

# 2014 State of Oklahoma Protocols Summary of significant changes from 2013

## Section 2F Oral Intubation – Adult

Page 2F.1 – protocol deleted

2013 2G Combitube Airway - Adult was removed from 2014 protocols shifting the label by one letter

## Section 3C Dyspnea – Asthma – Adult & Pediatric

Page 3C.1 – dosage change

Paramedic

**CHANGED FROM:** ADULT: MAGNESIUM SULFATE 1 GRAM VERY SLOW IVP OVER 10 MINS

**CHANGED TO:** ADULT: MAGNESIUM SULFATE 2 GRAMS VERY SLOW IVP OVER 10 MINS

AVOID/STOP IF HYPOTENSION OR KNOWN RENAL FAILURE

## Section 4J Post Cardiac Arrest Treatment - Adult & Pediatric

Page 4J.1 – dosage change

Paramedic

**CHANGED FROM:** DOPAMINE 10-20 mcg/kg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED OR NOREPINEPHRINE 2-4 mcg/kg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED

**CHANGED TO:** NOREPINEPHRINE 2-4 mcg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED OR DOPAMINE 5-20 mcg/kg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED

Page 4J.1 – language change

**CHANGED FROM:** CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

**CHANGED TO:** CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)  
TRANSPORT ASAP PER DESTINATION PROTOCOL

Page 4J.1 – language change

**DELETE** Under Exclusion Criteria for Induction of Hypothermia removed major surgery (with hospital stay) within 14 days and pregnancy

## Section 5C Acute Coronary Syndrome – Adult

Page 5C.1 – language change

Paramedic

**CHANGED FROM:** TREAT ANY CARDIAC DYSRHYTHMIAS/SHOCK BY THE RESPECTIVE PROTOCOLS ANALYZE 12-LEAD ECG – TREAT PER FOLLOWING FLOWCHART NOTIFY RECEIVING HOSPITAL IMMEDIATELY IF SUSPECTED STEMI

**CHANGED TO:** TREAT ANY CARDIAC DYSRHYTHMIAS/SHOCK BY THE RESPECTIVE PROTOCOLS ANALYZE 12-LEAD ECG – TREAT PER FOLLOWING FLOWCHART NOTIFY RECEIVING HOSPITAL IMMEDIATELY IF SUSPECTED STEMI TRANSPORT ASAP PER DESTINATION PROTOCOL

Page 5C.1 – dosage change

Flowchart

**ADD** NOREPINEPHRINE 2-4 mcg/min IVPB TITRATE TO SYS BP > 100 mmHg

## Section 5F Tachycardia – Stable – Adult & Pediatric

Page 5F.1 – dosage change

Treatment Priorities

Paramedic

**CHANGED FROM:** Adenosine 6 mg Rapid IVP if Regular

**CHANGED TO:** Adenosine 12 mg Rapid IVP if Regular

Page 5F.1 – language change

Paramedic

**ADD** OLMC Order Only Adult Diltiazem 0.25 mg/kg Slow IVP over 2 mins Max Dose 25 mg Up to Age 70 years max dose 10 mg 70+ years

Page 5F.1 – dosage change

Paramedic

**CHANGED FROM:** Adenosine 6 or 12 mg Rapid IVP May Repeat at 12 MG

**CHANGE TO:** Adenosine 12 mg Rapid IVP May Repeat at 12 MG

## Section 5M Ventricular Assist Device (VAD) Management – Adult

Page 5M.1 – language change

**ADD** Device added

Page 5M.2 – language change

**ADD** “Cardiac Arrest Care in Patients with a VAD: Follow same BLS and ACLS protocols (including defibrillation and cardioversion) Because of the assistance from the LVAD, patients may not be symptomatic with ventricular arrhythmias. Be sure to assess the patient first prior to intervention. The LVAD does NOT interfere with the patient’s heart rhythm. The native rhythm will appear on the monitor.”

