possible</li><li>Consider Midazolam or Ketamine for sedation as appropriate</li><li>Adult Synchronized Cardioversion at maximum joules</li><li>Pediatric Synchronized Cardioversion 0.5 to 1.0 j/kg, repeat as needed at 2 j/kg</li><li>12 lead ECG post conversion</li><li>Diltiazem (Adults only) – Consider Medical Control discussion for rhythms other than Atrial Fibrillation; contraindicated in the setting of Wolff-Parkinson-White Syndrome</li></ul>		

## Consult Online Medical Control As Needed

### Key Performance Indicators:

- 12 lead EKG obtained and reviewed by ALS / receiving facility
- Vital signs pre and post intervention

# Narrow Complex Tachycardia with Pulse

## Special Considerations:

- Refer to medication index/Handtevy for all medication dosing for both adults and pediatric patients.
- There are many non-medical causes of tachycardia, and situational clues should always be considered.
- Sinus tachycardia may be misinterpreted as Supraventricular Tachycardia or Atrial Fibrillation. Sinus tach >150 (adult) or >180 (pediatric) may be seen in sepsis or other compensatory state.
- Use caution in patients currently on antihypertensive medication with cardiac rate impact, such as Metoprolol.
- Adenosine may not be effective in converting atrial flutter / fibrillation but may slow rhythm sufficiently to better interpret.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Continuous pulse oximetry should be used for all tachycardia patients.
- Narrow complex tachycardia in the setting of alcohol withdrawal should be treated with fluids and midazolam, rather than a rate controlling medication.
- Consider a change of vector to anterior/posterior pad placement if initial cardioversion is unsuccessful.

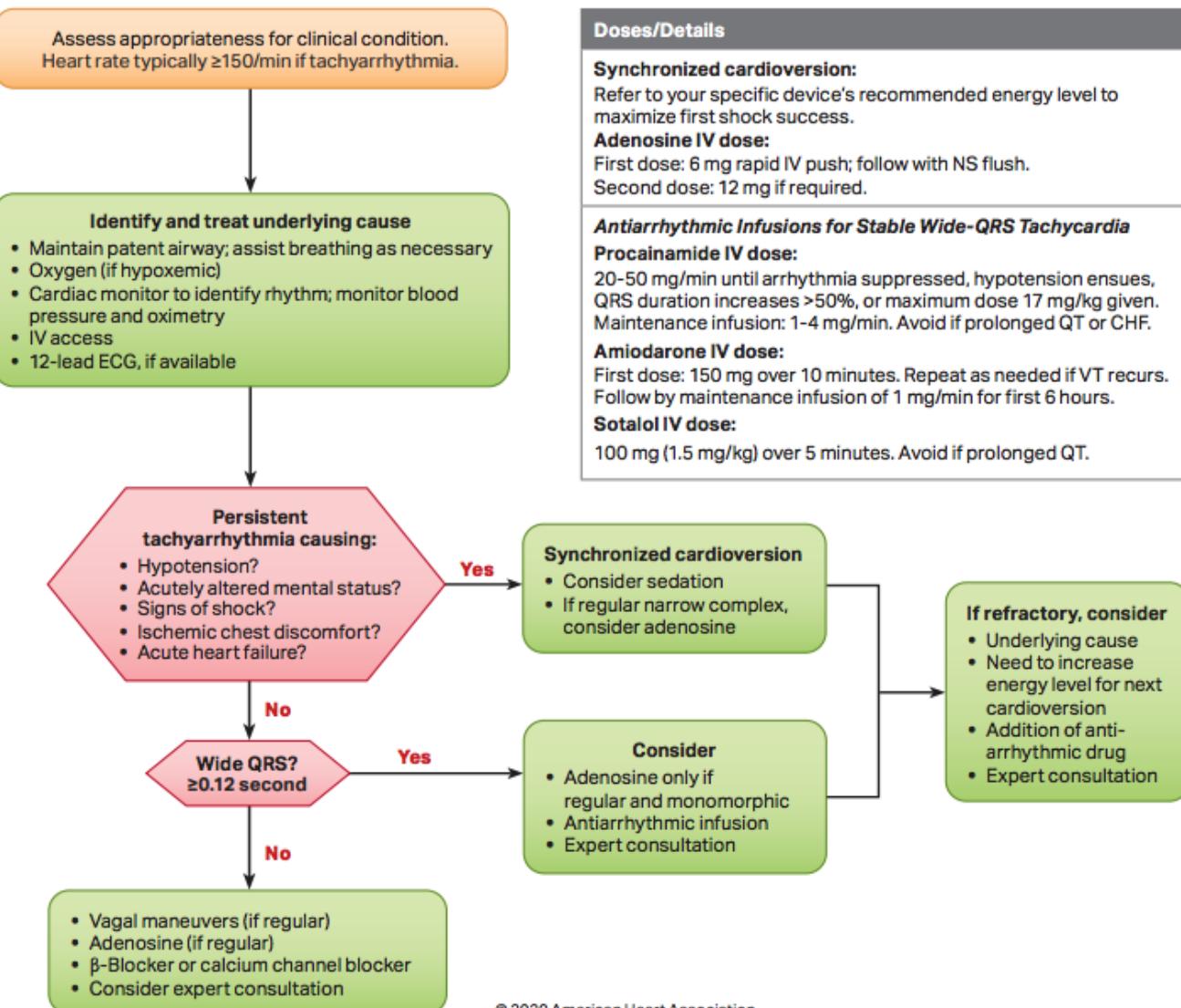
## References:

1. "Pediatric Tachycardia With a Pulse Algorithm", American Heart Association. [Pediatric Tachycardia With a Pulse Algorithm](#)
2. "Adult Tachycardia With a Pulse Algorithm", American Heart Association. [Adult Tachycardia With a Pulse Algorithm](#)
3. Honarbakhsh S, Baker V, Kirkby C, et al/Safety and efficacy of paramedic treatment of regular supraventricular tachycardia: a randomised controlled trial *Heart* 2017; **103**:1413-1418. <https://heart.bmjjournals.org/content/103/18/1413>



# Narrow Complex Tachycardia with Pulse

## Adult Tachycardia With a Pulse Algorithm

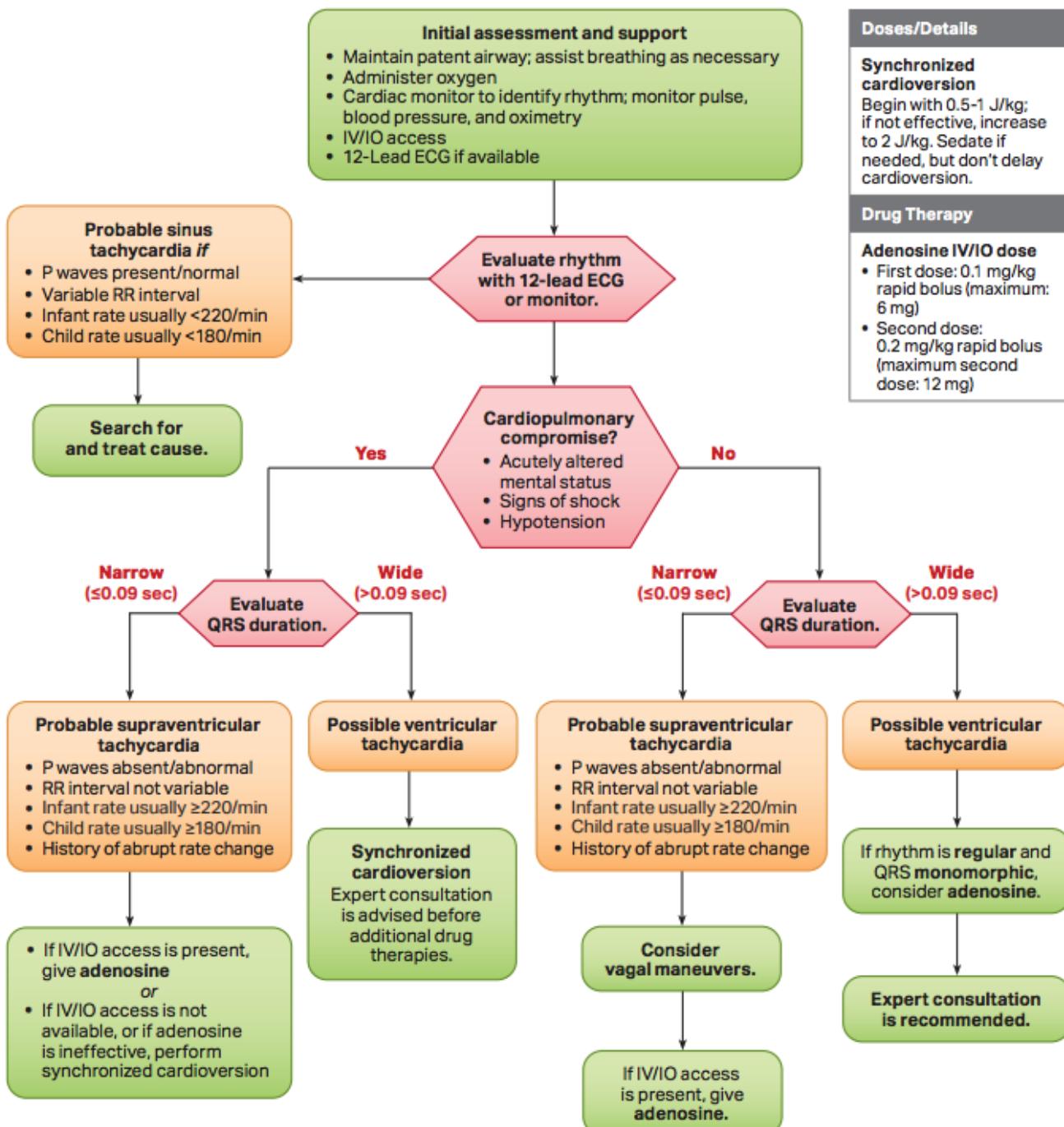


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# Narrow Complex Tachycardia with Pulse

## Pediatric Tachycardia With a Pulse Algorithm



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## Wide Complex Tachycardia with Pulse

### G O A L S

- Optimize oxygenation
- Optimize perfusion
- Consider possible causes

### Clinical Management Options

E M T A I P A P P

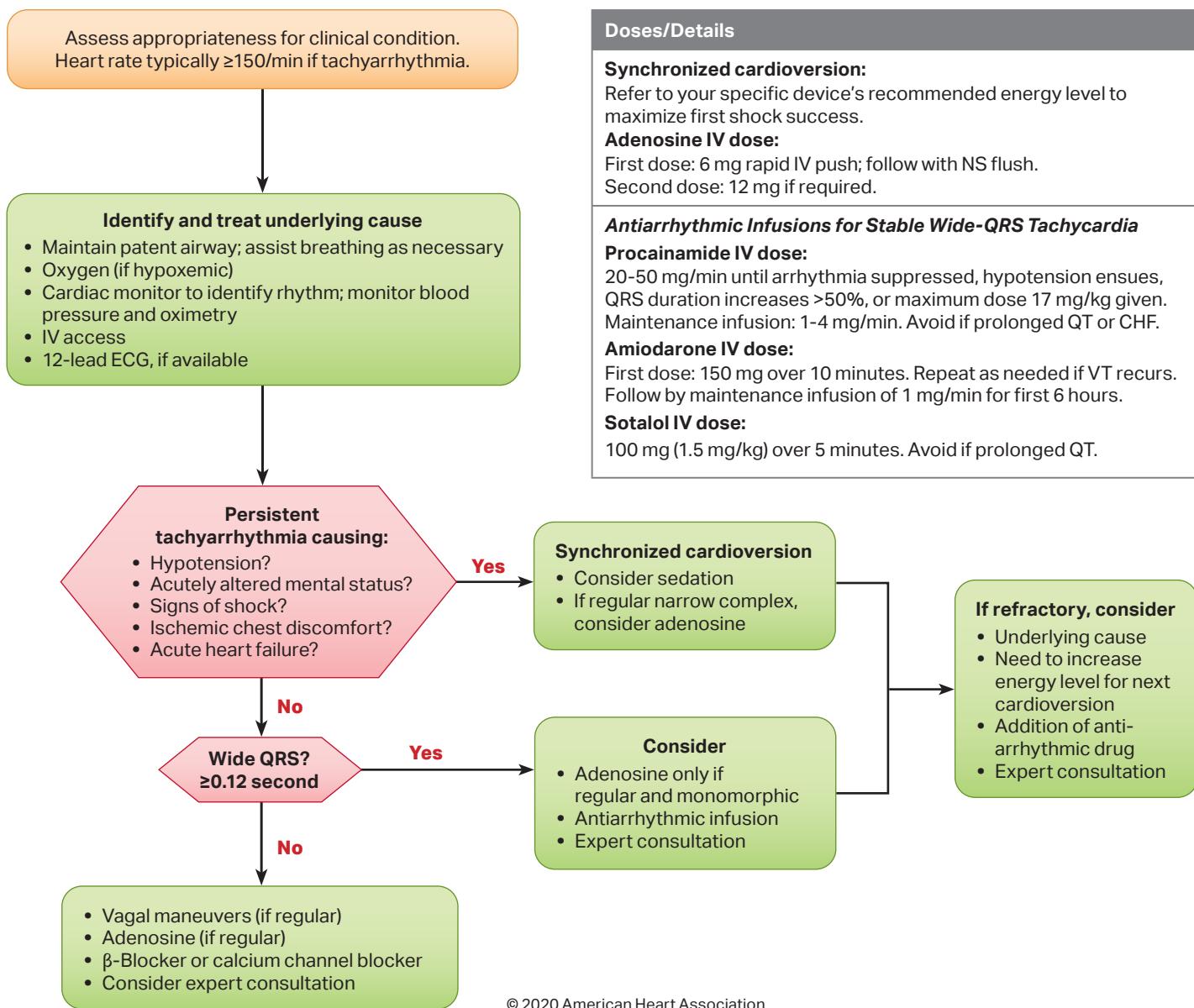
- Oxygen PRN titrated to SpO<sub>2</sub> 92%-96%.
- Basic airway management as indicated.
- Obtain 12-lead ECG and transmit as indicated.
- Apply waveform EtCO<sub>2</sub>
- IV/IO access as indicated
- Isotonic Crystalloid PRN titrated to SBP  $\geq$  100 mmHg or MAP  $\geq$  65
- Stable:
  - Lidocaine 1.0 – 1.5 mg/kg IV; may repeat every 5 minutes up to max 3 mg/kg
  - Unstable:
    - Adult synchronized cardioversion 200 Joules
    - Consider sedation if time permits: Midazolam 2.5 mg IN/IM/IV
  - Repeat 12-lead ECG post-cardioversion
- Stable: Consider **Amiodarone 150 mg in 100ml NS IV over 10 minutes**

### Consult Online Medical Control as Needed

### P E D I A T R I C S

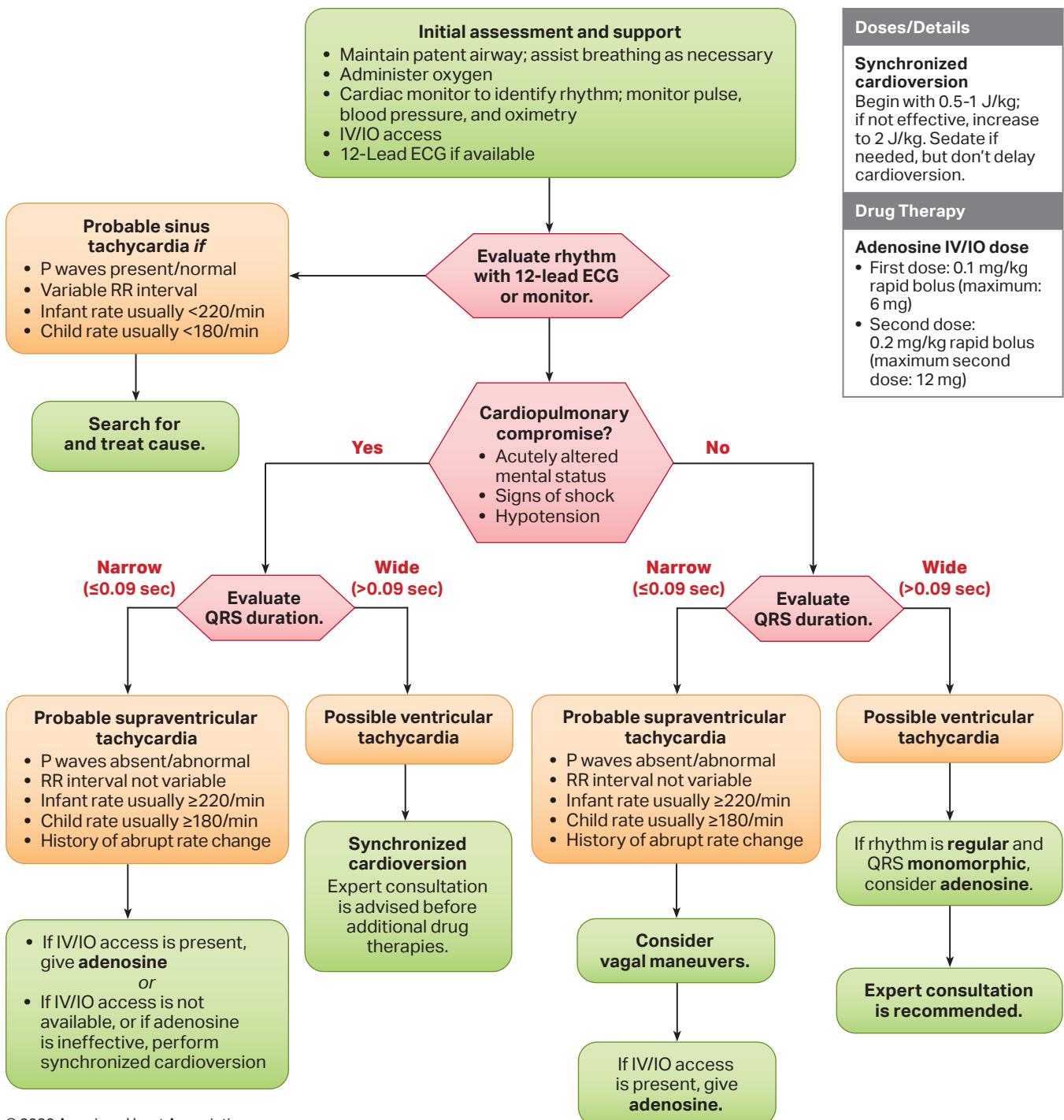
- Stable:
  - **Lidocaine 1mg/kg IV**; may repeat every 10-15 minutes up to a max 3mg/kg
  - **Amiodarone (Only available in the AP Bag):**
    - < 10kg: 5mg/kg IV in 50mL NS over 20 minutes – max 50mg.
    - >10kg: 5mg/kg IV in 100mL NS over 20 minutes
- Unstable:
  - Pediatric synchronized **cardioversion: 0.5 -1 J/kg**; repeat at 2 J/kg as needed.

## Adult Tachycardia With a Pulse Algorithm



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## Pediatric Tachycardia With a Pulse Algorithm



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# Wide Complex Tachycardia with Pulse

## Special Considerations:

- **Hyperkalemia** (slow and wide complex): **Calcium Chloride 1 gram IV** over 1-2 min
- **Tricyclic Overdose**: **Sodium Bicarbonate 50-100 mEq (1-2 amps) IV** and **Magnesium 1-2g IV** over 15 minutes
- **Torsades**: **Magnesium 2g in 100mL NS IV** over 5 minutes
- Artifact / Device failure
- Cardiac History
- Endocrine / Electrolyte
- Pulmonary Disease
- Can occur at HR < 150 (Contact Medical Command)
- Don't place defib pads over devices (e.g. port, AICD, etc)
- Per AHA guidance, arrhythmias with a polymorphic QRS appearance such as torsades, will usually not permit synchronization. If the patient has polymorphic VT, treat as VF with high energy unsynchronized shocks (e.g. defibrillation doses).

## Key Performance Indicators:

1. Document initial rhythm

## References:

1. [Definitions and Assessment Approaches for Emergency Medical Services for Children](#)
2. Pediatric Assessment Algorithm: [https://cpr.heart.org/-/media/cpr-files/cpr-guidelinesfiles/algorithms/algorithmpals Bradycardia\\_200707.pdf?la=en](https://cpr.heart.org/-/media/cpr-files/cpr-guidelinesfiles/algorithms/algorithmpals Bradycardia_200707.pdf?la=en)
3. [AHA Pediatric Tachycardia with a Pulse](#)
4. [AHA Adult Tachycardia with a Pulse](#)
5. Emamhadi M, Mostafazadeh B, Hassanijirdehi, M. Tricyclic antidepressant poisoning treated by magnesium sulfate: a randomized, clinical trial. *Drug and Chemical Toxicology*. 2012; 35(3).
6. Body R, Bartram T, Azam F, Mackway-Jones K. Guidelines in Emergency Medicine Network (GEMNet): guideline for the management of tricyclic antidepressant overdose. *Emerg Med Journal*. 2011; 28(4): 347 – 368.
7. Sarisoy O, Babaoglu K, Tugay S, Barn E, Gokalp AS. Efficacy of magnesium sulfate for treatment of ventricular tachycardia in amitriptyline intoxication. *Ped Emerg Care*. 2007; 23(9): 646 – 648.



# Diabetic Emergencies

		<b>Assessment</b>	
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
• Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape/Handtevy or similar.		<ul style="list-style-type: none"><li>Decreased alertness</li><li>Change in baseline mental status</li><li>Bizarre behavior</li><li>Skin temperature or color changes</li><li>Fruity breath</li><li>Kussmaul respirations</li><li>Dry mucous membranes</li><li>Slurred speech</li><li>Facial droop</li><li>Extremity weakness</li></ul>	<ul style="list-style-type: none"><li>Hypoxia</li><li>Brain trauma</li><li>CNS (Stroke, Tumor, Seizure, Infection)</li><li>Cardiac (MI, CHF)</li><li>Infection</li><li>Thyroid (hyper or hypo)</li><li>Shock (septic, metabolic, traumatic)</li><li>Toxicological / Carbon Monoxide / Cyanide</li><li>Acidosis / Alkalosis</li><li>Heat Stroke or Hypothermia</li><li>Electrolyte abnormality</li></ul>
<b>Clinical Management Options</b>			
E M T A E M T	A P P	<ul style="list-style-type: none"><li>Provide supplemental oxygen as needed with target SpO<sub>2</sub> 92 – 96%</li><li>Blood glucose assessment; if BGL &lt; 60 and intact gag reflex then Oral Glucose</li><li>Disconnect or disable insulin pump if present and trained. Contact Medical Control for further.</li><li>If BGL &lt; 60, administer Glucagon 1mg IM in adults.</li><li>For pediatrics, administer Glucagon 0.03mg/kg up to 1mg IM/IN.</li><li>Basic Airway Management as needed.</li><li>Monitor SpO<sub>2</sub> and ETCO<sub>2</sub>.</li><li>Obtain 12-lead ECG and transmit as indicated.</li></ul> <ul style="list-style-type: none"><li>Consider IV/IO access as indicated.</li><li>If BGL &lt; 60, administer 100ml bolus of Dextrose 10% infusion via IV/IO titrated to patient condition and response; Repeat BGL every 5 minutes and consider additional dosing as needed.</li><li>For pediatrics with a BGL &lt; 60, administer D10% infusion (2ml/kg).</li><li>If BGL &gt; 300 in adults or &gt; 200 in pediatrics or signs of dehydration, then isotonic crystalloid IV fluid bolus 20 cc/kg.</li></ul> <ul style="list-style-type: none"><li>Advanced Airway Management as needed</li></ul>	

**Consult Online Medical Control As Needed**



## Diabetic Emergencies

### **Special Considerations:**

- Refer to medication index for all medication dosing for both adults and pediatric patients.
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after Dextrose or Glucagon.
- In malnourished or neonatal patients, consider that the gluconeogenesis process may not be functional and Glucagon may not be effective.
- Do not let a patient's intoxication confuse your clinical practice; intoxication is frequently associated with hypoglycemia, trauma and other life threats.
- Hyperglycemia is initially treated with fluids since these patients are volume depleted.
- Any patient found to be hypoglycemic on oral agents without insulin use should be evaluated by the ED; oral agents typically have 24 hour dosing and the patient will likely experience recurrent hypoglycemia despite food intake or dextrose administration. Some long acting insulins may have similar effects.
- If hypoglycemic patients have returned to baseline and wish to refuse, try to make sure that the patient eats and that there is someone to observe them for repeat hypoglycemic episodes.
- When measuring blood glucose, the collection method recommended for the device in question (venous vs capillary) is likely to be most accurate. However, use of the alternate method (ie venous sampling for a capillary-intended device) should generally provide an assessment sufficiently accurate to identify blood glucose derangements in need of treatment, and in some instances may be more feasible in a limited-resource clinical environment.



# Hypertension

		Assessment	
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
• Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape/Handtevy or similar.		<ul style="list-style-type: none"><li>Decreased alertness</li><li>Change in baseline mental status</li><li>Bizarre behavior</li><li>Skin temperature or color changes</li><li>Fruity breath</li><li>Kussmaul respirations</li><li>Dry mucous membranes</li><li>Slurred speech</li><li>Facial droop</li><li>Extremity weakness</li></ul>	<ul style="list-style-type: none"><li>Hypoxia</li><li>Brain trauma</li><li>CNS (Stroke, Tumor, Seizure, Infection)</li><li>Cardiac (MI, CHF)</li><li>Infection</li><li>Thyroid (hyper or hypo)</li><li>Shock (septic, metabolic, traumatic)</li><li>Toxicological / Carbon Monoxide / Cyanide</li><li>Acidosis / Alkalosis</li><li>Heat Stroke or Hypothermia</li><li>Electrolyte abnormality</li></ul>
<b>Clinical Management Options</b>			
E M T A E M T	A P P	<ul style="list-style-type: none"><li>Provide supplemental oxygen as needed with target SpO<sub>2</sub> 92 – 96%.</li><li>Basic Airway Management as needed.</li><li>BGL assessment. Follow Diabetic Emergencies protocol as indicated.</li><li>Monitor SpO<sub>2</sub> and ETCO<sub>2</sub>.</li><li>Obtain 12-lead ECG and transmit as indicated. Follow Chest Pain/ACS/CHF protocol as indicated.</li><li>Consider IV/IO access as indicated.</li><li>Re-evaluate 12-lead ECG as indicated and transmit if indicated.</li><li>Advanced Airway Management as needed.</li></ul>	

## Consult Online Medical Control As Needed

### Special Considerations:

- Refer to medication index for all medication dosing for both adults and pediatric patients.



## Hypotension Non-Traumatic

### • resuscitation. **Assessment**

#### **Pediatric Pearls:**

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy and/or Brownselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

#### **Signs & Symptoms:**

- Restlessness, confusion, weakness
- Syncope
- Tachycardia
- Diaphoresis
- Pale, cool, clammy skin
- Delayed capillary refill
- Coffee-ground emesis
- Tarry stools

#### **Differential:**

- Infection/Sepsis
- Dehydration
- Vomiting
- Diarrhea
- Congenital heart disease
- Medication or Toxin
- Anaphylaxis
- Cardiac Failure (myocarditis)

### **Clinical Management Options**

E	A	I	P	A	<ul style="list-style-type: none"><li>• Oxygen</li><li>• Supine position, keep patient warm</li><li>• If suspected allergic reaction, follow the Allergic Reaction/Anaphylaxis protocol.</li><li>• BGL determination. Follow Diabetic Emergencies protocol if indicated.</li></ul>
M			P		<ul style="list-style-type: none"><li>• IV/IO access as indicated.</li><li>• These fluid boluses are for volume depletion – NOT for active bleeding.<ul style="list-style-type: none"><li>• Pediatric: Isotonic Crystalloid bolus 20 ml/kg may repeat 10ml/kg bolus x 2 PRN.</li><li>• Adult non-cardiac: Isotonic Crystalloid 500-1000 ml bolus, may repeat up to 2 liters.</li><li>• Adult Cardiac: Isotonic Crystalloid 250-500 ml bolus, may repeat up to 1 liter.</li><li>• <b>In circumstances when there is concern for volume overload, give in 500ml increments then reassess lung sounds and fluid status.</b></li></ul></li></ul>
T					<ul style="list-style-type: none"><li>• Adult: Norepinephrine (Levophed) infusion, titrated to MAP <math>\geq</math> 65 following fluid</li></ul>

**Consult Online Medical Control As Needed**



## Hypotension Non-Traumatic

### Norepinephrine Infusion and Dosing Volume

#### ADULT DOSING

**Step 1:** Determine concentration and mix medication prior to priming line. If concentration is 4000mcg/250ml or 16mcg/ml, mix 4 mg (4 ml) of Levophed in 250 ml NS, thus creating a concentration of 16 mcg/ml.

**Step 2:** Use 60 gtt set and determine infusion rate

Dose	2 mcg/min	4 mcg/min	6 mcg/min	8 mcg/min	10 mcg/min	12 mcg/min	14 mcg/min	16 mcg/min
Drops per minute	8	15	23	30	38	45	53	60

#### ADULT DOSING

#### Notes:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Adult hypotension can be defined as a systolic blood pressure of < 90 mmHg or MAP < 60 and signs or symptoms of hypoperfusion – altered mental status, increased respirations, tachycardia, poor pulses, skin changes.
- Consider all possible causes of shock and treat per appropriate COG.
- Patients should always have adequate intravascular fluid load prior to the use of vasopressors.
- MAP calculation = [(2 x diastolic) + systolic] divided by 3
- Isotonic Crystalloid should be avoided in patients in whom hemorrhage is suspected.
- Exam: Mental status, skin, heart, lungs, abdomen, back, extremities, and neuro.
- Consider performing orthostatic vital signs on patients in non-trauma situations are suspected blood or fluid loss.
- Consider all possible causes of shock and treat per appropriate protocol.
- Anaphylactic Shock:
  - Do not confuse Epinephrine 1:1,000 IM / SQ and 1:10,000 IV.
  - Treat patients with a history of anaphylaxis aggressively.
  - Routine assessment and supportive care of the patient's respiratory and cardiovascular systems is required.
  - Use caution when using Epinephrine for patients over 50 years of age.
  - Use caution when using Epinephrine for patients with a heart rate greater than 120 bpm.



## Hypotension Non-Traumatic

- Cardiogenic Shock:
  - Circulatory failure is due to inadequate cardiac function.
  - Be aware of patients with congenital defects.
  - Cardiogenic shock exists in the pre-hospital setting when an MI is suspected and there is no specific indication of volume-related shock.
  - Pulmonary edema or CHF may cause cardiogenic shock (pediatrics with congenital heart defects may rarely have pulmonary edema).
  - Marked, symptomatic tachycardia and bradycardia will also cause cardiogenic shock. Fix rate first.
- Hypovolemic Shock:
  - Patients suffering from hemorrhagic shock secondary to trauma, should be treated according to trauma guidelines and transported to the nearest appropriate facility.
  - Initiate a second large-bore IV for all patients in hypovolemic shock, resuscitate to a BP of 90 systolic.
- Neurogenic Shock:
  - Cushing's reflex is a sign of increased ICP (high blood pressure, low pulse rate, and widening pulse pressure).
- Septic Shock:
  - Hypotensive septic shock patients require aggressive fluid resuscitation and should receive vasopressor support if not responding to fluid challenges.



# Nausea / Vomiting

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Handtevy/Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

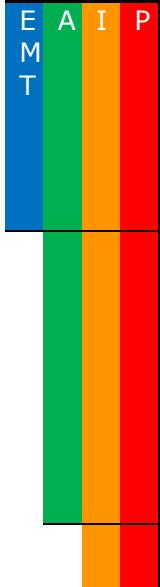
### Signs & Symptoms:

- Fever
- Pain
- Constipation
- Diarrhea
- Anorexia
- Hematemesis

### Differential:

- CNS (Increased ICP, headache, stroke, CNS lesions, Trauma or hemorrhage)
- Vestibular
- AMI
- Medications (NSAIDS, antibiotics, narcotics, chemotherapy)
- GI or GU disorders
- Uremia
- Gynecologic disease (Ovarian Cyst / PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or Toxin induced
- Pregnancy

## Clinical Management Options



- Provide supplemental oxygen as needed with target SpO<sub>2</sub> 92 – 96%.
- BGL assessment. Follow Diabetic Emergencies protocol as indicated.
- Monitor SpO<sub>2</sub> and ETCO<sub>2</sub>.
- Obtain 12-lead ECG and transmit as indicated. Follow Chest Pain/ACS/CHF protocol as indicated.
- Administer Ondansetron (Zofran) 4mg Oral Dissolvable Tablet (ODT).  
• May be repeated once in 15 minutes.
- IV/IO access as indicated.
- If Ondansetron (Zofran) ODT has not been given, administer Ondansetron (Zofran) 4mg IV/IM.  
• May be repeated once in 5 minutes.
- For pediatrics: Administer 0.1mg/kg (for pts. between 15kg - 40kg) IV/IM.  
• May be repeated once in 5 minutes, maximum total dose is 4mg.
- For patients who weigh > 40 kg, administer adult dose.
- Contraindicated for patients < 1 year of age.
- IV fluid with Isotonic Crystalloid 20ml/kg as needed for dehydration.
- 12-lead ECG monitoring and interpretation.
- Advanced airway measures as indicated.

## Consult Online Medical Control As Needed

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Assess number of times of emesis.
- Note the appearance of emesis: bloody, coffee ground, bilious – green bile – solids and liquid or just liquid.
- Heart rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.



# Obstetrical Emergency

## Assessment

### History:

- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para

### Signs & Symptoms:

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of the hands and face

### Differential:

- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion

## Clinical Management Options

E	A	I	P	A	<ul style="list-style-type: none"><li>• Oxygen, target SpO<sub>2</sub> to 92-96%.</li><li>• If post-partum hemorrhage, then fundal massage and encourage infant to breast feed.</li><li>• Obtain 12-lead ECG as indicated.</li><li>• Obtain BGL if indicated.</li><li>• Contact L&amp;D receiving facility as soon as reasonably possible.</li><li>• If trauma is indicated, transport to nearest trauma facility.</li><li>• IV/IO access with Isotonic Crystalloid titrated to effect for vaginal hemorrhage.</li><li>• Suspected Eclampsia: Magnesium Sulfate 4g (10% - 40ml) IV over 4 minutes; Max dose is 4g (8ml diluted to 40ml).</li><li>• Monitoring &amp; Interpretation of ECG and EtCO<sub>2</sub></li><li>• If seizures are present, administer VERSED 5mg slow IV/IN/IO/IM push titrated to effect. Repeat dose in 5 minutes if seizure persists.</li></ul>
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## Consult Online Medical Control As Needed

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- **Eclamptic seizures may occur up to 2 months post-partum. Always consider in pregnant/recently pregnant seizing patient.**
- Severe headache, vision changes, edema, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a SBP greater than >140 or a DBP > 90, or relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Ask patient to quantify bleeding - number of pads used per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation and fetal monitoring in a Trauma Center.
- Magnesium may cause hypotension and decreased respiratory drive, monitor closely.
- Post-partum hemorrhage defined as blood loss > 1000mL or greater than 500mL with signs/symptoms of hypotension. 500mL blood loss is commonly seen in uncomplicated vaginal deliveries without signs or symptoms. The perineum should be checked for bleeding from vaginal tears which may be mistaken for uterine bleeding. Bleeding should be controlled by direct pressure over the laceration.
- The most common cause of post-partum hemorrhage is uterine atony due to prolonged labor or multiple gestations
- If > 20 weeks, consider left lateral position.



# Obstetrical Labor and Childbirth

## Assessment

### History:

- Due date of LMP
- Time contractions started & how often
- Rupture membranes
- Time / amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history
- Gravida / Para status
- Medications
- If known high risk pregnancy

### Signs & Symptoms:

- Episodic pain
- Vaginal discharge or bleeding
- Crowning of urge to push
- Meconium
- Urge to defecate

### Differential:

- Abnormal presentation:
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta
- Premature labor

## Clinical Management Options

E	A	I	P	A
M	E		P	
T	M		P	
	T			

- Oxygen, target SpO<sub>2</sub> to 92-96%.
- When the newborn's mouth appears over the perineum, immediately suction mouth then nose if copious amounts of secretions are present around the infant's airway.
- If post-partum hemorrhage, then fundal massage and encourage infant to breast feed.
- Skin to skin contact for mother and baby.
- Reference Procedures for Birthing, and APGAR Scoring
- Notify L&D receiving facility as soon as reasonably possible.
- IV/IO access with Isotonic Crystalloid titrated to effect if vaginal hemorrhage is present.

## Consult Online Medical Control As Needed

### Special Considerations:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- **Contact OLMC with all indicated Complications of Labor**
- Document all times (delivery, contraction frequency, and length). Record APGAR at 1 minute and 5 minutes after birth.
- If maternal seizures: refer to the Obstetrical Emergencies Guideline. Eclampsia can occur up to 2 months post-partum.
- After delivery, allowing child to nurse and massaging the uterus (lower abdomen) will promote uterine contraction and help to control postpartum bleeding.
- Post-partum hemorrhage defined as blood loss > 1000mL or > 500mL with signs/symptoms of hypotension. The perineum should be checked for bleeding from vaginal tears. Bleeding should be controlled by direct pressure over the laceration.
- The most common cause of post-partum hemorrhage is uterine atony due to prolonged labor, or multiple gestations



# Obstetrical Newborn Care

## Assessment

### History:

- Due date and gestational age
- Multiple gestation (twins, etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Maternal medications
- Maternal risk factors:
  - Substance misuse
  - Smoking

### Signs & Symptoms:

- Respiratory distress
- Normal peripheral cyanosis or mottling
- Abnormal central cyanosis
- Altered level of responsiveness
- Bradycardia

### Differential:

- Airway failure
  - Secretions
  - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia

## Clinical Management Options

E	A	I	P	A
M	E		P	
T	M		P	
	T			

- Oxygen, target SpO<sub>2</sub> to 92-96%.
- Bulb suction only if copious amounts of secretions are present.
- Meconium aspirator suction if meconium or airway obstruction.
- Vigorously dry and stimulate infant.
- Keep the infant warm. This is of utmost importance. Utilize multiple blankets and increase unit/compartment temp even if you as the provider are uncomfortable.
- Obtain an APGAR Score @ 1 and 5 minutes.
- If stable allow to nurse and skin to skin contact for mother and baby.
- If just after birth pulse is < 100: BVM on "room air" for 30 seconds @ rate of 40-60 BPM.
- If after initial ventilations pulse continues at < 60 Begin **CPR: Birth to 5 days 120 compressions with asynchronous ventilations at 30 per minute. Begin with room air and progress to Oxygen.**
- If after initial ventilations pulse continues at 60 - 100: BVM only on "room air" add **Oxygen** as needed to increase SpO<sub>2</sub> if < 95%.
- If after initial ventilations pulse continues at > 100: Monitor and Reassess.
- BGL heel stick as indicated.
- Vascular access – IV or IO if cardiac arrest of critical condition.
- Naloxone if mother received narcotics just prior or during childbirth.
- Dextrose infusion if BGL < 50.
- Isotonic Crystalloid titrated to perfusion.
- Advance airway maneuvers and management as needed.

## Consult Online Medical Control As Needed

### Notes:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Non vigorous infant: evidenced by poor muscle tone, poor/absent respiration and heart rate < 100 bpm
- **If power suction is used, negative pressure must not exceed 100mmHg.**
- It is extremely important to keep infant warm
- Maternal sedation or narcotics will sedate infant. (Naloxone effective but may precipitate seizures if given because of mother's addiction during pregnancy but; not if medications were given by EMS just prior to childbirth).
- Consider hypoglycemia in infant and administer Dextrose per protocol.



# Overdose/Poisoning

Assessment			
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	
<ul style="list-style-type: none"><li>• Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by Handtevy/Broselow® Tape.</li></ul>		<ul style="list-style-type: none"><li>• Salivation</li><li>• Lacrimation</li><li>• Urination</li><li>• Defecation</li><li>• GI distress</li><li>• Emesis</li><li>• Bronchospasm</li><li>• Bronchorrhea</li><li>• Bradycardia</li><li>• Seizure</li></ul>	
<b>Clinical Management Options</b>			
E	A	I	P
M	E	P	A
T	M	P	A
T	T	P	A
<ul style="list-style-type: none"><li>• Ensure scene safety to include PPE.</li><li>• Contact law enforcement as needed; Use a high index of suspicion.</li><li>• Basic Airway Maneuvers as indicated.</li><li>• Obtain Blood Glucose Measurement. If glucose is &lt; 60 mg/dl, follow Diabetic Emergency protocol.</li><li>• Narcotic OD: Naloxone IN only, if respirations are depressed.</li><li>• Administer NARCAN 1mg per nostril while alternating nares via IN route only.</li><li>• Max dose 4mg.</li><li>• It is not necessary to administer large amounts for the patient to become entirely awake and oriented. This may cause significant agitation for the patient and potential harm to the crew.</li><li>• Obtain 12-lead ECG and transmit as indicated.</li><li>• EtCO<sub>2</sub> application and monitoring.</li></ul>			
<ul style="list-style-type: none"><li>• IV/IO access as indicated.</li><li>• Administer NARCAN 0.4 up to 4 mg IN/IM/IV/IO slow push titrated to improved respiratory effort.</li><li>• For pediatrics, NARCAN 0.1 mg/kg IV/IO over 2 minutes. May administer 2 mg IM if no IV/IO access available.</li><li>• If unable to establish IV, administer NARCAN IN.</li><li>• Do not administer Narcan if patient is intubated.</li></ul>			
<ul style="list-style-type: none"><li>• Advance airway maneuvers as indicated.</li><li>• Monitoring and interpretation of ECG &amp; EtCO<sub>2</sub>.</li><li>• Administer Adult dose Midazolam for extreme agitation. Reference medication index for dosages.</li><li>• Calcium Channel / Beta Blocker OD: Calcium Chloride, Epinephrine Infusion &amp; Glucagon (Beta blocker OD only).</li><li>• For Organophosphate OD, administer ATROPINE 1 mg every minute. Titrate to drying of secretions.</li><li>• Tricyclic or Phenobarbital OD: Sodium Bicarbonate 50mEq IV/IO until QRS narrows. Additional dose required by OLMC (Online Medical Control).</li><li>• Transcutaneous Cardiac Pacing PRN.</li><li>• If systolic BP remains &lt; 90mmHg after 2 L of fluid, administer Norepinephrine (Levophed) at 0.05 mcg/kg/min titrated in increments of 0.02 mcg/kg/min every 5 minutes up to 0.5 mcg/kg/min to maintain a MAP &gt; 65.</li></ul>			

**Consult Online Medical Control As Needed**



## Overdose/Poisoning

### Notes:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Poison Control Number is 1-800-222-1222.
- It is not necessary to administer large amounts for the patient to become entirely awake and oriented. This may cause significant agitation for the patient and potential harm to the crew.
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Tricyclic: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma, rapid progression from AMS to death.
- Depressants: decreased HR, BP, body temperature, and respirations; non-specific pupils.
- Stimulants: increased HR, BP, body temperature; dilated pupils, seizures.
- Anticholinergic: increased HR, body temperature; dilated pupils, mental status changes.
- Cardiac meds: dysrhythmias and mental status changes.
- Solvents: nausea, vomiting, and mental status changes.
- Cholinesterase / Insecticides: increased or decreased HR, increased HR, nausea / vomiting, diarrhea, pinpoint pupils
- Decon or Haz-Mat patients should be performed by trained personnel prior to initial patient contact or transport.
- Novel opioids, such as fentanyl and carfentanyl, may require very high doses of naloxone (10-20mg).