Page 5M.2 – language change

**DELETE** “Perform standard cardiac arrest resuscitation with the following exceptions/considerations: Cardioversion or Defibrillation with Heart Mate® II or Levacor® VAD. **DO NOT** remove power to VAD prior to cardioversion or defibrillation”

Page 5M.3 – language change

**ADD** Changing Controllers section moved to front of section and added different instructions

Page 5M.4 – language change

**ADD** New Alarms: Emergency Procedures

Page 5M.5 – language change

**DELETE** Changing Batteries: 9. Controller will start beeping and flashing green lights. 10. Replace with new fully charged battery by lining up the arrows on the battery and the clip and pressing until you hear a —click. (Figure 2) 11. Repeat previous steps with the second battery and battery clip.

Page 5M.6 – language change

**ADD** flowchart for Heartmate II Patient Assessment Protocol

REFER TO DOCUMENT

## **Section 6A Stroke – Adult & Pediatric**

Page 6A.1 – language change

**CHANGED FROM:** Early transport & ED notification if symptoms <3 hours

**CHANGED TO:** Early transport & ED notification if symptoms <6 hours

## **Section 8D Acute Allergic Reactions – Adult & Pediatric**

Page 8D.1 – language change

EMD

**ADD** ADVISE TO USE EPINEPHRINE AUTOINJECTOR IF AVAILABLE AND PATIENT'S PHYSICIAN HAS PRESCRIBED TO USE FOR SAME SYMPTOMS

Page 8D.1 – language change

EMT or Higher License

**CHANGED FROM:** For anaphylaxis only - ADULT: EPINEPHRINE 1:1000 0.3 mg (0.3 mL)

AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH PEDIATRIC: EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH

**CHANGED TO:** ADULT: \*\*EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN

ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS PEDIATRIC: \*\*EPINEPHRINE

1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS

Page 8D.1 – dosage change

Paramedic

**CHANGED FROM:** SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SYMPTOMS+SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID ADULT: EPINEPHRINE 1:1000 0.3 mg (0.3 mL) IM PEDIATRIC: EPINEPHRINE 1:1000, 0.01 mg/kg, IM NOT TO EXCEED 0.3 mg

**CHANGED TO:** SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SYMPTOMS AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID ADULT: \*\*EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH

## **Section 8E Snakebites Pit Vipers (Rattlesnakes, Copperheads, & Mocassins) (Crotalinae Envenomation) – Adult & Pediatric**

Page 8E.1 – language change

Treatment Priorities

**CHANGED FROM:** Epinephrine for anaphylaxis \*\*First two epi doses are standing order

**CHANGED TO:** Epinephrine for anaphylaxis \*\*First two epi doses are standing order. Any additional epi dose requires OLMC consult.

Page 8E.1 – language change

EMT or Higher License For anaphylaxis only

**CHANGED FROM:** ADULT: EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH PEDIATRIC: EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH

**CHANGED TO:** ADULT: \*\*EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS PEDIATRIC: \*\*EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 Min

Page 8E.1 – language change

**ADD** AEMT or Higher License: FOR ANAPHYLAXIS ONLY (ANAPHYLAXIS FROM SNAKEBITE IS RARE): ADULT: \*\*EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH PEDIATRIC: \*\*EPINEPHRINE 1:1000, 0.01 mg/kg IM NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg

Page 8E.1 –dosage change

Paramedic

**CHANGED FROM:** SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SYMPTOMS+SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC ADULT: EPINEPHRINE 1:1000 0.3 mg (0.3 mL) IM PEDIATRIC: EPINEPHRINE 1:1000, 0.01 mg/kg, IM NOT TO EXCEED 0.3 mg IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000 ADULT: EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES) PEDIATRIC: EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES)