# Pulmonary Edema/CHF

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy/Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

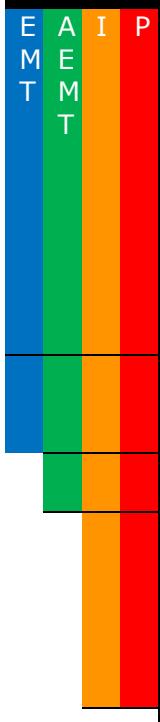
### Signs & Symptoms:

- Bilateral rales
- Jugular vein distention
- Pinky, frothy sputum
- Peripheral edema
- Diaphoresis
- Hypoperfusion
- Hypotension
- Chest pain
- Respiratory distress
- Apprehension
- Orthopnea

### Differential:

- Myocardial infarction
- Congestive heart failure
- Pulmonary embolus
- Pericardial tamponade
- Pleural effusion
- Pneumonia
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Toxic exposure

## Clinical Management Options



	<ul style="list-style-type: none"><li>• Provide supplemental oxygen as needed with target SpO<sub>2</sub> 92 – 96%.</li><li>• Position of comfort</li></ul>
	<ul style="list-style-type: none"><li>• If chest pain is reported and/or suspected, follow Chest Pain/ACS protocol.</li><li>• Ascertain and monitor lung sounds.</li><li>• If patient has wheezing, follow Respiratory Distress protocol.</li><li>• If lung sounds reveal crackles, if edema, or JVD are present, administer NITROGLYCERIN 0.4mg SL every 5 minutes with a SBP &gt;140 mmHg. Cease Nitro administration at SBP of 120mmHg.</li><li>• Maximum of 3 tablets.</li><li>• Consider CPAP with PEEP with rales/rhonchi indicating wet lung sounds.</li></ul>
	<ul style="list-style-type: none"><li>• Nitroglycerin topical paste to chest wall if SBP <math>\geq</math> 140 mmHg</li><li>• 4 lead and 12 lead ECG placement and acquisition</li><li>• Place EtCO<sub>2</sub></li></ul>
	<ul style="list-style-type: none"><li>• Vascular access</li></ul>
	<ul style="list-style-type: none"><li>• If anxiety- detrimental to patient's condition, administer VERSED 2.5mg slow IVP/IN/IM titrated to effect.</li><li>• Monitoring and interpretation of 12-lead ECG and waveform EtCO<sub>2</sub>.</li><li>• Administer ENALAPRILAT 1.25 mg slow IVP over 5 minutes if SBP &gt; 120mmHg .</li><li>• If patient becomes hypotensive, Norepinephrine (Levophed) infusion, titrated to MAP <math>&gt;</math> 65.</li><li>• Rapid sequence induction as needed to secure patent airway for oxygenation and ventilation.</li></ul>

**Consult Online Medical Control As Needed**



## Pulmonary Edema/CHF

### Notes:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Avoid Nitroglycerin in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 48 hours or other PDE erectile dysfunction medications due to potential severe hypotension.
- Careful monitoring of level of consciousness, BP, and respiratory status with above interventions is essential.
- Consider myocardial infarction in all these patients. If suspected give aspirin.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Connect CPAP to o2 source and select liter flow setting to generate appropriate PEEP for patient condition per guideline.
- Patient BP may drop with CPAP, if CPAP is necessary for oxygenation/ventilation, may move to add pressor.
- Hypotension in pulmonary edema may indicate poor cardiac function. Aggressive use of diuretics and nitroglycerin could result in significant hypotension and further reduction of cardiac output .



# Respiratory Distress

		Assessment	
<b>Pediatric Pearls:</b>		<b>Signs &amp; Symptoms:</b>	<b>Differential:</b>
<ul style="list-style-type: none"><li>Use pediatric dosing of medications or electrical therapy for a pediatric patient &lt; 37 kg and as defined by Handtevy or Broselow®.</li><li>Pediatric hypotension is defined as SBP &lt; 70 + (age in years x 2) mmHg</li></ul>		<ul style="list-style-type: none"><li>Shortness of breath</li><li>Pursed lip breathing</li><li>Decreased ability to speak</li><li>Increased respiratory rate and effort</li><li>Wheezing, rhonchi, rales, stridor</li><li>Use of accessory muscles</li><li>Fever, cough</li><li>Tachycardia</li><li>Anxious appearance</li></ul>	<ul style="list-style-type: none"><li>Asthma / COPD (Emphysema, Bronchitis)</li><li>Anaphylaxis</li><li>Aspiration</li><li>Pleural effusion</li><li>Pneumonia</li><li>Pulmonary embolus</li><li>Pneumothorax</li><li>Cardiac (MI or CHF)</li><li>Pericardial tamponade</li><li>Hyperventilation</li><li>Inhaled toxin (CO, etc.)</li><li>Croup / Epiglottitis</li><li>Congenital heart disease</li><li>Trauma</li><li>Hydrocarbon ingestion</li></ul>
<b>Clinical Management Options</b>			
E M T	A I P P	<ul style="list-style-type: none"><li>Oxygen PRN titrated to SpO2 92-96%.</li><li>Position of comfort/rest.</li><li>BLS airway management.</li><li>Obtain ECG; assess/transmit as indicated in Suspected ACS protocol.</li><li>Monitor EtCO2.</li><li>If wheezing (non-cardiac), may assist with patient's MDI 2 puffs PRN.</li><li>Administer albuterol 5mg via nebulizer as indicated for wheezing.</li></ul> <hr/> <ul style="list-style-type: none"><li>Consider IV/IO access as indicated.</li><li>Consider isotonic crystalloid bolus (20cc/kg).</li><li>For COPD or asthma exacerbation, consider Prednisone 60mg PO (adult only) or Methylprednisolone (125mg adults; 2mg/kg peds).</li><li>For Croup/Epiglottitis/Stridor, consider 2.5mg Epinephrine 1:1000 in 3ml normal saline nebulized via 6-8L oxygen.</li><li>For COPD or asthma exacerbation, consider Magnesium Sulfate 10% 1-2g for adults; 20 to 50mg/kg IV over 20 minutes. Do not exceed 2g.</li><li>If patient is at risk of impending respiratory failure, administer Epinephrine 1:1000 0.3mg via IM injection.</li><li>Advanced airway management as indicated with special attention to preoxygenation.</li><li>Ultrasound as indicated for suspected pneumo/hemothorax.</li><li>Advanced airway management as indicated with special attention to preoxygenation.</li></ul>	

**Consult Online Medical Control As Needed**



# Respiratory Distress

## Key Performance Indicators:

1. EtCO<sub>2</sub> measurement
2. ECG obtained

## Special Considerations:

- Refer to drug formulary charts or Handtevy for all medication dosing for both adults and pediatric patients.
- EtCO<sub>2</sub> and SpO<sub>2</sub> must be monitored continuously if either are abnormal or in the setting of a decline in patient's mental status/condition.
- A silent chest in respiratory distress is a sign for pre-respiratory arrest.
- Chronic COPD may have elevated CO<sub>2</sub> at baseline. Patient respiratory status must be reassessed after each nebulizer or medication administration to determine need for additional dosing.
- Consider CPAP/BiPap for continued respiratory distress and if adequate mask seal can be established. Note that this should never be used for a patient with diminished mental status or respiratory failure.
- Classic epiglottitis is a rare but critical finding. The patient will classically present with tripodding and drooling because of the pain with swallowing. You may also note retractions with respirations, a hoarse voice and/or fever.
- Croup patients are identified by the classic "barking" cough, and may present with distress and stridor.



## Bi-level / CPAP

### Pediatric Pearls:

- Not generally for use on patients under 13 years old.
- If it is felt to be a possible therapy for a child under 13yo, physician consult must be obtained prior.

### Signs & Symptoms:

- Respiratory distress or impending failure in a patient with a patent airway and preserved respiratory effort and mental status.

### Differential:

- Pulmonary Edema
- COPD exacerbation
- Respiratory Infection
- Asthma exacerbation

### Clinical Management Options



- Perform appropriate patient assessment, including obtaining vital signs, SpO<sub>2</sub>, EtCO<sub>2</sub>, and ECG.
- Determine need for CPAP vs. Bi-level (see reference below) and apply/initiate use of device
- Basic airway management as needed
- Ensure emergency equipment is immediately available and an alternate airway management plan has been established
- Albuterol as indicated (See note below)
- Monitor ETCO<sub>2</sub>
- IV / IO access as appropriate for patient condition
- IV fluid therapy as indicated with isotonic crystalloid, titrated to Adult SBP  $\geq$  100 mmHg
- Medication administration as indicated
- Advanced airway management as needed
- Sedation as needed to facilitate care (see note below)

### Consult Online Medical Control As Needed

### Benchmarks:

- 1) Documentation of patient mental status prior to initiation of CPAP/Bi-level and at facility arrival
- 2) Documentation of need for sedation related to CPAP/Bi-level toleration
- 3) Documentation of continuous pulse oximetry and preferably EtCO<sub>2</sub>

### Special Considerations:

- Notify the receiving facility as soon as possible that the patient is receiving Bi-level/CPAP treatment.
- If the patient is located within a healthcare facility, observe the patient on CPAP/Bi-level at the referring facility. If the patient is not tolerating this well, consult with the sending or receiving physician prior to transport; in general, defer transport until the patient has stabilized.
- If the patient does not improve or condition deteriorates despite CPAP/Bi-level, terminate this modality and move to BVM ventilation and BLS/ALS/APP airway management, using previously identified backup plans.
- While sedation may at times assist patients with tolerating this therapy, respiratory depression can also be a side effect of sedation and can contribute to a failed airway and intubation.
- Inline nebulizer may only be used in the CPAP setting secondary to the sensitivity of the Bi-level triggering device.



## Bi-level / CPAP

### Special Considerations, con't:

- HME filtration should be used inline as indicated; this may require additional oxygen to maintain sufficient pressures
- In certain circumstances, there may be indication to use CPAP/Bilevel as a bridging modality to delayed sequence intubation.

### Resources

#### **CPAP**

**CPAP** (Continuous Positive Airway Pressure) delivers a single, constant pressure during both inhalation and exhalation.

CPAP is generally employed to achieve one of two objectives: (1) to splint the upper airway as a treatment for sleep apnea, or (2) to augment oxygenation in the presence of refractory hypoxemia ( $\text{SpO}_2 < 90\%$  with  $\text{FiO}_2 > 60\%$ ). This form of respiratory failure/distress is generally caused by a ventilation/perfusion mismatch, which is often observed in such conditions as CHF, atelectasis, pulmonary embolism and pneumonia. CPAP treats refractory hypoxemia by increasing and maintaining alveolar pressures, which in turn promotes alveolar recruitment and oxygen diffusion.

#### **Bi-level**

Bi-level Positive Airway Pressure (Bi-level) is a form of Noninvasive Positive Pressure Ventilation (NPPV) and delivers two pressures. The lesser pressure, Expiratory Positive Airway Pressure (ePAP), is delivered upon exhalation. It is very similar to, and can achieve the same objectives, as CPAP. The second and greater pressure, Inspiratory Positive Airway Pressure (iPAP), is delivered during inhalation.

Bi-level may be employed to treat acute or pending respiratory failure/distress. Because iPAP augments ventilation, Bi-level can be an effective treatment for acute hypercapnia. COPD, multiple rib fractures with a flail segment or even extreme pain are common causes of acute hypercapnia.

Because ePAP is similar to CPAP pressure, Bi-level can also be used to treat refractory hypoxemia, with the additional bonus of assisting ventilation if necessary.

When treating acute hypercapnic respiratory failure/distress, the difference between the iPAP and ePAP pressures is of primary importance; this is Pressure Support. Ventilatory assistance increases as the distance between these two settings widens. For example, an iPAP/ ePAP of 16/6 provides greater ventilatory assistance than does 12/6, whereas both settings provide the same degree of oxygenation augmentation, because both 16/6 and 12/6 have ePAP settings of 6 cmH<sub>2</sub>O.



## Bi-level / CPAP

### Contraindications to Bi-level/CPAP Therapy

The following conditions are **ABSOLUTE contraindications** for Bi-level/CPAP therapy:

1. Patients with severe respiratory failure without spontaneous breathing.
2. Decreased level of consciousness that prevents the patient's ability to protect his/her own airway.
3. Inability to maintain a patent airway or adequately clear secretions.
4. Non-compliant patient.

The following conditions are **RELATIVE contraindications** to Bi-level/CPAP therapy; the risk versus benefit of ventilatory assistance should be considered:

1. Risk for aspiration of gastric content. In such cases a NG tube may be helpful.
2. Bullous lung disease (emphysema).
3. Pre-existing pneumothorax or pneumomediastinum, which may be complicated due to the increased pressure.
4. Hypotension.
5. Acute sinusitis or otitis media.
6. Epistaxis.
7. Recent facial, oral or skull surgery or trauma.

### Selection of Therapy

To determine the therapeutic objective, consider what is being treated: Acute hypercapnia? Refractory hypoxemia? Or both?

1. If refractory hypoxemia is the sole issue, CPAP is the desired treatment, since ventilatory assistance is not an issue. As evidenced by EtCO<sub>2</sub>, it is not uncommon for CHF patients suffering acute refractory hypoxemia to be hyperventilating. In such cases additional ventilatory support will further decrease an already low EtCO<sub>2</sub>.
2. If acute hypercapnia is the sole issue, Bi-level with a low ePAP setting is the desired treatment, since ventilation is the issue, while oxygenation augmentation is not necessarily needed.
3. If both refractory hypoxemia and acute hypercapnia are an issue, Bi-level with a higher ePAP pressure is the desired treatment; for here both ventilatory assistance and oxygenation augmentation are of concern.

### Settings

All settings are considered dynamic, in that they may need adjustment to meet patient demand as his/her condition changes. The following guidelines provide a standardized basis from which to initiate settings and make said changes.



## Bi-level / CPAP

### CPAP settings for Refractory Hypoxemia

1. Ensure adequate oxygen supply for CPAP device.
2. Explain the procedure to the patient.
3. Attach device to flowmeter/regulator (no blender available use 100% oxygen).
4. Place device in CPAP mode.
5. Adjust flowmeter/regulator to set CPAP pressure to 5 cm H<sub>2</sub>O using attached yellow sticker as a guide.
6. Place appropriate size mask on patient and check for leaks.
7. Confirm desired pressure and adjust flowmeter/regulator as needed.
8. Increase in increments of 2.5 cm H<sub>2</sub>O, as tolerated, to maintain desired SpO<sub>2</sub> (e.g. > 90%). If a CPAP setting of 10 cm H<sub>2</sub>O fails to maintain desired SpO<sub>2</sub>, consider possible intubation and manual ventilation.

### Bi-level settings for Acute Hypercapnia or a combination of Refractory Hypoxemia and Acute Hypercapnia

1. Ensure adequate oxygen supply for CPAP device.
2. Explain the procedure to the patient.
3. Attach device to flowmeter/regulator. If an oxygen blender is available set FiO<sub>2</sub> from 21% - 50% to maintain desired SpO<sub>2</sub> ( $\geq$  88% for known CO<sub>2</sub> retainers; 90% if refractory hypoxemia also an issue;  $\geq$  92% for all others). If refractory hypoxemia is also an issue, and a blender is not available use 100% oxygen as stated above under CPAP settings for Refractory Hypoxemia.
4. Place device in CPAP mode.
5. Adjust flowmeter/regulator to set CPAP pressure to 5 cm H<sub>2</sub>O using attached yellow sticker as a guide.
6. Place appropriate size mask on patient and check for leaks.
7. If no leaks adjust flow to set CPAP pressure to a minimum of 8 cmH<sub>2</sub>O.
8. Place device in Bi-level mode.
9. Adjust flowmeter/regulator to set CPAP to 10 cmH<sub>2</sub>O; this now becomes the iPAP (pressure when the patient inhales).
10. Adjust the ePAP knob to set the ePAP to 5 cmH<sub>2</sub>O (pressure when the patient exhales). A setting of 10/5 will provide pressure support of 5 cmH<sub>2</sub>O.
11. Assess the patient.
12. If the patient needs additional ventilatory support the iPAP can be increased to a **maximum of 13 cm H<sub>2</sub>O** with FlowSafe II+ providing pressure support of 8 cmH<sub>2</sub>O. If pressure support of 8 cmH<sub>2</sub>O fails to maintain desired SaO<sub>2</sub> or EtCO<sub>2</sub> consider possible intubation and manual ventilation.



## Bi-level / CPAP

### Indications of Bi-level/CPAP Therapy Failure

- Tachypnea > 35
- Hemodynamically unstable
- Decreasing GCS
- Persistent hypercarbia
- Poor tolerance
- Excessive secretions
- Vomiting
- Uncooperative agitation
- Pneumothorax
- Apnea
- Gastric distention
- Refractory hypoxia ( $\text{SpO}_2 < 90\%$ )
- Inability to ventilate

### References

1. Stoltzfus S. The role of noninvasive ventilation: CPAP and BiPAP in the treatment of congestive heart failure. *Dimens Crit Care Nurs.* 2006 Mar-Apr; 25(2):66-70.
2. Goodacre S. Pre-hospital Non-Invasive Ventilation For Acute Respiratory Failure: A Systemic Review and Network Meta Analysis. *Emergency Medicine Journal* 2014;31:778.
3. "Bi-Level Ventilation: Who Needs It and Who Doesn't? Pearls and Pitfalls - EmDOCs.Net - Emergency Medicine Education," emDOCs.net - Emergency Medicine Education, August 19, 2016, <https://www.emdocs.net/bi-level-ventilation-needs-doesnt-pearls-pitfalls/>.



# Seizure

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy/Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

### Signs & Symptoms:

- Altered mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious
- Fever
- Seizure activity
- Tongue trauma
- Rash
- Nuchal rigidity

### Differential:

- CNS/Head trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Electrolyte abnormality (Na, Ca, Mg, K)
- Medication non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia

## Clinical Management Options

E A I P A  
M E P P  
T M P P  
T

- Provide supplemental oxygen as needed with target SpO2 92 – 96%.
- BGL assessment. Follow Diabetic Emergencies protocol as indicated.
- Monitor SpO2 and ETCO2.
- Obtain 12-lead ECG and transmit as indicated. Follow Chest Pain/ACS/CHF protocol as indicated.
- SMR assessment
- BLS airway management as indicated.
- For any seizure in a pregnant or recently post-partum patient, consider eclampsia and consult the OB Emergencies COGs.
- Examine mental status, HEENT, heart, lungs, extremities, and neuro.
- Pediatric: Temp > 100.4 F then administer acetaminophen 15mg/kg.

---

- IV/IO access as indicated.
- Isotonic Crystalloid fluid challenge at 20 ml/kg
- Monitoring and interpretation of ECG & EtCO<sub>2</sub>
- Adults: Administer VERSED 5 mg IM/IN as first choice. If unable to administer IM/IN may use IV/IO push titrated to effect. Repeat dose in 5 minutes if seizures persist.
- Pediatrics: Administer VERSED 0.15 mg/kg IM/IN as first choice. If unable to administer IM/IN may use IV/IO push titrated to effect. Repeat dose in 5 minutes if seizures persist.
- Consider RSI/Advanced Airway measures as indicated

**Consult Online Medical Control As Needed**



# Seizure

## Notes:

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Impending status epilepticus is defined as two or more successive seizures or a continuous seizure lasting 5 minutes without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- Grand mal seizure (generalized) are associated with loss of consciousness, incontinence, and tongue trauma.
- Focal seizures (petit mal) effect only a part of the body and are not usually associated with a loss of consciousness.
- Jacksonian seizures are seizures which start as focal seizure then become generalized.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations, especially if Midazolam is used.
- Addressing the ABCs and verifying blood glucose is more important than stopping the seizure. Hypoglycemia is the 2<sup>nd</sup> most common cause of seizure.
- Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed head injury.



# Sepsis and Septic Shock

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by Handtevy/Broselow® Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

### Signs & Symptoms:

- Trigger for sepsis guideline:
  - Known or suspected infection -and-
  - EtCO<sub>2</sub> < 32 or > 45
- AND 2 or more of the following:
  - Temp < 96.8 F or > 100.4 F
  - Heart rate > 95
  - SBP < 100
  - Respiratory rate > 20
  - Altered Mental Status

### Differential:

- Arrhythmia
- Pulmonary embolism
- Anaphylaxis
- Drug intoxication
- Heat stroke
- Hypothermia
- Hypoglycemia
- Dehydration
- Stroke

- Treatment for patients who are not pregnant and are > 18 years of age.
- Signs of SIRS (Systemic Inflammatory Response Syndrome) have to meet at least 3 of the following criteria:
  - Temp > 100.4 or < 96
  - Pulse > 90 bpm
  - RR > 20 breaths/min.
  - EtCO<sub>2</sub> waveform 25 or < 25mmHg

## Clinical Management Options

E	A	I	P
M	E		A
T	M		P
T			P
			A

- Provide supplemental oxygen as needed with target SpO<sub>2</sub> 92 – 96%.
- BGL assessment. Follow Diabetic Emergencies protocol as indicated.
- Monitor SpO<sub>2</sub> and ETCO<sub>2</sub>.
- Obtain 12-lead ECG and transmit as indicated. Follow Chest Pain/ACS/CHF protocol as indicated.
- Treat wheezing, hypoxia, dyspnea, and pain as appropriate per protocol.
- IV/IO access as indicated.
- Treat for shock. Note signs of hypoperfusion or hypotension. Follow Hypotension/Shock protocol as indicated.
- Note if Systolic BP < 90mmHg or
- If MAP < 65mmHg
- Start 2 large-bore IVs and administer Lactated Ringers.
- Administer 500 mL boluses of LR titrated to a systolic BP > 90mmHg. This dose is not to exceed 20-30 mL/kg. Boluses may be given in rapid succession if systolic remains < 90 mmHg.
- Monitoring and interpretation of 12-lead ECG & EtCO<sub>2</sub>.
- IF patient is refractory to fluid administration, administer Norepinephrine infusion, titrate to MAP > 65 if not responsive to IV fluid.

**Consult Online Medical Control As Needed**



# Sepsis and Septic Shock

## **Special Considerations:**

- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Early septic patients often become hypothermic instead of developing fevers.
- Hypoglycemia is not uncommon in patients with sepsis, particularly those on beta blockers.
- Sinus tachycardia may be misinterpreted as SVT or A-fib. Sinus tachycardia > 150 bpm in the adult patient or > 180 in the pediatric patient may be seen with sepsis.



# Stroke

## Assessment

### Pediatric Pearls:

- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the Broselow® Tape or Handtevy.
- Fluids and medications titrated to maintain SBP >  $70 + (\text{age} \times 2)$  mmHg

### Signs & Symptoms:

- Altered Mental Status
- Weak / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Headache
- Seizure
- Sense of Impending Doom
- Hyper/hypotension
- Facial asymmetry or droop
- Impaired speech or comprehension

### Differential:

- Altered Mental status
- Transient Ischemic Attack (TIA)
- Seizure
- Hypoglycemia
- Hypoxia / Hypocarbia
- Stroke
- Thrombotic/embolic
- Hemorrhagic
- Tumor
- Trauma
- Atypical Migraine

## Clinical Management Options



- Provide oxygen as needed to maintain SpO<sub>2</sub> 92-96%
- Basic airway management as needed
- Blood glucose assessment – address hypoglycemia per protocol
- Head of bed to 20 deg unless concern for trauma or hypotension
- Cincinnati Prehospital Stroke Scale (CPSS) / VAN assessment / Time last normal
- Positive Stroke Screen / Glucose > 50 / last known well  $\leq$  24 hours, contact Medical Control for Stroke Alert and < 15 minute-on-scene time
- Patient should remain NPO until a swallow evaluation can be done
- Identify any anticoagulant medication the patient is taking, such as aspirin, Coumadin, Plavix, Eliquis, supplements, etc.
- Cardiac monitor and ECG; transmit as indicated
- Consider IV/IO access as indicated
- 20 ml/kg IV fluid bolus with isotonic crystalloid as indicated. May repeat for hypotension.
- Advanced airway management as indicated

## Consult Online Medical Control As Needed

### Key Performance Indicators:

1. Documentation of stroke scale used and findings
2. EMS scene time less than 20 minutes
3. Pre-arrival notification of receiving facility



## Stroke

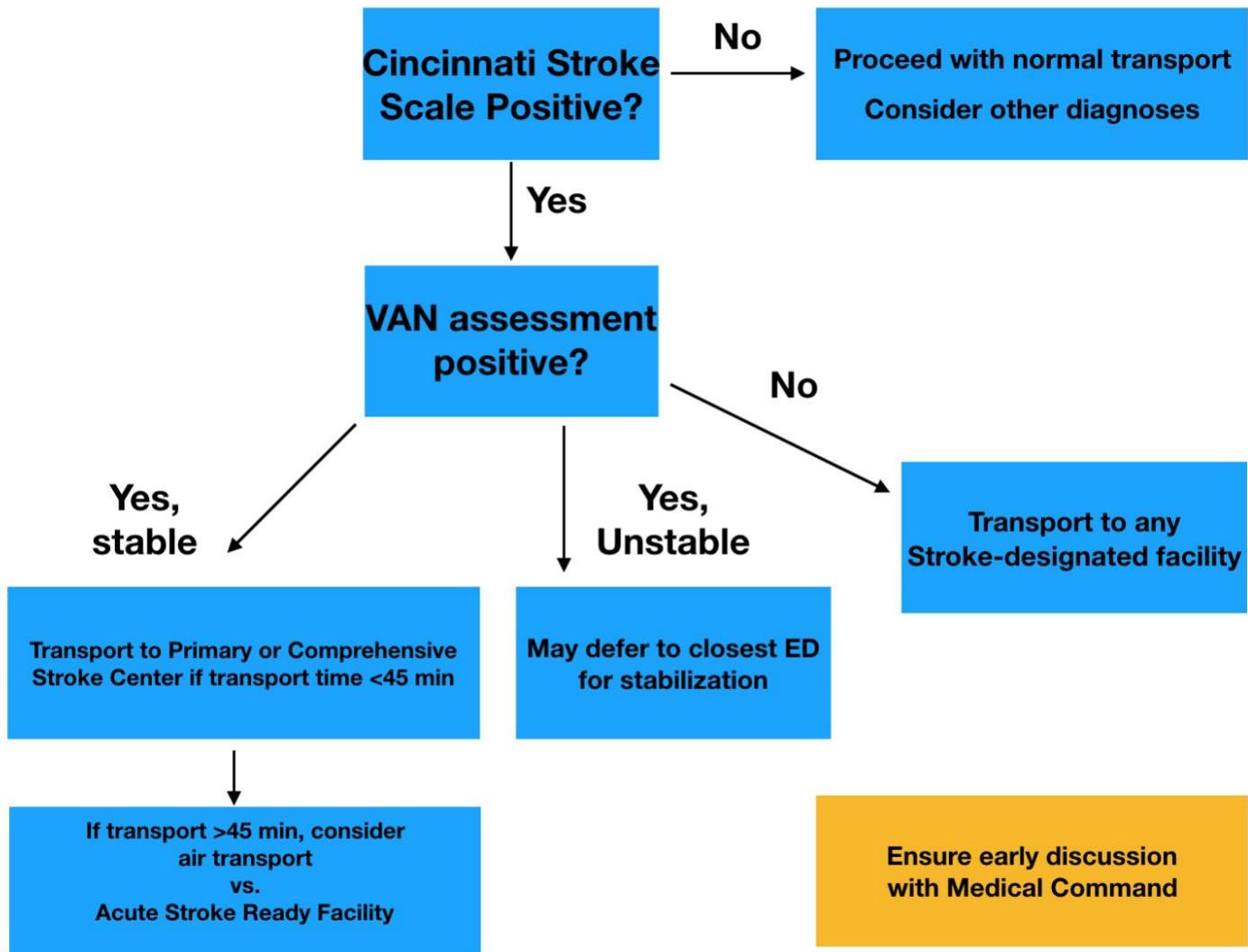
### **Special Considerations:**

- Refer to drug formulary charts or Handtevy for all medication dosing for both adults and pediatric patients.
- All suspected stroke patients should receive a CPSS assessment; if this assessment is positive, then a VAN assessment for large vessel occlusion should be completed.
- Contact Medical Command for all patients with acute stroke-like symptoms that have onset within 24 hours of estimated arrival at the receiving facility, so the receiving hospital can prepare for the patient's arrival. Describe your findings, including CPSS/VAN results, preferably to the Medical Command Physician. Medical command may order transport to another facility depending on resources best tailored for the patient. If the medical command physician is not at the receiving facility, that physician should ideally relay pertinent information to the receiving facility. EMS should continue with appropriate Medical Control alerts as well.
- Transport to the closest certified Primary Stroke Center or Comprehensive Stroke Center if the patient can arrive at the stroke center within 45 minutes of initiating transport. Otherwise, transport to an Acute Stroke Ready Hospital, if the patient can arrive at that facility within 45 minutes.
- Patients meeting VAN criteria should preferably be transported to a facility capable of endovascular intervention unless the situation requires otherwise, such as in the setting of patient instability.
- **It is always acceptable to defer to the closest Emergency Department for assistance in stabilizing the patient.**
- If a patient can be delivered by air (but not by ground) to a receiving facility within 24 hours of symptom onset, this may be advisable. Consider contact with Medical Command for assistance in deciding upon the utility of air medical transport.
- Onset of symptoms is defined as the last time the patient was seen symptom free; for example, awakening with stroke symptoms would be defined as an onset time of the previous night when the patient went to bed symptom free.
- Whenever possible, a family member should accompany the patient to the hospital to provide a detailed history or provide the hospital with the name and contact information of someone who can.
- IV access is preferred (sizes 20g or 18g with AC placement).



# Stroke

## Transport Decision Tree





## Stroke

STROKE DESIGNATION	FACILITY
Acute Stroke Ready Hospitals	Bedford Memorial Hospital
	Gretna Medical Center
	Southside Community Hospital
Primary Stroke Centers	Lynchburg General Hospital
	Roanoke Memorial Hospital
Comprehensive Stroke Center	University of Virginia Medical Center

Cincinnati Prehospital Stroke Scale (CPSS)			
Sign/Symptom	How tested	Normal	Abnormal
Facial Droop	Have the patient show their teeth or smile	Both sides of the face move equally	One side of the face does not move as well as the other
Arm Drift	The patient closes their eyes and extends both arms straight out for 10 seconds	Both arms move the same, or both do not move at all.	One arm either does not move, or one arm drifts downward compared to the other.
Speech	The patient repeats "The sky is blue in Cincinnati".	The patient says correct words with no slurring of words.	The patient slurs words, says the wrong words, or is unable to speak



# Stroke

## VAN (Vision, Aphasia, Neglect) Stroke Assessment Checklist

Instructions	Scale Definition	Score
<b>1a. Level of Consciousness:</b> Choose a response even if a full evaluation is prevented by ET tube, language, trauma, etc.	<p><b>0</b> = Alert; keenly responsive.  <b>1</b> = Arousal by minor stimulation to obey, answer, or respond.  <b>2</b> = Requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements.  <b>3</b> = Responds only with reflex responses or totally unresponsive.</p>	
<b>1b. LOC Questions:</b> Ask the month and his/her age. The answer must be correct - there is no partial credit for being close. Do not "help" the patient.	<p><b>0</b> = Answers both questions correctly.  <b>1</b> = Answers one question correctly (or dysarthria, intubated, foreign lang.)  <b>2</b> = Answers neither question correctly.</p>	
<b>1c. LOC Commands:</b> Ask to open and close eyes and to grip and release the non-paretic hand. Substitute another one step command if the hands cannot be used. Task can be demonstrated and then scored.	<p><b>0</b> = Performs both tasks correctly (ok if impaired by weakness).  <b>1</b> = Performs one task correctly.  <b>2</b> = Performs neither task correctly.</p>	
<b>2. Best Gaze:</b> Horizontal EOM tested by voluntary or oculocephalic maneuver (Doll's).	<p><b>0</b> = Normal.  <b>1</b> = Partial gaze palsy. Abnormal gaze in one or both eyes.  <b>2</b> = Forced deviation or total gaze paresis not overcome by the oculocephalic maneuver (Doll's).</p>	
<b>3. Visual:</b> Visual fields (upper and lower quadrants) are tested by confrontation, using finger counting or visual threat as appropriate. Patient must be encouraged, but if they look at.	<p><b>0</b> = No visual loss.  <b>1</b> = Partial hemianopia, quadrantanopia, extinction.  <b>2</b> = Complete hemianopia.  <b>3</b> = Bilateral hemianopia (blind including cortical blindness)</p>	
<b>4. Facial Palsy:</b> Ask, or use pantomime to have show teeth, raise eyebrows and close eyes. Score symmetry of grimace in response to noxious stimuli in the poorly responsive or non-comprehending patient.	<p><b>0</b> = Normal symmetrical movement.  <b>1</b> = Minor paralysis (flattened nasolabial fold, asymmetry on smiling).  <b>2</b> = Partial paralysis (total or near total paralysis of lower face).  <b>3</b> = Complete paralysis-1 or both sides (no facial movement upper/lower face)</p>	
<b>5. Motor Arm:</b> Extend the arms (palms down) 90 degrees (if sitting) or 45 degrees (if supine) and the leg 30 degrees (always tested supine). Drift is scored if the arm falls before 10 seconds. Can encourage using voice and pantomime.	<p><b>0</b> = No drift for 10 seconds.  <b>1</b> = Drift but does not hit bed or other support.  <b>2</b> = Some effort against gravity, but can't maintain-falls to bed.  <b>3</b> = No effort against gravity, limb falls.  <b>4</b> = No movement.  <b>X</b> = Amputation, joint fusion explain:</p> <p style="text-align: center;"><b>5a. Left Arm</b> <b>5b. Right Arm</b></p>	
<b>6. Motor Leg:</b> Leg extended 30 degrees (always test supine). Drift is scored if falls before 5 seconds. Can encourage using voice and pantomime.	<p><b>0</b> = No drift, leg holds position for full 5 seconds.  <b>1</b> = Drift but does not hit bed.  <b>2</b> = Some effort against gravity, but can't maintain-falls to bed.  <b>3</b> = No effort against gravity, leg falls to bed immediately.  <b>4</b> = No movement.  <b>X</b> = Amputation, joint fusion explain:</p> <p style="text-align: center;"><b>6a. Left Leg</b> <b>6b. Right Leg</b></p>	

[Click here for AHA Powerpoint on VAN Assessment](#)



## Stroke

### References:

1. Lima FO, Silva GS, Furie KL, et al. Field assessment stroke triage for emergency destination: A simple and accurate prehospital scale to detect large vessel occlusion strokes. *Stroke*. 2016;47:1997-2002. doi: 10.1161/STROKEAHA.116.013301
2. Evan Hodell, Shana D. Hughes, Megan Corry, Sean Kivlehan, Brian Resler, Nicolas Sheon & Prasanthi Govindarajan (2016) Paramedic Perspectives on Barriers to Prehospital Acute Stroke Recognition, *Prehospital Emergency Care*, 20:3, 415-424, DOI: [10.3109/10903127.2015.1115933](https://doi.org/10.3109/10903127.2015.1115933)
3. J. Adam Oostema, Todd Chassee, William Baer, Allison Edberg & Mathew J. Reeves (2020) Accuracy and Implications of Hemorrhagic Stroke Recognition by Emergency Medical Services, *Prehospital Emergency Care*, DOI: [10.1080/10903127.2020.1831669](https://doi.org/10.1080/10903127.2020.1831669)
4. Fu, Paul, Zi Wang, and Yuchuan Ding. "Prehospital Stroke Care, a Narrative Review." *Brain Circulation* 4, no. 4 (2018): 160. [https://doi.org/10.4103/bc.bc\\_31\\_18](https://doi.org/10.4103/bc.bc_31_18).



# EXPOSURE – AHLS

The following Protocols are approved by the BREMS Regional Operating Medical Director (OMD) to be used by regional Intermediates/Paramedics certified in Advanced Hazmat Life Support (AHLS) in response to a hazardous materials event. They are to be used in one of the following situations:

- 1.) Under standing orders in accordance with the guidelines in the AHLS provider manual 3<sup>rd</sup> edition. The following will be carried in close proximity to the Protocols/Medications listed below to be used as a reference:
  - Appendix A: Poisoning and Infection Treatment Paradigms (pages 481-502)
  - Appendix C: Toxidromes: Signs & Symptoms (pages 519-526)
- 2.) Under the direction of an Emergency Medicine physician at Lynchburg General ED. In the case of physician direction, direct communication is required and "relayed" orders are unacceptable.
- 3.) Under the direction of a toxicologist (M.D.) at a poison control center. In the case of physician direction, direct communication is required and "relayed" orders are unacceptable.



# EXPOSURE – Biological/Infectious

Stage at a safe distance from the scene. Contact fire service and Hazardous Material responders, if not already dispatched.

Wait for the scene to be cleared. Ensure patients are decontaminated.

Perform initial assessment and treat priority conditions.

Administer oxygen as needed. Support respirations as necessary and provide maximum flow oxygen- BVM or NRB mask.

**Medical Control Required is needed in order to activate the response of appropriate resources for needed medications.**

**M**

Receive authorization from Incident Command for the release of Antibiotics to front-line responders and follow their direction. **Consult Medical Control** for any concerns. Most prophylactic treatments may be administered in a delayed fashion and still be effective.

**M**

**Contact Medical Control for Further consideration**



# EXPOSURE – Blistering Agents

Stage at a safe distance from the scene. Contact fire service and Hazardous Material responders, if not already dispatched.

Wait for the scene to be cleared. Ensure patients are decontaminated.

Perform initial assessment and treat priority conditions.

Administer oxygen as needed. Support respirations as necessary and provide maximum flow oxygen- BVM or NRB mask.

If severe burns, **refer to Injury – Burns (Adult and/or Pediatric)**

**B** Transport and notify the receiving facility as soon as possible. **B**

**A**

**Follow IV/IO Protocol**

**A**

**I**

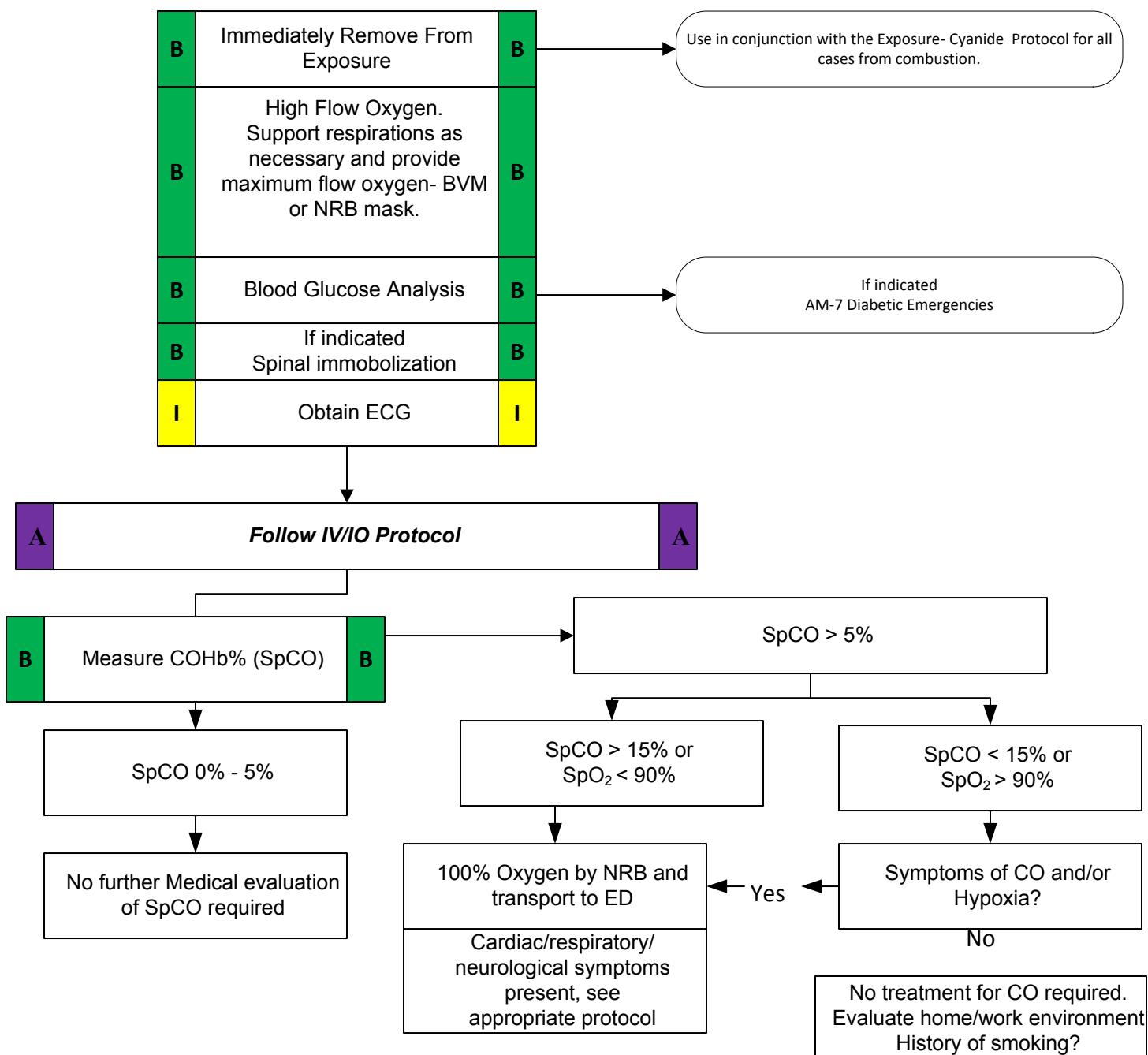
Obtain ECG

**I**

Contact Medical Control for Further consideration



# EXPOSURE – Carbon Monoxide

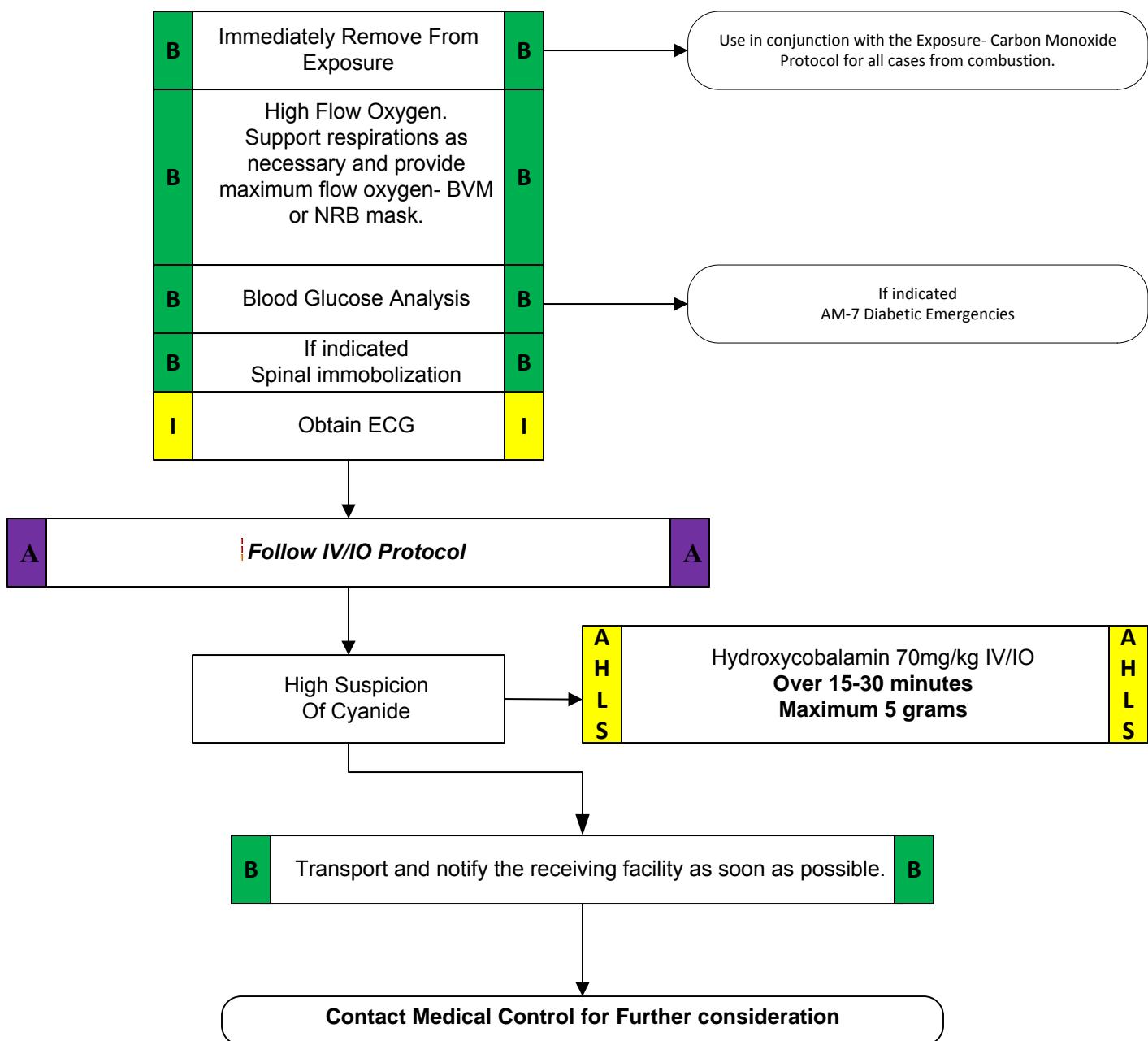


## KEY POINTS/CONSIDERATIONS

- Consider History of: FireFighter/Structure fire victim, ? CO exposure/source/duration, Age, Pregnancy
- Reason= accidental, criminal, suicide
- Signs / Symptoms: AMS, Headache, N&V, Chest Pain, Dyspnea, Neurological impairments, Vision problems, Tachycardia/Tachypnea, Arrhythmias, Seizures, Coma
- Differential Diagnosis: Other toxic fire byproduct, Cardiac event, Acute neurological event, Flu/GI illness, Intoxication, Diabetic problem, Headache of non-toxic origin
- Fetal hemoglobin has a greater attraction for CO than maternal hemoglobin. ED evaluation recommended for any CO exposed pregnant person.**



# EXPOSURE – Cyanide

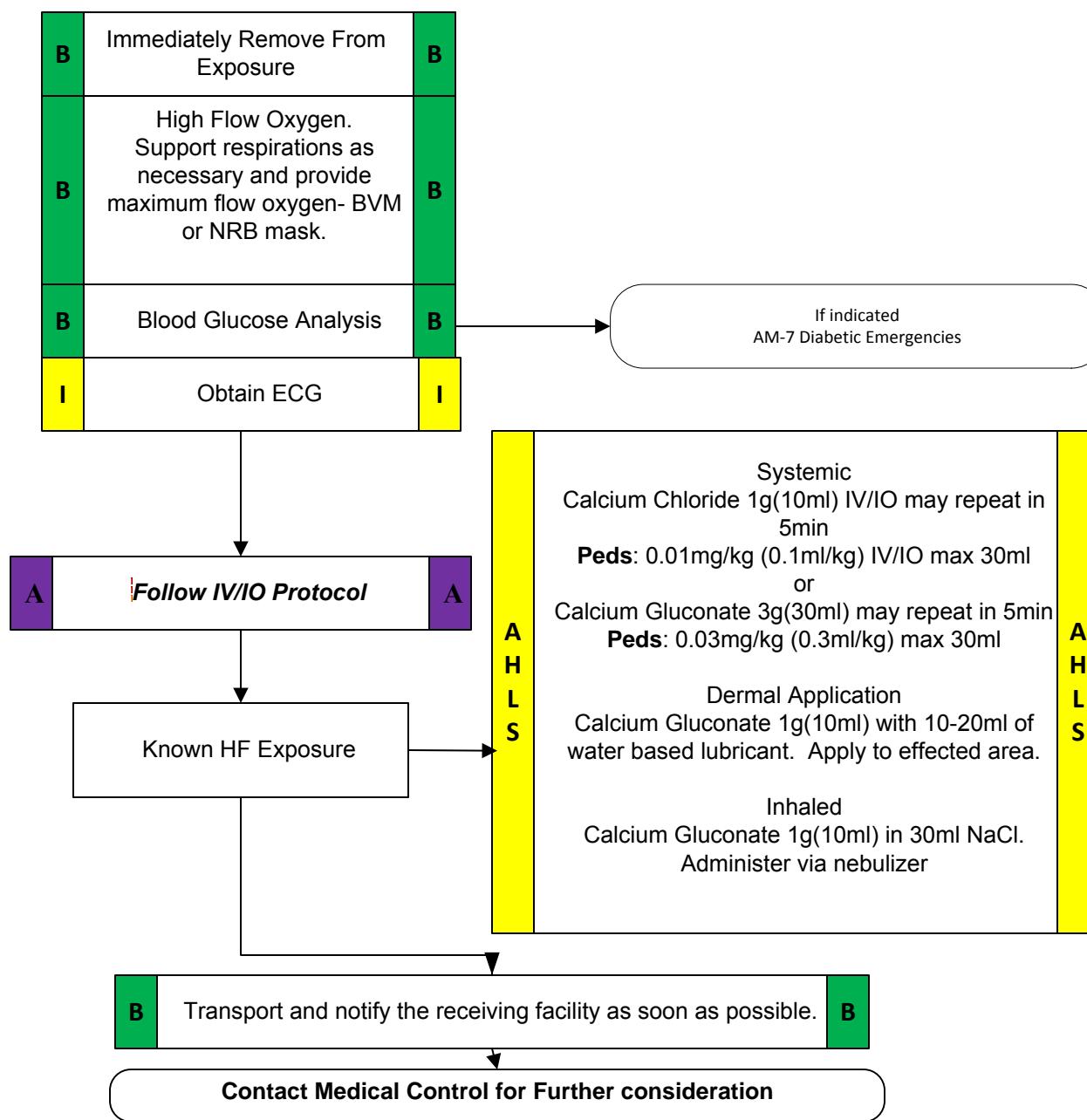


## KEY POINTS/CONSIDERATIONS

- Consider History of: smoke inhalation, ingestion of cyanide or cyanide forming compounds, eating large quantities of fruit pits, industrial exposure, trauma.
- Reason= accidental, criminal, suicide
- Time / Duration of exposure
- Signs / Symptoms: AMS, Malaise, Dyspnea, Dizziness, Seizures, Syncope, Reddened Skin, Chest Pain
- Differential Diagnosis: Diabetic Emergency, Infection, MI, Anaphylaxis, Renal Failure, Head Injury, Co-ingestant or exposure



# EXPOSURE – Hydrogen Fluoride/Hydrofluoric Acid

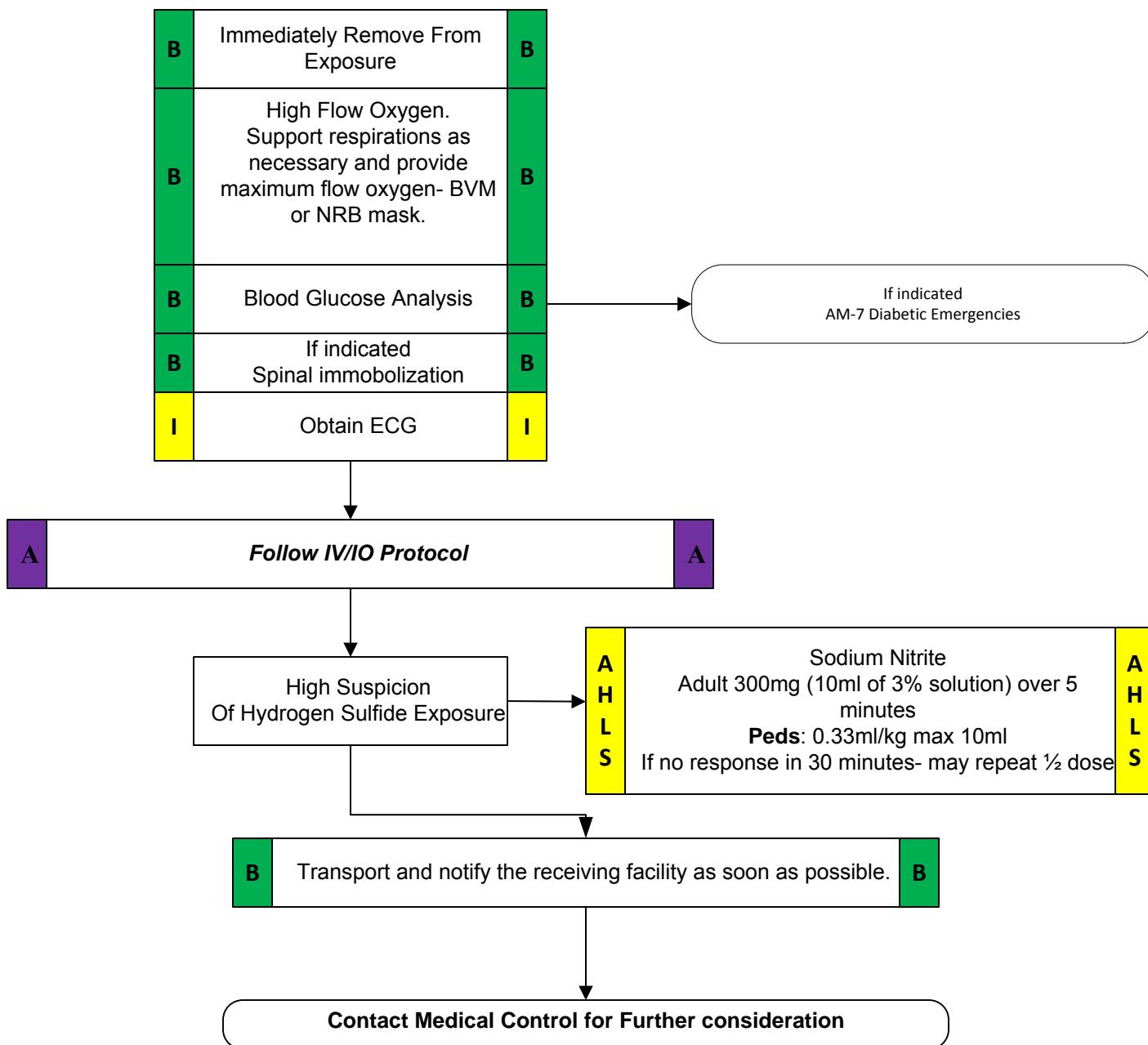


## KEY POINTS/CONSIDERATIONS

- Consider History of: occupational or accidental exposure
- Time / Duration of exposure
- Signs / Symptoms: AMS, Malaise, Dyspnea, Seizures, Delayed Onset Pulmonary Edema, Eye Irritation, Red Rash, Pain Disproportionate To Burn Area
- Hydrogen fluoride is a highly dangerous gas, forming corrosive and penetrating hydrofluoric acid upon contact with tissue. The gas can also cause blindness by rapid destruction of the corneas.
- Hydrofluoric acid is a calcium seeker.
- Hydrogen fluoride is used to make refrigerants, herbicides, pharmaceuticals, high-octane gasoline, aluminum, plastics, electrical components, and fluorescent light bulbs.
- Utilize appropriate PPE



# EXPOSURE – Hydrogen Sulfide

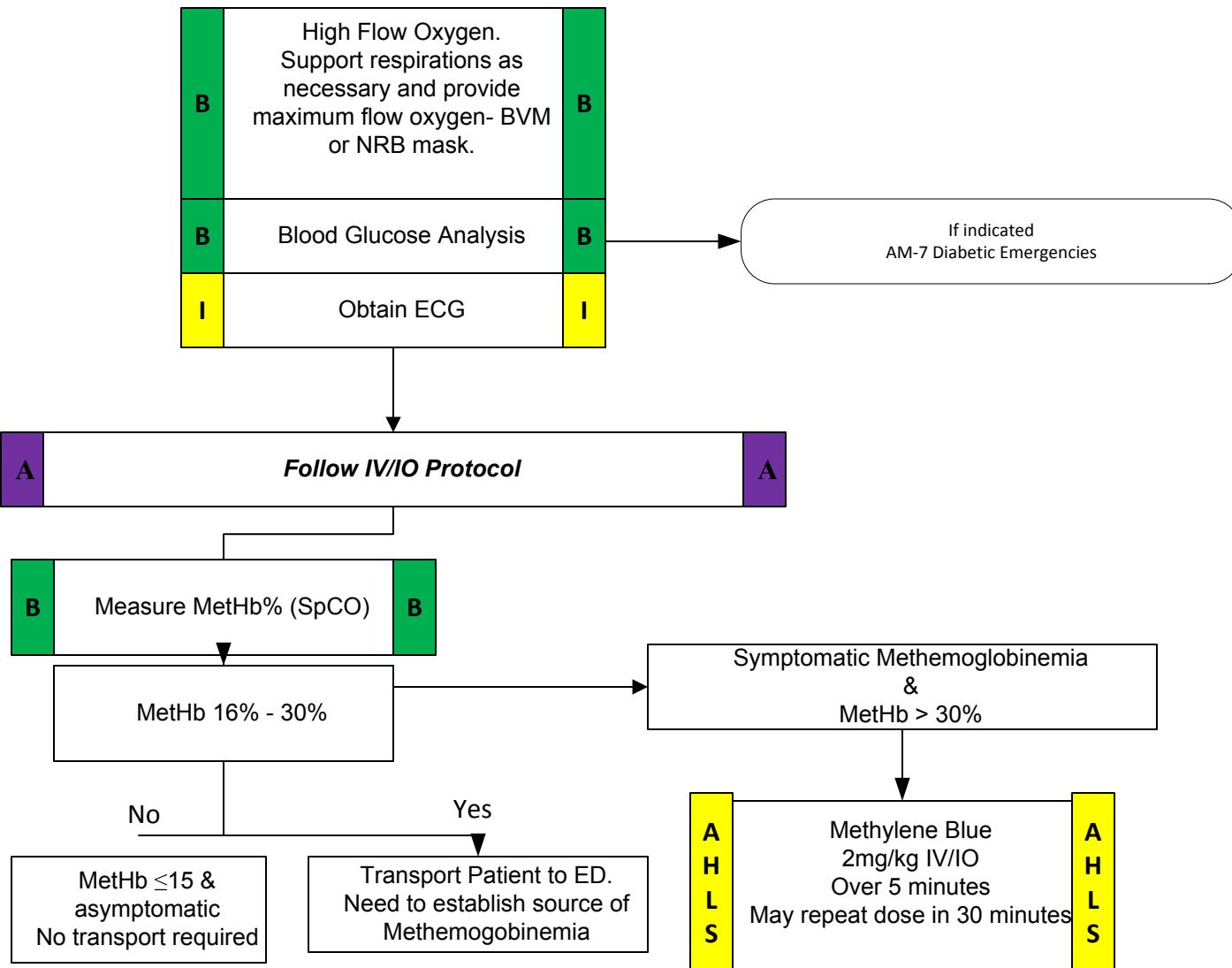


## KEY POINTS/CONSIDERATIONS

- Consider History of: occupational or accidental exposure, popular in “detergent suicides”
- Reason= accidental, criminal, suicide
- Time / Duration of exposure
- Signs / Symptoms: AMS, Malaise, Dyspnea, Dizziness, Seizures, Syncope, Pulmonary Edema, Eye Irritation, Cough
- Differential Diagnosis: Bleach, Ammonia or Chloride Gas
- Inhalation is the primary route of exposure, but delayed onset pulmonary edema is a concern.
- Synonyms include: dihydrogen sulfide, sulfur hydride, sulfurated hydrogen, hydrosulfuric acid, “sewer gas”, hepatic acid, sour gas and “stink damp”.
- Utilize appropriate PPE



# EXPOSURE – Methemoglobin Forming Compound



Exposure Protocols

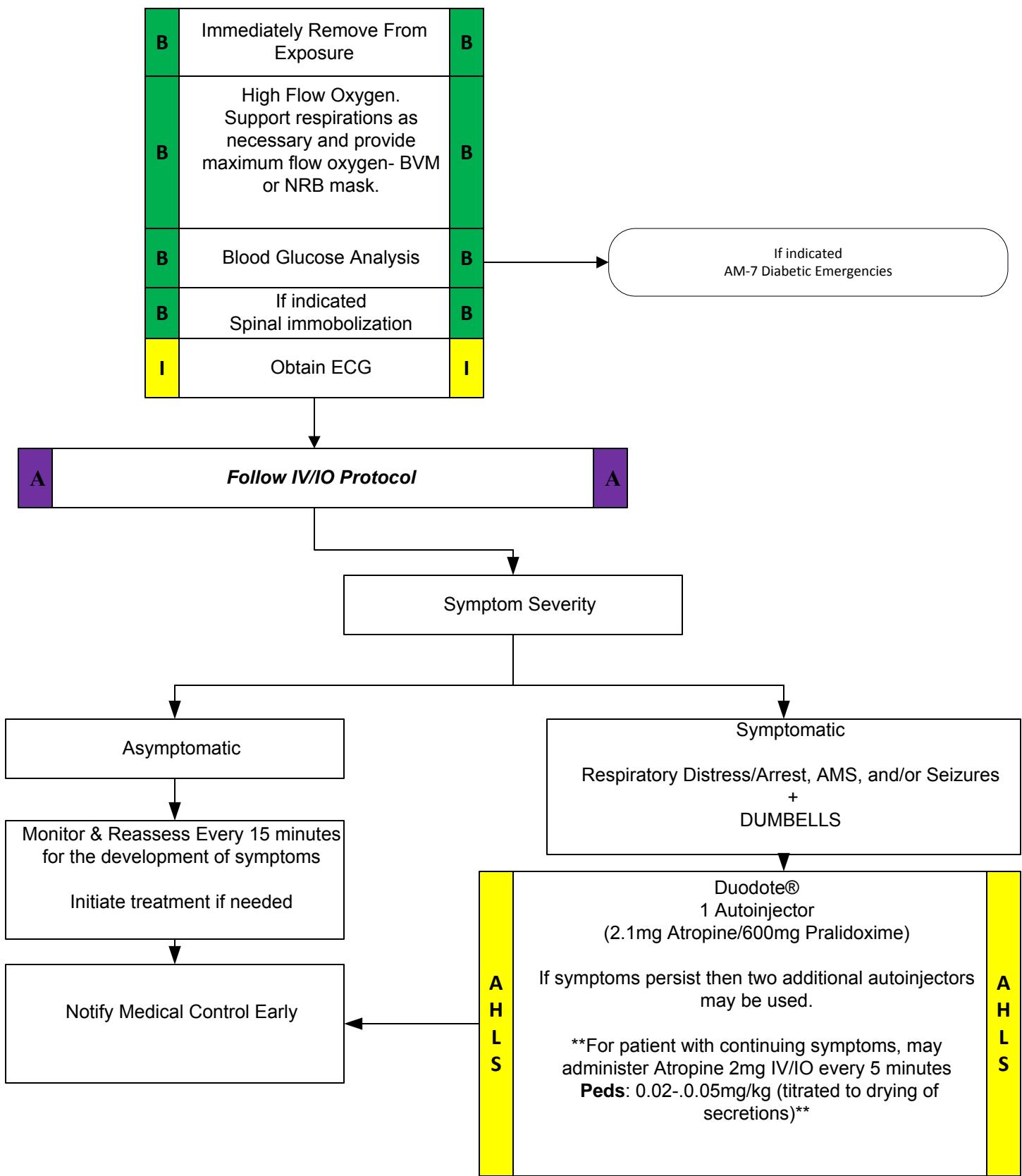
## KEY POINTS/CONSIDERATIONS

- Consider History of: drug therapy consistent with methemoglobinemia
- Signs / Symptoms: Cyanosis, AMS, Headache, Dyspnea, Neurological impairments, Syncope
- Differential Diagnosis: Hypoxemia, COPD
- Do not reverse methemoglobinemia if induced for treatment of cyanide or hydrogen sulfide poisoning.

Select Drugs documented to contribute to Methemoglobinemia	
Benzocaine, Cetacaine, Prilocaine (the 'caines')	Anesthetic – endotracheal intubation, transesophageal echocardiography, bronchoscopy, topical for hemorrhoids and dental/teething preps.
Celecoxib	Arthritic Pain
Dapsone	Prophylaxis for pneumocystis carinii in patients with human immunodeficiency virus (HIV). Also dermatologic applications.
EMLA Creams	Eutectic Mixture of Local Anesthetics.
Flutamide	Prostate Cancer
Nitrates	Food additives, well water, by-product of fertilizer run-off and incorporation into foods. Preservative
Nitric Oxide	Pulmonary vasodilatation
Nitroglycerin	Cardiac vasodilatation
Sodium Nitroprusside	Intravenous Antihypertensive, Vasodilator
Sodium Nitrate	Preservative salt used in meat and fish
Sulfonamides	Broad spectrum antibiotics



# EXPOSURE – Nerve Agent





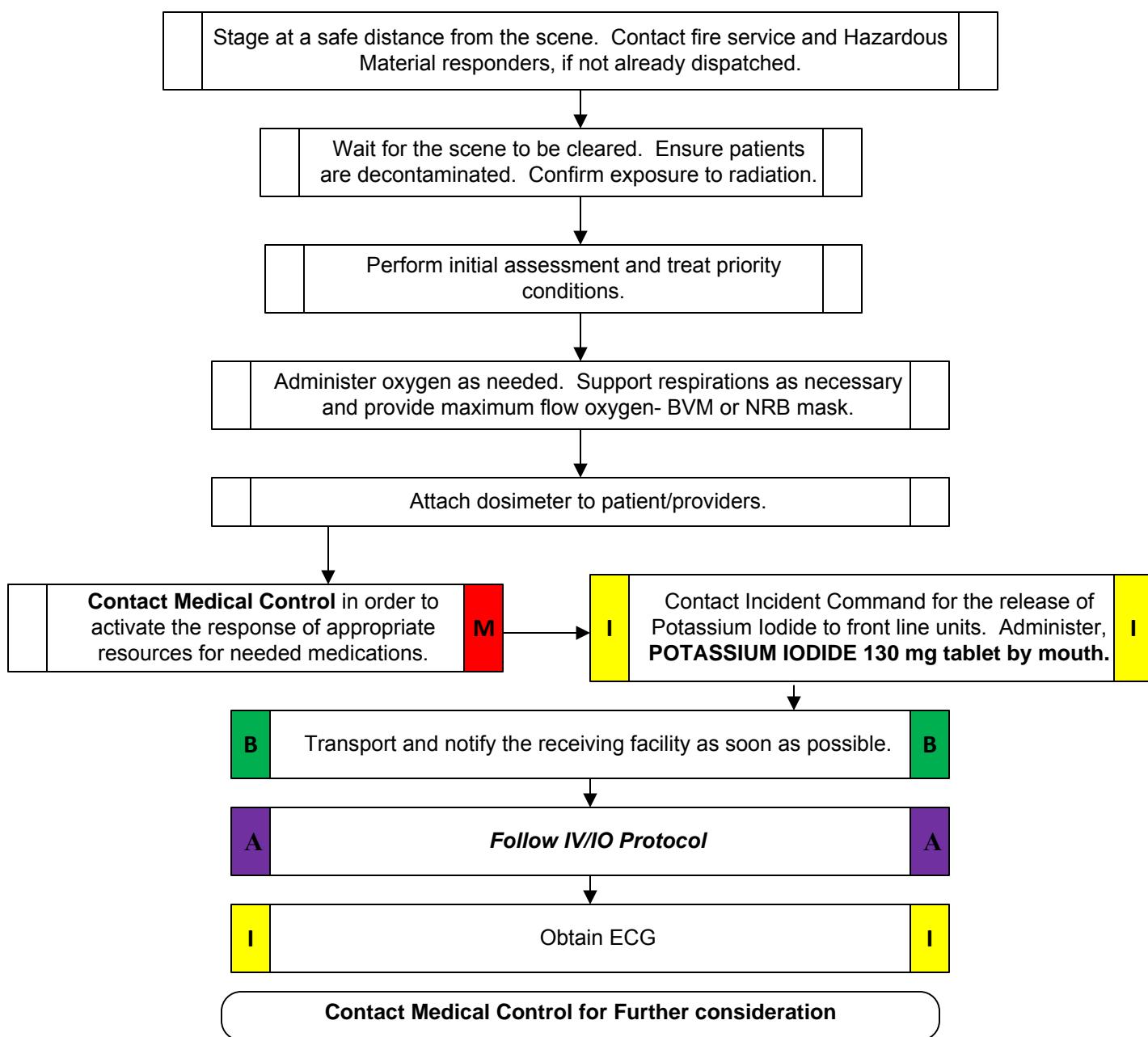
# EXPOSURE – Nerve Agent

## KEY POINTS/CONSIDERATIONS

- Consider History of: Exposure to chemical or biologic agent
- Time / Duration of exposure
- Potential exposure to unknown substance/hazard
- Farmer with exposure to pesticide
- Signs / Symptoms: DUMBELLS - Diarrhea, Urination, Miosis, Bradycardia, Emesis, Lacrimation, Lethargy and Salivation
- Differential Diagnosis: Vesicant (Blistering Agent) exposure (e.g. Mustard Gas), Respiratory Irritant Exposure (e.g. Hydrogen Sulfide, Ammonia, Chlorine)
- Follow appropriate decontamination and PPE use
- Seizure Activity: Any benzodiazepine by any route is acceptable.
- For patients with continued symptoms, there is no maximum dose for atropine.
- Carefully evaluate patients to ensure they are not from exposure to another agent (e.g. narcotics, vesicants, etc.)
- Atropine addresses excessive secretions, so atropine should only be given until salivation improves.



# EXPOSURE – Radiologic Agent



## KEY POINTS/CONSIDERATIONS

- **Alpha particles:** Alpha particles are slow-moving, low-energy particles that usually can be stopped by such things as clothing and paper. When they come in contact with the skin they penetrate only a few cells deep, therefore constituting a minor hazard.
- **Beta particles:** Beta particles are smaller than alpha particles, but are higher in energy. They can be stopped by aluminum and similar materials. Beta particles can be harmful if inhaled or ingested.
- **Gamma rays:** Gamma rays are more highly energized and penetrating than alpha and beta particles. Gamma radiation is extremely dangerous, carrying high levels of energy capable of penetrating thick shielding, capable of inflicting extensive cell damage. Protection can be provided by lead shielding.
- **Neutrons:** Neutrons are more penetrating than other types of radiation with penetrating power of 3 to 10 times greater than gamma rays. Exposure to neutrons causes direct tissue damage.



## Scope of Practice - Formulary

Medication	EMT	AEMT	I	P	AP	Route
Acetaminophen	●	●	●	●	●	PO
Adenosine			●	●	●	IV/IO
Afrin	●	●	●	●	●	IN
Albuterol Sulfate	●	●	●	●	●	Inhaled
Amiodarone					●	IV/IO
Aspirin	●	●	●	●	●	PO
Atropine Sulfate			●	●	●	IV/IO
Calcium Chloride			●	●	●	IV/IO
Cefazolin (Ancef)				●	●	IV/IO
Dextrose		●	●	●	●	IV/IO
Diltiazem, Cardizem					●	IV/IO
Diphenhydramine (Benadryl)	●	●	●	●	●	PO
Diphenhydramine (Benadryl)		●	●	●	●	IM/IV
Enalapril			●	●	●	IV/IO
Epinephrine 1:1,000*	●	●	●	●	●	IM - Epi Pen or pre-dosed syringe system only for EMT level
Epinephrine 1:1,000		●	●	●	●	Nebulized
Epinephrine 1:1,000		●	●	●	●	Calculated IM
Epinephrine 1:10,000			●	●	●	IV/IO
Etomidate					●	IV/IO
Fentanyl					●	IV/IO



## Scope of Practice - Formulary

Medication	EMT	AEMT	I	P	AP	Route
Glucagon	●	●	●	●	●	IM/IN
Glucagon*			●	●	●	*IV (In the setting of Beta Blocker Overdose)
Haloperidol, Haldol					●	IV/IO
Hydroxocobalamin, Cyanokit®				●	●	IV/IO
Isotonic Crystalloid Fluids*	●	●	●	●	●	IV/IO
						*EMTs may transport patients with IV fluids not requiring titration or adjustment, and without additives such as electrolytes (e.g., potassium, magnesium).
***Hypertonic			●	●	●	
Ketamine				●	●	IV/IO
***Doses >0.5mg/kg IV/IO/IM				●		
Ketorolac (Toradol)	●	●	●	●	●	IM/IV/IO
Labetalol					●	IV/IO
Lidocaine			●	●	●	IV/IO
Magnesium Sulfate 50%			●	●	●	IV/IO
Methylprednisolone			●	●	●	IM/IV/IO
Midazolam (Versed)			●	●	●	IM/IV/IO/IN
Morphine Sulfate			●	●	●	IM/IV/IO
Naloxone (Narcan)	●	●	●	●	●	IN Fixed/Unit Dose Medications
Naloxone (Narcan)			●	●	●	IN/IM/IV/IO Dose Calculation
Nitroglycerin SL		●	●	●	●	SL



## Scope of Practice - Formulary

Nitroglycerin Paste	●	●	●	●	Transdermal
Nitroglycerin Drip				●	IV/IO
Norepinephrine (Levophed)			●	●	●
Ondansetron (Zofran) ODT	●	●	●	●	●
Ondansetron (Zofran) Vial		●	●	●	●
Prednisolone			●	●	●
Rocuronium Bromide					●
Sodium Bicarbonate			●	●	●
Succinylcholine					●
Tranexamic Acid					●
Vasopressin					●
Blood/Blood Products					●
Initiate				●	●
Maintain		●	●	●	●
<b>Blood Modifiers</b>					
Anticoagulants					
Antiplatelet Agents	●	●	●	●	●
Hemostatic Agents	●	●	●	●	●
Thrombolytics				●	●
Anti-fibrinolytics (e.g. TXA – tranexamic acid)					●



## Scope of Practice - Formulary

\*NOTE: EMTs may administer medications within their scope of practice in addition to aiding in the administration of those medications. EMTs may also access a drug kit to access those medications.

Med math skills including dosage calculations and the measurement of medications to be administered are outside of the scope of practice of an EMT. EMTs may draw epinephrine from vials or ampules for the treatment of acute allergic reactions using devices and/or systems using syringes with mechanical limiters or color-coded or other clearly marked indicators to facilitate accurate dosing.

\*EMTs may transport patients with IV fluids not requiring titration or adjustment, and without additives including electrolytes (e.g. potassium, magnesium).

\*EMTs may provide BLS care and transport for patients with a saline lock or other non-flowing vascular access that was previously placed by a sending facility or existed prior (e.g. saline lock placed at a doctor's office or pre-existing PICC line for a patient receiving home antibiotics, etc). EMTs may not provide BLS transport for a patient with IV fluids or medications infusing unless the IV fluids are isotonic fluids without additives and set on a device to prevent titration/adjustment (e.g. Dial-A-Flo device), typically limited to inter-facility transports. EMTs may not assume care of an EMS patient with an IV started by an ALS provider earlier in the same response. If a special circumstance were to arise, please contact OLMC for further direction.

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\*\*\*This document contains **Red Dot** indicators as per state policy. See the link below for further.

All guidance listed in this document is per the Virginia Office of EMS State Scope of Practice Formulary which can be found here:

[Virginia OEMS State Scope of Practice - Formulary](#)

## BREMS Drug Box Configuration

Top Drawer				
Albuterol 0.083% Inh Solution 2.5mg/3ml (4)	Diphenhydramine 25mg Capsule (2) Green Lock (1)		Nitroglycerin 2% Ointment (5) Nitroglycerin 0.4mg Sublingual (25)	
Oxymetazoline 0.05% Nasal 15ml (Afrin)	Aspirin Baby Chewable 81mg (4) Ondansetron 4mg ODT (2)			
Acetaminophen (Tylenol) 500mg Tabs (2)	Acetaminophen (Tylenol) Liq 325mg/10.15ml (2) Glucagon 1mg Injection (1)			
Middle Drawer				
Lidocaine 100mg/5ml Pre-Load (3)	Prednisone 20mg Tab (3)	Epinephrine Inj 1:1000 (1mg/ml) 1ml (3)	Ondansetron 4mg/2ml Inj (2)	Diphenhydramine 50mg/ml Inj 1ml (2)
Adenosine 3mg/ml Inj 2ml (3)	Ketorolac Inj 30mg/ml 1ml (1)	Saline Bullets for Inh 3ml (2)	Norepinephrine 1mg/ml Inj 4ml (2)	Enalaprilat 1.25mg/ml Inj 2ml (1)
Naloxone 1mg/ml Inj 2ml (2)			Cefazolin 1gm Inj (2)	Magnesium Sulfate 1gm/2ml Inj (4)
				Methylprednisolone Succ 125mg Inj (1)
				Sodium Chloride 0.9% for Inj 10ml (2)
Bottom				
Narcotic Pouch	Atropine Sulfate 1mg Pre-Load (3) Calcium Chloride 1gm/10ml Pre-Load (1) Sodium Bicarbonate 50mEq Pre-Load (2)			Epinephrine 1:10,000 Pre-Load (6) Dextrose 10% in Water 250ml (2)
Midazolam 5mg/ml Inj 1ml (2)				
Morphine 10mg/ml Inj 1ml (1)				
Carpuject Holder (1)				

\*Pre-Loads may be replaced by vials at times due to medication back orders\*

\*Current per LGH Pharmacy as of 2022



## Acetaminophen (APAP) (Tylenol)

**Indications:** Fever with or without seizures, or pain

**Contraindications:** Allergy, hypersensitivity, severe hepatic impairment, or severe active liver disease

**Scope:** EMT, AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Route & Rate	Supply
Fever or Pain	500 - 1000mg	PO up to 2 doses	Adult – 500mg Tablets (2)

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
Fever or Pain	<45kg, 15mg/kg	PO using a 5ml syringe	Pediatric – 325mg/10.15ml (2)

<b>Precautions</b>	Pregnancy Category B. Also, use in caution with known thrombocytopenia and/or Liver Disease.
<b>Adverse/Side Effects</b>	N/V, abdominal pain
<b>Class</b>	Analgesic, Antipyretic
<b>Mechanism of Action</b>	Equivalent to aspirin in both analgesic and antipyretic effects. Unlike aspirin, acetaminophen has little effect on platelet function, no effect on homeostasis, and is not known to produce gastric bleeding. Acetaminophen is not an NSAID, as it has no anti-inflammatory properties. Absorption is rapid, peak 1-2h, duration 3-4h, $\frac{1}{2}$ life 1-3h. APAP is processed in the Liver.



## Adenosine

**Indications:** Supraventricular Tachycardia SVT (including WPW) refractory to vagal maneuvers

**Contraindications:** 2nd or 3rd degree heart block (without a functioning pacemaker); Known Sick sinus syndrome; Known History of Long QT Syndrome; Pregnancy Category C; Irregular Wide-complex tachycardia presumed to be WPW

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Supraventricular Tachycardia SVT	6mg x 1 12 mg x 1	Rapid IV/IO push with 10 ml flush	3mg/ml abbojects 2ml (3)

### ADULT DOSING

PEDIATRIC DOSING			
Indication	Dose	Route & Rate	Supply
Supraventricular Tachycardia SVT	1 <sup>st</sup> dose: 0.1mg/kg – Max dose of 6mg  2 <sup>nd</sup> dose: 0.2mg/kg – Max dose of 12mg	Rapid IV/IO push with 10 ml flush	3mg/ml abbojects 2ml (3)

<b>Precautions</b>	<p>Advising patient of the side effects of adenosine prior to administering can help minimize patient anxiety. Large bore IV, antecubital access or IO access &amp; IV wide open during administration; it may help to have your partner administer the fluid bolus.</p> <p>Start your ECG printout before administration and continue printing through bolus and conversion. Administration of adenosine will cause a period of asystole &amp; various conversion dysrhythmias, be patient, most will transiently resolve.</p>
<b>Adverse/Side Effects</b>	Flushing, Dizziness, Chest Pain, Lightheadedness, Dyspnea, Numbness, Headache, Nausea/Vomiting , Diaphoresis, Palpitations , Metallic Taste
<b>Class</b>	Supraventricular Antiarrhythmic, Nucleoside
<b>Mechanism of Action</b>	Slows tachycardias associated with the AV node via modulation of the autonomic nervous system without causing negative inotropic effects. It acts directly on sinus pacemaker cells and vagal nerve terminals to decrease chronotropic & dromotropic activity. Slows conduction through the AV node, blocks reentry pathways through the AV node, can transiently slow conduction in the SA node.



## Afrin/Otrivin Nasal Spray

**Indications:** Epistaxis

**Contraindications:** Hypertension, pregnancy, increased pressure in the eye (glaucoma), liver or kidney disease and/or damage.

**Scope:** EMT, AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Epistaxis	2-4 sprays to bleeding nostril, followed by direct pressure.	IN	15 ml spray bottle (1)

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
Epistaxis	1-2 sprays to bleeding nostril, followed by direct pressure.	IN	15 ml spray bottle (1)

**Precautions**

- 1) Use with caution in patients with diabetes mellitus or thyroid disease.
- 2) Use with caution in patients with prostatic hyperplasia and/or GI obstruction.
- 3) Temporary discomfort such as burning, stinging, sneezing, or an increased nasal discharge may occur.
- 4) Use extreme caution as the risk of angle closure glaucoma is increased in patients with narrow-angle glaucoma.
- 5) Use caution in patients with severe or unstable cardiovascular disease, orthostatic hypotension, or uncontrolled blood pressure disorders.
- 6) Patients with cerebral or coronary issues, Sjögren's syndrome, Raynaud's syndrome, or scleroderma are at risk for vascular insufficiency.

**Adverse/Side Effects**

Dry Nose / Rebound Nasal Congestion / Temporary Nasal Mucosa Irritation / Sneezing

**Class**

Imidazoline Derivative, Direct-Acting Sympathomimetic, Adrenergic Receptor Agonist, Decongestant Agent

**Mechanism of Action**

Oxymetazoline is an adrenergic  $\alpha_1$ - and  $\alpha_2$ -agonist and a direct-acting sympathomimetic drug. Stimulates adrenergic receptors, promoting vascular smooth muscle contraction by increasing intracellular calcium levels in response to ligand activation, causing local vasoconstriction of dilated arterioles and local reduction of blood flow.



## Albuterol Sulfate (Proventil, Ventolin)

**Indications:** Bronchospasm

**Contraindications:** Hypersensitivity

**Scope:** EMT, AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Bronchospasm	<ul style="list-style-type: none"><li>2.5mg in 3ml</li><li>Titrate O2 at 6-8 lpm</li><li>May repeat in 5 minutes if little to no improvement exist.</li></ul>	Nebulized	2.5mg of 0.03% solution – 3ml (4)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
Bronchospasm	<ul style="list-style-type: none"><li>2.5mg in 3ml</li><li>Titrate O2 at 6-10 lpm</li><li>May repeat in 5 minutes if little to no improvement exist.</li></ul>	Nebulized  *Consider adjusting delivery method to accommodate pediatric patient.	2.5mg of 0.03% solution – 3ml (4)

<b>Precautions</b>	<ol style="list-style-type: none"><li>1) If Paradoxical Bronchospasm occurs, discontinue Albuterol therapy, and consider other treatment.</li><li>2) May cause transient increase in blood glucose level in diabetic patients, similar to effect of steroids.</li><li>3) Use with caution for patients with cardiovascular disease as Albuterol can induce arrhythmias or other abnormal ECG presentations.</li><li>4) Use with caution as Albuterol may exacerbate various conditions for those with underlying Seizure Disorders, Hyperthyroidism, Glaucoma, and Hypokalemia.</li><li>5) Do not assume all wheezing is pulmonary, especially in a cardiac child; avoid Albuterol unless strong history of recurrent wheezing secondary to pulmonary etiology.</li></ol>
<b>Adverse/Side Effects</b>	Hypertension / Bronchospasm/ Chest Pain / Palpitations / Tachycardia / Excitement / Nervousness / Tremors
<b>Class</b>	Short-Acting Beta-2 Adrenergic Receptor Agonist (SABA), Bronchodilator Agent
<b>Mechanism of Action</b>	Selective to the mu-receptor, with primary actions in the brain through transitory stimulation prior to depression; binds to CNS opioid receptors, promotes analgesia and respiratory depression by decreasing brainstem respiratory centers response to CO <sub>2</sub> and electrical stimulation; inhibiting ascending pain pathways and altering perception of and response to pain; produces generalized CNS depression.



## Amiodarone

**Indications:** Acts directly on the myocardium to delay repolarization and increase the duration of the action potential. V-Fib or Pulseless V-Tach(pVT) Cardiac Arrest, Post Resuscitation Care, Wide Complex Tachycardia with a Pulse, & Symptomatic A-fib.

**Contraindications:** Without a pulse: None; With a pulse: Hypersensitivity, cardiogenic shock, severe bradycardia, sinus node dysfunction, heart blocks.

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 50mg/ml; (3) 3ml vials

### ADULT DOSING

Indication	Dose	Rate & Route	Note
V-fib or pVT Cardiac Arrest	1 <sup>st</sup> : 300 mg <b>6 mL</b> 2 <sup>nd</sup> : 150 mg <b>3 mL</b>	IV/IO push	4 minutes between 1 <sup>st</sup> and 2 <sup>nd</sup> doses.
V-fib or pVT Post resuscitation care – or – Wide Complex Tachycardia WITH a Pulse	150 mg	IV/IO infusion over 10 minutes	3 ml/50cc NS at 300gtts/min. Wait 10 minutes from the end of one infusion to start of next infusion. <b>MAXIMUM TOTAL DOSE IS 450 mg</b>
Symptomatic A-Fib			Alternative to diltiazem when there is a clinical concern.

### ADULT DOSING

PEDIATRIC DOSING			
Indication	Dose	Route & Rate	Supply
<b>NOT INDICATED</b>			

<b>Adverse/Side Effects</b>	Vasodilation (usually not associated with decreased cardiac output secondary to the negative inotropic effects), hypotension, bradycardia, AV block, increased QT interval, V-Tach.			
<b>Class</b>	Antiarrhythmic, Primarily Class III but has properties of all of the Vaughan Williams classifications			
<b>Mechanism of Action</b>	Prolongs the duration of the action potential and refractory period of all Cardiac fibers. Depresses the Phase 0 slope by causing a sodium blockade. Causes a Beta block as well as a weak calcium channel blockade. Primarily a Potassium-channel blocker (Class III antiarrhythmic) blocks the potassium channels that are responsible for phase 3 repolarization. Blocking these channels slows (delays) repolarization, which leads to an increase in action potential duration and an increase in the effective refractory period (ERP). Relaxes vascular smooth muscle, decreases peripheral vascular resistance, and increases coronary contractility.			
<b>Onset of Action</b>	Variable			
	<b>Peak Effect</b>	30 to 45 minutes	<b>Duration of Action</b>	Variable



## Aspirin

**Indications:** STEMI, suspected ACS

**Contraindications:** Allergy, known ulcer & GI bleeding

**Scope:** EMT, AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
STEMI or ACS	324 mg 4 tablets	PO	81 mg tablets (4)

**ADULT DOSING**

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
<b>NOT INDICATED</b>			

<b>Precautions</b>	1) Patients on blood thinners. 2) Pregnancy Category D: There is positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk (e.g., if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective).
<b>Adverse/Side Effects</b>	N/V, diarrhea, heartburn, GI bleeding
<b>Class</b>	Analgesic, Antipyretic, NSAID, platelet inhibitor
<b>Mechanism of Action</b>	Inhibits the formation of prostaglandins associated with pain, fever, and inflammation. Inhibits platelet aggregation by acetylating cyclooxygenase permanently disabling it so that it cannot synthesize prostaglandins and Thromboxane. Since Thromboxane A2 is important in clotting, its absence does not allow blood to clot effectively.



## Atropine Sulfate

**Indications:** Symptomatic Bradycardia (if TCP is not immediately available); Organophosphate poisoning

**Contraindications:** A-Fib or A-Flutter

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Symptomatic Bradycardia	1mg	Rapid IV/IO Push	Repeat every 5 min if needed. Max dose of 3mg.
Organophosphate Poisoning	1mg	IV/IO	1 mg IV/IO every minute titrated to drying of respiratory secretions.

### ADULT DOSING

PEDIATRIC DOSING			
Indication	Dose	Rate & Route	Note
Symptomatic Bradycardia	0.02 mg/kg Minimum of 0.1 mg Max dose: 1mg	Rapid IV/IO Push	Repeat x1 in 5 minutes.
Organophosphate Poisoning	0.02 mg/kg Minimum of 0.1 mg Max dose: 1mg	IV/IO	Repeat every 5 minutes until airway is dry and patient has adequate profusion.
For Intubation	0.02 mg/kg	IV/IO	Minimum is 0.1mg Max is 1mg

<b>Precautions</b>	Slow administration of atropine can cause paradoxical bradycardia.
<b>Adverse/Side Effects</b>	Pupil dilation, tachycardia, V-Tach, V-Fib, HA, dry mouth
<b>Class</b>	Parasympatholytic & Anticholinergic
<b>Mechanism of Action</b>	Competitive antagonist that selectively blocks all muscarinic responses to acetylcholine. Blocks vagal impulses, thereby increasing SA node discharge, thereby enhancing AV conduction and cardiac output. Potent anti-secretory effects caused by the blocking of acetylcholine at the muscarinic site. Atropine is also useful in the treatment of the symptoms associated with nerve agent poisoning.



## Calcium Chloride

**Indications:** Calcium channel or beta blocker overdose, hyperkalemia, hypocalcemia, hypermagnesemia, Hydrofluoric acid burn, Blood product transfusion; Cardiac arrest with presumed hyperkalemia or calcium channel blocker overdose; Pulseless VF/VT.

**Contraindications:** Hypersensitivity, patients receiving digitalis (can result in sudden cardiac arrest from ventricular fibrillation).

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Calcium channel or beta blocker overdose, hyperkalemia, hypocalcemia, hypermagnesemia, Hydrofluoric acid burn, Blood product transfusion; Cardiac arrest with presumed hyperkalemia or calcium channel blocker overdose; Pulseless VF/VT.	1g over 5 minutes	IV/IO	1gm in 10ml vial (1)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
NOT INDICATED			

**Precautions**

- 1) Rapid administration may be accompanied by a moderate fall in blood pressure as well as syncope due to peripheral vasodilation effects.
- 2) Use with extreme caution in the presence of severe hypokalemia due to the risk of acutely higher serum calcium and life-threatening arrhythmias.
- 3) For concurrent use with Sodium Bicarbonate, utilize separate IV/IO access lines for administration if possible; otherwise, ensure that any shared access line is adequately flushed between therapies to avoid a precipitation / crystallizing reaction of the two medications.
- 4) Calcium chloride should be used cautiously, if at all, in patients with vitamin D toxicity or hyperparathyroidism.
- 5) Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia. Give Calcium Chloride or Gluconate in addition to Sodium Bicarbonate if hyperkalemia suspected.