**CHANGED TO:** SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC ADULT: \*\*EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH PEDIATRIC: \*\*EPINEPHRINE 1:1000, 0.01 mg/kg IM NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000 ADULT: \*\*EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES) PEDIATRIC: \*\*EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg

## **Section 8F Bee/Wasp Stings & Fire Ant Bites (Hymenoptera Envenomation) – Adult & Pediatric**

Page 8F.1 – language change

EMD

**CHANGED FROM:** ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES). MOVE AWAY FROM STINGING INSECTS IF ABLE OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

**CHANGED TO:** ADVISE TO USE EPINEPHRINE AUTOINJECTOR IF AVAILABLE AND PATIENT'S PHYSICIAN HAS PRESCRIBED TO USE FOR SAME SYMPTOMS ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES). DO NOT MOVE THE PATIENT UNLESS IN DANGER OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

Page 8F.1 – language change

Treatment Priorities #2 Epinephrine for anaphylaxis

**CHANGED FROM:** Epinephrine for anaphylaxis \*\* First two epi doses are standing order

**CHANGED TO:** Epinephrine for anaphylaxis \*\* First two epi doses are standing order. Any additional epi dose requires OLMC consult.

Page 8F.2 – language change

EMT or Higher License

**CHANGED FROM:** ADULT: EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH PEDIATRIC: EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH

**CHANGED TO:** ADULT: \*\*EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS PEDIATRIC: \*\*EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS

Page 8F.2 – dosage change

Paramedic:

**CHANGED FROM:** ADULT: EPINEPHRINE 1:1000 0.3 mg (0.3 mL) IM PEDIATRIC: EPINEPHRINE 1:1000, 0.01 mg/kg, IM NOT TO EXCEED 0.3 mg DIPHENHYDRAMINE ADMINISTRATION & BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000 ADULT: EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES) PEDIATRIC: EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES)

**CHANGED TO:** ADULT: \*\*EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH PEDIATRIC: \*\*EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH DIPHENHYDRAMINE ADMINISTRATION & BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000 ADULT: \*\*EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES) PEDIATRIC: \*\*EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg

## Section 9B Fever – Adult & Pediatric

Page 9B.1 – dosage change

Paramedic

**CHANGED FROM:** NOREPINEPHRINE 2-4 mcg/kg/min

**CHANGED TO:** NOREPINEPHRINE 2-4 mcg/min

## Section 9E Dialysis-Related Issues – Adult & Pediatric

Page 9E.1 – dosage change

Paramedic

**CHANGED FROM:** NOREPINEPHRINE 2-4 mcg/kg/min

**CHANGED TO:** NOREPINEPHRINE 2-4 mcg/min

## Section 9I Vascular Access – Intraosseous – Adult & Pediatric

Page 9I.4 – language change

K. Fluid administration will require the use of a pressure infuser on the IV fluid bag. Due to the increased pressure of the marrow space, IV fluid will not infuse without assistance of the pressure infuser. Inflate pressure infuser until IV fluid is seen infusing with constant flow. Monitor for extravasation and monitor for need to reinflate pressure infuser. **Fluid delivery rate may be as high as 1 liter per hour at tibial site and up to 5 liters per hour at humeral head site.** L. In determining the site for IO access, consider knowledge of the anatomy, prior training and comfort in accessing that particular site, and how IO access at that site may or may not interfere with other care events (eg. use of the humeral head site for medication administration in cardiac arrest could disrupt the continuity of chest compressions).