**Adverse/Side Effects**

Bradycardia / Arrhythmia / Hypotension / Syncope / Hot-Flash / Chalky Taste / Extravasation

**Class**

Calcium Salt; Electrolyte, Beta-Blocker Toxicity Antidote, Calcium-Channel Blocker Toxicity Antidote

**Mechanism of Action**

The dissociation of Calcium Chloride in water provides normal constituents of calcium and chloride ions for maintenance of balance between intake and output mechanisms. In the presence of hyperkalemia, the influx of calcium assists with moderation of nerve and muscle performance via action potential excitation threshold regulation.



## Cefazolin (Ancef)

**Indications:** Patients 16 years of age or older, with obvious and apparent open fracture, deformity to the bone or crepitus, with laceration over the fracture site and/or exposed bone.

**Contraindications:** History or allergic reaction to antibiotics in cephalosporin class (ceftriaxone, cefalexin, etc.), and/or history of allergic reaction to antibiotics in penicillin class.

**Scope:** AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Patients 16 years of age or older, with obvious and apparent open fracture, deformity to the bone or crepitus, with laceration over the fracture site and/or exposed bone.	2g	IV/IO <ul style="list-style-type: none"><li>Using a 10ml syringe, withdraw 5ml sterile NaCl 0.9% from the vial. Alternatively, use a prefilled syringe.</li><li>Add 5ml to each of the Cefazolin vials.</li><li>Withdraw the contents of each vial into the syringe and inject into 100ml of 0.9% NaCl.</li><li>Infuse over 30 minutes.</li></ul>	1gm in 10ml vial (1)

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
<b>NOT INDICATED</b>			

**Precautions** Pregnancy and breastfeeding, elderly patients, anemia, coagulation disorders, gastrointestinal diseases, renal disease, dialysis.

**Adverse/Side Effects** Headaches, dizziness, seizures, nausea, vomiting, diarrhea, Clostridioides difficile infection (CDI), skin rash, injection site reactions, hypersensitivity reactions (e.g., Stevens-Johnson syndrome, anaphylaxis), renal failure, electrolyte abnormalities (e.g., hyperkalemia), anemia, neutropenia, thrombocytopenia.

**Class** Cephalosporins

**Mechanism of Action** Disrupts the synthesis peptidoglycan layer therefore weakening of bacterial cell wall which results in bacterial cell death.



## Dextrose 10%

**Indications:** Hypoglycemia

**Contraindications:** Intercranial hemorrhage, stroke, closed head injuries.

**Scope:** AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Hypoglycemia	100 ml bolus of Dextrose 10% IV/IO.	IV/IO	D10 premixed bag – 250ml (2)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
Hypoglycemia	D10 (2ml/kg)	IV/IO  *If IV cannot be obtained, administer Glucagon 0.03mg/kg up to 1mg IM/IN. <b>Be sure to only administer Glucagon IM/IN in these cases.</b>	D10 premixed bag – 250ml (2)

<b>Precautions</b>	Use with caution in patients with suspected increased ICP.
<b>Adverse/Side Effects</b>	Patients may complain of warmth, pain, or burning at the injection site. Extravasation causes necrosis. Infusing through larger vessels decreases the risk of necrosis
<b>Class</b>	Carbohydrate
<b>Mechanism of Action</b>	Glucose is readily processed in the blood. Through glycolysis, glucose is turned into pyruvate giving off a small amount of chemical energy (ATP). Pyruvate is further processed through the Citric Acid Cycle yielding even more energy. Glucose is a large molecule and is incapable of being absorbed into a cell without insulin and therefore increases damage to epithelium. It also causes an osmotic pressure as concentrations vary across membranes.



## Diltiazem

**Indications:** Reentrant supraventricular tachydysrhythmias, atrial fibrillation or atrial flutter with a rapid ventricular response, paroxysmal SVT.

**Contraindications:** Known hypersensitivity; History or 12-lead showing WPW; Sick sinus syndrome or 2nd or 3rd AVB except if the patient has a functioning ventricular pacemaker; SBP < 90mmHg; Myocardial infarction and pulmonary congestion; Sinus tachycardia

**Side Effects:** Tachycardia, hypertension, arrhythmias, chest pain, nausea, vomiting.

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Reentrant supraventricular tachydysrhythmias, atrial fibrillation or atrial flutter with a rapid ventricular response, paroxysmal SVT.	If patient is > 70 kg, administer 20 mg.  If < than 70 kg, administer 10 mg. (Max dose is 20 mg).	IV/IO	5mg/ml (10ml vial)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
<b>NOT INDICATED</b>			

**Precautions**

- 1) Use with caution for patients with hepatic impairment.
- 2) Use with caution in patients with left ventricular dysfunction as negative inotropic effects may worsen condition.
- 3) Avoid use in patients with conditions associated with heart failure due to an increased risk for worsened outcome with calcium-channel blockers

**Adverse/Side Effects**

Peripheral Edema / Hypotension / Bradycardia / Bundle-Branch Block / Complete AV Block / Cardiac Arrhythmia

**Class**

Non-Dihydropyridine Calcium-Channel Blocker, Class IV Antiarrhythmic Agent, Antihypertensive Agent

**Mechanism of Action**

Inhibits calcium ions from entering slow channels or select voltage-sensitive areas of vascular smooth muscle and myocardium during depolarization, lowering calcium overall levels, promoting relaxation of coronary vascular smooth muscle and coronary vasodilation, decreasing myocardial contractility, peripheral arterial resistance, and cardiac output, ultimately improving oxygen delivery to the myocardial tissue of patients with vasospastic angina.



## Diphenhydramine (Benadryl)

**Indications:** Allergic Reaction, Anaphylaxis, Adult dystonic reaction, or Persistent nausea/vomiting

**Contraindications:** Hypersensitivity

**Scope:** EMT (*PO administration only*), AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Allergic Reaction, Anaphylaxis, Adult dystonic reaction, or persistent nausea/vomiting	<ul style="list-style-type: none"><li>EMT: 50mg PO</li><li>A, I, P, AP: 50mg PO or 25mg IV/IO</li></ul>	IV/IO	5mg/ml (10ml vial)

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
Allergic Reaction, Anaphylaxis, Adult dystonic reaction, or persistent nausea/vomiting	D10 (2ml/kg)	<p>IV/IO</p> <p>EMT: No Benadryl to pediatric patients 8 and under. Must be 8 years of age AND able to swallow a pill.</p> <ul style="list-style-type: none"> <li>• 1 mg/kg IM/IV over 1 minute.</li> <li>• For infant/child Max dose is 25 mg.</li> <li>• If patient is in severe shock and unable to establish IV, administer</li> <li>• Benadryl via IO access over 1 minute. Max dose is 25mg.</li> </ul>	5mg/ml (10ml vial)

**Precautions**

- 1) Use with caution in the presence of moderate-to-severe hypertension.
- 2) Use with extreme caution in patients with a chronic history of asthma, cardiovascular disease, or thyroid dysfunction.
- 3) Closely and consistently monitor recipients for signs and symptoms of CNS depression and nervous system agitation.
- 4) Diphenhydramine overdose may produce significant signs of toxicity such as severe agitation, dry mucous membranes, flushed skin, elevated body temperature, blurry vision, tachyarrhythmias, rhabdomyolysis, etc.
- 5) Diphenhydramine should NOT be given to a patient with decreased mental status and/ or a hypotensive patient as this may cause nausea, vomiting, and/ or worsening mental status.
- 6) In anaphylaxis, Diphenhydramine may decrease mental status.

**Adverse/Side Effects**

Anticholinergic or Antimuscarinic Effects / Drowsiness / Fatigue / GI-Discomfort / Hypotension / Tachycardia

**Class**

First-Generation H1 Receptor Antagonist, Competitive Muscarinic Acetylcholine Antagonist, Antihistamine Agent

**Mechanism of Action**

Competes with histamine for H1-receptor sites located on effector cells of the respiratory smooth muscle, vascular endothelial tissue, gastrointestinal tract tissue, cardiac tissue, immune tissue, and central nervous system (CNS) neurons. Acts as an inverse agonist at the H1 receptor, reversing the effects of histamine on capillaries and reducing symptoms of allergic reaction. Readily crosses blood-brain barrier and inversely agonizes the H1 CNS receptors, resulting in drowsiness and medullary cough center suppression.



## Epinephrine

**Indications:** Cardiac arrest, Bradycardia, Allergic reaction or Anaphylaxis, Respiratory distress with presumed bronchospasm, Uncontrollable external hemorrhage

**Contraindications:** None in the emergency setting

**Scope:**

- EMT: EpiPen, or may draw epinephrine from vials or ampules for the treatment of acute allergic reactions using devices and/or systems using syringes with mechanical limiters or color-coded or other clearly marked indicators to facilitate accurate dosing.
- AEMT, Intermediate, Paramedic, AP Paramedic:

**Preferred Dosing Reference:** Handtevy or Broselow®

**1: 1,000 Concentration: 1 mg/mL | 1:10,000 Concentration: 0.1 mg/mL | 1:100,000 Concentration 10 mcg/mL**

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Cardiac Arrest	1 mg 1:10,000 <b>10 mL</b>	IV/IO q 8 min	
Non-hemorrhagic Hypotension – or – Bradycardia	20 mcg 1:100,000 <b>2 mL</b>	IV/IO q 5 min PRN	Titrate to MAP > 65
	2 – 20 mcg/min	IV Infusion	
Anaphylaxis	0.3 mg 1:1,000 <b>0.3 mL</b>	IM	May repeat every 5 minutes up to total 1.2 mg *May assist with prescribed Epi Pen
	2 – 20 mcg/min	IV/IO Infusion	Titrate to respiratory and circulatory effect
Respiratory Distress	0.3 mg 1:1,000 <b>0.3 mL</b>	IM	May repeat every 5 minutes up to total 1.2 mg May assist with prescribed Epi Pen (0.3 mg)
	2 mg 1:1,000	Nebulizer	2 mg (2 mL) of 1:1,000 mixed with 1 ml NS

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
Cardiac Arrest	0.01 mg/kg 1:10,000 Max dose: 1 mg	IV/IO q 4 min	
Bradycardia	0.01 mg/kg 1:10,000 Max dose: 1 mg	IV/IO	<b>Contact OLMC for repeat IVP doses</b>
	0.1 – 1 mcg/kg/min	IV/IO Infusion	
Hypotension	<b>0.1 – 1 mcg/kg/min</b>	<b>IV/IO Infusion</b>	<b>OLMC Required</b>
Anaphylaxis BLS PROVIDERS	If 8 to 29.9 kg then 0.15 mg	IM	<b>Contact OLMC for repeat IM doses</b> <b>Do not administer if &lt; 8 kg</b> May assist with prescribed Epi Pen
	If $\geq$ 30 kg then 0.3 mg	IM	
Anaphylaxis ALS PROVIDERS	0.01 mg/kg 1:1,000 Max dose: 0.3 mg	IM	
	0.1 – 1 mcg/kg/min	IV/IO Infusion	
Respiratory Distress Strider/Barking – or – < 2 Y/O with bronchiolitis	0.01 mg/kg 1:1,000 Max dose: 0.3 mg	IM	<b>Contact OLMC for repeat IM doses</b>
		Nebulizer	0.5 mg 1:1,000 mixed with 4 ml NS – or – 0.5 mg of 1,10:000

**Adverse/Side Effects** Palpitations, anxiety, tremulousness, headache, dizziness, nausea, vomiting, increased myocardial oxygen demand

**Class** Sympathetic Agonist. Epinephrine is a naturally occurring catecholamine. It is a potent alpha- and beta-adrenergic stimulant with more profound beta effects.

**Mechanism of Action** Epinephrine works directly on alpha- and beta-adrenergic receptors with effects of increased heart rate, cardiac contractile force, increased electrical activity in the myocardium, increased systemic vascular resistance, increased blood pressure, and increased automaticity. It also causes bronchodilation.

## Epinephrine Infusion and Dosing Volume

### ADULT DOSING

<b>Step 1:</b> Determine concentration and prepare medication.	Epi 1 mg/ml (1:1,000)	Mix 2 mg of Epi 1 mg/ml in 250 ml NS, thus creating Epi 8 mcg/ml
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**Step 2:** Use 60 gtts set and determine infusion rate

Dose in mcg/min	2 mcg	4 mcg	6 mcg	8 mcg	10 mcg	12 mcg	14 mcg	16 mcg	18 mcg	20 mcg
Drops per minute	15 gtts	30 gtts	45 gtts	60 gtts	75 gtts	90 gtts	105 gtts	120 gtts	135 gtts	150 gtts

### ADULT DOSING



## Etomidate

**Indications:** Use of sedation in drug assisted intubation

**Contraindications:** Sepsis, hypertension, hypovolemia, esophageal varices, renal impairment

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Use of sedation in drug assisted intubation	0.3mg/kg	IV/IO	2mg/ml in 20ml (1)

### ADULT DOSING

PEDIATRIC DOSING			
Indication	Dose	Route & Rate	Supply
NOT INDICATED			

<b>Precautions</b>	Known to inhibit adrenal steroid production up to 8 hours and up to 24 hours in elderly and debilitated patients. Can exacerbate symptoms in known heart failure patients. Caution in patients with renal failure.
<b>Adverse/Side Effects</b>	Nausea, vomiting, adrenal suppression
<b>Class</b>	Cortisol Synthesis Inhibitor; General Anesthetic
<b>Mechanism of Action</b>	Short-acting, nonbarbiturate general anesthetic used for rapid induction of anesthesia with minimal cardiovascular effects.



## Fentanyl

**Indications:** Pain management, ACS or STEMI, Constant Crush Injury > 4 hours, Procedural sedation

**Contraindications:** Hypotension or Respiratory depression

**Scope:** Paramedic may administer yet AP Paramedic must retain responsibility for the BREMS AP Bag/Exchange.

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Pain management	25 – 100 mcg		Titrate to pain management & may repeat 25-50 mcg q 5 minutes.
ACS	<b>0.5 to 2 mL</b>		
Constant crush injury > 4 hours		IV/IO/IM/IN	Maintain MAP > 65
Procedural sedation	<b>Max total dose: 300 mcg</b>		

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
Pain management			<b>Do not administer repeat doses if &lt; 6 kg</b>
Constant crush injury > 4 hours	1 <sup>st</sup> : 1.0 mcg/kg 2 <sup>nd</sup> and 3 <sup>rd</sup> : 0.5 mcg/kg	IV/IO/IM/IN	May repeat q 5 min up to <b>max total 2 mcg/kg</b> Maintain SBP > 70 + (age in years x 2) mmHg
Procedural sedation			

<b>Precautions</b>	Narcan should be available. Lower doses should be considered in elderly and frail patients.
<b>Adverse/Side Effects</b>	Fentanyl may cause muscle rigidity, particularly involving the muscles of respiration. As with other narcotic analgesics, the most common serious adverse reactions reported to occur with fentanyl are respiratory depression, apnea, rigidity, and bradycardia. Other adverse reactions that have been reported are hypertension, hypotension, dizziness, blurred vision, nausea, emesis, laryngospasm, and diaphoresis. May cause Respiratory Depression.
<b>Class</b>	Opioid, Schedule II controlled substance
<b>Mechanism of Action</b>	Competitive agonist that binds to opioid receptors which are found principally in the central and peripheral nervous system.



## Glucagon

**Indications:** Hypoglycemia or Beta-blocker overdose

**Contraindications:** None in the emergency setting

**Scope:** EMT, AEMT – Only administer in the setting of hypoglycemia

Intermediate, Paramedic, AP Paramedic – Administer if needed in either hypoglycemia or beta blocker overdose.

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Hypoglycemia	1 mg	IM/IN	Vial contains 1 mg powder and 1 ml diluent (1)
Beta-blocker overdose	4 mg	IV/IO	Combine per training

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Supply
Hypoglycemia	0.1 mg/kg Max dose: 1 mg	IM	Vial contains 1 mg powder and 1 ml diluent (1)
Beta-blocker overdose		IV/IO	Combine per training

<b>Precautions</b>	Glucagon for Hypoglycemia is only effective if there are sufficient stores of glycogen in the liver. Pregnancy Category B
<b>Adverse/Side Effects</b>	Hypotension, dizziness, headache, nausea, vomiting.
<b>Class</b>	Hormone secreted by the alpha cells of the pancreas
<b>Mechanism of Action</b>	Glucagon causes a breakdown of stored glycogen to glucose, and inhibits the synthesis of glycogen from glucose. Glucagon exerts a positive inotropic action on the heart and decreases renal vascular resistance.



## Haloperidol

**Indications:** Used to treat certain mental/mood disorders (e.g., schizophrenia, schizoaffective disorders) & Tourette's disorder, Severe nausea/vomiting

**Contraindications:** Severe toxic central nervous system depression, Parkinson's disease

**Scope:** AP Paramedic

**Supply:** 5mg/ml in 1ml (2)

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Mental mood disorders	5 mg	IV/IO/IM	May repeat x 1 q 10 min
Severe nausea/vomiting			

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
<b>NOT INDICATED</b>			



## Hydroxocobalamin, Cyanokit®

**Indications:** Known or suspected cyanide poisoning (to include inhalation, ingestion or dermal exposure), Signs of cyanide ingestion that include: altered LOC, seizures, coma, cardiovascular collapse, vomiting, mydriasis, tachypnea(early), bradypnea(late), hypertension(early), hypotension(late).

**Contraindications:** Hypersensitivity

**Scope:** AP Paramedic

**Supply:** 5g bottle (1)

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Cyanide poisoning	5g	IV/IO	<p>Add 200 mL of 0.9% Sodium Chloride into the vial. (This is not included in the kit.)</p> <ul style="list-style-type: none"><li>• Vial contains 5 g of medication.</li><li>• Shake for at least 60 seconds to reconstitute.</li><li>• Infuse into patient over 15 minutes.</li><li>• One vial is a complete starting dose.</li><li>• <b>Must contact OLMC:</b> Depending on the severity of the poisoning and patient response, for a second dose over 15 minutes may be infused for a total dose of 10g.</li></ul>

## ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
Cyanide poisoning	70mg/kg	IV/IO	Power must be reconstituted in 50ml of NS. (This is not included in the kit.) Run at 2gtts/sec using a 15gtts set.

**Precautions** Known anaphylactic reactions to hydroxocobalamin or cyanocobalamin, allergic reaction include: anaphylaxis, chest tightness, edema, urticarial, pruritus, dyspnea, rash. Substantial increases in blood pressure may occur following Cyanokit Administration. Patients with renal insufficiency.

**Adverse/Side Effects** Chromaturia (red colored urine), erythema (red skin), headache, nausea

**Class** Antidote (for known or suspected cyanide poisoning)

**Mechanism of Action** Action of Cyanokit is the ability to bind cyanide ions. Each hydroxocobalamin ion can bind one cyanide ion by substituting it for the hydroxylan linked to the trivalent cobalt ion. Bind forms cyanocobalamin. Cyanocobalamin is excreted in the urine.

<b>Precautions</b>	Elderly Patients with Dementia-Related Psychosis Pregnancy Category C
<b>Adverse/Side Effects</b>	Tachycardia, hypotension, and hypertension. QT prolongation and/or ventricular arrhythmias. Dystonia
<b>Class</b>	Antipsychotic
<b>Mechanism of Action</b>	The precise mechanism of action has not been clearly established. This drug is known to be substantially excreted by the kidney



## Isotonic Crystalloid Fluids

**Indications:** Hypovolemia, Sepsis, Dehydration, Establishing vascular access and medication administration

**Contraindications:** Fluid overload resulting in pulmonary edema and/or congestive heart failure

**Scope:** AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Hypovolemia Sepsis Dehydration Establishing vascular access and medication administration	<ul style="list-style-type: none"><li>• 20ml/kg</li><li>• 30ml/kg in the setting of sepsis</li></ul>	IV/IO	May titrate dose and administration rate based on assessment, MAP > 65 or permissive hypotension when indicated, and most appropriate clinical operating guideline

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
Hypovolemia Sepsis Dehydration Establishing vascular access and medication administration	Pediatric: 20 ml/kg Newborn: 10 ml/kg	IV/IO	May titrate dose and administration rate based on assessment, mental status and vital signs, and most appropriate clinical operating guideline

<b>Precautions / Side Effects</b>	Crystalloid fluids are administered for volume expansion as indicated. Crystalloid fluids, such as Lactated Ringers or Normal Saline, do not add oxygen binding capacity. Rapid volume resuscitation of crystalloid fluids, preferably through large-bore line, may be indicated in the acute setting. Always monitor for signs of fluid overload and titrate to a desired effect. Maintenance infusion is indicated as needed to maintain patent access or minimum volume to maintain volume homeostasis.
<b>Interactions</b>	None
<b>Class</b>	Isotonic to human plasma
<b>Mechanism of Action</b>	Approximate concentrations of various solutes and do not exert as osmotic effect, expand intravascular volume without disturbing ion concentration or significant fluid shift.



## Ketamine

**Indications:** Pain, Severe bronchospasm, Procedural sedation, Rapid sequence induction, Excited delirium, Lifesaving procedure

**Contraindications:** Uncontrolled Hypertension, Hypersensitivity. Be cautious administering to elderly patients.

**Scope:** AP Paramedic

**Supply:** 50mg/ml in 10ml (2)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Pain – or – Severe bronchospasm	10 mg	IV/IO infusion over 10 minutes	If the patient is hemodynamically unstable defined as MAP < 65 and/or respiratory failure, then ketamine may be used first for pain.  If the patient is hemodynamically stable defined as MAP $\geq$ 65 and no respiratory failure, then the appropriate total amount of fentanyl ( $\geq$ 100 mcg) should be administered first; then ketamine can be administered x1 10 minutes later if no relief in pain occurred.
	25 – 50 mg	IM	For IV/IO infusion, 10 mg (0.1 mL) mixed in 100 mL isotonic then administer with 60 gtt wide open; may repeat x1 at 20 minutes.  May repeat IM every 30 minutes titrated to pain management or presence of nystagmus.
Procedural sedation	100 mg	IV/IO push over 1 minute	May repeat IV/IO push every 10 - 20 minutes titrated to effect.
Rapid Sequence Induction	200 mg		
Violent Excited delirium – or – Lifesaving procedure	400 mg	IM	May repeat IM every 30 minutes titrated to effect. Lifesaving procedure when IV/IO access cannot be obtained.

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
<b>NOT INDICATED</b>			

<b>Precautions</b>	Laryngospasms and other forms of airway obstruction have occurred. Use with caution in patients with history of Schizophrenia. Be aware that in lower dosing some patients may experience partial disassociation.
<b>Adverse/Side Effects</b>	Respiratory depression may occur, Laryngospasms, Hypertension, Emergence Reactions (Hallucinations, Delirium), dizziness, nausea, vomiting
<b>Class</b>	Ketamine hydrochloride is a rapid-acting dissociative anesthetic.
<b>Mechanism of Action</b>	The anesthetic state produced by ketamine hydrochloride has been termed "dissociative anesthesia" in that it appears to selectively interrupt association pathways of the brain before producing somatesthetic sensory blockade. It may selectively depress the thalamoneocortical system before significantly obtunding the more ancient cerebral centers and pathways (reticular-activating and limbic systems).



## Ketorolac (Toradol)

**Indications:** Pain management

**Contraindications:** DO NOT ADMINISTER to ANY of the following: Renal disease and/or renal failure patients, any stage of pregnancy, active labor or actively breast feeding, multi-systems trauma, patients who are currently on anti-coagulants (for the exception of ASA), allergy to ASA or NSAIDs, Age < 15 years old, GI bleeding, or known active bleed.

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Pain management	15 mg	IVP	
	30	IM	

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
NOT INDICATED			

<b>Precautions</b>	In late pregnancy, as with other NSAIDs, toradol should be avoided because it may cause premature closure of the ductus arteriosus. Can cause renal injury. Should be used with caution in patients with preexisting asthma.
<b>Adverse/Side Effects</b>	Gastrointestinal Effects - Risk of Ulceration, Bleeding, and Perforation, and skin exfoliative dermatitis. Can cause serious gastrointestinal adverse events including bleeding, ulceration and perforation, of the stomach, small intestine, or large intestine, which can be fatal. These serious adverse events can occur at any time, with or without warning symptoms. Patients with asthma may have aspirin-sensitive asthma and should not be administered to patients with this form of aspirin sensitivity.
<b>Class</b>	Nonsteroidal anti-inflammatory drug (NSAID)/nonopioid analgesic
<b>Mechanism of Action</b>	Ketorolac tromethamine is a nonsteroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity in animal models. The mechanism of action of ketorolac, like that of other NSAIDs, is not completely understood but may be related to prostaglandin synthetase inhibition. The biological activity of ketorolac tromethamine is associated with the S-form. Ketorolac tromethamine possesses no sedative or anxiolytic properties.



## Labetalol

**Indications:** Hypertensive crisis (SBP >200mmHg; DBP >120mmHg) with symptoms of headache, chest pain, AMS. Hypertensive relative to CVA/stroke (SBP > 185mmHg; DBP >110mmHg), or tachyarrhythmias.

**Contraindications:** Hypersensitivity, CHF, cardiogenic shock, bradycardia, or pediatrics

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Hypertensive crisis (SBP >200mmHg; DBP >120mmHg) with symptoms of headache, chest pain, AMS. Hypertensive relative to CVA/stroke (SBP > 185mmHg; DBP >110mmHg), or tachyarrhythmias.	10mg over 1-2 minutes	IV/IO	5mg/ml in 4ml (1)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
NOT INDICATED			

**Precautions**

- 1) Hypotension and bradycardia have been reported, especially with high-dose IV administration.
- 2) Patient should remain supine during and for up to 3 hours after IV administration due to high probability of orthostatic hypotension.
- 3) Use extreme caution with IV therapy for patients with nonallergic bronchospastic disease, including chronic bronchitis and emphysema.
- 4) Use caution in patients with well compensated CHF due to risk of myocardial contractility depression and worsening heart failure.
- 5) Use caution in patients with diabetes mellitus, especially labile diabetes, due to possible masked signs and symptoms of hypoglycemia.
- 6) Use caution in patients with hepatic impairment due to high probability that drug metabolism may be decreased.

**Adverse/Side Effects**

Orthostatic Hypotension / Dizziness / Nausea / Paresthesia / Headache / Diaphoresis

**Class**

Selective Alpha-1 Adrenergic Antagonist, Non-selective Beta-1 & Beta-2 Adrenergic Antagonist, Antihypertensive Agent

**Mechanism of Action**

Non-selectively antagonizes beta-adrenergic receptors, and selectively antagonizes alpha-1-adrenergic receptors. Following intravenous administration, labetalol has nearly 7 times the beta-blocking ability than alpha-blocking ability. Antagonism of alpha-1-adrenergic receptors leads to vasodilation and decreased vascular resistance, decreasing BP which, is most pronounced while standing. Antagonism of beta-1-adrenergic receptors leads to a slight decrease in heart rate. Antagonism of beta-2-adrenergic receptors leads to some of the side effects of labetalol such as bronchospasms. Labetalol leads to sustained vasodilation over the long term without a significant decrease in cardiac output or stroke volume, and a minimal decrease in heart rate.



## Lidocaine

**Indications:** V-Fib or Pulseless V-Tach(pVT) Cardiac Arrest, Post Resuscitation Care, Wide Complex Tachycardia with a Pulse, Pain Management for IO Flush, Eye Injury, Pain Management for Kidney Stone

**Contraindications:** Second- and third-degree heart blocks, CHF

**Scope:** \*AEMT (Only in the setting of placing an IO), Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** Drug box contains 1gm/D5W 250ml (1)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
V-fib or pVT Cardiac Arrest	1mg/kg once followed by 0.5mg/kg for second and subsequent doses	IV/IO	Max total patient dose of 3 mg/kg.
Wide Complex Tachycardia with a Pulse	1mg/kg once followed by 0.5mg/kg for second and subsequent doses	IV/IO	Max total patient dose of 3 mg/kg.
IO Flush	40 mg <b>2 mL</b>	Slow IO Push	Non-cardiac arrest patients Dilute with isotonic solution to 10 ml

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
V-fib or pVT Cardiac Arrest	1 mg/kg Max dose: 100 mg	IV/IO Push	q 4 minutes to max total patient dose of 3 mg/kg
Wide Complex Tachycardia with a Pulse			
IO Flush	0.5 mg/kg Max dose: 40 mg	Slow IO Push	Non-cardiac arrest patients Dilute with isotonic solution to 10 ml

## ADULT DOSING

**Step 1:** Determine concentration and mix medication prior to priming line.

Drug box contains 1gm/D5W 250ml (1)

**Step 2:** Use 60 gts set and determine infusion rate (clock method)

Dose	1 mg	2 mg	3 mg	4 mg
Drops per minute	15	30	45	60

## ADULT DOSING

### Precautions

CNS depression may occur when the drug exceeds 300mg/hr. Lidocaine should be used with caution when administered concomitantly with Procainamide and beta-blockers as drug toxicity may result.

### Adverse/Side Effects

Drowsiness, seizures, confusion, hypotension, bradycardia, heart blocks, nausea, vomiting, and respiratory and cardiac arrest

### Class

Antiarrhythmic (Class 1b), Sodium channel blocker

### Mechanism of Action

Lidocaine depresses depolarization and automaticity in the ventricles, and increases the ventricular fibrillation threshold by increasing phase IV repolarization.



## Magnesium Sulfate 50%

**Indications:** V-Fib or Pulseless V-Tach(pVT) Cardiac Arrest, Wide Complex Tachycardia with a Pulse, All Torsade de Pointes, Respiratory Distress or Failure, OB Seizures (eclampsia)

**Contraindications:** Hypotension, third degree AV block, routine dialysis patients, known hypocalcemia.

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 1gm/2ml (4)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
V-fib or pVT Cardiac Arrest	2g (50%)	IV/IO Push	
Wide Complex Tachycardia WITH a Pulse (Torsade de Pointes)	2g (50%) loading dose over 5 minutes. Follow with 0.5g to 1g per hour.	IV/IO Infusion	
Respiratory Distress/Failure	1-2g (10%) over 20 minutes.	IV/IO 1-2g diluted to 10ml	To make a 10% solution when drawing from the vial, add 8ml of NS to each 1gm (2ml) vial of Mag Sulfate.
OB Seizures/Eclampsia	4g (10% - 40ml) IV over 4 minutes; Max dose is 4g (8ml diluted to 40ml).	IV/IO	To make a 10% solution when drawing from the vial, add 8ml of NS to each 1gm (2ml) vial of Mag Sulfate.

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
V-fib or pVT Cardiac Arrest	(50%) 25-50 mg/kg. Max dose is 2g.	IV/IO Push	q 5 minutes to max dose of 2 g
Wide Complex Tachycardia WITH a Pulse (Torsade de Pointes)	(50%) 25-50 mg/kg. Max dose is 2g.	IV/IO Infusion	Place into 50 ml NS to infuse over 5 minutes
Respiratory Distress/Failure	1-2g (10%) over 20 minutes.	1-2g diluted to 10ml	To make a 10% solution when drawing from the vial, add 8ml of NS to each 1gm (2ml) vial of Mag Sulfate.

<b>Precaution</b>	Magnesium Sulfate should be administered slowly to minimize side effects. Use with caution in patients with known renal insufficiency. In hypermagnesemia Calcium Chloride should be available as an antidote if serious side effects occur
<b>Adverse/Side Effects Class</b>	Hypotension, cardiac arrest, respiratory/CNS depression, flushing, sweating, bradycardia, decreased deep tendon reflexes, drowsiness, respiratory depression, arrhythmia, hypothermia, itching, and rash. Antiarrhythmic (Class V), Electrolyte
<b>Mechanism of Action</b>	Magnesium Sulfate is a salt that dissociates into the Magnesium cation and the sulfate anion. Magnesium is an essential element in numerous biochemical reactions that occur within the body. Magnesium Sulfate acts as a calcium channel blocker and blocks neuromuscular transmission. Hypomagnesemia can cause refractory ventricular fibrillation. Magnesium Sulfate is also a central nervous system depressant used for seizures associated with eclampsia and it is also a bronchodilator.



## Methylprednisolone

**Indications:** Allergic reaction/Anaphylaxis, Respiratory distress from presumed bronchospasm

**Contraindications:** None in the emergency setting

**Scope:** AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Allergic reaction/Anaphylaxis, Respiratory distress from presumed bronchospasm	125 mg	IV/IO/IM	125mg/2ml (1)

### ADULT DOSING

PEDIATRIC DOSING			
Indication	Dose	Rate & Route	
Allergic reaction/Anaphylaxis	2 mg/kg	IV/IO/IM	
Respiratory distress	Max dose: 125mg		

**Precautions**

- 1) Use with extreme caution in patients with recent myocardial infarction due to risk of left ventricular free wall rupture.
- 2) Blood pressure elevations may occur with average to large corticosteroid doses.
- 3) Use caution in patients with congestive heart failure, hypertension, or renal insufficiency due to risk of fluid retention.
- 4) Cardiac arrhythmia or cardiac arrest has been reported with rapid injection of high doses; proper administration technique advised.
- 5) Avoid administering drug into deltoid muscle as this increases the risk of subcutaneous atrophy.
- 6) Increased potassium excretion or sodium retention may occur with average to large corticosteroid doses in patients with CHF or HTN.
- 7) May cause transient increases in BLS when administered to diabetic patients.

**Adverse/Side Effects**

Hypertension, hyperglycemia, vertigo, headache, nausea, hiccups, and peptic ulcer

**Class**

Glucocorticoids steroid

**Mechanism of Action**

Methylprednisolone is a synthetic steroid with potent anti-inflammatory properties. Effective as anti-inflammatory agents, they are used in the management of allergic reactions, asthma, and anaphylaxis. Methylprednisolone alters the body's immune response. Swelling is reduced because it prevents the white blood cells traveling to the area.



## Midazolam

**Indications:** Procedural/maintenance sedation, Anticonvulsant, Rapid Sequence Induction, Acute behavioral emergencies, EtOH withdrawal, Uncontrolled Anxiety/Panic Attack

**Contraindications:** Allergy, Shock, Coma, Closed Angle Glaucoma, Pregnancy Category D

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply: (Please note the differences in box vs. AP bag below)**

\*BREMS Drug Box – 5mg/1ml (2)

\*AP Bag – 1mg/ml in 5ml (2)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Procedural/maintenance sedation – or – Acute psychiatric or toxicologic behavioral emergency	2.5 – 5 mg	IV/IO	For IV/IO: Repeat q 3-5 minutes to effect For IM/IN: Repeat q 10-15 minutes to effect Maintain MAP > 65
	5 – 10 mg	<b>IM/IN</b>	
Rapid Sequence Induction	5 – 10 mg	IV/IO	
Anticonvulsant – or – EtOH Withdrawal	5 mg	IV/IO	
	10mg	<b>IM/IN</b>	
Uncontrolled Anxiety / Panic attack	0.5 – 1 mg	IV/IM/IN	

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
Procedural/maintenance sedation	0.05 mg/kg Max dose: 5 mg	IV/IO	<b>DO NOT ADMIN IF &lt; 5 KG</b> Repeat PRN to effect.
Anticonvulsant	0.1 mg/kg Max dose: 5 mg	IV/IO/IM/IN	Maintain SBP > 70 + (Age in years x 2) mmHg

<b>Precautions</b>	Premedication with an opiate may potentiate midazolam and lead to apnea. Reducing the dose to 50% is suggested in elderly and patients under the influence of other CNS depressants.
<b>Adverse/Side Effects</b>	Minor: N/V, Headache, Drowsiness, Lethargy, Cough, Hiccups Major: Respiratory Depression, Apnea, Hypotension, Cardiac Arrest, Paradoxical CNS stimulation
<b>Class</b>	Short-acting benzodiazepine central nervous system (CNS) depressant.
<b>Mechanism of Action</b>	Acts at the level of the limbic, thalamic, and hypothalamic regions of the CNS through potentiation of GABA (inhibitory neurotransmitter). Decreases neural cell activity in all regions of CNS. Anxiety is decreased by inhibiting cortical and limbic arousal. Promotes relaxation through inhibition of spinal motor reflex pathway, also depresses muscle & motor nerve function directly. As an anticonvulsant, augments presynaptic inhibitions of neurons, limiting the spread of electrical activity. However, it does not alter the electrical activity of the seizure's focus. Midazolam has twice the affinity for benzodiazepine receptors than diazepam and has more potent amnesic effects. It is short acting and roughly 3-4 times more powerful than diazepam.



## Morphine Sulfate

**Indications:** Acute pain

**Contraindications:** Hypersensitivity, hypoperfusion, adult SBP <110 mmHg and pediatric SBP <80 mmHg

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Acute pain	<ul style="list-style-type: none"><li>• 4mg slow IVP up to 10mg PRN.</li><li>• Max dose is 10mg</li></ul>	IV/IO/IM/IN	10mg in 1 ml (1)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
Acute pain	<ul style="list-style-type: none"><li>• 0.1mg/kg</li><li>• Max dose is 10mg</li></ul>	IV/IO/IM/IN	10mg in 1 ml (1)

**Precautions**

- 1) Avoid use in patients with circulatory shock; further reduction in cardiac output or blood pressure may occur.
- 2) Use extreme caution in patients with known or suspected risk of adrenal insufficiency including Addison's Disease.
- 3) Use extreme caution for patients with significant COPD or decreased respiratory reserve due to risk of decreased respiratory drive.
- 4) Use caution in patients susceptible to intracranial effects of carbon dioxide retention i.e., brain tumors or increased intracranial pressure.
- 5) Severe hypotension or syncope in ambulatory patients may occur especially in those with compromised ability to maintain blood pressure.
- 6) Avoid use with mixed agonist/antagonist or partial agonist analgesics.
- 7) Use caution when injecting intramuscularly in patients with hypotension or shock, since impaired perfusion may prevent absorption.
- 8) Respiratory depression, sedation, and hypotension may occur in patients with cirrhosis.
- 9) Rapid intravenous administration may result in chest wall rigidity.

**Adverse/Side Effects**

Respiratory Depression / Respiratory Arrest / Hypotension / Hallucinations / Nausea / Vomiting / Constipation / Pruritis / Rash

**Class**

Opioid Receptor Agonist, Opioid Analgesic Agent

**Mechanism of Action**

Selective to the mu-receptor, with primary actions in the brain through transitory stimulation prior to depression; binds to CNS opioid receptors, promotes analgesia and respiratory depression by decreasing brainstem respiratory centers response to CO<sub>2</sub> and electrical stimulation; inhibiting ascending pain pathways and altering perception of and response to pain; produces generalized CNS depression.



## Naloxone

**Indications:** Reversal of respiratory depression caused by opiates or synthetic narcotics

**Contraindications:** Known allergy, known hypersensitivity, neonates with narcotic use by mother

**Scope:** \*EMT (*Intra-nasal route only*), AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 1mg/ml in 2ml (2)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Non-synthetic organic opiate overdose	0.4 – 2 mg	IV/IN/IM	Repeat PRN to effect.
Synthetic opiate overdose	10 – 20 mg	IV	OLMC Required

### ADULT DOSING

PEDIATRIC DOSING			
Indication	Dose	Rate & Route	Note
Opiate overdose	0.1 mg/kg Max dose: 2 mg	IV/IN	Repeat PRN to effect. Contact OLMC for higher dosing

<b>Adverse/Side Effects</b>	Tachycardia, hypotension with rapid administration, HTN, dysrhythmias, N/V and diaphoresis. In neonates, opioid withdrawal may be life-threatening if not recognized.
<b>Class</b>	Opioid antagonist
<b>Mechanism of Action</b>	Naloxone hydrochloride is an opioid antagonist that antagonizes opioid effects by competing for the same receptor sites. Naloxone hydrochloride reverses the effects of opioids, including respiratory depression, sedation, and hypotension.



## Nitroglycerin

**Indications:** Chest Pain, CHF/Pulmonary Edema

**Contraindications:** Hypotension, hypovolemia, severe bradycardia or tachycardia, use of erectile dysfunction drugs within past 24hrs up to 48 hours depending on use of extended release medications.

**Scope:** EMT – SL tablet only

AEMT, Intermediate, Paramedic – SL tablet and Nitropaste 2% Ointment

AP Paramedic – SL tablet, Nitropaste, Nitro Drip

**Supply:**

Bottle contains (25) 0.4mg SL tablets (1)

Nitropaste packet contains 2% ointment – 1 inch packet (5)

Nitro drip – Nitroglycerin in D5W 100mcg/ml in 252ml (1) – **AP Bag Only**

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
ACS chest pain – or – CHF/Pulmonary edema	0.4 mg	SL	Repeat x 3 regardless of the amount of doses administered PTA of EMS. Maintain SBP > 100 mmHg
	1 inch (1 packet)	Topical paste	x 1 and place on the chest Maintain SBP > 100 mmHg; wipe off if SBP becomes < 100 mmHg

### ADULT DOSING

## PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
<b>NOT INDICATED</b>			

### Precautions

- 1) Use caution in patients with poor cardiac function, blood volume depletion, existing hypotension, cardiomyopathy, CHF, or acute myocardial infarction.
- 2) Severe hypotension may occur in patients with constrictive pericarditis, aortic or mitral stenosis, and preexisting hypotension.
- 3) Patients with concomitant use of diuretics are at greater risk for severe hypotension accompanied by paradoxical bradycardia and angina.
- 4) Do not use paddle of cardioverter or defibrillator over a transdermal patch as this will concentrate local current and may result in burns.
- 5) Elderly patients may experience more pronounced adverse events such as hypotension, dizziness, and fainting due to increased sensitivity.

### Adverse/Side Effects

Increased ICP / Anaphylaxis / Methemoglobinemia / Hypotension / Dizziness / Headache / Lightheadedness / Flushing / Dry Mouth

### Class

Nitrate, Antianginal / Antihypertensive / Vasodilator Agent

### Mechanism of Action

Converted by mitochondrial aldehyde dehydrogenase in smooth muscle cells to nitric oxide which, promotes conversion of GTP to cGMP in vascular smooth muscle and other tissues, leading to the relaxation of vascular smooth muscles, arteriolar and venous dilatation; increasing blood flow to the myocardium, reducing cardiac preload and afterload, decreasing myocardial wall stress and ameliorating anginal symptoms; reducing coronary artery spasm, decreasing systemic vascular resistance as well as systolic and diastolic blood pressure.



## Norepinephrine

**Indications:** Hypotension, septic shock, shock persisting after adequate fluid volume replacement

**Contraindications:** Known allergy, **hypovolemic shock from hemorrhage except for OLMC approval.**

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 1mg/ml in 4ml (4)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Hypotension – or – Septic shock – or – Persistent shock after volume replacement	4-12 mcg/min	IV/IO	Titrate to a MAP > 65

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
<b>NOT INDICATED</b>			

**Adverse/Side Effects**

Systemic: Ischemic injury due to potent vasoconstrictor action and tissue hypoxia.  
Cardiovascular: Bradycardia, probably as a reflex result of a rise in blood pressure, arrhythmias, tachycardia  
Nervous: Anxiety, transient headache.  
Respiratory: Respiratory difficulty.  
Skin and Appendages: Extravasation necrosis at injection site. Gangrene of extremities has been rarely reported. Overdoses or conventional doses in hypersensitive persons (e.g., hyperthyroid patients) cause severe hypertension with violent headache, photophobia, stabbing retrosternal pain, pallor, intense sweating, and vomiting.

**Class****Mechanism of Action**

Sympathomimetic: Alpha/Beta agonist

Norepinephrine acts predominantly on alpha-adrenergic receptors to produce constriction of resistance and capacitance vessels, thereby increasing systemic blood pressure and coronary artery blood flow. Norepinephrine also acts on beta1-receptors, although quantitatively less than either epinephrine or isoproterenol. In relatively lower doses, the cardiac-stimulant effect of norepinephrine is predominant; with larger doses, the vasoconstrictor effect predominates. Similar to epinephrine, norepinephrine has direct agonist effects on effector cells that contain alpha and beta receptors.

## Norepinephrine Infusion and Dosing Volume

### ADULT DOSING

**Step 1:** Determine concentration and mix medication prior to priming line. If concentration is 4000mcg/250ml or 16mcg/ml, mix 4 mg (4 ml) of Levophed in 250 ml NS, thus creating a concentration of 16 mcg/ml.

**Step 2:** Use 60 gtt set and determine infusion rate

Dose	2 mcg/min	4 mcg/min	6 mcg/min	8 mcg/min	10 mcg/min	12 mcg/min	14 mcg/min	16 mcg/min
Drops per minute	8	15	23	30	38	45	53	60

### ADULT DOSING



## Ondansetron

**Indications:** Moderate to severe nausea, vomiting

**Contraindications:** Known allergy, do not use Zofran concurrently with Procainamide, Haldol, or Amiodarone due to QT prolongation.

**Scope:** \*EMT (*ODT – Orally Dissolving Tablet Only*), AEMT, Intermediate, Paramedic, AP Paramedic

**Supply:** 4mg/2ml vial (2); 4mg ODT (2)

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Moderate to severe nausea - or - Vomiting	4mg	*ODT	Repeat x1 q 15 minutes.
	4mg	IV/IO/IM	Repeat x1 q 5 minutes.

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
Moderate to severe nausea - or - Vomiting	0.1 mg/kg	IV/IM	Only if weight > 6 kg
	2 mg = ½ tab	*ODT	For 12 – 23 kg patients
	4 mg = 1 tab	*ODT	For 24 – 36 kg patients

<b>Adverse/Side Effects</b>	Arrhythmias (including ventricular and supraventricular tachycardia, premature ventricular contractions, and atrial fibrillation), bradycardia, electrocardiographic alterations (including second-degree heart block, QT/QTc interval prolongation, and ST segment depression), palpitations, and syncope.
<b>Class</b>	Anti-emetic, Selective Serotonin (5HT3) Receptor Antagonist
<b>Mechanism of Action</b>	Ondansetron reduces the activity of the vagus nerve, which activates the vomiting center in the medulla oblongata and also blocks serotonin receptors in the chemoreceptor trigger zone. It has little effect on vomiting caused by motion sickness. Safely tolerated at high dose ranges.



## Prednisolone (Prednisone)

**Indications:** Bronchodilation and anaphylaxis

**Contraindications:** Hypersensitivity

**Scope:** AEMT, Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

### ADULT DOSING

Indication	Dose	Rate & Route	Supply
Bronchodilation and anaphylaxis	60mg	PO	20mg tablets (3)

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
NOT INDICATED			

<b>Precautions</b>	Caution in nursing and OB patients, children and active and untreated infections.
<b>Adverse/Side Effects</b>	Nausea, thromboembolism, peptic ulcers, issues with wound healing
<b>Class</b>	Corticosteroid
<b>Mechanism of Action</b>	Suppresses acute and chronic inflammation, potentiates vascular smooth muscle relaxation, and may alter airway hyperactivity



## Rocuronium Bromide

**Indications:** Rapid Sequence Induction, Targeted temperature management post ROSC and post intubation.

**Contraindications:** Patients with anticipated difficult airway who can be managed by basic maneuvers / BVM / CPAP with adequate oxygenation and ventilation.

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 10mg in 10ml (2)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Rapid Sequence Induction	1mg/kg	IV/IO	

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
<b>NOT INDICATED</b>			

<b>Precautions</b>	Prior administration of succinylcholine may enhance the neuromuscular blocking effect of rocuronium and its duration of action.
<b>Adverse/Side Effects</b>	Hypersensitivity reactions are possible. Use caution in patients with: known significant hepatic disease, pulmonary hypertension, valvular heart disease, causes respiratory paralysis. Supportive airway control must be continuous and under direct observation at all times.
<b>Class</b>	Non-depolarizing neuromuscular blocking agent
<b>Mechanism of Action</b>	Rocuronium bromide acts by competing with acetylcholine for cholinergic receptors at the motor end plate. Rapid to intermediate onset of action, depending on dose, with an intermediate duration of action. Has no analgesic properties and the patient may be conscious, but unable to communicate by any means. Patients should be pre-medicated with a sedative (versed/ketamine) as Rocuronium has no effect on level of consciousness. First muscles affected include eyes, face, neck; followed by limbs, abdomen, chest; diaphragm affected last. Recovery usually occurs in the reverse order and may take longer than 60 minutes.



## Sodium Bicarbonate

**Indications:** Metabolic Acidosis (severe hypoxia, late cardiac arrest), Hyperkalemia, Tricyclic or Phenobarbital Overdose, Crush Syndrome

**Contraindications:** Avoid in the Pediatric DKA patient except in cardiac arrest.

**Scope:** Intermediate, Paramedic, AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** Prefilled abboject 50 mEq (2)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Cardiac Arrest	100 mEq	IV/IO Push	
TCA / Phenobarbital Overdose	50 mEq	IV/IO Push	Bolus 50 mEq (50 mL), then begin maintenance infusion of 100 mEq (100 mL) in 1.0 L of LR wide open.
	100 mEq	IV/IO Infusion	
Chlorine Gas Exposure	2 mEq	Nebulizer	Mix 2 mEq (2 ml) with 2 ml sterile water to nebulize May repeat q 20 min with max of 2 doses
Crush Injury	50 mEq	IV Infusion	Mix 50 mL into 1 L isotonic and run wide open

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Route & Rate	Supply
NOT INDICATED			

**Precautions**

- 1) Use caution in patients with renal impairment due to increased risk for sodium retention.
- 2) Use caution in presence of anuria or oliguria due to increased risk for excessive sodium retention.
- 3) Use caution in children < 2 years old; rapid injection of hypertonic solutions may result in decreased CSF pressure or intracranial bleeding.
- 4) Edematous conditions with sodium retention (e.g., CHF, severe renal insufficiency) have an increased risk for worsening sodium retention.
- 5) Avoid extravasation of IV hypertonic solutions due to risk of chemical cellulitis, tissue necrosis, ulceration, or sloughing at infiltration site.
- 6) Avoid risk of fluid and/or solute overloading resulting in electrolyte dilution, overhydration, congested states, and pulmonary edema.
- 7) Consider hyperkalemia with wide complex, bizarre appearance of QRS complex, and bradycardia. Give Calcium Chloride or Gluconate in addition to Sodium Bicarbonate if hyperkalemia suspected.
- 8) If patient suspected of Excited Delirium Syndrome suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.
- 9) Sodium Bicarbonate and Calcium Chloride / Gluconate should not be mixed. Ideally give in separate lines.

**Adverse/Side**

**Effects**

Alkalosis, Hyperirritability, Seizures, Tetany (electrolyte imbalance), Cardiac & respiratory arrest, Lowering of serum potassium, Decreased fibrillation threshold.

**Class**

Alkalinating Agent

**Mechanism of Action**

In the presence of hydrogen ions, sodium bicarbonate dissociates to sodium and carbonic acid, the carbonic acid picks up a hydrogen ion changing to bicarbonate and then dissociates into water and CO<sub>2</sub>, functioning as an effective buffer and alkalinizing the blood. In summary, increases plasma bicarbonate, which can buffer metabolic acids and move TCAs and phenobarbital off receptor sites and back into circulation.



## Tranexamic Acid

**Indications:** Moderate to severe hemorrhage and/or for injury < 3 hours old, SBP < 90 mmHg with suspected hemorrhage.

**Contraindications:** Hypersensitivity to tranexamic acid or any of the ingredients, or active intravascular clotting.

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 100mg/ml in 10ml (1)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Moderate to severe hemorrhage	1 g	Topical	Epistaxis, soak on gauze and place intranasal or IN atomizer
			Wound, soak on gauze or place topically with syringe
		Dental, soak on gauze and place on affected gum/site	
	1 g	Nebulizer	Tonsil and/or hemoptysis, nebulize 5 ml (0.5 g) x 2 for 1 g dose
Hypotension with suspected hemorrhage	2 g	Slow IVP	Monitor for hypotension.

### ADULT DOSING

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
<b>NOT INDICATED</b>			

<b>Precautions</b>	Allergic dermatitis, giddiness, and hypotension have been reported occasionally.  Hypotension has been observed when intravenous injection is too rapid. To avoid this response, the solution should not be injected rapidly.  Use with caution in patients with history of thrombotic events or potentially having an active MI or PE.				
<b>Adverse/Side Effects</b>	Dizziness, nausea, vomiting, chest pain				
<b>Class</b>	Antifibrinolytic Agent				
<b>Mechanism of Action</b>	Tranexamic acid is a competitive inhibitor of plasminogen activation, and at much higher concentrations, a noncompetitive inhibitor of plasmin, i.e., actions similar to aminocaproic acid. Tranexamic acid is about 10 times more potent in vitro than aminocaproic acid. Tranexamic acid binds more strongly than aminocaproic acid to both the strong and weak receptor sites of the plasminogen molecule in a ratio corresponding to the difference in potency between the compounds. Tranexamic acid in a concentration of 1 mg per mL does not aggregate platelets in vitro.				
<b>Onset of Action</b>	5 – 15 minutes	<b>Peak Effect</b>	Varies	<b>Duration of Action</b>	~ 3 hours



## Vasopressin, Pitressin

**Indications:** Cardiac arrest to replace first or second dose of epinephrine.

**Contraindications:** Hypersensitivity

**Scope:** AP Paramedic

**Preferred Dosing Reference:** Handtevy or Broselow®

**Supply:** 20u/ml in 1 ml (2)

### ADULT DOSING

Indication	Dose	Rate & Route	Note
Cardiac arrest to replace first or second dose of epinephrine.	40 units	IV/IO	Single dose usage prior to the administration of epinephrine during cardiac arrest.

### PEDIATRIC DOSING

Indication	Dose	Rate & Route	Note
<b>NOT INDICATED</b>			

<b>Precautions</b>	CAD, CHF, renal disease
<b>Adverse/Side Effects</b>	None when administered for indications. However, high doses could result in: abdominal cramps; hypertension; angina; myocardial ischemia.
<b>Class</b>	Hormone; Vasopressor
<b>Mechanism of Action</b>	Non adrenergic vasoconstrictor (V1 receptor), Anti-diuretic at low doses (V2 receptor)



# Cyanokit Administration Chart

## Cyanokit

ADULT Dose: 5 grams / 15 min.

Directions: Mix 200ml NS into bottle via double spike

Do Not Shake Bottle to mix

Open Vent on Drip Set to allow air into bottle

Concentration: 25mg/ml

Drip Rate: 266 gtts/min.

PEDIATRIC Dose: 70mg/kg

Broselow®	Weight kg.	Weight lb.	Dose:	Amount Given
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Pink	6 kg.	13 lb.	425mg	17 ml
Red	8 kg	18 lb.	575mg	23 ml
Purple	10 kg.	22 lb.	700mg	28 ml
Yellow	12-14 kg	26 -31 lb.	850-975mg	34-39 ml
White	16-18 kg	35 - 40 lb.	1125-1275mg	45-51 ml
Blue	20 kg	44 lb	1400mg	56 ml
Orange	26 kg	58 lb	1825mg	73 ml



# Epinephrine Administration Chart

## Epinephrine Drip

Dose: 2-10 mcg/min.

Directions: Add 1mg of EPI into a 250ml bag

<i>Dose</i>	<i>Drip Rate</i>
2 mcg	30 gtts/min
4 mcg	60 gtts/min
6 mcg	90 gtts/min
8 mcg	120 gtts/min
10 mcg	150 gtts/min

Note: It does **NOT** matter whether you use EPI 1:1,000 or 1:10,000

Contents: 250ml Bag of NS  
3ml syringe  
60 gtts set  
1 filter needle



# Magnesium Sulfate Administration Chart

## Magnesium Sulfate Drip

<b>ROSC:</b>	Dose:	4 Grams / 15 min.
	Directions:	Add 4 Grams of Mag. into a 100ml bag
	Drip Rate:	<b>100gtts / min.</b>
<b>Asthma:</b>	Dose:	2 Grams / 20min.
	Directions:	Add 2 Grams of Mag. into a 100ml bag
	Drip Rate:	<b>75gtts / min.</b>
Contents:	(1) 100ml Bag NS (1) 15 gtts set	(1) 10ml syringe (1) needle



# Levophed/Norepi Administration Chart

## Levophed / Norepi

Dose: 2-12 mcg/min. Initial dose: 5 mcg/min.

Directions: Add 4mg (1 vial) to 250ml bag of D5W

Tritate to systolic BP > 90

mcg/min.	2	4	5	6	8	10	12
drops/min.	8	15	19	23	30	38	45

Contents: (1) 250ml bag NS /  
D5W (1) 10ml syringe  
(1) 60 gtt set (2) needles



# Lidocaine Administration Chart

## Lidocaine Drip

Dose: 1-4 mg/min.

Premixed bag contains (4mg/ml)

<i>Dose</i>	<i>Drip Rate</i>
1 mg	15 gtts/min
2 mg	30 gtts/min
3 mg	45 gtts/min
4 mg	60 gtts/min

Contents: (1) 60 gtts set



# Nitroglycerin Administration Chart

## Nitroglycerin Drip

Dose: **25** mcg/min. Tritate up/down by 10mcg/min.

Goal is target systolic BP of 140

Premixed bottle of 250ml with 2500mcg

*Remember to open vent on glass bottle for flow*

mcg /min.	<b>25</b>	35	45	55	65	75	85
drops /min.	<b>4</b>	5	7	8	10	11	13

Contents: Nitro pump tubing is 15 gtt/min.



# TXA Administration Chart

## Tranexamic Acid (TXA)

Dose: 1 gram over 10 min.

Directions: Add 1 gram into 100ml bag  
NS.

Drip Rate: 150 gtts/min.

-OR-

**15 gtts/ 6 sec.**

Criteria for Use: Must meet All

Age > 16 yrs.

Blunt or Penetrating Trauma

Evidence of Internal or External hemorrhage

Tachycardia > 120 bpm or Hypotension < 75 mmHg systolic

**Do Not give TXA < 15 min. from hospital**

Contents: (1) 100ml bag NS  
(1) 10ml syringe w/ needle



# Glasgow Coma Scale

<b>Eye Opening</b>			
		Spontaneous	4
		To verbal stimulation	3
		To painful stimulation	2
		No response	1
<b>Verbal</b>	Over 5 years		
		Oriented/appropriate	5
		Confused conversation	4
		Inappropriate words	3
		Incomprehensible sounds	2
		No response	1
<b>Motor</b>	Over 5 years		
		Obeys commands	6
		Localization of pain	5
	Flexion to Pain	Withdrawal (pain)	4
		Abnormal (pain)	3
		Extension (pain)	2
		None	1
<b>TOTAL GLASGOW COMA SCALE</b>			<b>3 – 15</b>



# Glasgow Coma Scale- Child/Infant Modified GCS

	<b><u>CHILD</u></b>	<b><u>INFANT</u></b>	
<b>Eye Opening</b>	Spontaneous To speech To pain only No response	Spontaneous To speech To pain only No response	4 3 2 1
<b>Best Verbal Response</b>	<b><u>CHILD</u></b> Oriented, appropriate Confused Inappropriate words Incomprehensible sounds No response	<b><u>INFANT</u></b> Coos and babbles Irritable cries Cries to pain Moans to pain No response	5 4 3 2 1
<b>Best Motor Response</b>	<b><u>CHILD</u></b> obeys commands Localizes painful stimuli Withdraws in response to pain Flexion in response to pain Extension in response to pain No response	<b><u>INFANT</u></b> Moves spontaneously and purposefully Withdraws to touch Withdraws in response to pain Abnormal extension posture to pain Abnormal flexion posture to pain No response	6 5 4 3 2 1

**TOTAL GLASGOW COMA SCALE**

**3 – 15**



# On-Scene Physician Form

This EMS service would like to thank you or your effort and assistance. Please be advised that the EMS Professionals are operating under strict protocols established by their medical director and the Commonwealth of Virginia. As a licensed physician, you may assure medical care of the patient. In order to do so, you will need to:

- Receive approval to assume the patient's medical care from the EMS agencies online medical control physician.
- Show proper identification including current Virginia Medical Board Registration/Licensure.
- Accompany the patient to the hospital.
- Carry out any intervention that does not conform to the EMS agencies protocols. EMS personnel cannot perform any interventions or administer medications that are not included in their protocols.
- Sign all orders on the EMS patient care report.
- Assume all med-legal responsibility for all patient care activities until the patient's care is transferred to another physician at the hospital.
- Complete the "Assumption of Medical Care" section of this form below.

## Assumption of Medical Care

I, \_\_\_\_\_, MD; License #:\_\_\_\_\_.  
**(Please Print your Name Here)**

Have assumed authority and responsibility for the medical care and patient management for

**(Insert Patient's Name Here)**

I understand that I must accompany the patient to the Emergency Department. I further understand that all EMS personnel must follow Virginia EMS Rules and Regulations as well as BREMS EMS protocols.

\_\_\_\_\_, MD Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time: \_\_\_\_\_ AM/PM  
**(Physician Signature Here)**

\_\_\_\_\_, EMS \_\_\_\_\_ Witness  
**(EMS Lead Crew Member Signature Here)** **(Witness Signature)**



# Pediatric References

## APGAR Score

The APGAR Scale is to be completed on a newborn baby 1 minute and 5 minutes after birth.

	<b>0 Points</b>	<b>1 Point</b>	<b>2 Points</b>
<b>Heart Rate (bpm)</b>	Absent (0)	Slow (<100 beats/min.)	$\geq 100$ beats/min.
<b>Respirations</b>	Absent (0)	Slow, irregular	Good, crying
<b>Muscle Tone</b>	Limp	Some flexion	Active motion
<b>Reflex (Stimulation)</b>	No response	Grimace	Cough, sneeze, cry
<b>Color</b>	Blue or pale	Pink body with blue extremities	Completely pink

## PEDIATRIC AIRWAY EQUIPMENT

<b>Age Weight (kg)</b>	<b>Laryngoscope Blade</b>	<b>Endotracheal Tube</b>	<b>Suction Catheter</b>
Newborn 3 kg - 5kg	0-1 Miller	3.0 - 3.5 Uncuffed	6-8 French
Infant 6 kg - 9kg	1 Miller	3.5 Uncuffed	8 French
Toddler 10kg - 11 kg	1 Miller	4.0 Uncuffed	8 – 10 French
Small Child 12 kg – 14 kg	2 Miller	4.5 Uncuffed	10 French
Child 15 kg – 18 kg	2 Miller or Mac	5.0 Uncuffed	10 French
Child 19 kg – 22 kg	2 Miller or Mac	5.5 Uncuffed	10 French
Large Child 24 kg – 28 kg	2 – 3 Miller or Mac	6.0 Cuffed	10 French

### Endotracheal tube size estimation (age > 1 year)

- Tube size = (Age in years + 16) x 4
- Tube size = the width of the tip of the child's pinky fingernail



# Pediatric References

## Pediatric Tylenol

15mg/kg Dose Concentration 325mg/10.15ml

6 – 8 lbs	(3 - 4 kg)	1.25 ml (40mg)
9 – 11 lbs.	(4 – 5 kg)	1.875 ml (60mg)
12 – 17 lbs.	(6 – 8 kg)	2.5 ml (80mg)
18 – 23 lbs.	(9 – 10 kg)	3.75 ml (120mg)
24 – 35 lbs.	(11 – 16 kg)	5 ml (160mg)
36 – 47 lbs.	(17 – 21 kg)	7.5 ml (240mg)
48 – 59 lbs.	(22 – 27 kg)	10 ml (320mg)
60 – 71 lbs.	(28 – 32 kg)	12.5 ml (400mg)
72 – 99 lbs.	(33 – 45 kg)	15 ml (480mg)



# Pediatric References

Pediatric Versed Administration Chart			
Color	Weight(KG)	Versed(5mg/mL)	
		MG	ML
GRAY	3	0.45	0.1
GRAY	4	0.6	0.1
GRAY	5	0.75	0.2
PINK	6	0.9	0.2
PINK	7	1.05	0.2
RED	8	1.2	0.2
RED	9	1.35	0.3
PURPLE	10	1.5	0.3
PURPLE	11	1.65	0.3
YELLOW	12	1.8	0.4
YELLOW	13	1.95	0.4
YELLOW	14	2.1	0.4
WHITE	15	2.25	0.5
WHITE	16	2.4	0.5
WHITE	17	2.55	0.5
WHITE	18	2.7	0.5
BLUE	19	2.85	0.6
BLUE	20	3	0.6
BLUE	21	3.15	0.6
BLUE	22	3.3	0.7
BLUE	23	3.45	0.7
ORANGE	24	3.6	0.7
ORANGE	25	3.75	0.8
ORANGE	26	3.9	0.8
ORANGE	27	4.05	0.8
ORANGE	28	4.2	0.8
ORANGE	29	4.35	0.9
GREEN	30	4.5	0.9
GREEN	31	4.65	0.9
GREEN	32	4.8	1.0
GREEN	33	4.95	1.0
GREEN	34	5	1.0
GREEN	35	5	1.0
GREEN	36	5	1.0

# PEDIATRIC ASSESSMENT

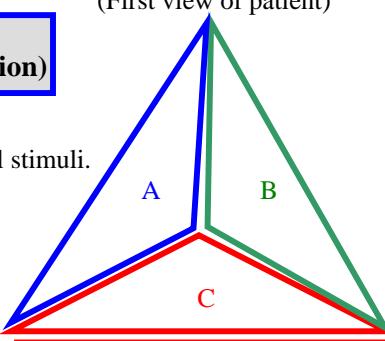
## General Impression

(First view of patient)

### Airway & Appearance (Open/Clear – Muscle Tone /Body Position)

**Abnormal:** Abnormal or absent cry or speech. Decreased response to parents or environmental stimuli. Floppy or rigid muscle tone or not moving.

**Normal:** Normal cry or speech. Responds to parents or to environmental stimuli such as lights, keys, or toys. Good muscle tone. Moves extremities well.



### Work of Breathing (Visible movement / Respiratory Effort)

**Abnormal:** Increased/excessive (nasal flaring, retractions or abdominal muscle use) or decreased/absent respiratory effort or noisy breathing.

**Normal:** Breathing appears regular without excessive respiratory muscle effort or audible respiratory sounds.

### Decision/Action Points:

- Any abnormal findings or life-threatening chief complaint such as major trauma/burns, seizures, diabetes, asthma attack, airway obstruction, etc (urgent) – proceed to Initial Assessment. Contact ALS if ALS not already on scene/enroute.
- All findings normal (non-urgent) – proceed to Initial Assessment.

## Initial Assessment

(Primary Survey)

### Airway & Appearance (Open/Clear – Mental Status)

**Abnormal:** Obstruction to airflow. Gurgling, stridor or noisy breathing. Verbal, Pain, or Unresponsive on AVPU scale.

**Normal:** Clear and maintainable. Alert on AVPU scale.

### Breathing (Effort / Sounds / Rate / Central Color)

**Abnormal:** Presence of retractions, nasal flaring, stridor, wheezes, grunting, gasping or gurgling. Respiratory rate outside normal range. Central cyanosis.

**Normal:** Easy, quiet respirations. Respiratory rate within normal range. No central cyanosis.

### Circulation

(Pulse Rate & Strength / Extremity Color & Temperature / Capillary Refill / Blood Pressure)

**Abnormal:** Cyanosis, mottling, or pallor. Absent or weak peripheral or central pulses; Pulse or systolic BP outside normal range; Capillary refill > 2 sec with other abnormal findings.

**Normal:** Color normal. Capillary refill at palms, soles, forehead or central body ≤ 2 sec. Strong peripheral and central pulses with regular rhythm.

### Decision/ Action Points:

- Any abnormal finding (C, U, or P) – Immediate transport with ALS. If ALS is not immediately available, meet ALS intercept enroute to hospital or proceed to hospital if closer. Open airway & provide O<sub>2</sub>. Assist ventilations, start CPR, suction, or control bleeding as appropriate. Check for causes such as diabetes, poisoning, trauma, seizure, etc. Assist patient with prescribed bronchodilators or epinephrine auto-injector, if appropriate.
- All findings on assessment of child normal (S) – Continue assessment, detailed history & treatment at scene or enroute.

### Normal Respiratory Rate:

Infant (<1yr): 30- 60  
Toddler (1-3yr): 24- 40  
Preschooler(4-5yr): 22- 34  
School-age(6-12yr): 18 -30  
Adolescent(13-18yr): 12 -20

### Normal Pulse Rate:

Infant: 100-160  
Toddler: 90-150  
Preschooler: 80-140  
School-age: 70-120  
Adolescent: 60-100  
Pulses slower in sleeping child / athlete

### Lower Limit of Normal Systolic BP:

Infant: >60 (or strong pulses)  
Toddler: >70 (or strong pulses)  
Preschooler: >75  
School-age: >80  
Adolescent: >90  
Estimated min.SBP >70 + (2 x age in yr)

## Pediatric CUPS (with examples)

<u>Critical</u>	<b>Absent airway, breathing or circulation</b> (cardiac or respiratory arrest or severe traumatic injury)
<u>Unstable</u>	<b>Compromised airway, breathing or circulation</b> (unresponsive, respiratory distress, active bleeding, shock, active seizure, significant injury, shock, near-drowning, etc.)
<u>Potentially Unstable</u>	<b>Normal airway, breathing &amp; circulation but significant mechanism of injury or illness</b> (post-seizure, minor fractures, infant < 3mo with fever, etc.)
<u>Stable</u>	<b>Normal airway, breathing &amp; circulation No significant mechanism of injury or illness</b> (small lacerations or abrasions, infant ≥ 3mo with fever)

### Neonatal Resuscitation

Dry, Warm, Position, Tactile Stimulation.  
Suction Mouth then Nose.  
Call for ALS back-up. Administer O<sub>2</sub> as needed.

### Apnea/Gasping, HR <100 or central cyanosis

Ventilate with BVM @ 40-60/min

#### HR<60 after 30 sec BVM

Chest Compressions @ 120/min - 3:1  
1/3 to 1/2 chest depth  
2 thumb encircle chest or 2 fingers

#### ALS available & HR <60

Intubate  
Epinephrine  
0.01-0.03mg/kg  
IV/IO/ET  
1:10,000  
q 3-5 min

### APGAR Score

	0 pts	1 pt	2 pts
<b>Pulse</b>	Absent	<100	≥100
<b>Resp</b>	Absent	Slow Irregular	Good
<b>Tone</b>	Limp	Some flexion	Active motion
<b>Reflex</b>	None	Grimace	Cough Sneeze
<b>Color</b>	Blue	Pink Body Blue Limbs	All Pink

### ALS Guidelines

#### Asystole or PEA

Assess airway & start CPR  
Intubate & ventilate with oxygen  
Epinephrine: 0.01 mg/kg 1:10,000 IV/ IO  
0.1 mg/kg 1:1000 ET  
Continue Epinephrine q 3-5 min, same dose  
Consider possibility of hypoxia, hypovolemia, hypothermia, hyper/hypokalemia, tamponade, tension pneumothorax, toxins/poisons/drugs or thromboembolism & treat if present.

#### Bradycardia

Assess airway & give oxygen  
Intubate if decreased consciousness  
Start CPR if HR<60.  
Epinephrine: 0.01 mg/kg 1:10,000 IV/ IO  
0.1 mg/kg 1:1000 ET  
Continue Epinephrine q 3-5 min, same dose  
Atropine 0.02 mg/kg IV/ IO / ET  
minimum dose 0.1 mg  
maximum dose 0.5 mg child; 1.0 mg teen

### Glasgow Coma Score

Infants	Children /Adults
<b>Eye Opening</b>	
Spontaneous	4 Spontaneous
To speech/sound	3 To speech
To pain	2 To pain
No response	1 No response
<b>Verbal Response</b>	
Coos or babbles	5 Oriented
Irritable crying	4 Confused
Cries to pain	3 Inappropriate words
Moans to pain	2 Incomprehensible
None	1 None
<b>Motor Response</b>	
Spontaneous	6 Obey commands
Withdraws touch	5 Localizes pain
Withdraws pain	4 Withdraws pain
Abnormal flexion	3 Abnormal flexion
Abnormal extension	2 Abnormal extension
No response	1 No response

### Respiratory / Cardiac Arrest Treatment

	Infant <1yr	Child 1-8yr	Teen 9-18yr
<b>Ventilation only</b>	20/min	20/min	12/min
<b>CPR method</b>	2 fingers	1 hand	2 hand
<b>Chest Depth</b>	1/3-1/2	1/3-1/2	1/3-1/2
<b>Compression Rate</b>	≥ 100/min	100/min	100/min
<b>Ratio</b>	5:1	5:1	5:1

CPR should be started for HR<60.

Only AEDs with pediatric capabilities should be used on patients < 8 yrs. of age (approx. 25kg or 55lb).

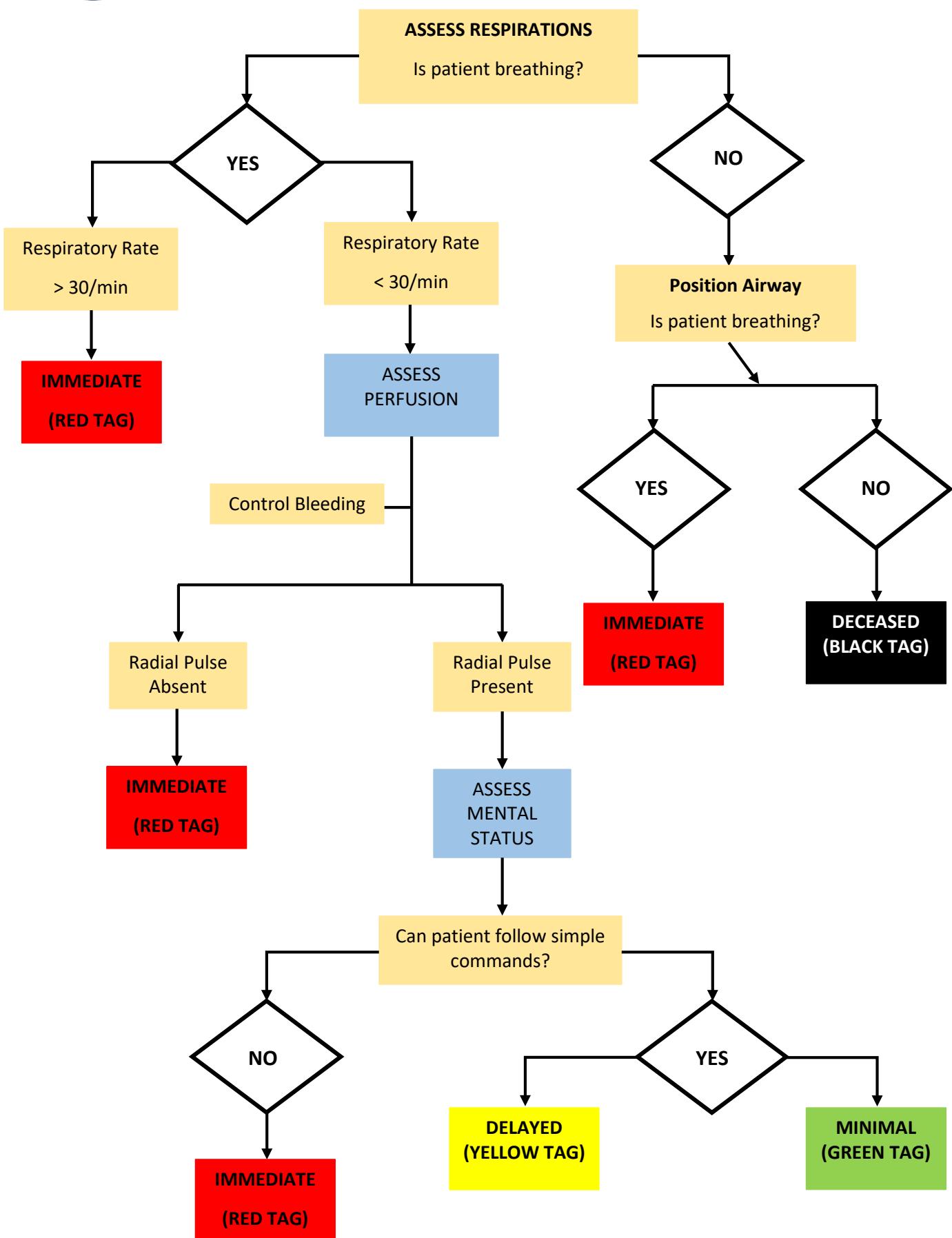
#### VF or pulseless VT

Defibrillate up to 3 times as needed  
2j /kg 4j /kg 4j /kg  
Start CPR, intubate, ventilate with O<sub>2</sub>  
Epinephrine: 0.01 mg/kg 1:10,000 IV/ IO  
0.1 mg/kg 1:1000 ET  
Defibrillate 4j / kg  
Amiodarone 5mg/kg IV/IO or  
Lidocaine 1mg / kg IV/ IO/ ET or  
Magnesium 25-50mg/kg IV/ IO  
(for torsades de pointes or hypomagnesemia)  
Defibrillate 4j / kg



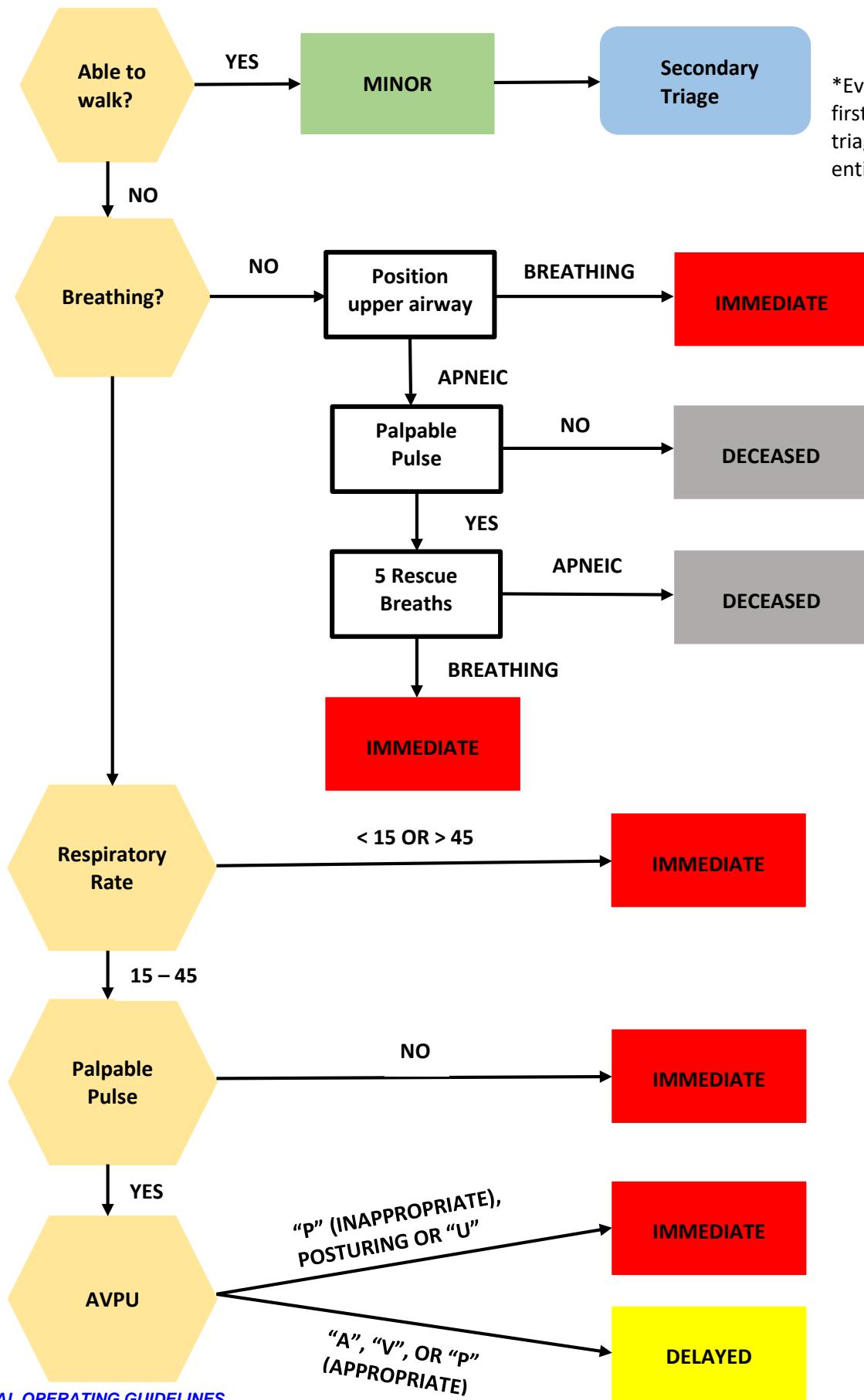
# Triage: S.T.A.R.T. - Adult

Remember RPM: Respirations, Perfusion, Mental Status





## Triage: JumpSTART – Pediatric



\*Evaluate infants first in secondary triage using the entire JS algorithm



## Scope of Practice – Procedures

Medication	EMT	AEMT	I	P	AP	Special Considerations
12-Lead ECG Acquisition	●	●	●	●	●	
12-Lead ECG Interpretation			●	●	●	
Assessment – Adult	●	●	●	●	●	
Assessment – Pediatric	●	●	●	●	●	
Airway – CPAP/BiPap	●	●	●	●	●	
Airway – Cricothyrotomy				●	●	
Airway – Bougie			●	●	●	
Airway – iGel	●	●	●	●	●	
Airway – Intubation			●	●	●	
Airway – O2 Administration	●	●	●	●	●	
Airway – Suctioning	●	●	●	●	●	
Behavioral Restraint - Physical	●	●	●	●	●	
Behavioral Restraint - Chemical			●	●	●	*I, P, and AP Requires special training as per the ROMD
Blood Glucose Analysis	●	●	●	●	●	
Capnography	●	●	●	●	●	*EMT Requires special training as per ROMD/Agency OMD
Cardioversion			●	●	●	
Chest Decompression			●	●	●	
Childbirth – Abnormal Birth Emergencies	●	●	●	●	●	
Childbirth – Standard Delivery	●	●	●	●	●	



## Scope of Practice – Procedures

Medication	EMT	AEMT	I	P	AP	Special Considerations
Childbirth – Care of the Newborn	●	●	●	●	●	
Defibrillation	●	●	●	●	●	*EMT & AEMT – Manual AED defibrillation only
Double Sequential Defibrillation			●	●	●	
End Tidal CO <sub>2</sub> Detection	●	●	●	●	●	
External Pacing			●	●	●	
Gastric Tube Placement			●	●	●	
Intranasal & Intramuscular Proced	●	●	●	●	●	
Pandemic Response – COVID19	●	●	●	●	●	
Pandemic Response – COVID19 Respiratory Considerations & Airway Management	●	●	●	●	●	
Pulse Oximetry	●	●	●	●	●	
Spinal Motion Restriction	●	●	●	●	●	
Ultrasound					●	*AP Requires special training as per ROMD
Venous Access – Central Line Access				●	●	
Venous Access – External Jugular Access			●	●	●	
Venous Access – Intraosseous Access (EZ-IO)		●	●	●	●	

\*This document contains **Red Dot** indicators as per state policy, which may only be performed once training per the ROMD and/or Agency OMD has been completed. All guidance listed in this document is per the Virginia Office of EMS State Scope of Practice Formulary which can be found here:

[Guidance Document - Scope of Practice](#)

[VA OEMS Scope of Practice - Procedures](#)

**CLINICAL OPERATING GUIDELINES**

UPDATED: 09.01.2023

# 12 Lead ECG Acquisition

## Indications:

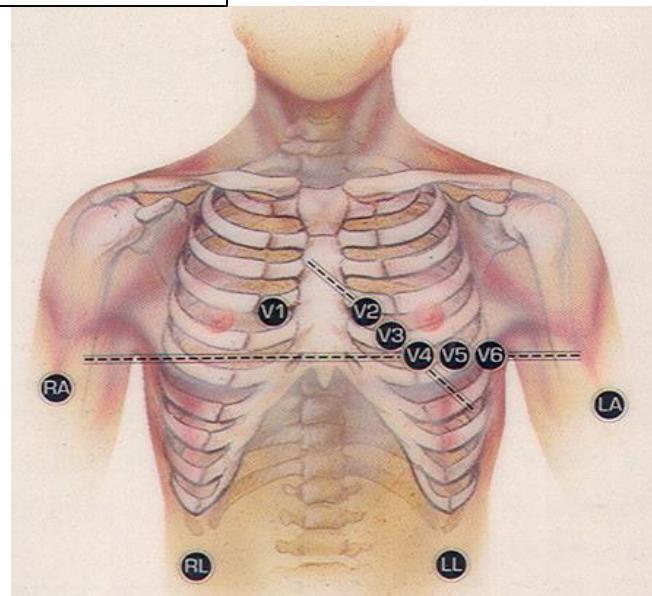
- Any patient complaining of chest pain or believed to be of cardiac origin.

## Procedure:

- Explain what you are going to do to the patient. Reassure him or her that the machine will not shock them.
- Prepare all of the equipment and assure the cable is in good repair. Check to make sure there are adequate leads and materials for prepping the skin.
- Prep the skin. Dirt, oil, sweat and other materials on the skin can interfere with obtaining a quality tracing. The skin should be cleansed with an appropriate substance. If the patient is diaphoretic, dry the skin with a towel. On very hot days or in situations where the patient is very diaphoretic, tincture of Benzoin can be applied to the skin before attaching the electrode. Patients with a lot of hair may need to have the area immediately over the electrode site shaved to assure good skin/electrode interface.
- Place pads according to diagram.
- Assure that all leads are attached and a good tracing is being received.
- Acquiring 12 Lead requires the patient to be supine and motionless.
- Record the tracing. **PRINT OUT the 12 LEAD.**
- EMT-Basic and Enhanced- may read what the 12 lead prints out to Medical Control. Intermediate and Paramedic- may interpret the 12 lead rhythm (state if they see ST elevation in any of the leads). Do not completely rely on the machine's interpretation of the tracing. If necessary, confirm with Medical Control.
- Transmit the tracing to the receiving facility, if capable. Providers can email the 12 lead to [lghcp@centrahealth.com](mailto:lghcp@centrahealth.com). After obtaining and transmitting, disconnect the 12 Lead.

- RA- Right arm
- LA- Left arm
- RL- Right leg
- LL- Left leg
- V1- 4<sup>th</sup> intercostal space at right sternal border
- V2- 4<sup>th</sup> intercostal space at left sternal border
- V3- Directly between V2 and V4
- V4- 5<sup>th</sup> intercostal space at midclavicular line
- V5- Level with V4 at left anterior axillary line
- V6- Level with V5 at left midaxillary line

	FR	
EMT	EMT	EMT
AEMT	Adv. EMT	AEMT
I	Intermediate	I
P	Paramedic	P



# 12 Lead ECG Interpretation

## Indications:

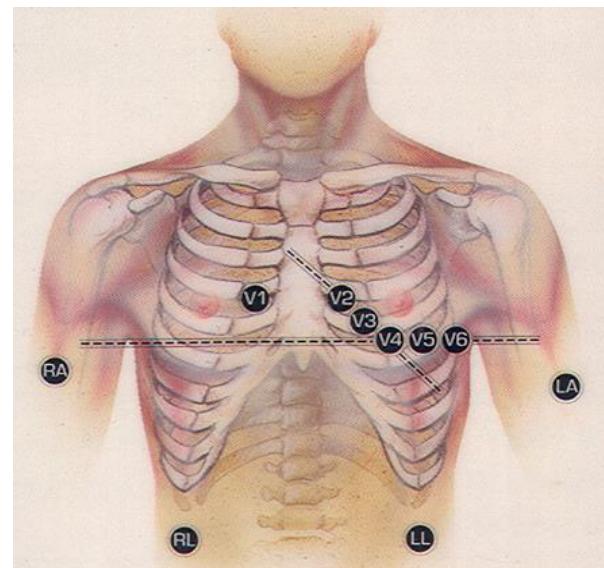
- Any patient complaining of chest pain or believed to be of cardiac origin.

I	Intermediate	I
P	Paramedic	P

## Procedure:

1. Make sure to follow 12 Lead ECG Obtain Procedure in order to properly obtain the 12 Lead ECG.
2. Read the 12 lead to interpret the ECG rhythm and give report to Medical Control.
3. If possible, identify location of ST elevation.

- RA- Right arm
- LA- Left arm
- RL- Right leg
- LL- Left leg
- V1- 4<sup>th</sup> intercostal space at right sternal border
- V2- 4<sup>th</sup> intercostal space at left sternal border
- V3- Directly between V2 and V4
- V4- 5<sup>th</sup> intercostal space at midclavicular line
- V5- Level with V4 at left anterior axillary line
- V6- Level with V5 at left midaxillary line



# Assessment- Adult

## Indications:

- Any patient requesting a medical evaluation who is too large to be measured with a Broselow-Luten Resuscitation tape.

FR		
EMT	EMT	EMT
AEMT	Advanced EMT	AEMT
I	Intermediate	I
P	Paramedic	P

## Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, bystander safety, and patient/caregiver interaction.
- Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
- Assess mental status (AVPU) and disability (GCS).
- Control major hemorrhage and assess overall priority of patient.
- Perform focused history and physical based on patient's chief complaints, making efforts to protect patient privacy and modesty.
- Assess the need for critical interventions. If none are anticipated, downgrade or cancel additional responding units as appropriate.
- Maintain an ongoing assessment throughout transport to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the patient care report.

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Blue Ridge EMS Council.



# Assessment - Pediatric

## Indications:

- Any child who can be measured with the Broselow – Luten Resuscitation tape.

FR		
EMT	EMT	EMT
AEMT	Advanced EMT	AEMT
I	Intermediate	I
P	Paramedic	P

## Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, bystander safety, and patient/caregiver interaction. Take reasonable steps to protect patient privacy and modesty.
- Assess patient using the pediatric triangle of ABC's.
  - Airway and appearance: speech/cry, muscle tone, interactiveness, look/gaze, movement of extremities.
  - Work of breathing: absent or abnormal airway sounds, use of accessory muscles', nasal flaring, body positioning.
  - Circulation of skin: pallor, mottling, cyanosis.
- Establish spinal immobilization if suspicion of spinal injury.
- Establish responsiveness appropriate for age (AVPU, GCS, etc.)
- Color code using Broselow-Luten tape.
- Assess disability (pulse, motor function, sensory function, papillary reaction).
- Perform focused history and physical exam . Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam. Concurrently, remember that pediatric patients unable to verbalize their own complaint should be fully exposed for assessment.
- Record vital signs (BP > 3 years of age, cap refill < 3 years of age).
- Include immunizations, allergies, medications, past medical history, last meal, and events leading up to injury or illness where appropriate.
- Treat chief complaint as per protocol.