## **Section 10O Splinting of Injuries – Adult & Pediatric**

Page 10O.4 – language change

**ADD #9.** Victims of penetrating trauma (stabbings, gunshot wounds) to the head, neck, and/or torso SHOULD NOT receive spinal motion restriction unless there is one or more of the following:

- Obvious neurologic deficit to the extremities
- Significant secondary blunt mechanism of injury (eg. – fell down stairs after getting shot)
- Priapism
- Neurogenic shock
- Anatomic deformity to the spine secondary to injury

Page 10O.4 – language change

**ADD # 16.** For pediatric patients found in car seats and involved in motor vehicle collisions, use the following if spinal motion restriction indicated:

- Infants restrained in a rear-facing car seat may be immobilized and extricated in the car seat if the immobilization is secure and his/her condition allows (no signs of respiratory distress or shock)
- Children restrained in a car seat (with a high back) may be immobilized and extricated in the car seat; however, once removed from the vehicle, the child should be placed in spinal motion restriction.
- Children restrained in a booster seat (without a back) need to be extricated and immobilized following standard spinal motion restriction procedures.

## **Section 10P Blast Injury – Adult & Pediatric**

Page 10P.1

**ADD** protocol

## **Section 15A Multiple Patient Scenes/Mass Casualty Event Concepts**

Pages 15A.2-15A.7 entire protocol has been revamped

## **Section 15E Nerve Agents**

Page 15E.3 – dosage change

**CHANGED FROM:** Auto-Injectors Atropine 2mg

**CHANGED TO:** Auto-Injectors Atropine 4mg

## **Sections 16 A-MM Formulary**

Protocols have been alphabetized

## **Section 16GG – Naloxone (Narcon)**

Page 16GG.1

Dosage changes in the following Protocols:

Respiratory Arrest – Adult (3A)

Specific Causes of Cardiac Arrest – Adult (4I)

Altered Mental Status – Adult (6B)

Syncope – Adult (6E)

Poisonings – General Management – Adult (8A)

\*Special note added regarding Opiate Antagonist for Emergency Medical Responders and Emergency Medical Technicians.

**2F – ORAL INTUBATION  
ADULT**

**EMT-INTERMEDIATE 85**

**ADVANCED EMT**

**PARAMEDIC**

Indications:

1. Hypoxia and/or hypoventilation refractory to non-invasive airway/respiratory management.
2. Airway protection to minimize aspiration in the setting of sustained altered mental status with a Glasgow Coma Scale Score <8.
3. Impending airway edema in the setting of respiratory tract burns or anaphylaxis.

Contraindications:

1. Three unsuccessful oral and/or nasal intubation attempts in the above settings. An intubation attempt has occurred when the tip of the endotracheal tube is advanced beyond the gum line or into a nare. Attempts are counted per patient not per intubator.
2. Waveform capnography not immediately available.

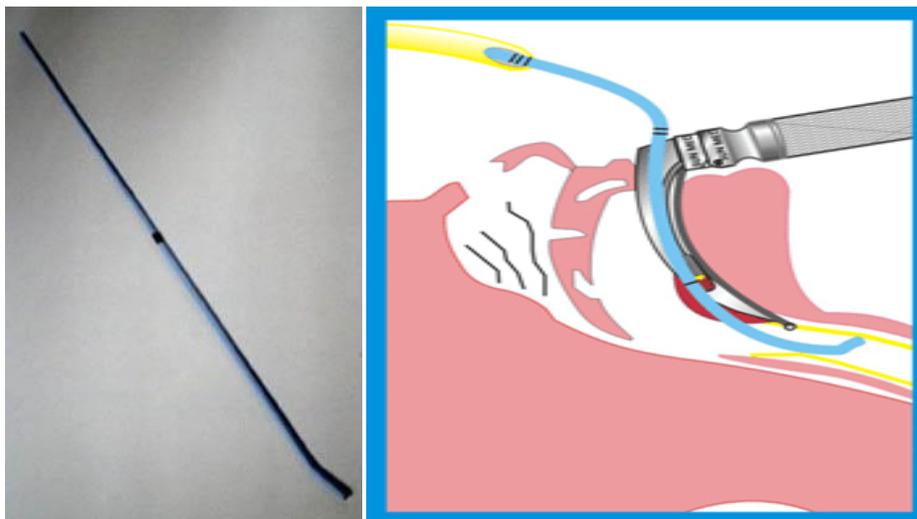
Technique:

1. Walk the laryngoscope down the tongue to avoid placing the laryngoscope in the esophagus.
2. If unable to lift the mandible with the laryngoscope, place your left forearm on the pt's head for leverage.
3. If the vocal cords are poorly visualized in any patient, manipulate the thyroid cartilage with your right hand until appropriate visualization is achieved. Have a colleague hold the thyroid cartilage in this place while you finish intubating. This technique is referred to as "bimanual laryngoscopy" and works much more reliably than cricoid pressure.
4. If the vocal cords are still poorly visualized in obese patients without suspected spinal injury, elevate their head/neck/shoulders. Place blankets or pillows under the head/neck/shoulders until the patient's chin or nose is level with the chest.
5. If ambient light inhibits visualization of the larynx, block this light by any means possible, including a blanket stretched over your head and the patient's head and neck.
6. In adult patients of appropriate size, strong preference is given for using the 8.0 mm endotracheal tube for orotracheal intubation. Use of this sized tube enables inpatient pulmonary care unable to be performed with smaller sized tubes.

## PROTOCOL 2F: Oral Intubation – Adult, cont.

The Flex-Guide™ Introducer (also known as the Gum Elastic Bougie – see Special Note):

The Flex-Guide™ Introducer is a single patient use, semi-rigid plastic rod with an angled tip, promoting glottic passage when the vocal cords are incompletely visible during laryngoscopy. A 1 cm wide black band is located along the Flex-Guide™ to help determine correct placement depth. The Flex-Guide™ shape and elasticity allow the intubator to feel a “washboard” sensation as the anteriorly-angled tip is advanced down the tracheal rings. Failure to feel a "washboard" sensation indicates inadvertent esophageal placement and the Flex-Guide™ must be fully withdrawn before reattempting placement. The Flex-Guide™ length allows it to be advanced to the carina where resistance is met, also a means of confirming tracheal rather than esophageal placement. Avoid storing the Flex-Guide™ coiled, as it works best in these regards when it is straight. The Flex-Guide™ is contraindicated in patients  $\leq 16$  years of age.



Flex-Guide™ Introducer Technique:

1. Advance the angled tip facing anteriorly, with continual visualization by laryngoscopy. Anytime resistance is met, stop advancing and reassess placement - forceful passage can result in perforation of soft tissues.
2. Stabilize the Flex-Guide™ when in place, while maintaining laryngoscopy
3. Direct a colleague to slide the endotracheal tube over the Flex-Guide™. He or she stabilizes the proximal end of the Flex-Guide™ as it emerges from the sliding endotracheal tube.
4. Take control of the endotracheal tube, sliding it down the Flex-Guide™ length, while being careful to avoid Flex-Guide™ migration. Once the endotracheal tube has passed to an appropriate estimated endotracheal depth, stabilize it while your colleague withdraws the Flex-Guide™ prior to laryngoscope removal.

## PROTOCOL 2F: Oral Intubation – Adult, cont.

### Confirmation of Oral Endotracheal Placement:

The following sequence is to be used (and its use documented) to verify and maintain correct oral endotracheal placement without fail:

1. **Visualization of endotracheal tube passage between the vocal cords.**
2. **Detection of End-tidal carbon dioxide.** End-tidal carbon dioxide (EtCO<sub>2</sub>) detection shall be confirmed within 60 seconds of endotracheal tube placement. The capnography adaptor is to be placed at the bag-valve device-endotracheal tube interface for the first ventilation. The normal waveform indicating correct endotracheal placement reflects a rapid upstroke with the beginning of exhalation, the exhalation plateau ending at the point of EtCO<sub>2</sub> measurement, and a rapid downstroke with the beginning of inhalation. Any waveform that does not show rhythmic rise and fall correlating with assisted ventilations indicates incorrect tube placement and the tube must be withdrawn. **To be perfectly clear, the use of an endotracheal tube for ongoing oxygenation and ventilation is dependent upon continuously measurable capnography waveforms.** See Protocol 3H-Capnography for discussion of EtCO<sub>2</sub> values.
3. **Auscultation. Auscultate the epigastrium.** If epigastric sounds are heard, intubation is to be reattempted. The endotracheal tube placed in the esophagus may be left in place, at the intubator's discretion, until another endotracheal tube is correctly placed and verified. If no epigastric sounds are heard, proceed to **auscultation of the thorax bilaterally.** Breath sounds are best auscultated in the anterior to mid axillary lines. If breath sounds are present on the right and absent on the left, this suggests a right main stem intubation. Withdraw the endotracheal tube 1cm and repeat auscultation. If necessary, the tube may be withdrawn an additional 1-2cm.
4. **Assessment of physiologic changes.** These include equal rise and fall of the chest, condensation in the endotracheal tube on exhalation, improvement in the patient's color, and improvement in the patient's respiratory distress or failure.
5. **Secure the endotracheal tube with a tube holder and place a cervical collar.**  
When intubated patients are moved during EMS care, waveform capnography must be rechecked for any change. If the waveform continues to show a normal pattern of rapid upstroke with exhalation, exhalation plateau, and rapid downstroke with inhalation, no further repeat confirmation is required. If at any time, the capnography waveform is abnormal, steps 2-5 must be rechecked and documented. If at any time during patient care there is doubt as to correct endotracheal placement of intubation, you must either re-verify by this sequence or reattempt correct endotracheal placement. While the intubator may delegate confirmation steps to his/her colleagues, he or she is ultimately responsible to ensure that a complete confirmation sequence is performed. If the intubator accompanies the patient to the hospital, he or she remains ultimately responsible for ongoing endotracheal tube placement confirmation. If the intubator does not accompany the patient to the hospital by ambulance or helicopter ambulance transport, the primary transporting/treating paramedic or RN assumes ultimate responsibility for ongoing endotracheal tube placement confirmation.



## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### **PROTOCOL 2F: Oral Intubation – Adult, cont.**

#### Special Note:

*This protocol details the proper use of the Flex-Guide™ to illustrate one method of assisting the establishment of orotracheal intubation. The Oklahoma State Department of Health and the University of Oklahoma Department of Emergency Medicine EMS Section do not exclusively endorse the Flex-Guide™ for invasive airway use by EMS professionals. Check with your EMS system's medical oversight physician(s) for specific protocol directions on equipment to be used in establishing orotracheal intubation if not using the Flex-Guide™.*