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the Blue Ridge EMS Council.



# Airway – Continuous Positive Airway Pressure (CPAP)

## Indications:

- Is indicated in patients for whom inadequate ventilations is suspected. This could be as a result of pulmonary edema, pneumonia, COPD, asthma, drowning, etc. In asthmatic patients, continuous monitoring is required to reduce the risk of respiratory depression or arrest.
- Impending respiratory or ventilatory failure resulting from pulmonary edema or COPD when intubation may be emergently required.
- Patient is alert, responsive, and is still able to handle secretions and protect their airway.

EMT	EMT	EMT
A	AEMT	A
I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Patients less than 18 years of age.
- Inability to obtain a tight mask seal.
- Uncooperative or obtunded patients.
- Inability to handle secretions or maintain airway.
- Mild exacerbations of chronic obstructive pulmonary disease.
- Patients with tracheotomies.
- Trauma
- Hypovolemia/Shock

## Complications:

- Discomfort
- Facial irritation or conjunctivitis
- Gastric distention
- Aspiration
- Pneumothorax (especially in COPD patients)

## Procedure: (This procedure is only for the application of the Boussignac CPAP device).

1. Discuss the procedure with the patient, including each of the following:
  - Effects of positive pressure ventilation
  - Possibilities of discomfort
  - Need for cooperation
2. Check all equipment before proceeding:
  - Oxygen source
  - Pre-packaged CPAP mask, tubing, and head harness
3. Apply SPO<sub>2</sub> and cardiac monitor.
4. Connect the pre-set green extension tube to the flow meter.
5. Place patient in the most comfortable position (normally full or semi-fowlers).
6. Choose the best mask size (85% of the population will fall into the medium range).
7. Inflate mask with syringe until cushion is tight.
8. Open the flow meter at 15 LPM and ensure that there is flow coming through the device.
9. Initially hold the mask in place on the patient's face until breathing is comfortable for the patient. Continue to discuss the procedure with the patient and provide reassurance.
10. When tolerated, place the head harness on the patient and make necessary adjustments in the straps to ensure a tight fitting mask. Secure the mask in place by attaching 4 flexible straps on the harness.
11. Continue to monitor for patient comfort and air leaks due to mask position. Make adjustments in the seal as needed by inflating or deflating the mask with a syringe.
12. Adjust the flow meter as clinically indicated to change the amount of positive pressure.

**15 LPM = 5cmH<sub>2</sub>O CPAP; 20 LPM = 7.5cmH<sub>2</sub>O; 25 LPM = 10cmH<sub>2</sub>O**

**\*\*\*COPD patients should only receive a MAX of 5cm H<sub>2</sub>O**

**\*\*\*Never exceed 10cmH<sub>2</sub>O for any patient**



# Airway – Continuous Positive Airway Pressure (CPAP)(continued)

**Procedure:** (This procedure is only for the application of the Boussignac CPAP device).

13. Attach nebulizer treatment as indicated (see below).
14. Suctioning can be accomplished via a flexible suction catheter that can be inserted through the open end of the CPAP mask, thus eliminating any interruption in positive pressure.
15. Obtain vital signs including SPO2 every 5 minutes while patient is on CPAP and discontinue its use if any of the following is encountered:
  - a. Blood pressure falls below 90mmHg
  - b. SPO2 falls below 90%
  - c. Mental status deteriorates such that the patient is unable to tolerate the procedure
16. It may be necessary to discontinue CPAP, assist ventilations with a bag-valve mask and prepare for assisted ventilation/intubation.
17. Assess for possible aspiration or pneumothorax.
18. Contact medical control at the receiving facility ASAP to ensure notification of nursing and respiratory therapy staff to CPAP usage.



• **KEY POINTS/CONSIDERATIONS**

- Providing mask CPAP may result in early physiologic improvement with less potential for intubation in patients with pulmonary edema or severe COPD exacerbations where respiratory failure is imminent.
- It is important to calm the patient as much as possible during the procedure. Attempt to discuss all procedures with the patient prior to application of CPAP.
- Standard nebulizer equipment should be attached to the open end of the CPAP mask when necessary. Beware of excess use of Albuterol in CHF patients as the medication can increase cardiac strain and worsen heart failure.
- COPD patients should only have a Max of 5cmH2O, unless otherwise advised by Medical Control, as these patients are at increased risk of barotraumas i.e. pneumothorax.
- Unless the patient cannot tolerate the procedure or hemodynamic or respiratory variables deteriorate, the patient shall remain on CPAP until transfer at the receiving facility.
- Be aware of and economize oxygen utilization by using the on-board oxygen system as much as possible. When using a D size oxygen cylinder:
  - 15 LPM will provide 23 minutes of CPAP
  - 20 LPM will provide 16 minutes of CPAP
  - 25 LPM will provide 14 minutes of CPAP



# Airway – Cricothyrotomy, Surgical

## **Indications:**

- Complete airway obstruction lasting > 3 minutes.
- Inability to secure airway by any other invasive means.

P

Paramedic

P

## **Relative Contraindications:**

- Contraindicated if < 10 years old.
- Suspected laryngeal fractures.
- Bleeding disorders.

## **Procedure: Use of the Adult PERTRACH Disposable Emergency Cricothyrotomy device**

1. Observe universal precautions (sterile gloves minimum).
2. Place patient in supine position with head extended (if cervical spine is intact). If this is not advisable have second person stabilize the cervical spine in a jaw thrust procedure while you insert the device.
3. Open the sterile package, prep the neck area with betadine or alcohol (the kit contains directions with illustrations).
4. Locate the cricothyroid membrane.
5. Remove the dilator from the package and advance it into the tube.
6. Ensure the syringe is attached to the splitting needle.
7. Insert the splitting needle through the skin directly over the cricothyroid membrane. While advancing splitting needle perpendicular to the skin, lightly pull back on the plunger of syringe until you see air bubbles or you feel a break in resistance, cease advancement of splitting needle.
8. Incline the needle more than 45 degrees toward the carina and complete insertion. Always maintain the tip of the needle in the midline of the airway.
9. Remove the syringe.
10. Insert tip of dilator into the hub of the splitting needle. Squeeze wings of needle, then open them out to split needle. Remove needle, continuing to pull them apart in opposite directions, while leaving the dilator in trachea.
11. Place thumb on knob while first and second fingers are curved under flange of trachea tube. By exerting pressure, advance dilator and trach tube into position until flange is against skin.
12. Remove dilator. Inflate cuff until you have control of the airway. Verify with pilot balloon. Secure trach tube around patient's neck with twill tie. Attach oxygen delivery device to tube, if necessary.

## **Recommendations:**

- Gauze pads may be placed around the trach tube, between skin and the 15mm adaptor, thus varying the length of the tube in the trachea, as needed.
- Test position of trach tube in airway after its insertion by suctioning trachea through it. Also, listen for breathing sounds. If you are not sure you are in the airway, use the second needle and repeat the procedure.

## **Warnings:**

- Insertion of device through thyroid cartilage can injure vocal cords.
- Retraction of the dilator back through unspilt needle could result in damage to dilator. Over-inflation of cuff may cause cuff to burst.



# Airway – Endotracheal Tube Introducer (Bougie)

## Indications:

- Patient must meet the clinical indication for oral intubation.

I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Three attempts at orotracheal intubation.
- Do not use on endotracheal tube smaller than 6.0
- Do not use for nasotracheal intubation.

## Procedure:

1. Holding the Bougie in your right hand an the angled tip pointing upward, gently advance the bougie anteriorly (under the epiglottis or over the posterior notch) to the glottic opening (cords).
2. Gently advance the device until resistance is encountered at the carina.
3. If no resistance is encountered and the entire length of the bougie is inserted, the device is in the esophagus.
4. The bougie is correctly placed when you see the device going through the cords, when you feel the washboard effect of the tip on the trachea, and/or when you meet resistance while advancing the bougie (bougie is at the carina).
5. Once positioned, withdraw the bougie until the black line mark is aligned with the lip and advance the lubricated ETT over the bougie and into the trachea. This indicates that the tip is well beyond the cords and the proximal end has enough length to slide the ETT over.
6. If resistance is encountered- caused by the ETT catching on the arytenoids or aryepiglottic folds- withdraw the ETT slightly, rotate 90 degrees and reattempt. If this is unsuccessful, use a smaller tube.
7. At no time should the ETT be forced as this may cause laryngospasm.
8. Once ETT is in position, while holding the tube, remove the bougie through the ETT.



# Airway – I-GEL

## Indications:

- Adult cardiac or respiratory arrest.
- Adult unresponsive medical or trauma patients without gag reflexes.
- I-Gel is a back-up airway to the ET [Intermediate/Paramedic Only].
- I-Gel is a back-up airway to the oropharyngeal and nasopharyngeal airway for [EMT-B and Advanced].

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Responsive patients with an intact gag reflex.
- Severe facial swelling from anaphylaxis.
- Severe neck swelling/trauma and/or neck hematoma.
- Caustic burns.
- Patient with known esophageal disease.
- Patients who have ingested caustic substances.
- Foreign body obstruction.
- Laryngectomies and tracheostomy.

## Caution:

- Because of the chance of regurgitation, the provider operating the BVM should assure they use proper BSI procedures to protect them from splash that may come from the gastric tube port (this port is not to be blocked when there is no gastric tube in place).

## Procedure:

1. Estimate ideal body weight.
2. Pre-oxygenate the patient.
3. Open packaging and prepare i-gel, securing strap, and suction.
4. Open the lubricant and place a small bolus on the inner side of the main shell of the package.
5. Lubricate the back, sides, and front of the i-gel with a thin layer of enclosed lubricant.
6. Position the head: "sniffing" position is ideal, "neutral" position is acceptable.
7. Hold the I-Gel by the bite block with the dominant hand. With non-dominant hand, hold mouth open and apply chin lift. Position the device so that the i-gel 02 cuff outlet is facing the patient. Introduce the leading soft tip into the mouth of the patient in the direction of the hard palate.
8. Glide the device downward and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
9. The tip of the airway should be located into the upper esophageal opening with the cuff located against the laryngeal framework. The incisors should be resting on the bite block
10. Secure the device by sliding the strap underneath the patient's neck and attaching to the hook ring. Take care to ensure that the strap is secured appropriately.
11. Commence with positive pressure ventilation per appropriate protocols
12. Complete all applicable airway confirmation fields including chest rise, equal bilateral breath sounds, absence of epigastric sounds and end-tidal CO<sub>2</sub> reading
13. Secure the device. Reconfirm airway placement after device is secured, after every patient movement and at regular intervals.
14. Document the time, provider, provider level, and success for the procedure.

## Considerations

- Insertion can be achieved in less than 5 seconds
- Sometimes a feel of "give-away" is felt before the end point resistance is met. This is due to the passage of the bowl of the i-gel through the facial pillars. It is important to continue to insert the device until a definitive resistance is felt
- Once correct insertion is achieved and the teeth are located on the integral bite block, do not repeatedly push down or apply excessive force during insertion
- If there is resistance, remove, re-lubricate, and reposition the airway before repeat insertion. No more than three attempts on one patient should be attempted.
- It is not necessary to insert fingers or thumbs into the patient's mouth during insertion
- Sizes 3 and 4 accept a 12 French suction catheter for insertion through the gastric channel to empty fluid from the stomach. Size 5 accepts a 14 French suction catheter for insertion through the gastric channel to empty fluid from the stomach.



# Airway – I-GEL

## Female Ideal body weight by height

Height	Ibs	kg	Height	Ibs	kg
4' 7"	74.8	34	5' 10"	150.7	68.5
4' 8"	79.86	36.3	5' 11"	155.76	70.8
4' 9"	84.92	38.6	6' 0"	160.82	73.1
4' 10"	89.98	40.9	6' 1"	165.88	75.4
4' 11	95.04	43.2	6' 2"	170.94	77.7
5' 0"	100.1	45.5	6' 3"	176	80
5' 1"	105.16	47.8	6' 4"	181.06	82.3
5' 2"	110.22	50.1	6' 5"	186.12	84.6
5' 3"	115.28	52.4	6' 6"	191.18	86.9
5' 4"	120.34	54.7	6' 7"	196.24	89.2
5' 5"	125.4	57	6' 8"	201.3	91.5
5' 6"	130.46	59.3	6' 9"	206.36	93.8
5' 7"	135.52	61.6	6' 10"	211.42	96.1
5' 8"	140.58	63.9	6' 11"	216.48	98.4
5' 9"	145.64	66.2	7' 0"	221.54	100.7

## Male Ideal Body Weight by Height

Height	Ibs	kg	Height	Ibs	kg
4' 7"	84.7	38.5	5' 10"	160.6	73
4' 8"	89.76	40.8	5' 11"	165.66	75.3
4' 9"	94.82	43.1	6' 0"	170.72	77.6
4' 10"	99.88	45.4	6' 1"	175.78	79.9
4' 11	104.94	47.7	6' 2"	180.84	82.2
5' 0"	110	50	6' 3"	185.9	84.5
5' 1"	115.06	52.3	6' 4"	190.96	86.8
5' 2"	120.12	54.6	6' 5"	196.02	89.1
5' 3"	125.18	56.9	6' 6"	201.08	91.4
5' 4"	130.24	59.2	6' 7"	206.14	93.7
5' 5"	135.3	61.5	6' 8"	211.2	96
5' 6"	140.36	63.8	6' 9"	216.26	98.3
5' 7"	145.42	66.1	6' 10"	221.32	100.6
5' 8"	150.48	68.4	6' 11"	226.38	102.9
5' 9"	155.54	70.7	7' 0"	231.44	105.2



# Airway – Intubation, Endotracheal

## Indications:

- Adult cardiac or respiratory arrest.
- Pediatric cardiac arrest- Paramedic only.
- Adult unresponsive medical or trauma patients.

I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Gag reflex present.
- D<sub>50</sub> or Naloxone to be used (precaution only).

## Procedure:

### Prepare equipment

1. Leave suction on throughout the procedure.
2. Have available: Magill forceps, lubricant, tape, CO<sub>2</sub> detector.
3. Prepare the endotracheal tube: attach a 10 ml syringe, insert a stylet [avoid tip protrusion], lubricate tip, and check cuff [10 ml air].
4. Age < 8 yrs: select appropriate size uncuffed tube from Broselow tape.
5. Prepare the laryngoscope: assemble, check light.

### Prepare the patient

1. Trauma: stabilize the neck in neutral position.  
Medical: perform a head tilt.  
Pediatric: maintain neutral head position.
2. Suction the airway clear [use a rigid-tip catheter].
3. Remove any foreign bodies.
4. Insert an oropharyngeal airway [patient must not gag].
5. Apply a BVM with oxygen at 15 LPM.
6. Ventilation rate: Adults: 12-20/min.
7. Assure bilateral breath sounds and equal chest rise.

### Intubate patient [MAX: 2 attempts, 30 seconds each]:

1. Assistant applies cricoid pressure, if possible. Once cricoid pressure is applied, it is held until successful intubation.
2. Hold the laryngoscope in the left hand.
3. Remove the oropharyngeal airway [suction, if needed].
4. Insert blade into the right side of the mouth.
5. Displace the tongue left:
  - Curved blade: place tip into the vallecula.
  - Straight blade: place tip under the epiglottis [use in infants].
6. Lift the handle perpendicular to the blade. Do not pry.
7. Visualize vocal cords: insert endotracheal tube between them.
8. Advance the cuff 2 cm past the vocal cords.
9. Remove the stylet.
10. Inflate the cuff [10 ml air]. Avoid excessive pressure.
11. Confirm tube placement by using an end-tidal CO<sub>2</sub> monitoring device.
12. Reposition the endotracheal tube, if needed.
13. Reinsert the oropharyngeal airway as a bite block.
14. Secure the tube with a manufactured tube holder.
15. Always recheck tube placement after moving the patient. Suction as needed.



# Airway – Intubation, Endotracheal (continued)

## Complications:

- Trauma to teeth, epiglottis, cords (do not pry).
- Perforation of trachea, esophagus (lubricate, stylet position)
- Emesis and aspiration (apply cricoid pressure).
- Laryngospasm (lubricate).
- Arrhythmias (oxygenate first).
- Right mainstream bronchus intubation (check breath sounds).
- Esophageal intubation (confirm endotracheal intubation with CO2 detector, visualize cords, check breath sounds).
- Increased intracerebral pressure (assure no gag reflex).
- Pediatric: monitor heart rate since stimulation of the airway may induce brady cardiac arrhythmias.

I	Intermediate	I
P	Paramedic	P

## Special Cases: [Medical Control Required for Intermediate Level]

- Any intubation in a child < 1 year:
  - **Atropine 0.02mg/kg IV/IO/IM**
    - Minimum 0.1 mg.
    - Maximum 1 mg.
- Patients at risk for increased Intracranial Pressure (ICP- head injury):
  - **Lidocaine 2mg/kg IV/IO** over 60 seconds if able to give 3 minutes before intubation. If immediate intubation is required, DO NOT give the Lidocaine.



# Airway – Oxygen Administration

The amount of oxygen administered should be based on clinical evaluation of the patient (i.e. respiratory rate and depth, skin color and temperature, capillary refill, level of consciousness, lung sounds, and history of present illness/mechanism of injury).

Treat the patient not the monitoring device. In such cases, oxygen should be delivered in a manner that maintains oxygen saturation (saO<sub>2</sub>) levels of 92% - 95%, not higher.

FR	
EMT	EMT
A	Advanced EMT
I	Intermediate
P	Paramedic

For patients on home oxygen, continue their home delivery level EXCEPT in patients with signs of shock or respiratory complaints. If pulse oximetry is not available, oxygen should be delivered to the potential hypoxic drive patient 1 to 4 lpm via nasal cannula. Increased oxygen delivery may result in respiratory depression; be prepared to assist ventilation with a bag-valve-mask device.

## The following devices are commonly used in pre-hospital settings:

### Nasal Cannula:

1 lpm	24%
2 lpm	28%
3 lpm	32%
4 lpm	36%
5 lpm	40%
6 lpm	44%

### Non-rebreather Mask:

10 – 15 lpm    80 -100%



# Airway – Suctioning, Tracheal

## **Indications:**

- Secretions in an endotracheal or tracheostomy tube/stoma.
- Difficulty ventilating above patients.

I	Intermediate	I
P	Paramedic	P

## **Complications:**

- Trauma to trachea [gentle insertion, proper catheter]
- Emesis and aspiration [suction ready]
- Bronchospasm [wheezing]
- Arrhythmias
- Increased intracerebral pressure

## **Procedure:**

### **Prepare the patient:**

1. Apply the appropriate size BVM.
2. Give oxygen at 15 LPM.
3. Support ventilations 12-20/min. or higher as indicated.

### **Prepare equipment:**

1. Suction on adults 80-120 mm Hg; children 80-100 mm Hg; infants 40-60 mm Hg.
2. Open a sterile suction catheter packet.
3. Place gloves on. Have sterile water or saline ready.

### **Suction the patient (Max: 10 seconds each for adults, 3-5 sec for infants):**

1. First, ventilate at 20-24 breaths/min. for 10 sec (infants: 40 breaths/min.).
2. Dip the catheter in sterile water or saline to lubricate.
3. Insert the catheter as far as it will go without forcing.
4. Cover the suction valve with thumb to begin suctioning.
5. Twist the catheter while removing it.
6. Re-ventilate at 20-24 breaths/min. for 10 sec (infants: 40 breaths/min.).
7. Check patient's pulse and breath sounds (both sides of chest).
8. Repeat sequence if needed, cleaning catheter with sterile water or saline as required.



# Behavioral Restraint

## Indications:

- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew.
- This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means.
- Physical or chemical restraint should be a last resort technique.
- Police officer(s) should be on scene when using restraints for combative patients.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Procedure:

- When verbal and non-verbal communication does not work, physical restraint is usually the next means for restraining a patient. The national standard of care for restraining patients includes:
  - 1) Making sure that police are present and that you have adequate help.
  - 2) Plan your activities.
  - 3) Estimating the range of motion of the patient's arms and legs, and stay beyond that range until ready.
  - 4) REMEMBER BSI! AND YOUR & YOUR PARTNER'S SAFETY!!
  - 5) Have one rescuer talk to and reassure the patient throughout the restraining procedure.
  - 6) Approach with five persons (if possible), one assigned to each limb, all to act at the same time.
  - 7) Secure all four limbs with soft restraints approved by Operational Medical Direction.
  - 8) Position the patient face up.
  - 9) Use multiple soft straps or other soft restraints to ensure that the patient is adequately secured.
  - 10) If the patient is spitting on rescuers, place a surgical mask on the patient.
  - 11) Reassess the patient's distal circulation frequently and adjust restraints as safe and necessary if distal circulation is diminished.
  - 12) Document the reasons why the patient was restrained and the technique of restraint used.

## Examples of Acceptable Restraints & Methods:



# Blood Glucose Analysis

## Indications:

- Altered mental status
- Known diabetic history
- Hyperthermia or hypothermia
- Prolonged trauma resuscitation
- Seizures/status epilepticus
- Pancreatitis

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Procedure:

1. Take body substance isolation precautions.
2. Clean the patient's finger with an alcohol wipe and allow the alcohol to dry. Make sure the alcohol does not contaminate the blood sample.
3. Puncture the patient's finger with a sterile lancet to retrieve a small blood sample.
4. Place the blood sample onto a chemical reagent strip.
5. Following the manufacturer's recommendations, place the test strip in the glucometer and wait for the reading to appear.
6. Record the reading.
7. Treat the patient according to the signs and symptoms by referring to the appropriate protocol.
8. If the blood glucose level is less than 60 or greater than 300, then the blood glucose determination should be re-evaluated every 15 minutes.

## KEY POINTS/CONSIDERATIONS

- Since all glucometers work differently, the provider must be familiar with the manufacturer's instructions. The slightest mistake can alter the measurement's accuracy. For example, make sure the code numbers on the test strips match those on the digital reading on the glucometer.



# Capnography

## **Indications:**

- Shall be used as soon as possible in conjunction with any airway management adjunct, including endotracheal, nasotracheal, cricothyrotomy, I-Gel, or BVM.
- Should be used on all patients treated with CPAP, magnesium, epinephrine, or in respiratory distress.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## **Contraindications:**

- None

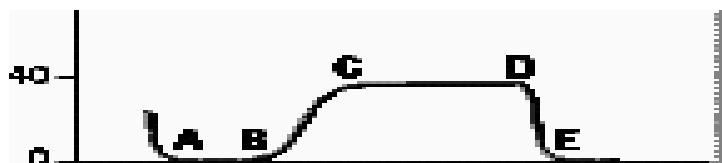
## **Procedure:**

### Intubated patients:

1. Confirm tube placement using traditional methods outlined per the protocol for the device used, to include secondary confirmation device.
2. Attach the Capnography tube device to the advanced airway port.
3. Observe waveform and numerical values present after 6 respiratory exchanges have occurred.

### Non-Intubated Patients:

1. Patient should be assessed and respiratory needs addressed.
2. Apply the sampling device as appropriate per the manufacturer's guidelines.
3. Observe the waveform and numerical values present after 6 respiratory exchanges have occurred.



**A-B:** A near zero baseline- Exhalation of CO<sub>2</sub> free gas contained in dead space.

**B-C:** Rapid, sharp rise- Exhalation of mixed dead space and alveolar gas.

**C-D:** Alveolar plateau- Exhalation of mostly alveolar gas.

**D:** End-tidal value- Peak CO<sub>2</sub> concentration- normally at the end of exhalation.

**D-E:** Rapid, sharp down stroke- Inhalation

# Capnography (continued)

Sudden loss of EtCO<sub>2</sub> to zero or near zero



EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

**Possible causes:**

- Airway disconnection
- Dislodged ET tube/esophageal intubation
- Totally obstructed/kinked ET tube
- Complete ventilator malfunction

Sustained low EtCO<sub>2</sub> with good alveolar plateau



**Possible causes:**

- Hyperventilation
- Hypothermia
- Sedation, anesthesia
- Dead space ventilation

Sustained low EtCO<sub>2</sub> without alveolar plateau

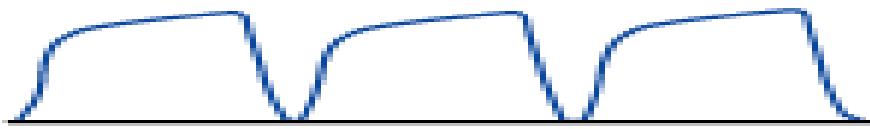


**Possible causes:**

- Incomplete exhalation
- Partially kinked ET tube
- Bronchospasm
- Mucous plugging
- Poor sampling techniques

# Capnography (continued)

Elevated EtCO<sub>2</sub> with good alveolar plateau



EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

**Possible causes:**

- Inadequate minute ventilation/hypoventilation
- Respiratory depressant drugs
- Hyperthermia, pain, shivering

Gradually increasing EtCO<sub>2</sub>



**Possible causes:**

- Hypoventilation
- Rising body temperature/malignant hyperthermia
- Increased metabolism
- Partial airway obstruction
- Absorption of CO<sub>2</sub> from exogenous source

Exponential decrease in EtCO<sub>2</sub>



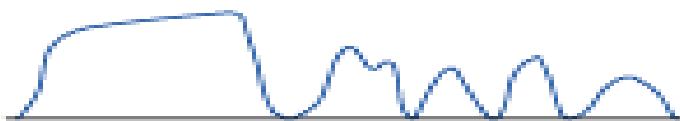
**Possible causes:**

- Cardiopulmonary arrest
- Pulmonary embolism
- Sudden hypotension; massive blood loss
- Cardiopulmonary bypass



# Capnography (continued)

Sudden decrease in EtCO<sub>2</sub> to a low non-zero value



EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

Possible causes:

- Leak in the airway system
- ET tube in hypopharynx
- Poorly fitting anesthetic mask
- Partial airway obstruction
- Partial disconnect from ventilator circuit

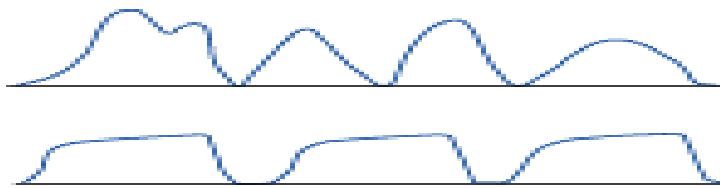
Rise in baseline and EtCO<sub>2</sub>



Possible causes:

- Defective exhalation valve
- Rebreathing of previous exhaled CO<sub>2</sub>
- Exhausted CO<sub>2</sub> absorber

Spontaneous breathing during mechanical ventilation



Spontaneous breathing efforts may be evident on the CO<sub>2</sub> waveform display. The patient on the top demonstrates poorer quality spontaneous breathing effort than the patient on the bottom.



# Cardioversion

## Indications:

### Unstable signs include:

- Altered mental status, ongoing chest pain, hypotension, or other signs of shock.
- Note: rate-related symptoms uncommon if heart rate < 150/min.

I	Intermediate	I
P	Paramedic	P

## Procedure:

### SYNCHRONIZED CARDIOVERSION:

1. Turn the unit on.
2. Consider sedation.
3. Attach combo pads or prepare paddles as described under defibrillation procedure above.
4. Apply ECG electrodes.
5. Observe the cardioscope to determine the rhythm(LEAD II).
6. Activate the synchronization mode.
7. Assure that a “sync marker” occurs on each QRS complex. If not, increase the QRS size, or choose LEAD I or III.
8. Select the appropriate energy level:
  - **Monophasic:** 100 joules. If no change, synchronized cardiovert at 200 joules. If no change synchronized cardiovert at 300 joules. If no change, synchronized cardiovert at 360 joules.
  - **Biphasic:** 75 joules. If no change, synchronized cardiovert at 120 joules. If no change, synchronized cardiovert at 150 joules. If no change, synchronized cardiovert at 200 joules.
9. Charge the unit.
10. Assure “All clear!”
11. Deliver shock.

### **Synchronized Cardioversion**, according to monitor, select energy setting:

- **Monophasic** – 50J for SVT or Atrial Flutter.
  - If no change, repeat synchronized cardiovert at 100J.
  - If no change, repeat synchronized cardiovert at 200J.
  - If no change, repeat synchronized cardiovert at 300J.
  - If no change, synchronized cardiovert at 360J.
- **Biphasic**- 75J for SVT or Atrial Flutter.
  - If no change, repeat synchronized cardiovert at 120J.
  - If no change, repeat synchronized cardiovert at 150J.
  - If no change, repeat synchronized cardiovert at 200J.



# Needle Chest Decompression

## Indications:

Field relief of tension pneumothorax is indicated ONLY when the patient has progressive severe respiratory distress with cyanosis, decreased breath sounds of the affected side, and late hypotension. In addition, the patient may have distended neck veins, and tracheal shift away from the affected side. If the patient is intubated, there should be increasing difficulty in ventilating.

I	Intermediate	I
P	Paramedic	P

## Complications:

- Hemorrhage from vessel laceration.
- Creation of a pneumothorax if one was not already present.
- Laceration of the lung.
- Infection.

## **Procedure:**

1. Maintain airway and administer oxygen by non-rebreather face mask at 15 LPM.
2. Expose the entire chest.
3. Clean the affected side.
4. Insert the 14GA, 3.25" catheter and needle assembly over the top of the rib in the fourth or fifth intercostal space in the midaxillary line. IF unsuccessful, insert the catheter and needle assembly over the top of the rib in the second or third intercostal space at the midclavicular line.
5. Remove the needle from the catheter and leave the plastic catheter in place.
6. If a rubber glove is not available, then attach a one-way device to end of catheter.
7. Confirmation of a successful decompression would include improved hemodynamic status with improved respiratory effort, improved ETCO<sub>2</sub> and/or pulse oximetry, equal rise & fall of the chest, clear bi-lateral breath sounds.
8. Contact Medical Control immediately to notify the receiving facility of critical patient status.

## Reference:

<http://bulletin.facs.org/2018/06/atls-10th-edition-offers-new-insights-into-managing-trauma-patients/>

## KEY POINTS/CONSIDERATIONS

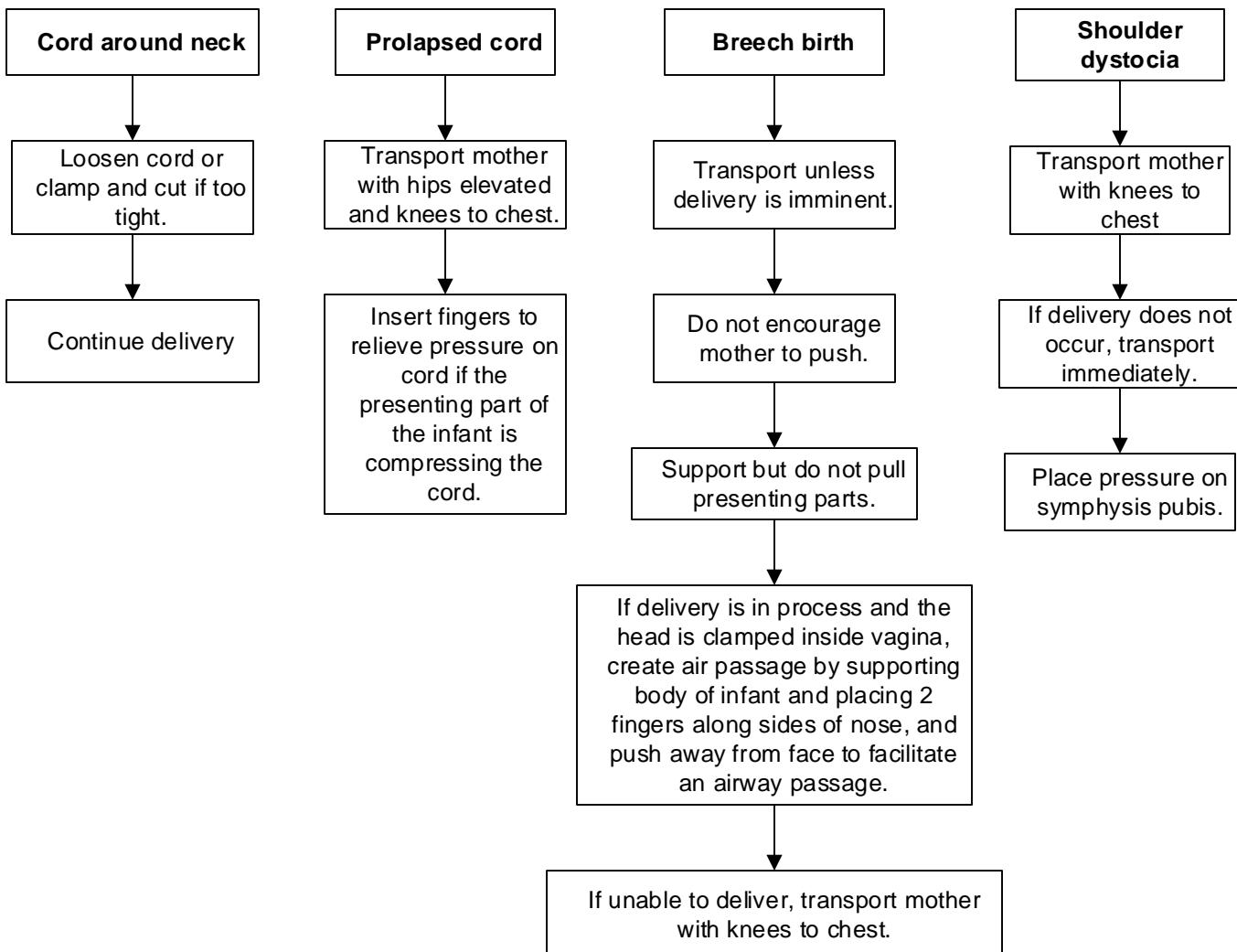
- Tension pneumothorax is rare, but when present it must be treated immediately.
- Non-tension pneumothorax is relatively common, is not immediately life threatening and should not be treated in the field.
- Positive pressure ventilation may lead to the development of a pneumothorax and to rapid progression to tension pneumothorax.
- A needle decompression performed on a patient without a pneumothorax will cause a pneumothorax.



# Childbirth- Abnormal Birth Emergencies

## Universal Patient Care Protocol

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P



Contact Medical Control for further consideration.

### KEY POINTS/CONSIDERATIONS

Patients going to Lynchburg area hospitals:

- Patients who are > 20 weeks are to be transported to Virginia Baptist. If the patient is < 20 weeks the patient is to be transported to Lynchburg General.
- All trauma patients, regardless of stage of pregnancy, are to be transported to Lynchburg General.



# Childbirth- Uncomplicated Delivery

Contact receiving facility to notify of delivery

Observe head crowning

 Follow **Universal Patient Care** Protocol

- Prepare mother for delivery
- Set up equipment and administer oxygen as necessary

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Delivery of head:

Firm, gentle pressure with flat of hand to slow expulsion.

Allow head to rotate normally, check for cord around neck, wipe face free of debris. Suction mouth and nose with bulb syringe, only if meconium is present. Do not aggressively suction the infant.

## Delivery of body:

Place one palm over each ear. With next contraction, gently move head downward until upper shoulder appears. Then gently lift up on the lower shoulder.

Support the head and neck with one hand and buttocks with the other. Document all times (delivery, contraction frequency, and length).

## Newborn and cord:

Keep newborn at level of vaginal opening. Keep warm and dry. After 10 seconds, clamp cord in two places with sterile equipment at least 6-8 inches from newborn.

Cut between clamps. Do not pull on the cord to deliver the placenta. If the placenta delivers, place it in the bag provided in the OB kit. Take the placenta to the hospital with the patient.

## KEY POINTS/CONSIDERATIONS

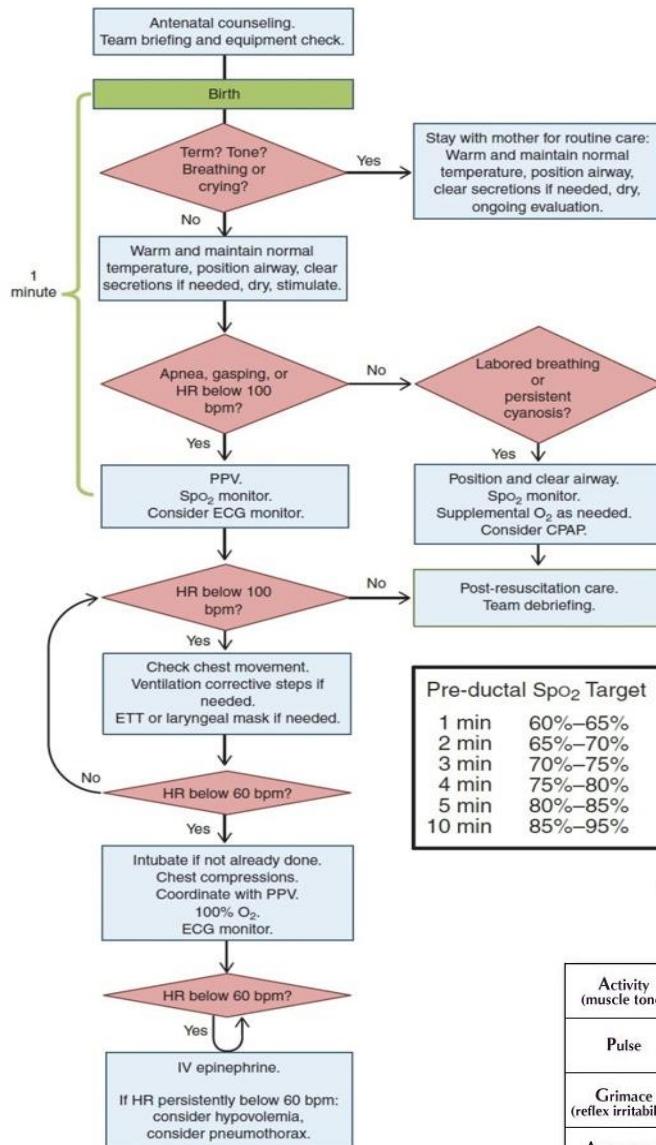
### Patients going to Lynchburg area hospitals:

- Patients who are > 20 weeks are to be transported to Virginia Baptist. If the patient is < 20 weeks the patient is to be transported to Lynchburg General.
- All trauma patients, regardless of stage of pregnancy, are to be transported to Lynchburg General.
- After delivery, massaging the uterus (lower abdomen) will promote uterine contractions and help to control post-partum bleeding.
- Some perineal bleeding is normal with any childbirth. Large quantities of blood or free bleeding are abnormal.
- If delivery becomes imminent, prepare to deliver and protect mother's privacy if possible (stop the ambulance and prepare for delivery).



# Childbirth - Care of the Newborn

## Standard Procedures



EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

Pre-ductal Spo <sub>2</sub> Target	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

## APGAR SCORING SYSTEM

	0 Points	1 Point	2 Points	Points totaled
Activity (muscle tone)	Absent	Arms and legs flexed	Active movement	
Pulse	Absent	Below 100 bpm	Over 100 bpm	
Grimace (reflex irritability)	Flaccid	Some flexion of Extremities	Active motion (sneeze, cough, pull away)	
Appearance (skin color)	Blue, pale	Body pink, Extremities blue	Completely pink	
Respiration	Absent	Slow, irregular	Vigorous cry	

Severely depressed	0-3
Moderately depressed	4-6
Excellent condition	7-10

### KEY POINTS/CONSIDERATIONS

- Temperature:** Keep the infant warm & dry. Allow skin to skin contact with the parent.
- Airway:** Provide O<sub>2</sub> as needed. (See permissible pre-ductal chart above.)
- Suction:** Only as needed; if meconium is present, suction until mucosa is clear
- Breathing:** Stimulate the baby to cry by tapping its feet or buttocks; DO NOT stimulate if meconium is present.
- Circulation:** Assess heart rate and color
- If the infant's heart rate is <100bpm, but >60bpm, begin positive pressure ventilation via BVM. Please note that when providing PPV, only small "puffs" of the BVM are necessary. Do not over ventilate the infant.
- If the infant's heart rate is near or <60bpm, initiate chest compressions at a 3:1 ratio - (3 compression; 1 ventilation). A 2-thumb technique is recommended.
- APGAR:** Assign APGAR scoring at 1 minute after birth, and then again at 5 minutes after birth.

\*Reference – Neonatal Resuscitation Program, 7<sup>th</sup> edition update, June, 2016



# Defibrillation

## Indications:

- Cardiac arrest.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Procedure:

### **DEFIBRILLATION:**

1. Turn the unit on.
2. Apply electrodes to chest according to manufacturer's instructions. Confirm shockable rhythm.
3. Place defibrillator in appropriate lead usually the "Paddles" or "Pads" mode.
4. Use either combo electrode pads or the paddles:
  - Combo pads: apply electrode pads/cables to clean, dry skin according to manufacturer's recommendations.
  - Paddles: apply gel [or use gel pads] and press paddles firmly to chest  
(Use pediatric paddles if weight < 10 kg)  
Sternum-> right upper anterior chest  
Apex -> left lower anterior lateral chest
5. Observe the monitor to confirm the rhythm.
6. Select energy level using manufacturer's recommendations. If the rescuer does not know the type of biphasic waveform in use, a default dose of 200 J is acceptable.  
For monophasic machines, the default dose is 360 J.
7. Press the charge button, assure "**All clear**", deliver shock.



# Double Sequential External Defibrillation (Double Shock)

## Indications:

- **Adult Patients ONLY**
- Any patient who has persisted in ventricular fibrillation/tachycardia, without even transient interruption of fibrillation, as per the persistent VF/VT protocol.
- At least one shock was delivered using different pads applied so as to produce a different current vector than the first set and all other indicated treatment modalities have been implemented.
- An ALS provider has verified the persistence of the arrhythmia immediately post-shock.

I	Intermediate	I
P	Paramedic	P

**Procedure:** This procedure calls for two (2) defibrillators. After the 2<sup>nd</sup> shock, provider can administer a Double Sequential External Shock.

1. Ensure quality of CPR is not compromised during prolonged efforts.
2. Prepare the sites for attachment of an additional set of external defibrillation pads by drying the sites and minimizing interference of hair or other obstacles to good pad adhesion.
3. Apply a new set of external defibrillation pads adjacent to, but not touching, the pad set currently in use.
4. Assure that controls for the second cardiac monitor are accessible to the code commander.
5. An approved ALS provider will verify that the resuscitation checklist has been fully executed.
6. On rhythm check, the ALS provider will confirm the rhythm.
  - If a shockable rhythm is detected, CPR will resume immediately. The provider will verify that both cardiac monitors/defibrillators are attached to the patient, that all pads are well adhered, and direct the simultaneous charging of both attached cardiac monitors. When both monitors are charged to maximum energy and all persons are clear, the code commander or another acceptable provider will push both shock buttons as synchronously as possible. A brief rhythm/pulse check will occur and CPR will resume as appropriate.
  - If a non-shockable rhythm is present care will resume according to the appropriate protocol.

## Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the agency OMD.



# End-Tidal CO<sub>2</sub> Detection

## Indications:

- All patients who have been intubated.

## Therapeutic Effect:

- Measures presence of CO<sub>2</sub> in the airway.

I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Prolonged down time or death.

**Procedure:** (This procedure is written for the EZ-Cap device. Other devices are available that have different colors so providers must be familiar with what their agency may carry).

1. Inspect detector for purple color and dryness.
2. Suction any fluid present in the endotracheal tube.
3. Attach detector to BVM.
4. Connect BVM with CO<sub>2</sub> detector to ET tube. Keep detector clean and dry.
5. Begin ventilations using proper rate. Do not use continuous hyperventilation.
6. Observe CO<sub>2</sub> detector for color changes during exhalation.
7. Monitor detector for color change and initiate corrective measures:
  - **Patient with a pulse:**
    - Yellow, leave in place.
    - Tan, re-evaluate: Check possible causes of low perfusion such as inadequate ventilation, hypovolemia, etc. Ventilate 6 more times and re-assess tube placement and CO<sub>2</sub> detector for color change.
    - Purple, problem: Tube is incorrectly placed, extubate. Ventilate with BVM, re-intubate.
  - **Patient with prolonged pulselessness:**
    - Yellow, leave in place.
    - Tan, re-evaluate: May be due to retained CO<sub>2</sub> from BVM ventilation, ETOH, carbonated drinks, or inadequate CPR. Ventilate 6 more times and re-assess tube placement and CO<sub>2</sub> detector for color change.
    - Purple, problem: **Visualize vocal cords.** If tube is placed below vocal cords, leave in place, and check adequacy of CPR. If tube is incorrectly placed, extubate, ventilate with BVM and re-intubate.

## Special Considerations:

- CO<sub>2</sub> detectors are only an adjunct to careful patient assessment.
- Do not use detectors as sole method of assessing correct tube placement, especially in the patient without a pulse. Keep detector clean and dry.
- If detector is not purple upon removal from package, discard the detector.
- Fluid in detector inactivates detector. If wet will appear mottled. If this happens discard the detector, it is no longer reliable.
- If pediatric detector is unavailable, adult detector can be used only for the initial assessment of tube placement (see # 6 above). CO<sub>2</sub> detectors become inactivated when used for long periods of time. Usually limit to 2 hours in the adult and 1 hour for pediatric use. See specific manufacturer guidelines provided for your detector.



# External Pacing

## Indications:

- For a patient with poor perfusion, pulse < 60 bpm and after administration of atropine 1mg.

I	Intermediate	I
P	Paramedic	P

## Procedure:

1. Turn the unit on.
2. Consider sedation.
3. Apply ECG electrodes.
4. Observe the monitor to determine the rhythm [LEAD II].
5. Apply QUICK-PACE or Combo electrode pads to clean, dry skin according to manufacturer's instructions: (Use pediatric pacing pads if weight < 10 kg)
6. Place defibrillator in the pace mode.
7. Set the pacing rate to 60/min. in adults, 100/min. in child  $\geq$  6 yrs., 120/min. in child, < 6 yrs. This rate can be adjusted up or down (based on patient clinical response) once pacing is established.
8. Increase mA, assure pacing spike precedes each QRS, until a spike appears on the monitor to indicate each delivered pacing stimulus. This represents electrical capture.
  - Adults: Increase the mA until a QRS complex follows each spike. Max: 200 mA.
  - Children: Increase the mA to reach 40 MA (until a QRS follows each spike). Max: 100 mA.
9. Reassess patient for signs of improved perfusion. If no improved perfusion or mechanical capture - discontinue pacing.
10. Modify the current as needed to maintain effective pacing with both electrical and mechanical capture.



# Gastric Tube Insertion

## Indications:

- For adults only.
- To decompress gastric distention in the intubated patient.

I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Patient not intubated.
- Nasal insertion not to be attempted.

## Procedure:

1. Assemble equipment - OG tube, 50 ml syringe, tape, emesis basin, gloves, saline for irrigation, stethoscope, suction, lubricant.
2. Observe universal precautions.
3. Measure the tube from the patient's mouth, around the earlobe to the umbilicus; mark the correct tube length.
4. Insert lubricated tube into the mouth.
5. Pass the tube to the predetermined length. Do not force the tube if resistance is encountered. If unable to insert tube to predetermined measurement, the tube may be in the trachea or curled in the patient's throat.
6. Check the placement by aspirating gastric contents. If there is no return place a stethoscope over the epigastric region and auscultate while injecting 20-30 ml of air into the tube.
7. Tape the tube in place and connect to low suction as indicated.
8. Document the procedure, size of tube, tube placement check and patient response.
9. Intermediates/Paramedics trained on the I-Gel, may use Gastric tube in conjunction with the I-Gel when needed.



# M.A.D. Intranasal Administration Tool Procedure

## Indications:

The need exists for administering medications that are either unable to be given by another established route or the preferred method is unsafe or a hazard to the provider. (i.e. potential needle stick from a violent patient)

Effective non-oral route for:

- Pain management/incident pain with Fentanyl or sedatives for restlessness/agitation.
- Reversal of opiate overdose with Naloxone®
- Seizure management with benzodiazepines
- Hypoglycemia management with Glucagon®

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Contraindications:

- Nasal trauma or obstruction (copious mucous, bleeding, anatomic obstruction, or foreign body) or a known allergy to the medication being considered for IN administration.

## Procedure:

- Explain procedure and expected outcome to patient and family.
- Fill syringe with prescribed amount of medication solution using the most concentrated form of the medication available. \*\*
- Connect the MAD® (nasal sprayer) to the syringe via luer-lock mechanism.
- Inspect the nostril for significant amounts of blood or mucous discharge. Presence of these discharges will limit mucosal absorption.
- Suction the nasal passage prior to medication delivery if needed.
- Lean head back slightly or lay flat.
- Place the tip of the MAD® in the nostril.
- Squirt half of the medication into each nostril. Splitting the dose doubles the available mucosal surface area for drug absorption and increases the rate and amount of absorption.

\*\*The *ideal* volume for intranasal administration is 0.2-0.3ml and the maximum recommended volume per nostril is 1ml. If dose is greater than 0.5ml, apply it in two separate doses allowing 5-10 minutes apart for each dose. The spacing allows the former dose to absorb.

The MAD® atomizer has a dead space of 0.1ml, so particularly for doses less than 0.9ml be sure to take the dead space into account by adding 0.1ml to the final volume (i.e. volume of dose + 0.1ml)





## Procedure 24 - Intramuscular Injections

### Clinical Indications:

1. Route indicated by guideline when rate of absorption needs to be slower and/or prolonged in action.
2. When other administration routes are unsuccessful, unsafe, or unavailable.

### Contraindications:

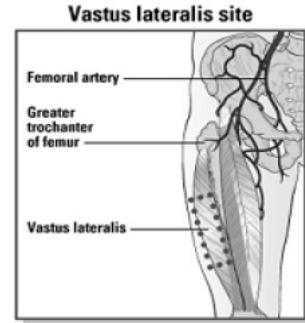
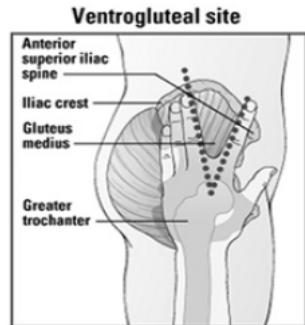
1. No absolute contraindications

### Notes & Precautions:

1. Prepare appropriate equipment:
  - a. Needle size & length –  $\frac{1}{2}$  to 1 inch for deltoid, 1 to 1.5 inch for larger muscles
  - b. 25 g for aqueous medications, 21 gauge for oily or thicker medications.
  - c. Appropriately sized syringe to measure the administration volume.
  - d. Chlorohexidine wipe and band aids
2. Appropriate injection sites:
  - a. Posterior deltoid for injections of up to 2 mL in adults contingent upon muscle mass development.
  - b. Vastus Lateralis for injections of 2 mL or less in children and adults.
  - c. Ventrogluteal site for injections of 2 to 5 mL in adults, or 2 mL or less in children.

### Procedure:

1. Prepare equipment, inspect medication, perform medication cross check – Right: patient, drug, dose, route, indication, time
2. Locate appropriate injection site:
  - a. Deltoid: Identify the bony portion of the shoulder where the clavicle and scapula meet (acromioclavicular joint), then measure 3-4 fingers down the arm from the acromioclavicular joint, slide 1-2 fingers posteriorly on the arm.
  - b. Vastus Lateralis: Locate on the anterior and lateral aspects of the thigh, then divide the area into thirds between the greater trochanter of the femur and the lateral femoral condyle, injection is given into the middle third.
  - c. Ventrogluteal: Place heel of palm on patient's greater trochanter of the femur, then place index finger on the anterior superior iliac spine and spread other fingers posteriorly, injection is given in the V formed between the index finger and the second finger.
3. Cleanse site with Chlorohexidine
4. Stretch or flatten the skin over the selected site to allow for smoother entry of the needle.
5. Hold the syringe like a dart and quickly insert the needle into the tissue and muscle at a 90-degree angle.
6. Slowly inject the medication, once injected then quickly withdraw the syringe and properly dispose.
7. Gently massage the injection site to increase absorption and distribution.
8. Apply firm pressure and place band aid over site.



# Pandemic – COVID19 Respiratory Virus

## Purpose:

To establish a uniform guideline for managing situations where personnel and equipment have been exposed to COVID-19 (Human Novel Coronavirus of 2019).

Goals include minimizing or eliminating responders' exposure risk while maintaining excellent patient care.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Response Precautions

1. Identify premise information while enroute. Notes may indicate recent exposure to areas or persons with known COVID-19. Carry to and don appropriate PPE prior to entering the location.

## Patient Assessment

1. While maintaining high quality patient care, initial assessment should begin from a distance of at least 6 feet or sufficiently private outside with patient permission. If not already in place, all personnel in contact with the patient should immediately don PPE and if possible place a mask over the patient's face.
2. Limit the number of personnel inside the residence to essential-only.
3. Follow BREMS Protocols for treating your patient, while utilizing the BREMS Temporary Offline Order for Treat & Release as necessary.

## Recommended PPE and transport procedures

1. Follow Standard, Contact, and Airborne Precautions, including the use of the following PPE at a minimum:
  - Disposable patient examination gloves
  - Disposable isolation gown,
  - Respiratory protection (N-95 or higher-level respirator),
  - Eye protection (goggles or disposable face shield the fully covers the front and sides of the face).
2. The driver should remove and dispose of gown/gloves/eye protection and perform hand hygiene before entering the vehicle to avoid soiling the driver compartment. Respiratory protection should be maintained during transport.
3. All personnel should avoid touching their face.



# Pandemic – COVID19 Respiratory Virus

## (Continued)

### Purpose:

To establish a uniform guideline for managing situations where personnel and equipment have been exposed to COVID-19 (Human Novel Coronavirus of 2019).

Goals include minimizing or eliminating responders' exposure risk while maintaining excellent patient care.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

### Recommended PPE and transport procedures continued

4. Follow CDC guidelines for isolation precautions: Preventing Transmission of Infectious Agents in Healthcare Settings.
5. Consult with medical control before performing aerosol-generating procedures for specific guidance if desired.
6. Exercise caution if an aerosol-generating procedure (BVM ventilation, oral suctioning, ET tube intubation, nebulizer treatment, CPAP, biPAP, or CPR is necessary.
  - a. BVMs and other ventilator equipment should be equipped with HEPA filtration to filter expired air.
  - b. If possible, the rear doors of the medic unit should be opened and the HVAC system should be activated during aerosol-generating procedures, away from pedestrian traffic.
7. Notify healthcare facility as soon as possible that the patient has an exposure history and signs and symptoms suggestive of COVID-19 so that the appropriate control precautions may be taken prior to patient arrival.
8. Keep the patient separate from others as much as possible. Family members and other contacts of patients should not ride in the transport vehicle, if possible, but should consider isolation measures in their home for the period of incubation.
9. Documentation should include all EMS providers involved in the response and the level of contact with the patient. This documentation may need to be shared with local public health authorities.

### Decontamination of Personnel and Equipment

1. Leave the rear doors of the medic unit open to allow for sufficient air changes to remove potentially infectious particles.
2. Wear disposable gown and gloves while cleaning the vehicle. A faceshield can also be worn when splashes or sprays are anticipated.
3. Follow directions on cleaning agents to correctly disinfect areas. Keep doors open while cleaning.
4. Cleaning/disinfecting products that are labeled to have demonstrated effectiveness against viruses similar to SARS CoV-2 (the virus that causes COVID-19) or other human coronaviruses should be used.

### Diligence and Prevention

1. Use proper personal hygiene including soap and water to properly wash your hands regularly.
2. Keep your hands away from your face.
3. Keep up to date with current CDC and VDH guidelines.



# Pandemic Response - COVID19

## Respiratory Considerations & Airway Management

### Purpose:

To provide best practice guidance regarding respiratory treatment and airway management in the setting of a patient with suspected or confirmed infectious respiratory disease, and to recommend tactics to mitigate risk to providers.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

### Background:

We have an obligation and desire to provide high quality patient care while mitigating provider exposure and conserving the EMS resources of the Region; this requires close attention and careful adjustment to typical care pathways to ensure both patient and provider safety.

There is increased risk of infectious exposure to providers when administering aerosol-generating procedures (AGP), including bag valve mask (BVM) ventilation, oropharyngeal suctioning, endotracheal intubation, nebulizer treatment, continuous positive airway pressure (CPAP), bi-phasic positive airway pressure (biPAP), or resuscitation involving emergency intubation or cardiopulmonary resuscitation. This document discusses appropriate use of these interventions during an airborne/droplet based infectious pandemic.

### General Considerations

- Care provided in fresh air and UV light should be maximized. This means assessing the patient outside when possible, and maintaining maximum ventilation when in the truck/indoors.
- PPE for providers, and reverse isolation for patients (ie a surgical mask) is critical.
- Many medications are in shortage, and the patient's MDIs/spacer should accompany them to the hospital when possible, preferably in a container of some sort labeled with the patient's name. See below for guidance on provider use of these medications.
- Home CPAP devices including mask should also be brought with the patient.
- Individual agencies should provide guidance to providers regarding ideal settings for ambulance ventilation and air flow, including the use of negative pressure.
- Steroid use should be restricted to those in whom a diagnosis of COPD or asthma exacerbation is suspected; ideally, suspicion for this should be supported by previous diagnosis of these conditions.
- While COVID-19 is currently present in the community at large, it must be recognized that other pathology remains as well.
- When possible, non-respiratory routes of medication administration (ie IM/IV) are preferred.



# Pandemic Response - COVID19

## Respiratory Considerations & Airway Management

### Patient Care Considerations

- **If the patient is in mild or no respiratory distress with appropriate oxygen saturations, then care is as usual while maintaining appropriate PPE.**
- **If the patient is in moderate respiratory distress, then the following considerations may be made:**
  - When indicated, oxygen should be supplied by device such as nasal cannula or nonrebreather.
  - The patient's albuterol or albuterol/ipatropium MDI may be used in lieu of a nebulizer treatment; the provider should assist the patient in taking 4-5 puffs with adequate breaths in between. Be aware that this may provoke cough; encourage shielding and quick mask replacement for the patient, and ensure provider PPE is in place.
  - If a nebulizer is felt to be necessary prior to hospital arrival, consider providing this via a mask- type device prior to loading the patient, while still outside.
  - In every instance, a surgical mask should be placed over the oxygen or nebulizer mask prior to initiating oxygen flow to catch droplets/aerosols generated.
  - Consider early use of Magnesium IV, as well as Epinephrine 1:1,000 IM, in appropriate patients.
  - If a vasopressor is needed, the medication of choice would be Levophed/Norepi. Refer to protocol and chart reference for dosing.
- **If the patient is in severe respiratory distress, then the following considerations may be made:**

**\*Severe respiratory distress, for the purpose of this protocol, is defined as an oxygen saturation of 85% or less, despite use of a non-rebreather and/or severe physical symptoms, such as retractions. Understand that permissive hypoxia is acceptable.**

  - If COVID-19 infection is suspected or confirmed, then early DAI in open air may be appropriate rather than CPAP/BiPAP.
  - During this pandemic, CPAP/BiPAP should be restricted to patients in whom the provider strongly suspects the absence of COVID-19 infection, or if the withholding of this modality would likely cause harm to the patient. Provider PPE in this instance should be impeccable, understanding that contamination of vehicle, and provider's uniform and exposed skin/hair will likely still occur and require decontamination.
  - If airway management is indicated, this should be performed by the most experienced provider.
  - Video laryngoscopy which allows some distance between the patient and provider is preferable. If this is not an option, then placement of supraglottic airway is preferable to direct laryngoscopy.
  - Some providers prefer a barrier device such as a clear plastic drape tented over the patient's head during intubation to limit aerosol spread; if this is desired as an option, it must be trialed beforehand during simulated airway management with Advanced Practice Paramedic or OMD supervision on an airway mannequin to ensure complete competency.
  - Both BVM and ventilator used should have HEPA filtration; if this is not possible, then at minimum a spare N95 must be firmly secured over the exhalation port.
  - Confirmation and documentation of placement by end tidal capnography is mandatory.



# Pandemic Response - COVID19

## Respiratory Considerations & Airway Management

- If the patient is in cardiac arrest, then the following considerations may be made:
  - As always, resuscitation in place is recommended.
  - Providers must have complete PPE in place.
  - Attention must be paid to minimizing aerosolized secretions. This could include:
    - A nonrebreather with oxygen running over the patient's mouth during the initial 200 compressions for passive oxygenation
    - Ventilation with a Bag-valve-mask with HEPA filter or N95 secured over exhaust port.
    - Supraglottic airway placement and filtered BVM as described above.
    - A mechanical compression device should be placed and used as soon as possible.
    - Supraglottic airway is preferable to endotracheal intubation.
    - Standard management guidelines for Cardiac Arrest care should be followed otherwise.



# Pulse Oximetry

## Procedure:

1. Ensure patient has a radial pulse or that the point of attachment is warm and is being perfused.
2. Ensure there is no polish on the nail.
3. Turn oximeter power on.
4. Attach probe and ensure that a good signal is being received (according to the manufacturer's recommendations).
5. Record oxygen saturation.

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

The goal is to obtain a SaO<sub>2</sub> level of 98% to 99%.

<u>SaO<sub>2</sub> Reading</u>	<u>Oxygen Device</u>	<u>Oxygen Volume</u>
95% - 99%	None	None
91% - 94%	Nasal cannula	2-6 lpm
86% - 91%	Non-rebreather	15 lpm
Less than 86%	Non-rebreather or bag-value mask	At least 15 lpm

Regardless of the SaO<sub>2</sub> level, EMS providers should never withhold oxygen from a patient complaining of difficulty breathing or chest pain. These patients, and patients with any kind of shock, should be given oxygen by a non-rebreather mask at 10-15 lpm.

## KEY POINTS/CONSIDERATIONS

- Patients with carbon monoxide poisoning will have falsely high readings.
- Cold extremities will not obtain an accurate reading.



# Spinal Motion Restriction

## Objective:

To determine whether it is appropriate for the certified provider to apply spinal motion restriction in the pre-hospital setting.

The following constitutes a positive spinal assessment and any ONE positive finding indicates the need for spinal motion restriction:

- Midline cervical and/or thoracic spinal tenderness or palpable deformity during exam.
- Any neurologic complaint (numbness, weakness).
- High energy mechanism of injury plus any of the following:
  - a. Altered mental status
  - b. Drug/alcohol intoxication
  - c. Inability to communicate (includes language barrier)
  - d. Presence of a painful, distracting injury
  - e. Age < 3

EMT	EMT	EMT
A	Advanced EMT	A
I	Intermediate	I
P	Paramedic	P

## Procedure:

1. Place the patient in the appropriately sized C-collar.
2. If the patient is **ambulatory** on scene or if the patient can safely self-extricate:
  - a. Assist the patient to the EMS stretcher,
  - b. Transport the patient in a supine position. If the patient is having respiratory issues, then the head of stretcher can be elevated 30 degrees.
3. If the patient is **not ambulatory** or if extrication is required:
  - a. Use a rigid extrication device (e.g. scoop stretcher/vacuum mattress) as needed to move the patient to the EMS stretcher if possible.
  - b. Remove the rigid extrication device once patient is on the EMS stretcher, if possible. If you use a long backboard, remove the device once the patient is on the EMS stretcher, if possible.
4. The head may be supported with head blocks or similar device to prevent rotation.
5. Secure the patient with seatbelts to the EMS stretcher in the supine position.

## **Patients who do not require spinal motion restriction must have all of the following:**

1. GCS 15
2. No spine tenderness or anatomic abnormality.
3. No acute neurologic impairment.
4. No distracting injury.
5. No evidence of intoxication/cognitive impairment.

## **If the patient has a negative spinal assessment:**

1. Transport in a position of comfort.
2. Place the patient in an appropriately sized C-collar if age > 65. In patients > 65 years and injury is suspected, regardless of a negative spinal assessment, place a C-collar on this age group. Studies have shown older adults (> 65 years) without midline tenderness may still have a significant cervical fracture. Cervical fractures are twice as common in this age group.



# Venous – Central Line Access

## Indications:

- Cardiac arrest situation when IV/IO access is not obtainable or is inadequate.

I	Intermediate	I
P	Paramedic	P

## Procedure:

1. Set up a Normal Saline IV with emphasis on fully flushing the IV tubing.
2. Expose the central line area.
3. Prepare equipment
  - alcohol pads or equivalent
  - several 4x4 pads
  - 2 – 10ml syringes
  - surgical mask
4. Take one of the 10ml syringes and draw up 10ml of Normal Saline from the IV bag.
5. Open a 4x4 pad and place around the tip of the access port to create a sterile field.
6. Apply surgical mask.
7. Cleanse the tip of the central line (port you intend to access) aggressively with the alcohol pad or equivalent cleanser (Betadine, etc.)
8. Clamp or pinch tube then remove the cap and place the 10ml syringe (without saline) to the catheter. **Note: The central lines should never be left open to air.**
9. Unlock the clamp on the central line, if applicable, and aspirate 5 cc of blood from the port and discard. Blood should aspirate freely. If it does not, replace the cap and do not use the access.
10. Lock the clamp if applicable and remove the syringe with the aspirated blood. Dispose in a biohazard container.
11. Apply the syringe with the 10ml of Normal Saline to the port, unlock the clamp, and flush the device. The saline should flush easily. Re-clamp.
12. Remove syringe and apply the Normal Saline IV to the port. Unclamp and adjust flow rate.



# Venous – External Jugular Vein IV

## **Indications:**

- External jugular cannulation is appropriate in the critical patient who needs IV access and in whom no suitable IV/IO access is found or when attempts at peripheral IV/IO access have been unsuccessful.

I	Intermediate	I
P	Paramedic	P

## **Contraindications:**

- Vein is not visible.

## **Procedure:**

1. Place the patient in the supine position, preferably head down, to distend the vein and to prevent air embolism.
2. If C-spine injury is not suspected, turn the patient's head to the opposite side. If C-spine precautions are necessary, manually stabilize the head in a neutral position during the procedure.
3. Clean the site and align the angiocath with the vein, pointing the needle at the junction of the medial and middle thirds of the clavicle.
4. Press on the vein just above the clavicle to make it more prominent and insert the angiocath at the midpoint of the vein, cannulating in the usual manner.
5. Once the needle is removed from the angiocath quickly attach the IV tubing to prevent the introduction of an air embolism.
6. Tape the IV tubing securely. Cervical collars can be placed over the IV site if C-spine immobilization is necessary.

## **KEY POINTS/CONSIDERATIONS**

- The external jugular vein runs in a line from the angle of the jaw to the junction of the medial and middle third of the clavicle. Pressing on the vein just above the clavicle will make it more prominent.
- This is a painful site to access, so typically this procedure is reserved for use in patients with extreme decrease in LOC or unresponsive.





## Procedure 31: Intraosseous Infusion

### Clinical Indications:

1. Cardiac Arrest
2. Critical patient where rapid vascular access is unavailable by other means in the following conditions:
  - a. Multisystem trauma with severe hypovolemia
  - b. Severe dehydration with vascular collapse and/or loss of consciousness
  - c. Respiratory failure or respiratory arrest
  - d. After 2 unsuccessful IV attempts and/or patient is unstable.

### Contraindications:

1. Fracture proximal to the proposed intraosseous site.
2. History of osteogenesis imperfecta.
3. Current or recent infection at proposed intraosseous site.
4. Previous intraosseous insertion at the identified site within 24 hours.
5. Joint replacement at or above the selected intraosseous site.

### Notes/Precautions:

1. Any prehospital fluids or medications approved for IV use may be given through an IO line.

### Procedure:

1. Follow guidance & training from Arrow® EZ-IO®: <https://www.teleflex.com/usa/en/clinical-resources/ez-io/index#>
2. Prepare EZ-IO assuring that complete needle set with trochar and needle are present, and the set is sterile and unused.
3. Identify landmarks for insertion:
  - a. Humeral head (patients > 12 years of age) - place the patient's palm on their umbilicus with the elbow on the ground or stretcher. Use your thumb to identify the humeral shaft. Slide thumb towards humeral head with firm pressure. Locate the tubercle by the prominent bulge. Use the opposite hand to pinch anterior and posterior humerus to assure midline position on the humerus.
  - b. Proximal tibia - Identify anteromedial aspect of the proximal tibia palpated just below the inferior border of the patella. Insertion site is 1-2 cm (2 finger breadths) below this on the flat surface of the tibia.
  - c. Distal tibia - Identify the anteromedial aspect of the distal tibia (2 cm proximal to the medial malleolus).
  - d. Distal femur (patients < 12 years of age)- Place leg in perpendicular position with foot pointing up. Identify superior border of patella. Insertion site is 1-2 cm (2 finger breadths) above the patellar superior border.
4. Prep the selected insertion site with chlorohexidine.
5. Hold the intraosseous needle at 90-degree angle aimed away from the nearest joint. Power the driver until a *pop* or *give* is felt indicating a loss of resistance. Do not advance the needle further.
6. Remove the stylette and place in a sharps container.
7. Attach a syringe filled with at-least 5 mL of NS and aspirate to confirm placement. Inject 5 mL of NS to clear the needle while observing for infiltration.
8. Attach saline lock and/or IV tubing and adjust flow rate. A pressure bag may be used to enhance flow when appropriate.
9. Stabilize and secure the needle.
10. Unless contraindicated, administer lidocaine. Adult dosage: 40mg; Pediatric dosage: 0.5mg/kg not to exceed 40mg. Allow to dwell 60 seconds to prior re-administering infusion or administration of medications. Lidocaine may be repeated once if pain persists at half the original dose.
11. When administering medications via IOA, a 10 mL flush of NS should follow.
12. Document the procedure, time, and result in the ePCR.

# Policies

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# BREMS COMMUNICATION

**Lynchburg General Hospital Emergency Department:** EMS personnel are to provide pre-arrival notification of all patients inbound to Lynchburg General Hospital.

Contact: LGH Medical Control  
Via 800mhz: "LGH-ER" talk group  
Via Channel 9: Press 5-4-4  
Via phone: 434-200-3262 or 434-200-3263; (last resort only  
434-200-3211)  
12 Lead Fax #: 434-200-1508  
12 Lead Email: [lghcp@centrahealth.com](mailto:lghcp@centrahealth.com)

**Bedford Memorial Hospital:** EMS personnel are to provide pre-arrival notification of all patients inbound to Bedford Memorial Hospital.

Contact: Bedford Medical Control  
Via 800mhz: "BCMH ED" talk group  
Via Channel 9: Press 2-2-4  
Via Channel 10: Contact Bedford County Sheriff's Office  
Via phone: 540-587-3250

**Gretna Medical Center:** EMS personnel are to provide pre-arrival notification of all patients inbound to Gretna Medical Center.

Contact: GMC Emergency Department  
Via phone: 434-200-4917 (Line 1)  
Via phone: 434-200-4918 (Line 2)  
12 Lead Email: [gmced@centrahealth.com](mailto:gmced@centrahealth.com)  
12 Lead Fax: 434-200-4921  
ED Main Numbers: 434-200-4002  
ED Main Numbers: 434-656-4602  
Charge Nurse: 434-200-4946

**Virginia Baptist Hospital Outpatient Department or Labor and Delivery:** EMS personnel are to provide pre-arrival notification of all patients inbound to Virginia Baptist Hospital.

Contact: VBH Outpatient Department  
Via 800mhz: "VBH-OPD" talk group  
Via Channel 9: Press 8-2-4  
Via phone: 434-200-4192 (Outpatient Department)  
Via phone: 434-200-4660 (Labor & Delivery)  
Via phone: 434-200-5765 (After 11pm for both Outpatient Dept. & Labor & Delivery)

Alternative: Contact LGH Medical Control and the communication specialist can contact labor and delivery by phone.



# BREMS COMMUNICATION (continued)

**Roanoke Memorial Hospital:** EMS personnel are to provide pre-arrival notification of all patients inbound to Roanoke Memorial Hospital.

Contact: RMH Med-Comm  
Via Channel 10  
Via phone: 540-981-7500 (EMS dedicated line)  
Via phone: 540-981-7337 (alternative to EMS dedicated line)

**University of Virginia Medical Center:** EMS personnel are to provide pre-arrival notification of all patients inbound to the University of Virginia Medical Center.

Contact: UVA Med-Comm  
Via Med Channel 9 or Med Channel 10  
Via phone: 434-924-9287

EMS personnel are to provide pre-arrival notification to the receiving hospital of all inbound patients. It is imperative the hospital receive pre-arrival notification of the below circumstances. Notify the receiving hospital of the following: Name of EMS agency and level of care provided to patient.

- Moderate to critically ill or injured patients in need of advanced life support (ALS) care or treatment advice.
- Moderate to critically ill or injured patients may require immediate medical attention upon arrival at medical facility (AIC judgment).
- An incident requiring transport of multiple patients to a single medical facility. Example: vehicle accidents, fires, etc.
- When the inbound facility has made a prior request to be notified of all or specific types of patients being transported to their facility.
- Online medical control should be established as soon as possible without delaying critical patient care. Medical control should be established at some point on a call requiring any treatment outlined in these protocols. Providers are not required to wait until they have completed standing orders to contact on-line Medical Control. Providers should contact Medical Control whenever advice, confirmation, or direction is needed.
- Online medical control should be established with the receiving facility physician only. Request that the physician be brought to the radio prior to requesting treatment and medication orders as the information is relayed.



# BODY SUBSTANCE ISOLATION and INFECTION CONTROL

## Universal Blood and Body Fluid Precautions:

- Body fluids include: saliva, blood, sputum, gastric secretions, urine, feces, cerebrospinal fluids, breast milk, serosanguinous fluid, semen, and/or bodily drainage.
- Universal precautions should be observed with every patient if contact with their blood and/or body fluid is in any way possible, no matter what the diagnosis. This includes, but is not limited to, starting IV's, intubation, suctioning, caring for the trauma patient, OB/GYN emergencies, and bed-to-stretcher transfers.

## Precautions Include:

1. Wear gloves if contact with blood or body fluids may occur.
2. Wear gowns if soiling of clothing with blood or body fluids may occur. Gowns must be impervious to fluids, particularly in the chest and arm areas.
3. Wear masks if aerosolization of blood or body fluids may occur, i.e. during suctioning, insertion of endotracheal tubes, and other invasive procedures, or when a patient is displaying signs and symptoms suggestive of an infection with an airborne, or respiratory route of transmission, or the provider has been notified that the patient has an infection with a respiratory component.
4. Wear goggles when spattering of blood or body fluids may occur.
5. Use airway adjuncts whenever mouth-to-mask resuscitation is indicated. Adjuncts include pocket masks, face shields, and bag-valve-mask.
6. Always wash hands after contact.
- Contaminated equipment.
  - Place disposable equipment in a red biohazard waterproof bag and dispose of it in a location approved for biohazard waste or by a service licensed to haul biohazard waste.
  - Non-disposable equipment must be rendered safe for handling before being put back into service. Refer to manufacturers' recommendations for proper cleaning and disinfecting.
  - Sterilize the following items, if non-disposable, before reusing: Laryngoscope blade, respiratory therapy equipment, and the respiratory component of any automated CPR device.
7. Place linens soiled with blood or body fluids in red bags that are fluid resistant. Wear gloves when handling soiled linens.
8. Dispose of needles and syringes in a rigid, puncture-resistant container. Recapping of needles are not recommended.
9. Do not place needles or other contaminated items in any drug box.
10. Avoid contaminating the outside of the container when collecting blood or other specimens. Wipe off any visible soiled containers prior to labeling the container. Place specimens in a puncture-resistant, leak-proof container marked with a biohazard label. Do not place specimens in the pockets of uniforms.
11. Wipe blood and body fluid spills promptly, then decontaminate with a solution of 5.25 percent household bleach diluted 1:100 with water or other CDC-approved detergent disinfectant. Wear gloves when cleaning up spills.
12. Clean interior of ambulance and on-board equipment routinely. Follow agency procedures for recommendations.



# DETERMINATION OF DEATH and TERMINATION OF ACLS

- For patients 21 years of age and older only.
- Patients in cardiac arrest due to hypothermic conditions are not a candidate for field termination (including drowning patients).
- Patients who have a potential, viable pregnancy should be worked and transported to the hospital.

Termination of Resuscitation efforts is an online Medical Control decision only! Termination of Resuscitation prior to leaving residence. All patients without Return of Spontaneous Circulation (ROSC) who are transported to the hospital will be reviewed.

## Medical cardiac arrest pronouncement algorithm

Pre-hospital patient, upon call in, presents with medical cardiac arrest, has **NO perfusing rhythm**, and receives “**YES**” answers to all questions should be pronounced in the field without transport to a hospital.

- a. Consider the emotional needs of those present when considering termination efforts. Termination of resuscitation is appropriate in most circumstances.
- b. Provide a complete report of patient’s history, condition, and treatment.
- c. Follow any additional courses of treatment as directed by on-line Medical Control

Y    N      Airway secured via supraglottic device or ET tube with confirmation?  
Y    N      IV/IO access in place  
Y    N      ACLS performed by pre-hospital personnel for at least 20 min or greater? If initial rhythm was V-Fib or pulsesless V-Tach, was ACLS performed for at least 40 minutes?  
Y    N      Appropriate ACLS drugs have been administered?

## Trauma related cardiac arrest pronouncement algorithm

Pre-hospital patient, upon call in, present with trauma-related cardiac arrest in the field without transport to a hospital.

- No resuscitation for blunt trauma after bilateral needle decompression with no signs of life and/or no organized electrical activity.
- No resuscitation for penetrating trauma if no return of vital signs after bilateral needle decompression.



# DETERMINATION OF DEATH and TERMINATION OF ACLS (continued)

If the patient meets the following criteria (performed by 2 EMS certified providers) the patient should not be resuscitated.

- No vital signs, no signs of life such as breathing activity or movement and asystole on the cardiac monitor.
- No resuscitation for blunt trauma after bilateral needle decompression with no signs of life and/or no organized electrical activity. No resuscitation for penetrating trauma if no return of vital signs after bilateral needle decompression.
- No resuscitation if significant time lapse since cardiac arrest.
- Decapitation.
- Transection of chest and/or abdomen.
- Rigor mortis (not applicable in the hypothermic patient).
- Decomposition of the body.
- Lividity (not applicable in the hypothermic patient).
- Charring of the body.
- Extensive head trauma with exposed brain tissue.
- Chest injury/trauma indicative of mortal injury.
- Other bodily disfigurement indicative of mortal injury.

If online Medical Control directs the termination of resuscitation efforts.

- If resuscitation efforts are terminated on the scene, the pre-hospital provider should document the time and on-line physician name on the PPCR or patient reporting software.
- Follow local guidelines concerning the notification of law enforcement and/or Medical Examiner. Remain on the scene until the proper authorities arrive.
- Document patient's history, condition, and treatment on the PPCR or patient reporting software.
- Proceed to the on-line Medical Control hospital and exchange the drug box.
- The PPCR and/or patient reporting printout should be signed by the online Medical Control physician at the earliest opportunity.
- If you have a field termination of CPR which is directed by LGH Medical Control, **a copy of the PPCR or copy of the electronic report is needed. This is required as an attachment to the patient's death certificate.** Please place a copy of the PPCR in the box located at Medical Control. You may fax your PPCR or copy of your electronic report to: 434- 200 -5350.



# DETERMINATION OF NON-VIABILITY GUIDELINES

**Background:** Under existing laws of the Commonwealth of Virginia EMS practice standards, pre-hospital providers should initiate cardiopulmonary resuscitation on all patients without vital signs UNLESS the patient presents with a condition that is non-compatible with life.

Advanced cardiac life support must be initiated on all patients who are found apneic and pulseless, **Unless:**

1. The emergency care providers must follow **BREMS Policy 7** in regards to DDNR/Palliative Care Instructions, or “other” DNR orders from care facilities and/or orders by a physician.
2. To determine the non-viability of a patient, the following action steps are to be performed by 2 EMS certified providers.
  - a. There is an injury that is obviously incompatible with life and visual/physical inspection of the body (mortal injury and obvious death).
    - No vital signs, no signs of life such as breathing activity or movement and asystole on the cardiac monitor.
    - No resuscitation for blunt trauma after bilateral needle decompression with no signs of life and/or no organized electrical activity.
    - No resuscitation for penetrating trauma if no return of vital signs after bilateral needle decompression.
    - No resuscitation if significant time lapse since cardiac arrest.
    - Decapitation.
    - Transection of chest and/or abdomen.
    - Rigor mortis (not applicable in the hypothermic patient).
    - Decomposition of the body.
    - Lividity (not applicable in the hypothermic patient).
    - Charring of the body.
    - Extensive head trauma with exposed brain tissue.
    - Chest injury/trauma indicative or mortal injury.
    - Other bodily disfigurement indicative of mortal injury.
    - Physical assessment of patient to include evaluation of the airway, breathing, and circulatory status (absent), and auscultation of breath and heart sounds (absent).
3. Patient(s) at crime scene incidents are to be evaluated as indicated above. The EMS providers should be sensitive to evidence on or around the patient. **Providing complete and thorough documentation is essential if any area or item within the crime scene is disturbed during this process.**
4. Online medical direction is received. This may include online medical direction from the patient's physician.
5. Rigor mortis and lividity are not to be used as a guideline for determining non-viability in hypothermic patients.



# DETERMINATION OF NON-VIABILITY

## GUIDELINES (continued)

6. If none of the above conditions can be determined, resuscitative measures are to be initiated and carried out in accordance with the appropriate guideline.

### **EMT-Intermediate/Paramedic ONLY**

Once initiated, resuscitation efforts must be continued until a physician terminates the resuscitation. When all of the following circumstances have been met, advanced cardiac life support may be stopped prior to hospital arrival:

1. There must be good contact between the EMS provider and the medical control physician.
2. There must be at least two EMS providers on the scene during the resuscitation effort.
3. There has not been any Return of Spontaneous Circulation with a spontaneous palpable pulse for at least one five-minute period at any time during the resuscitation.
4. The patient does not have spontaneous respirations, eye opening, motor response, or other continued neurological activity at the time stopping resuscitation is contemplated.
5. Intermediate/Paramedic AIC present and the medical control physician must be in agreement concerning the termination of ACLS.

The cause of the cardiac arrest must be something other than drowning, hypothermia, acute airway obstruction, overdose, electrocution or lightning strike.



# Disposition of Patients and Patient Instructions

- This policy applies to all credential levels, including first responders.
- Mentally capable patients maintain the right to refuse care and/or transport. If unsure, contact Medical Control. Medical Control may not order a patient who is capable to be transported but may be able to talk with the patient directly and convince him or her to seek appropriate treatment or transport. Patients who are not capable at the time of the EMS encounter and/or present a danger to themselves or others shall be transported to a local emergency department for mental health evaluation, or to an approved alternative destination. Providers should make every effort to transport patients with their consent, regardless of capacity. However transport of incapacitated individuals may occur without their consent as necessary. Contact law enforcement for assistance with transporting patients without their consent. Disagreement with the provider does not itself constitute lack of capacity.
- All patients refusing service shall be informed of the availability of service and:
  - offered treatment and transport in a non-confrontational, polite manner;
  - advised to call 911 for emergency service if desired; and
  - advised the patient(s) to accept full responsibility for his/her actions.
- Patients are considered to be capable of refusing care if they do not endorse suicidal or homicidal ideation, are oriented to person, place and time (or to their baseline mental status in a nursing home), and can express understanding of the risk of refusal.
- The use of alcohol or other drugs should not be used solely as a criterion for rendering a person incapable of making a medical decision. Rather, the circumstances of the event should be taken into account. For example, the patient who has used alcohol or other drugs with a potential for head trauma and altered mental status will require transport based on implied consent whereas the substance-using patient in their home with no evidence of trauma who meets the capacity criteria listed above may be capable of making a medical decision.
- Documentation.
  - In the Patient Care Report narrative, describe the patient encounter, VITAL SIGNS, and advice given. Document that the patient is alert and oriented to person, place, and time, and that the patient understands given instructions.
  - If possible, have the patient sign the AMA form, have a third party witness the signature, and give a copy to the patient. If not possible, document the reason why this was not accomplished (patient refused to sign, etc.).
- EMS personnel shall not discuss cost, system status/unit availability, or any other non-clinical subject in regard to a patient's decision to accept or decline treatment and/or transport.



# DOCUMENTATION AND CONFIDENTIALITY

All patient information will be kept confidential. Patients may have access to their medical records by submitting a written request to the agency and must submit proof of identification prior to the information being released. Patient information will not be divulged to any other individual or organization, with the exception of when subpoenaed by the court for a proceeding.

Documentation of patient care should, at a minimum, include the following:

1. A patient care report will be written for each patient who is seen, treated, or transported by EMS agency. The report should be completed on the pre-hospital patient care report form used by the agency.
2. In addition to information required by the Commonwealth of Virginia, documentation also should include
  - The patient's chief complaint;
  - Vital signs and times;
  - Treatment provided and times;
  - ECG strip(s), if monitored;
  - Changes in the patient's condition;
  - Contact with Medical Control; and
  - Any deviation from protocols.
3. If the patient refuses treatment or transport, he/she must be deemed medically competent and must not be intoxicated by alcohol or drugs and must not be considered harmful to himself/herself or others. The documentation of such refusal should include:
  - the patient's full name;
  - the reason for response;
  - reason for the patient's refusal;
  - vital signs and times if patient allows;
  - any other physical signs or symptoms;
  - perceived level of consciousness;
  - names and signatures of witnesses;
  - signature of the patient; and
  - any additional refusal forms.

When a patient is transported, a copy of the report must be left at the receiving hospital.



# DDNR & Palliative Care

- Pre-hospital providers may, at times, withhold cardiopulmonary resuscitation (CPR) and advanced cardiac life support (ACLS) due to a patient's pre-determined wishes. •For resuscitative efforts to be withheld at a patient's home, a valid state of Virginia Durable Do Not Resuscitate (DDNR) order must be present, a valid P.O.S.T/P.O.L.S.T./M.O.L.S.T. document and valid DNR jewelry. *\*\*\*As of July 1<sup>st</sup>, 2017, all Virginia EMS Providers can accept out-of-state DDNR documents.*
- Other acceptable orders for transfers of care from hospitals, and other long-term care facilities are electronic copies, paper copies, P.O.S.T documents and DNR jewelry.
- **Living Wills must be addressed by ON-LINE Medical Direction ONLY.**

## **DDNR Qualifications:**

- Must be signed by the patient and/or the patient's Power of Attorney (or person who can legally make decisions for the patient).
- "Person authorized to consent on the patient's behalf" means any person authorized by law to consent on behalf of the patient incapable of making an informed decision or, in the case of a minor child, the parent or parents having custody of the child or the child's legal guardian or as otherwise provided by law.
- To clarify: This means that a DDNR order may be issued by a physician upon the request of a person authorized to consent on the patient's behalf in cases when the patient is a minor or incapable of making an informed decision regarding consent for a DDNR order.
- Must have a valid physician signature
- Determine that the DDNR order is intact and not defaced.
- The provider should verify the identity of the DDNR patient through the family members or friends at the scene, or with appropriate photo identification (i.e. a valid Driver's License and/or valid state issued photo I.D.).
- Once validity is verified, resuscitation efforts may be ceased or withheld.
- Document all pertinent information on PPCR form including:

DDNR form number  
Patient name  
Physician name  
Date of issue  
Method of identification

## **Prohibited resuscitation measures with DDNR:**

- Cardiopulmonary Resuscitation (CPR)
- Endotracheal intubation or other advanced airway management. This does NOT include CPAP
- Artificial ventilation
- Defibrillation
- Cardiac resuscitation medications



# DDNR & Palliative Care

## ENCOURAGED COMFORT MEASURES:

- Airway (excluding intubation or advanced airway management)
- Suction
- Supplemental oxygen delivery devices including CPAP
- Pain medications (ALS – per protocol) or intravenous fluids
- Bleeding control
- Patient positioning
- Other therapies deemed necessary to provide comfort care or to alleviate pain

And remember, a DDNR does **NOT** mean DO NOT TREAT or DO NOT CARE!

## REVISIONS:

- DDNR Orders may be revoked or rescinded by the patient OR the authorized decision-maker for the patient, by destroying the EMS-DDNR form or alternate DNR form or by verbally withdrawing consent to the order

## REVISIONS IN THE VIRGINIA DDNR vs. EMS DNR:

- The DDNR program, adopted by the Virginia State Board of Health, became effective on January 3, 2000. Once issued, the DDNR orders do not expire.
- DDNR forms may be honored in any facility, program or organization operated or licensed by the State Board of Health or by the Department of Mental Health, Mental Retardation and Substance Abuse Services, or operated, licensed or owned by another state agency.
- DDNR orders can now be written for anyone, regardless of health condition or age. Inclusion of minors is a significant change in the emergency DDNR order.