Medical Literature References  
2F – Oral Intubation – Adult

1. Sime J, Bailitz J, Moskoff J. The bougie: an inexpensive lifesaving airway device. *J Emerg Med.* 2012 Dec;43(6):e393-5.
2. Davis DP, Koprowicz KM, Newgard CD, Daya M, Bulger EM, Stiell I, Nichol G, Stephens S, Dreyer J, Minei J, Kerby JD. The relationship between out-of-hospital airway management and outcome among trauma patients with Glasgow Coma Scale Scores of 8 or less. *Prehosp Emerg Care.* 2011 Apr-Jun;15(2):184-92.
3. Wang HE, Mann NC, Mears G, Jacobson K, Yealy DM. Out-of-hospital airway management in the United States. *Resuscitation.* 2011 Apr;82(4):378-85.
4. Combes X, Jabre P, Margenet A, Merle JC, Leroux B, Dru M, Lecarpentier E, Dhonneur G. Unanticipated difficult airway management in the prehospital emergency setting: prospective validation of an algorithm. *Anesthesiology.* 2011 Jan;114(1):105-10.
5. Neumar RW, Otto CW, Link MS, Kronick SL, Shuster M, Callaway CW, Kudenchuk PJ, Ornato JP, McNally B, Silvers SM, Passman RS, White RD, Hess EP, Tang W, Davis D, Sinz E, Morrison LJ. Part 8: adult advanced cardiovascular life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;122(suppl 3):S729–S767.
6. Thomas S, Judge T, Lowell MJ, MacDonald RD, Madden J, Pickett K, Werman HA, Shear ML, Patel P, Starr G, Chesney M, Domeier R, Frantz P, Funk D, Greenberg RD. Airway management success and hypoxemia rates in air and ground critical care transport: a prospective multicenter study. *Prehosp Emerg Care.* 2010 Jul-Sep;14(3):283.
7. Kupas DF, Kauffman KF, Wang HE. Effect of airway-securing method on prehospital endotracheal tube dislodgment. *Prehosp Emerg Care.* 2010 Jan-Mar;14(1):26-30.
8. Davis DP, Fisher R, Buono C, Brainard C, Smith S, Ochs G, Poste JC, Dunford JV. Predictors of intubation success and therapeutic value of paramedic airway management in a large, urban EMS system. *Prehosp Emerg Care.* 2006 Jul-Sep;10(3):356-62.
9. Levitan RM, Kinkle WC, Levin WJ, Everett WW. Laryngeal view during laryngoscopy: a randomized trial comparing cricoid pressure, backward-upward-rightward pressure, and bimanual laryngoscopy. *Ann Emerg Med.* 2006 Jun;47(6):548-55.
10. Wang HE, Yealy DM. Out-of-Hospital Endotracheal Intubation: Where Are We? *Ann Emerg Med* 2006 47(6):532-541.
11. Wang HE, Davis DP, O'Connor RE, Domeier RM. Drug-assisted intubation in the prehospital setting (resource document to NAEMSP position statement). *Prehosp Emerg Care.* 2006 Apr-Jun;10(2):261-71.
12. Silvestri S, Ralls GA, Krauss B, Thundiyil J, Rothrock SG, Senn A, Carter E, Falk J. The effectiveness of out-of-hospital use of continuous end-tidal carbon dioxide monitoring on the rate of unrecognized misplaced intubation within a regional emergency medical services system. *Ann Emerg Med.* 2005 May;45(5):497-503.
13. Colwell CB, McVane KE, Haukoos JS, Wiebe DP, Gravitz CS, Dunn WW, Bryan T. An evaluation of out-of-hospital advanced airway management in an urban setting. *Acad Emerg Med.* 2005 May;12(5):417-22.
14. Davis DP, Hoyt DB, Ochs M, Fortlage D, Holbrook T, Marshall LK, Rosen P. The effect of paramedic rapid sequence intubation on outcome in patients with severe traumatic brain injury. *J Trauma.* 2003 Mar;54(3):444-53.
15. Katz SH, Falk JL. Misplaced endotracheal tubes by paramedics in an urban emergency medical services system. *Ann Emerg Med.* 2001 Jan;37(1):32-7.
16. Gausche M, Lewis RJ, Stratton SJ, Haynes BE, Gunter CS, Goodrich SM, Poore PD, McCollough MD, Henderson DP, Pratt FD, Seidel JS. Effect of out-of-hospital pediatric endotracheal intubation on survival and neurological outcome: a controlled clinical trial. *JAMA.* 2000 Feb 9;283(6):783-90.

**TREATMENT PRIORITIES**

1. Vital signs  
(including EtCO<sub>2</sub>, if equipped)
2. Oxygenation support
  - Ø O<sub>2</sub> by NC, NRB
  - Ø BVM, Bi/CPAP, ETT if indicated
3. Ventilation support
  - Ø BVM, Bi/CPAP, ETT if indicated
4. Nebulization therapy
  - Ø Albuterol, Ipratropium bromide