## Alternate Forms of DDNR Identification:

- DDNR bracelets and necklaces are available and can be honored in place of the Virginia Durable DNR Order form by emergency medical services providers. Only approved necklaces or bracelets can be honored. These alternative forms of identification must have the following information:
  - Patient's full legal name
  - Durable DNR number from the Virginia DDNR form or a unique number to the patient number that the vendor has assigned
  - The words "Virginia Durable Do Not Resuscitate"
  - The vendor's 24-hour phone number
  - The physician's name and phone number



# DDNR & Palliative Care

## “Other DNR”:

- EMS providers can also honor an **“Other” DNR Order** that is in a patient’s chart in a health care facility **for transport from one healthcare facility to another** pursuant to VA code § 54.1-2987.1
- "This section *shall not prevent, prohibit or limit* a physician from issuing a written order, other than a Durable Do Not Resuscitate Order, not to resuscitate a patient in the event of cardiac or respiratory arrest in accordance with accepted medical practice."
- An “Other” DNR Order is written or verbally given by a physician who has a bona fide physician/patient relationship. The physician’s order *requires the same information that is on the yellow State DNR form*. It must contain the patient’s full legal name, the physician’s signature and the date issued.
- ***This can be written on the patient’s chart or a doctor’s prescription pad.***
- EMS providers can honor the “Other” DNR for transport from one healthcare facility to another, however, *the EMS provider does not have to take this “Other” DNR Order when transporting a patient from one health care facility to another.*
- Instead, they must document in writing on their Pre-Hospital Patient Call Report form that they received a doctor’s verbal order.



# DDNR & Palliative Care

## Examples:

## Policies



### Durable Do Not Resuscitate Order

Virginia Department of Health

Patient's Full Legal Name \_\_\_\_\_ Date \_\_\_\_\_

#### Physician's Order

I, the undersigned, state that I have a bona fide physician/patient relationship with the patient named above. I have certified in the patient's medical record that he/she or a person authorized to consent on the patient's behalf has directed that life-prolonging procedures be withheld or withdrawn in the event of cardiac or respiratory arrest.

I further certify (must check 1 or 2):

- 1. The patient is CAPABLE of making an informed decision about providing, withholding, or withdrawing a specific medical treatment or course of medical treatment. (Signature of patient is required)
- 2. The patient is INCAPABLE of making an informed decision about providing, withholding, or withdrawing a specific medical treatment or course of medical treatment because he/she is unable to understand the nature, extent or probable consequences of the proposed medical decision, or to make a rational evaluation of the risks and benefits of alternatives to that decision.

If you checked 2 above, check A, B, or C below:

- A. While capable of making an informed decision, the patient has executed a written advanced directive which directs that life-prolonging procedures be withheld or withdrawn.
- B. While capable of making an informed decision, the patient has executed a written advanced directive which appoints a "Person Authorized to Consent on the Patient's Behalf" with authority to direct that life-prolonging procedures be withheld or withdrawn. (Signature of "Person Authorized to Consent on the Patient's Behalf is required.)
- C. The patient has not executed a written advanced directive (living will or durable power of attorney for health care). (Signature of "Person Authorized to Consent on the Patient's Behalf is required)

I hereby direct any and all qualified health care personnel, commencing on the effective date noted above, to withhold cardiopulmonary resuscitation (cardiac compression, endotracheal intubation and other advanced airway management, artificial ventilation, defibrillation, and related procedures) from the patient in the event of the patient's cardiac or respiratory arrest. I further direct such personnel to provide the patient other medical interventions, such as intravenous fluids, oxygen, or other therapies deemed necessary to provide comfort care or alleviate pain.

Physician's Printed Name \_\_\_\_\_

Physician's Signature \_\_\_\_\_

Emergency Phone Number \_\_\_\_\_

Patient's Signature \_\_\_\_\_

Signature of Person Authorized to Consent on the Patient's Behalf \_\_\_\_\_

Copy 1 – To be kept by patient



# DDNR & Palliative Care

## Examples:

**STOP Do Not Resuscitate**

**Durable Do Not Resuscitate Order**  
VIRGINIA DEPARTMENT OF HEALTH

Patient's Full Legal Name \_\_\_\_\_ Date \_\_\_\_\_

**Physician's Order**

I, the undersigned, state that I have a bona fide physician/patient relationship with the patient named above. I have certified in the patient's medical record that he/she or a person authorized to consent on the patient's behalf has directed that life-prolonging procedures be withheld or withdrawn in the event of cardiac or respiratory arrest.

I further certify [must check 1 or 2]:

1. The patient is CAPABLE of making an informed decision about providing, withholding or withdrawing a specific medical treatment or course of medical treatment. (Signature of patient is required; see reverse.)

2. The patient is INCAPABLE of making an informed decision about providing, withholding or withdrawing a specific medical treatment or course of medical treatment because he/she is unable to understand the nature, extent or probable consequences of the proposed medical decision, or to make a rational evaluation of the risks and benefits of alternatives to that decision.

If you checked 2 above, check A, B or C below:

A. While capable of making an informed decision, the patient has executed a written advanced directive which directs that life-prolonging procedures be withheld or withdrawn.

B. While capable of making an informed decision, the patient has executed a written advanced directive which appoints a "Person Authorized to Consent on the Patient's Behalf" with authority to direct that life-prolonging procedures be withheld or withdrawn. (Signature of "Person Authorized to Consent on the Patient's Behalf" is required; see reverse.)

C. The patient has not executed a written advanced directive (living will or durable power of attorney for health care). (Signature of "Person Authorized to Consent on the Patient's Behalf" is required; see reverse.)

I hereby direct any and all qualified health care personnel, commencing on the effective date noted above, to withhold cardiopulmonary resuscitation (cardiac compression, endotracheal intubation and other advanced airway management, artificial ventilation, defibrillation and related procedures) from the patient in the event of the patient's cardiac or respiratory arrest. I further direct such personnel to provide the patient other medical interventions, such as intravenous fluids, oxygen or other therapies deemed necessary to provide comfort care or alleviate pain.

Physician's Printed Name \_\_\_\_\_ Physician's Signature \_\_\_\_\_ Emergency Phone Number \_\_\_\_\_

**Policies**

**Patient's Signature**

I, the undersigned, hereby direct that in case of my cardiac or respiratory arrest, efforts at cardiopulmonary resuscitation not be initiated and not be continued once initiated. I understand that I may revoke these directions at any time by physical cancellation or destruction of this form or by orally expressing a desire to be resuscitated to qualified health care personnel. I also understand that if qualified health care personnel have any doubts about the applicability or validity of this order, they will begin cardiopulmonary resuscitation.

\_\_\_\_\_  
Signature of Patient

**Signature of Person Authorized to Consent on the Patient's Behalf**

I, the undersigned, hereby certify that I am authorized to provide consent on the patient's behalf by virtue of my relationship to the patient as \_\_\_\_\_ (in order of priority: designated agent, parent, spouse, adult child, parent, adult brother or sister, other relative in descending order of blood relationship). In my capacity, I hereby direct that in case of the patient's cardiac or respiratory arrest, efforts at cardiopulmonary resuscitation not be initiated and not be continued once initiated. I understand that I may revoke these directions at any time by physical cancellation or destruction of this form or by orally expressing a desire to be resuscitated to qualified health care personnel. I also understand that if qualified health care personnel have any doubts about the applicability or validity of this order, they will begin cardiopulmonary resuscitation of the patient.

\_\_\_\_\_  
Signature of Person Authorized to Consent on the Patient's Behalf

**EMS Personnel Will Look for This Order in the Following Places:**

- On the back of the door leading to the patient's bedroom
- On the bedside table, beside the patient's bed
- On the refrigerator
- In the patient's wallet
- On an approved alternate form of identification (bracelet or necklace)



# DDNR & Palliative Care

## Examples:

HIPAA permits disclosure to health care professionals and authorized decision makers for treatment	
<b>Virginia Physician Orders for Scope of Treatment (POST)</b>	
This is a Physician Order Sheet based on the patient's current medical condition and wishes. Any section not completed creates no presumption about the patient's preferences for treatment.	
<b>A CARDIOPULMONARY RESUSCITATION (CPR):</b> Person has no pulse and is not breathing.	
✓one only <input type="checkbox"/> Attempt Resuscitation <input type="checkbox"/> Do Not Attempt Resuscitation (DNR/No CPR)	
When Do Not Attempt Resuscitation is checked, qualified healthcare personnel are authorized to honor this order as if it were a Durable DNR Order.	
<i>When not in cardiopulmonary arrest, follow orders in B &amp; C</i>	
<b>B MEDICAL INTERVENTIONS:</b> Patient has pulse and/or is breathing.	
✓one only <input type="checkbox"/> Comfort Measures: Treat with dignity and respect. Keep warm and dry. Use medication by any route, positioning, wound care and other measures to relieve pain and suffering. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. Transfer to hospital only if comfort needs cannot be met in current location. Also see "Other Instructions" if indicated below.	
<input type="checkbox"/> Limited Additional Interventions: Includes comfort measures described above. Do not use intubation or mechanical ventilation. May consider non-invasive airway support (e.g., CPAP or BiPAP). Use additional medical treatment, antibiotics, IV fluids and cancer monitoring as indicated. Transfer to hospital if indicated. Avoid intensive care unit. Also see "Other Instructions" if indicated below.	
<input type="checkbox"/> Full Interventions: In addition to Comfort Measures above, use intubation, mechanical ventilation, cardioversion as indicated. Transfer to hospital if indicated. Include intensive care unit. Also see "Other Instructions" if indicated below.	
<b>Other Instructions:</b>	
<b>C ARTIFICIALLY ADMINISTERED NUTRITION:</b> Always offer food and fluids by mouth if feasible.	
✓one only <input type="checkbox"/> NO feeding tube (Not consistent with patient's goals given current medical condition)	
<input type="checkbox"/> Feeding tube for a defined trial period (specific goal to be determined in consultation with treating physician)	
<input type="checkbox"/> Feeding tube long-term if indicated	
<b>Other Instructions:</b>	
<b>DISCUSSED WITH:</b>	
<input type="checkbox"/> Patient <input type="checkbox"/> Agent under Advance Medical Directive <input type="checkbox"/> Court Appointed Guardian <input type="checkbox"/> Other person legally authorized	
<b>PHYSICIAN:</b> My signature below indicates that I have discussed the decisions documented herein with the patient or the person legally authorized to consent on the patient's behalf and have considered the patient's goals for treatment, to the best of my knowledge.	
Physician Name (Print) (Mandatory)	Physician Phone (Mandatory)
Physician Signature (Mandatory)	Date (Mandatory)
<b>Signature of the Patient OR the Person Legally Authorized to Consent on Patient's Behalf (Mandatory)</b>	
Patient's Signature	Patient's Name (Print)
Signature of Person Signing on Behalf of the Patient	Name of Person Signing on Behalf of the Patient
Describe Authority to Sign for Patient (Medical Power of Attorney, Guardian, Spouse, Adult Child, Parent, Sibling, Other Blood Relative)	
Phone	Address
<b>FORM SHALL ACCOMPANY PATIENT WHEN TRANSFERRED OR DISCHARGED</b>	
<small>           © 2014 Virginia POST Collaborative.            Do not alter this form.            Rev. 2/2014         </small>	
<small> <a href="http://www.virginiaPOST.org">www.virginiaPOST.org</a> </small>	
<small>           Page 1 of 2         </small>	

HIPAA permits disclosure to health care professionals and authorized decision makers for treatment	
<b>NAME</b> <b>LAST 4 SSN</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<b>CARE SETTING OF ORIGIN</b>	
<input type="checkbox"/> Long-Term Care <input type="checkbox"/> Hospital <input type="checkbox"/> Home <input type="checkbox"/> Hospice facility <input type="checkbox"/> Outpatient Practice <input type="checkbox"/> Other _____	
<b>Name of Care Setting:</b> _____	
Signature of Healthcare Professional Preparing Form: _____ Name of Healthcare Professional Preparing Form (Print): _____ Date Prepared: _____	
The intent of this form is to reflect decisions for life-sustaining treatment based on the patient's current medical condition. This form should be reviewed with a treating physician and updated when the patient's medical condition changes, when the patient moves to a new facility or when the patient's preferences change. If a patient is unable to make decisions and is therefore unable to sign this form, the directions on this form should reflect the patient's preferences as best understood by the person authorized to consent under Virginia Law. HIPAA permits disclosure to health care professionals and electronic registry as necessary for treatment.	
<b>Directions for Healthcare Professionals</b>	
<b>Completing POST</b> <ul style="list-style-type: none"> <li>The orders should reflect patient's current preferences.</li> <li>A physician, nurse practitioner or physician assistant who has a bona fide physician/patient relationship with the patient must sign POST. Nurse practitioners and physician assistants are authorized to sign POST forms under the Code of Virginia Sections §64.1-2957.02 and §64.1-2952.2. Health care organizations may have policies that impose limitations on this authority based on their individual scope of practice.</li> <li>Use of original form is encouraged. A photocopy, fax or electronic version may be honored as if it were an original.</li> </ul>	
<b>Using POST</b> <ul style="list-style-type: none"> <li>When comfort cannot be achieved in the current setting, the patient, including someone who has chosen "Comfort Measures," should be transferred to a setting able to provide comfort (e.g. treatment of a hip fracture).</li> <li>IV medication to enhance comfort may be appropriate for a patient who has chosen "Comfort Measures."</li> <li>Always offer food and fluids by mouth if medically feasible.</li> </ul>	
<b>Revoking/Making Changes to POST</b> <ul style="list-style-type: none"> <li>To change POST, the current POST form must be voided and a new POST form completed. If no new form is completed, full treatment and resuscitation may be provided.</li> <li>As long as the patient can make his/her own decisions, the patient may revoke consent for POST and may request changes to POST. If a patient tells a healthcare professional that he/she wishes to revoke his/her consent to POST or change POST, the healthcare professional caring for the patient should draw a line through the front of the form and write "VOID" in large letters on the original, with the date and the professional's signature, and notify the patient's physician. A new POST form may then be completed if desired by the patient.</li> <li>If not in a healthcare facility, the patient who can make his/her own decisions may revoke consent for POST orders by voiding the form as described above and informing a healthcare professional. The healthcare professional must then notify the patient's physician so that appropriate orders may be written and a new POST form created if desired by the patient.</li> <li>If the patient signs this form, the patient's treatment goals should be honored if the patient becomes unable to make decisions, as provided in the Code of Virginia § 54.1-2986.1.</li> <li>If the patient is unable to make healthcare decisions, a legally authorized medical decision maker, in consultation with the treating physician, may sign this form, revoke consent to, or request changes to the POST orders to continue carrying out the patient's own preferences in light of changes in the patient's condition.</li> </ul>	
<b>Persons Legally Authorized to Consent for Patient Incapable of Making an Informed Decision:</b>	
<small>           An agent named in an Advance Directive (§54.1-2983) may consent for the patient under the terms of the Advance Directive. If the patient has no Advance Directive, the following persons may consent for the patient in this order: guardian, adult child, parent, adult sibling, other relative in descending order of blood relationship (§54.1-2986)         </small>	
<b>FORM SHALL ACCOMPANY PATIENT WHEN TRANSFERRED OR DISCHARGED</b>	
<small>           POST forms are available to medical care providers and organizations that have agreed to the standards set forth by the Virginia POST Collaborative.            Contact: <a href="mailto:inquiry@virginiaPOST.org">inquiry@virginiaPOST.org</a> </small>	
<small>           Page 2 of 2         </small>	



# DRUG BOX POLICY AND EXCHANGE PROCEDURE

ALL BREMS agencies can exchange drug boxes at the emergency department. Drug boxes contain only medications. IV supplies and other soft supplies will be exchanged through system outlined below for our local hospitals.

## **Lynchburg General Hospital ED**

Drug boxes are located in the EMS Equipment Room accessible by keypad. All IV fluids and soft supplies like c-collars, ET tubes, and oxygen masks will be kept in the BREMS ACUDOSE Supply Tower. The IV exchange items will be handled by EMS personnel individually (after filling out the BREMS Acudose Supply Tower Exchange Form).

## **Bedford County Memorial ED**

Agencies needing to exchange a drug box will ask the ED nurse or ED technician to assist with the exchange . The fluids and other IV supplies will be exchanged with the ED nurse from the floor stock.

## **Gretna Medical Center**

Agencies bringing a drug box will exchange in the ED with the ED receiving nurse. Fluids and other soft supplies will be exchanged with the ED nurse from the floor stock by request one for one used on the patient.

## **Southside Community Hospital (Farmville)**

Agencies bringing a drug box will exchange in the ED with the ED receiving nurse. Fluids and other soft supplies will be exchanged with the ED nurse from the floor stock by request one for one used on the patient.

## **Ambulance Storage Instructions**

All exchanged drug boxes will be stored in a locked cabinet on the ambulance.

## **Exchange at all other hospitals need to be directed by the Emergency Department**



# DRUG BOX POLICY AND EXCHANGE PROCEDURE (continued)

## LGH

1. AIC gives completed patient copy of the PPCR to receiving nurse. Obtain patient ID stickers from the ED registrar and applies to every page of the copied PPCR.
2. If you have an ECG printout, you must also apply a Patient ID sticker to the ECG printout.
3. AIC obtains and completes the drug replacement requisition sheet provided in the drug box.
  - AIC obtains patient ID stickers from the ED registrar and applies it to the drug replacement requisition sheet.

## LGH and BCMH

3. Complete the Pharmacy Administration Record (found in drug box).
  - All medication administrations will be documented on this form (including controlled substances).
  - AIC must print and sign their name and place state certification number on the form.
  - Original physician signature is required ONLY when drug administrations were online directed.
  - DEA # required only when controlled substances are administered as an online order.
  - Obtain wastage witness signature.
  - Leave the completed form in the drug box.
  - Make sure the reseal lock number and the old box # and new box # are on the form.
4. Place the Drug Replacement Requisition Form with a copy of the PPCR inside the drug box. Place a green lock on the drug box. If the green seal is broken, you will need to exchange the drug box at the pharmacy. Replacement green locks will not be available in the ED.
5. Exchange box (record on BREMS drug box exchange record).

Failure to properly complete required exchange procedure will be considered a non compliance issue.

Non compliance issues include;

- failure to list all medications used on the drug box requisition sheet;
- failure to obtain physician signature on the drug box requisition sheet when needed;
- failure to obtain physician DEA Number on the drug box requisition sheet when needed;
- failure to properly sign out wastage;
- failure to sign your full name, OEMS state certification number, and agency name; and
- failure to include a copy of your PPCR;
- failure to place the reseal #, old and new box # on the form.



# DRUG BOX POLICY AND EXCHANGE PROCEDURE (continued)

## ALS soft supplies

*(IV supplies / Saline Loc's and other Patient Supplies not found in the BREMS' EMS drug box.)*

- Patient taken to assigned room.
- Provider gives completed patient copy of the PPCR to receiving nurse. Obtain a patient ID sticker from the ED registrar and apply to every page of the copied PPCR. If you have an ECG printout, you must also apply a Patient ID sticker to the ECG printout.
- Provider obtains and completes Acudose Supply Tower form provided in the EMS room.
- Provider obtains patient ID sticker from the ED registrar and applies it to the Acudose Supply Tower Form.
- Provider gives the Acudose Supply Tower form to the ED representative responsible for supply exchange.
- Place the Acudose Supply Tower form in the locked wall box outside of the EMS equipment room.

## BLS/no drugs used

- Patient taken to assigned room.
- Provider gives completed patient copy of the PPCR to receiving nurse. Obtain a patient ID sticker from the ED registrar and apply to every page of the copied PPCR. If you have an ECG printout, you must also apply a Patient ID Sticker to the ECG printout.
- Provider obtains and completes Acudose Supply Tower form provided in the EMS room.
- Provider obtains patient ID sticker from the ED registrar and applies it to the Acudose Supply Tower form.
- Provider gives the Acudose Supply Tower form to the ED representative responsible for supply exchange.
- Place the Acudose Supply Tower form in the locked wall box outside of the EMS equipment room.



# EXPOSURE PROCEDURE

**This guideline is written as a reference on how to manage exposure to infectious/communicable diseases. If your agency has a plan in place, please follow your agency recommendations and requirements.**

- As soon as possible, wash exposed area with soap and water. First aid treatment as necessary.
- If wound is not life threatening to injured individual, do not delay care of your patient.
- As soon as possible after exposure, and upon arrival at the hospital, notify your agency Infection Control Officer.
- Inform the hospital emergency department “Charge Nurse” of the exposure to ensure that the “source patient” blood is drawn and sent for laboratory testing.
- Do not seek medical treatment in the hospital unless the injury requires such treatment or the Infection Control Officer and Emergency Department Physician feels that treatment necessary.
- The exposed individual should be sent to the agency approved physician for baseline examination and/or baseline blood samples within 24 hours of the exposure.
- The laboratory results of the “source patient” shall be communicated to the Agency Infection Control Officer and the exposed individual within 24 hours to determine if any additional treatments are required.

**My agency Infection Control Officer is:**

\_\_\_\_\_  
\_\_\_\_\_

**(Name)**

**(Contact Number)**



# HELICOPTER UTILIZATION AND OPERATIONS

**Background:** When determining the need for aeromedical transport, the consideration should be made as early as possible.

## Indication for Consideration:

### 1. Clinical Criteria.

- Glasgow Coma Scale less than 10.
- Penetrating trauma to the abdomen, pelvis, chest, neck, or head.
- Spinal cord or spinal column injury or any injury producing paralysis.
- Two or more long bone fractures or pelvis fracture.
- Major burns (to include transport to a specialized burn center) or burns to the face, hands, feet, or perineum; burns with respiratory involvement.
- Advanced life support to ground providers.
- Chest pain with ST elevation; if helicopter utilization will shorten transport time to the ED (> 45 minute transport to receiving hospital).
- Stroke patients; if helicopter utilization will shorten transport time to the ED.
- If the patient's needs exceed the capabilities of the ground unit, the helicopter and the skill of the flight crew may be considered.

### 2. Mechanism of Injury.

- Vehicle with roll-over with unbelted passengers.
- Vehicle striking a pedestrian greater than 20mph.
- Falls greater than 10 feet.
- Motorcycle victim ejected at greater than 20mph.

### 3. Difficult Access.

- Wilderness rescue.
- Ambulance egress or access impeded by road conditions, weather, or traffic.

### 4. Time/Distance Factors.

- Transport time to local hospital by ground ambulance greater than transport time to trauma center by helicopter.
- Prolonged extrication.

## Operations:

1. Contact the medevac service communications center with the exact location for rendezvous. Include route numbers, GPS coordinates, any pertinent landmarks, landing zone commander identification, and radio frequency/channel/talk group.
2. Provide the communications center with all available patient information and care being administered. Minimum information should include the chief complaint, age, sex, baseline vital signs including Glasgow Coma Scale.



# HELICOPTER UTILIZATION AND OPERATIONS

## (Continued)

3. Set up a landing zone that is at least 100 by 100 square feet and free of any obstructions or loose materials. The surface should be as level as possible with each corner marked with a strobe light, traffic cone or other visible marker. A fifth marker should be placed on the downwind side of the landing zone. Be sure to secure the markers, as the rotor wash can blow them a great distance. You can also mark the landing zone with rescue vehicles parked in a triangular fashion with their headlights on low beam until the helicopter is on final approach. No white lights (head lights or scene lights) should be used at the landing zone. Never aim any lights into the pilot's eyes. This could destroy his night vision and result in a crash.
4. If setting up a landing zone in the roadway, it is essential that you mark all utility lines and relay their exact location as well as any other hazards to the pilot. Utility lines must be marked with a warning device below the wires spaced 4 to 5 feet apart. Do this for all utility lines in the area.

### Aeromedical Transport Services

- Centra One (Lynchburg): 866-924-7633
- Pegasus (Charlottesville): 800-552-1826
- Lifeguard 10 (Roanoke): 540-344-4357



# MASS CASUALTY INCIDENT MANAGEMENT

**Background:** A mass casualty incident (MCI) is any incident that injures enough people to overwhelm the resources usually available in a particular system or area.

## Goals of MCIM.

- Do the greatest good for the greatest number.
- Manage scarce resources.
- Do not relocate the disaster.

The first emergency unit to arrive at a mass casualty incident is by default “In Charge” (the Incident Commander) until relieved. As a result, the individuals on the first emergency response unit must take immediate actions to begin to manage the entire incident. These actions may be the most important steps taken in the entire incident. The initial unit must resist the “temptation” to begin one-on-one patient care.

1. **Assess the scene for safety:** look for the following which may pose a hazard: fire, electrical hazards, spilled or contained flammable liquids, hazardous materials, other life threats, and debris that pose a threat to rescuers or their vehicles.
2. **Scene size-up.**
  - Type of incident?
  - Approximate number of patients.
  - Severity of injuries.
  - Area involved, including problems with scene access.
3. **Send information.**
  - Report the scene size-up information to the dispatcher.
  - Request additional resources.
  - Ensure rapid hospital notification.
4. **Set-up:** set-up the scene for the best management of mass casualties by on-scene and responding units.
  - Staging.
  - Secure access and egress.
  - Secure adequate space for work areas (triage, treatment, transportation).
5. **START triage:** this triage method assures rapid initial assessment of all patients as the basis for assignment to treatment and as the first medical assessment of the incident.
  - Begin where you are.
  - Relocate green patients.
  - Move in an orderly pattern.
  - Maintain count.
  - Minimal treatment.



# QUALITY MANAGEMENT

Per **12 VAC 5-31-600** each agency in the Commonwealth of Virginia shall have a quality management system in place. In that regulation it is noted that an agency shall maintain a QM report that documents quarterly PPCR or Patient Care report reviews that are supervised by the Operational Medical Director.

In an effort to maintain QM throughout the region, each agency has a seat on the Regional Performance Improvement and Trauma Performance Improvement Committees. These two regional PI committees were formed to help agencies remain compliant with the State code.

The EMS Council in an effort to continue to keep the guidelines up to date and to bring the latest in pre-hospital medicine to the providers of the region will from time to time request certain information from each agency. The EMS Council intends to compile this information to determine the effectiveness of field interventions and look for areas in which we may improve, lessen restrictions, or re-evaluate specific protocols to ensure appropriate care for those who request the services of EMS.

Periodically agencies or specific providers may be asked to participate in trial uses of potential guidelines for evaluation purposes. In such a case the PPCR or Patient Care report must be submitted to the EMS Council and a mandatory survey or questionnaire may accompany the privilege of participation.



# Physician on Scene

## Policy:

The medical direction of pre-hospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the Commonwealth of Virginia.

## Purpose:

- To identify a chain of command to allow field personnel to adequately care for the patient.
- To assure the patient receives the maximum benefit from pre-hospital care.
- To minimize the liability of the EMS system as well as any on-scene physician.

## Procedure:

- When a non-medical control physician offers assistance to EMS or a patient is being attended to by a physician with whom they do not have an ongoing patient relationship, EMS personnel must provide the on scene physician form to the physician. All requisite documentation must be verified and should the physician wish to continue providing medical assistance to EMS and the patient, the physician must be approved by online Medical Control as soon as possible with consideration of the clinical situation.
- When a patient is being attended to by a physician with whom they have an ongoing patient-provider relationship, EMS personnel may follow orders given by the physician if the orders conform to current BREMS EMS protocols, the physician agrees to the requirements presented on the “on scene physician” form, and if the physician signs the patient care report. Notify Medical Control at the earliest opportunity.
- EMS personnel may accept orders from a patient’s physician over the phone with the approval of Medical Control. The EMS provider should obtain the specific order and the physician’s name and phone number for relay to Medical Control so that Medical Control can discuss any concerns with the physician directly. For the purposes of this policy, a physician may be considered “on scene” and therefore able to take medic-legal responsibility for the patient (and therefore issue orders) if contact is made with the physician by telephone or other “live” but remote two-way communication method. For the purposes of this policy a physician does not have to be physically present to be considered “on scene.”
- Orders received from an authorized (as determined by this policy) physician may be followed, even if they conflict with exiting local protocols, provided the orders encompass skills and/or medications approved by both BREMS and the State Medical Board for a provider’s credential level. Under no circumstances shall EMS personnel perform procedures or give medications that are outside their scope of practice and/or credential as per the BREMS EMS system standard document (this document) and the Virginia Medical Board.



# Practitioner Disciplinary Policy

In BREMS EMS System, a practitioner's right to practice medicine is based on extension of the Medical Director's license to practice medicine. For the purposes of this procedure, a "practitioner" is any individual practicing in the BREMS region at the level of First Responder or higher level of certification. If, in the opinion of the Medical Director, an action (or failure to act) on the part of a practitioner is of such a nature that the action or failure to act is inconsistent with, or a violation of these procedures, or the practice standard generally accepted in the medical community, the actions described below shall occur.

1. The practitioner will be notified in writing of the issues/concerns that merit attention by the Medical Director. Notwithstanding this written-notice provision, the provisions of 2 and 3 below, and the based on the severity and nature of the act (or failure to act), the Medical Director or his/her designee may suspend a practitioner's right to practice upon receipt of information sufficient in the judgment of the medical director or his/her designee to support immediate suspension in the interests of patient safety. If the Medical Director or his/her designee invokes an immediate suspension, this shall be followed by written notice within three (3) working days of such immediate suspension.
2. A written explanation by the individual explaining the incident shall be presented to the Medical Director within three (3) working days of receipt of the Medical Director's issues/concerns. If not written, an explanation of the incident is sent to the Medical Director by that deadline. The Medical Director may base his/her decision upon such information that is available to him/her as of that deadline.
3. The Medical Director or the individual may request a second meeting to further discuss the concerns. If this option is exercised, the meeting shall occur within five (5) working days of receipt of the request.
4. After reviewing all materials, the Medical Director will issue a disposition of the matter. The Medical Director may exercise one or more of the following options:
  - no action taken/matter resolved;
  - remediation training;
  - warning;
  - require to precept at the approved level again;
  - temporary suspension of all practice privileges or suspension of specific practice privileges; and
  - permanent suspension of practice privileges.

Any suspension of practice privileges will extend to all jurisdictions where the practitioner's right to practice relies on the extension of the agency Operational Medical Director's license to practice medicine.

5. After the individual is notified in writing of the Medical Director's decision, he/she may appeal to the Patient Safety Committee. This appeal must be presented within five (5) working days of the decision of the Medical Director to the Medical Director or his/her designee for referral to the Patient Safety Committee.



# Practitioner Disciplinary Policy

6. The Patient Safety Committee will meet as soon as is practical after the receipt of the written request for appeal. If the practitioner's ability to practice has been suspended for greater than seven (7) days, this meeting will be held with all deliberate speed and effort will be made to convene the meeting within ten (10) days. The committee shall consist of the following representatives:

- One (1) physician member who is not the Medical Director.
- In cases involving ALS providers, two (2) paramedics plus one (1) physician.
- In cases involving BLS providers, one (1) ALS provider, one (1) BLS provider, and one (1) physician.

7. One member of the Patient Safety Committee shall be designated by the Patient Safety Committee as the presiding officer for purposes of hearing an appeal. The Patient Safety Committee may hear witnesses (the participation of which is the responsibility of the party calling the witness) and consider documentation and other evidence. The practitioner exercising the appeal may be accompanied by an individual(s) of his/her choice. Patient Safety Committee meetings are not adversarial, however, so the only individual who may address the committee is the practitioner. The decision of the Patient Safety Committee shall be in the form of written findings of fact and imposition of actions consistent with those findings of fact.



# Safe Transport of Pediatric Patient

## Policy:

Without special considerations, children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric patients during EMS transport.

## Purpose:

To provide a safe method of transporting pediatric patients within an ambulance.

To protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

## Procedure:

- Drive cautiously at safe speeds observing traffic laws.
- Tightly secure all monitoring devices and other equipment.
- Ensure that all pediatric patients less than 8 years of age are restrained with an approved child restraint device secured appropriately to the stretcher or captain's chair. All others will need an appropriate restraint device.
- Ensure that all EMS personnel use the available restraint system during the transport.
- Transport adults and children who are not patients properly restrained and in an alternate passenger vehicle, whenever possible.
- Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
- Never attempt to hold or allow the parents/caregivers to hold the patient during transport.
- For patients with medical conditions that may be aggravated by stress, level 1 or level 2 , make every attempt to optimize safety when comforting the child.
- Do not transport the pediatric patient who is assessed as meeting trauma center criteria in a child seat that was involved in the collision that produced the child's injury.



# SPECIAL CONSIDERATION IN TRANSPORT OF THE PEDIATRIC PATIENT

1. Any pediatric patient (patients 12 years of age and younger) being evaluated for seizure, apnea, cyanosis or alteration in consciousness will be transported.
2. If parents refuse transport, a physician will be contacted via on-line medical communications for further steps to be taken.
3. If the patient is not transported, the EMS providers will document that they spoke to the parents or legal guardian regarding:
  - Their strong recommendation for immediate transport.
  - Their concern for a life-threatening medical condition.
  - The physician consulted and all steps taken.

Failure to follow these steps will be considered a deviation of the protocols.



# SPECIAL CONSIDERATION IN TRAUMA OF THE PEDIATRIC PATIENT

1. Aeromedical flights of patients < 16 years of age that meet the below criteria will be transported to a pediatric trauma center.
2. Aeromedical utilization should be considered by EMS if the patient meets the below criteria and it will not cause a significant delay in transport of the patient.
3. No ground transportation of a pediatric patient will bypass a Level II Trauma Center unless specifically authorized by a physician (via Medical Control communications).
4. There will be no rendezvous with a helicopter at Lynchburg General Hospital. If transported to LGH the patient will be evaluated in the emergency department and a transfer decision made by an attending physician.

## Criteria.

- GCS < 14.
- Systolic Blood Pressure < 90mmHg.
- Respiratory Rate < 10 or > 29 breaths/minute.
- Respiratory Rate < 20 breaths/minute in an infant < 1 year.
- Penetrating injury to the head, neck, torso, or extremities proximal to the elbow, and knee.
- Flail chest.
- Two or more proximal long bone fractures.
- Crushed, de-gloved, or mangles extremity.
- Amputation proximal to the wrist or ankle.
- Pelvic fractures.
- Open or depressed skull fracture.
- Paralysis.
- Fall > 10 feet or twice the child's height.
- Auto versus pedestrian or bicycle- thrown, run over, or > 20 mph impact.
- Motorcycle/ATV crash > 20 mph.
- MVC.
  - Intrusion > 12 inches at the occupant site or > 18 inches at any site.
  - Ejection.
  - Death in the same passenger compartment.



# STATEMENT OF MEDICAL RELEASE/REFUSAL GUIDELINES

**Background:** A person with decision-making capacity is oriented to person, place, time, and situation. Suicidal patients should never be considered as mentally competent.

Any competent adult may refuse medical care and/or transportation for any reason as long as he/she is, in fact, mentally competent and has been fully informed of the circumstances surrounding their illness or injury. A mentally competent patient is considered to be alert and oriented to person, place, time, and event or situation. Suicidal patients should not be considered as being mentally competent.

When an adult refuses treatment, perform the following procedures.

1. Perform as thorough assessment as possible and allowed by the patient. Completely inform the patient of his/her medical condition. Indicate what treatment is necessary and what possible complications may occur from refusing care within the scope of your training. Document assessment findings and indications that the patient understands and is competent to refuse care.
2. Encourage the patient to grant consent for treatment and transportation to the hospital.
3. Do not force assistance on a patient/person with decision-making capacity.
4. Always have at least one witness present. Obtain written release. It is preferable to have a neutral party to witness the signing of the release.
5. Any pregnant patient regardless of age is considered to be an adult.
6. Any patient displaying documents from a recognized court system that indicates the patient is an emancipated minor is considered to be an adult; should be accompanied by photo identification.
7. Any patient who is age 14 or older is considered to be an adult unless they are in the care and company of a parent or legal guardian who are competent (i.e., school official, law enforcement, etc.).
8. If there is doubt to a patient's mental capacity or the patient is a minor, perform the following procedure.
  - If an emergency medical condition exists, initiate treatment under implied consent when informed consent cannot be quickly obtained from another appropriate party.
  - A reasonable form of restraint may be used only if necessary and when there is implied consent. Restraint should only be used when the patient is a threat to themselves or others. Restraint should not exceed that which is reasonably necessary. If the patient is combative, reasonable care should be used. Whenever possible, law enforcement personnel should be utilized to assist. Document what indications lead to your determination of incompetence.
  - If a parent refuses medical care for a child, follow the same steps outlined above for competent adults. If you believe that the child has a life threatening condition, local law enforcement or social services officials should be contacted immediately. Consultation between the EMS provider, medical command, and the appropriate authorities may allow authorities to take the child into protective custody.



# STATEMENT OF MEDICAL RELEASE/REFUSAL GUIDELINES (continued)

## Documentation:

Document verbatim what you told the patient relative to specific risks and potential complications that could result from refusing care and transportation. Include measurement indicators used to assess the patient's decision-making capacity and ability to understand.

In certain situations where the provider is in doubt or concerned regarding the patient's condition or assistance is needed in making a rational medical decision, the provider should always err on the side of the patient. The provider should contact online medical direction for guidance. While the physician is not there they may be able to assist in the decision-making process by your assessment findings and description of the current conditions and/or situation.



# SUDDEN INFANT DEATH SYNDROME (SIDS) AND DEATH OF A CHILD

**Background:** Rescuers should not make any assumptions or judgments. Observe, assess, and document accurately and objectively.

1. Ensure scene safety.
2. Perform a scene survey to assess environmental conditions and mechanism of illness or injury.
3. Form a general impression of the patient's condition.
4. Observe standard precautions.
5. Establish patient responsiveness.
6. Assess airway and breathing. Confirm apnea.
7. Assess circulation and perfusion.
8. Initiate cardiac monitoring. Confirm absent pulse.
9. Determine whether to perform further resuscitation measures.
  - If patient does not exhibit rigor mortis, proceed with cardiopulmonary resuscitation as permitted by medical direction, following the protocol for non-traumatic cardiac arrest. During resuscitation, perform steps 11 and 12 below. Initiate transport.
  - If patient exhibits rigor mortis, do not resuscitate as permitted by medical direction. Proceed with step 10. Do not make any assumptions or judgments.
10. Provide supportive measures for parents and siblings.
  - Explain the resuscitation process, transport decision, and further actions to be taken by hospital personnel or the medical examiner.
  - Reassure parents that there was nothing they could have done to prevent death.
  - Allow the parents to see the child and say goodbye.
  - Maintain a supportive, professional attitude no matter how the parents react.
  - Whenever possible, be responsive to parental requests. Be sensitive to ethnic and religious needs, or responses, and make allowances for them.
11. Obtain patient history using a nonjudgmental approach. Ask open-ended questions.
  - Has the child been sick?
  - Can you describe what happened?
  - Who found the child? Where?
  - What actions were taken after the child was discovered?
  - Has the child been moved?
  - When was the child last seen before this occurred, and by whom?
  - How did the child seem when last seen?
  - When was the last feeding provided?



# **SUDDEN INFANT DEATH SYNDROME (SIDS) AND DEATH OF A CHILD (continued)**

12. Reassess the environment. Document findings, noting the following:

- where the child was located upon arrival;
- description of objects located near the child upon arrival; and
- unusual environmental conditions, such as a high temperature in the room, abnormal odors, or other significant findings.

13. If the parents interfere with treatment or attempt to alter the scene, initiate the following actions:

- remain supportive, sympathetic, and professional.
- avoid arguing with the parents or exhibiting anger.
- do not restrain the parents or request that they be restrained unless scene safety is clearly threatened.

14. Document the call, including the following information:

- time of arrival;
- initial assessment findings and basis for resuscitation decision;
- time of resuscitation decision;
- time of arrival at hospital if resuscitation and transport were initiated;
- parental support measures provided if resuscitation was not initiated;
- history obtained (note who provided the information); and
- environmental conditions turned over to law enforcement personnel.



# TRAUMA ALERT STATUS NOTIFICATION AND REPORT

Pre-hospital personnel are responsible for notifying the receiving hospital of a patient that meets criteria for a trauma alert (listed below) or if they believe the patient should be alerted based on mechanism of injury listed below. **These criteria are to be used as guidelines and are not absolutes.** Medical communications and the receiving physician may decide to upgrade or downgrade the response based on the complete history of the trauma.

## Level I

- *Clinical evidence of shock following trauma (adult BP < 90 or HR < 50 or > 130)*
- *Airway compromise/respiratory distress (includes chest needle decompression)*
- *All intubated trauma patients*
- *Significant penetrating trauma to head, neck, or torso (torso is above the inguinal ligaments, including genitalia)*
- *Unresponsive (GCS 8 or less with significant MOI)*
- *Uncontrolled hemorrhage or vascular injury (life or limb threatening)*
- *Amputations proximal to the wrist/ankle*
- *Blunt and penetrating traumatic arrest with signs of life in the field*

## Level II

- *Suspected vascular injury (includes crushed, de-gloved, mangled extremity)*
- *Second and third degree burns > 20% TBSA, significant inhalation injury or high voltage electrical injury (> 600 volts)*
- *GCS 9-13 with significant MOI*
- *Clinical evidence of spinal cord injury (paralysis, numbness, loss of sensation)*
- *Femur, pelvic, or spinal injury (excludes ground level fall with isolated hip/femur injury)*
- *Pregnancy > 20 weeks (or fundal height above the umbilicus) with significant MOI or abdominal pain, vaginal bleeding or absence of fetal movement*
- *Ejection (partial or complete) from automobile*
- *Motorcycle crash with ejection, significant or multiple injuries*
- *2 or more long bone fractures*
- *Auto vs. pedestrian/bicyclist thrown, run over, or with significant impact*
- *Injured patients transferred by air*

## Level III

- *Altered mental status or GCS 14 with significant MOI*
- *Loss of consciousness following trauma*
- *Fall > 10 feet*
- *Significant penetrating injury to an extremity*
- *Suspected multiple injuries*
- *Open fracture (includes partial/complete digit amputations)*
- *Suspected intra-abdominal injury*
- *Second and third degree burns isolated to hands, feet, genitalia, perineum, or major joints <20% BSA*
- *Patients age 75 or older with evidence of head trauma*
- *Evidence of multiple facial injuries/fractures without airway compromise*
- *MVC rollover with complaint of injuries*



# TRAUMA ALERT STATUS NOTIFICATION AND REPORT (continued)

## **Note:**

- Have a low threshold to alert or upgrade minor trauma with known anticoagulant use.
- The criteria above are guidelines, not absolutes. If there are concerns about the appropriateness of an alert, consult the lead physician.
- Document in the ED any reason for deviation from above guidelines.

## **Trauma Report Format:**

**Purpose:** To standardize the format for trauma radio reports and better recognize patients in need of trauma alert.

## **Radio Report will consist of the following:**

- mechanism of Injury;
- injuries to the patient;
- vitals;
- GCS (refer to R-3: Glasgow Coma Scale if necessary);
- loss of consciousness ( yes or no);
- treatment of the patient; and
- trauma alert (yes or no), alert level and reason the provider feels the patient meets the particular trauma level.

**Note:** Although patient may technically meet trauma alert criteria, the case may be discussed with a physician and upgraded or downgraded based on individual circumstances.



# TREATMENT OF MINORS

**Background:** Any consent/refusal of treatment and/or transportation by or for a pediatric patient (14 years of age and below) must have Medical Control consultation.

1. Patients 12 years of age and younger are to be considered pediatric patients for the purpose of the pediatric guidelines. Providers should establish on-line Medical Control if there is any question on whether to treat a patient following adult or pediatric protocols.
2. The use of a Broselow tape for drug dosages and appropriate equipment sizing is strongly encouraged for appropriate pediatric patients.
3. The pre-hospital provider may treat and/or transport, under the doctrine of implied consent, any minor who requires immediate care to save a life or prevent serious injury.
4. If a minor refuses needed care or if a minor is injured or ill and no parental contact is possible, the provider should contact on-line Medical Control for additional instructions.
5. The provider should always act on the side of appropriate patient care. Careful and complete documentation is always important.
6. If the ill or injured patient is a young child and the parent is present, the pre-hospital provider should refer to the appropriate pediatric guideline and consider the following in regard to transport.
  - Transport conscious children with a parent unless it interferes with proper patient care.
  - Allow the parent to hold or touch the child whenever possible.
  - Both the parent and child will respond best to open and honest dialogue.



# VERIFICATION OF ON-SCENE PERSONNEL

1. EMS personnel will accept an order only from a physician with a license to practice medicine in the Commonwealth of Virginia. Other health care professionals, i.e. nurses, medical technicians, physician assistants, have no role in providing Medical Control.
2. EMS personnel may accept written orders from a physician transferring a patient from one medical facility to another if the orders are appropriate and within the scope of these protocols.
3. When not in a medical facility, and not known by the providers, the individual must provide identification verifying that he/she is a physician and willing to provide Medical Control to the providers.
4. The EMS providers will ask the physician to sign the PPCR. At the EMS providers' discretion, he/she will ask the physician to accompany the patient to the hospital. If the physician agrees and the orders are within the scope of these protocols, the EMS providers should follow them.
5. If the on-scene physician refuses the procedures outlined in step #4 or orders supplied are inappropriate, the following shall be taken:
  - immediately contact Medical Control;
  - advise the on-scene physician that you are operating under the direction of a medical command physician and ask him/her to speak with the on-line physician. If radio communications are not available, contact must be made by phone;
  - the medical command physician may ask the on-scene physician to provide an identification proving he/she is licensed to practice medicine in the Commonwealth of Virginia;
  - the on-scene physician will be granted or denied permission to treat the patient by the medical command physician; and
  - the providers shall continue treating the patient with the assistance of the on-scene physician if permission is granted.
6. If permission is denied, inform the physician that the on-line medical command physician is assuming the responsibility for patient care.