**3C – DYSPNEA – ASTHMA  
ADULT & PEDIATRIC**

<b>EMERGENCY MEDICAL DISPATCHER</b>
<b>EMERGENCY MEDICAL RESPONDER</b>
<b>EMT</b>
<b>EMT-INTERMEDIATE 85</b>
<b>ADVANCED EMT</b>
<b>PARAMEDIC</b>

ADVISE TO AVOID PHYSICAL EXERTION  
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).  
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS  
(eg. ALBUTEROL INHALER)  
AS PREVIOUSLY PRESCRIBED FOR ASTHMA SYMPTOMS

**EMR**
**EMT**

GENERAL SUPPORTIVE CARE  
OBTAIN VITAL SIGNS  
O<sub>2</sub> VIA NC, NRB, OR BVM AS APPROPRIATE  
APPLY CARDIAC MONITOR (if equipped)  
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

**EMT OR HIGHER LICENSE:**

MEASURE END-TIDAL CO<sub>2</sub> & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, \*\*Mandatory use if pt intubated)  
**ADULT:** APPLY Bi/CPAP IF INDICATED (if equipped)

**ADULT & PEDIATRIC WEIGHT ≥15kg:** NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg  
**PEDIATRIC WEIGHT <15kg:** NEBULIZED ALBUTEROL 2.5 mg & IPRATROPIUM BROMIDE 0.25 mg MAY  
REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED

**FOR SEVERE ASTHMA REFRACTORY TO NEBULIZATION:**

**ADULT:** EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH  
**PEDIATRIC:** EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH  
**OLMC ORDER ONLY FOR EPHINEPHRINE IF PT ≥50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE >140/90 mmHg**

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

**EMT-I85**
**AEMT**

**ADULT:** INTUBATE IF INDICATED

IV ACCESS  
**ADULT:** IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS  
**ADULT:** IV NS 250 mL BOLUS IF SYS BP < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,  
**ADULT:** REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA  
**PEDIATRIC:** IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg  
**PEDIATRIC:** IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

**AEMT OR HIGHER LICENSE:**

**FOR SEVERE ASTHMA REFRACTORY TO NEBULIZATION:**  
**ADULT:** EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM  
**PEDIATRIC:** EPINEPHRINE 1:1000 0.01 mg/kg (0.01 mL/kg) NOT TO EXCEED 0.3 mg (0.3 mL) IM  
**OLMC CONSULT FOR EPHINEPHRINE IF PT ≥50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE >140/90 mmHg**

**PARAMEDIC**

**ADULT:** METHYLPREDNISOLONE 125 mg IVP. MAY GIVE IM IF NO VASCULAR ACCESS OBTAINED.  
**PEDIATRIC:** METHYLPREDNISOLONE 2 mg/kg NOT TO EXCEED 125 mg IVP. MAY GIVE IM IF NO VASCULAR ACCESS OBTAINED.  
**ADULT:** MAGNESIUM SULFATE 2 GRAMS VERY SLOW IVP OVER 10 MINS  
**AVOID/STOP IF HYPOTENSION OR KNOWN RENAL FAILURE ADULT:**  
MEDICATION-ASSISTED INTUBATION IF INDICATED  
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Medical Literature References  
3C– Dyspnea – Asthma - Adult & Pediatric

1. Williams TA, Finn J, Perkins GD, Jacobs IG. Prehospital continuous positive airway pressure for acute respiratory failure: a systematic review and meta-analysis. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):261-73.
2. Shan Z, Rong Y, Yang W, Wang D, Yao P, Xie J, Liu L. Intravenous and nebulized magnesium sulfate for treating acute asthma in adults and children: a systematic review and meta-analysis. *Respir Med*. 2013 Mar;107(3):321-30.
3. VandenHoek TL, Morrison LJ, Shuster M, Donnino M, Sinz E, Lavonas EJ, Jeejeebhoy FM, Gabrielli A. Part 12: cardiac arrest in special situations: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(suppl 3):S829–S861.
4. Walker DM. Update on epinephrine (adrenaline) for pediatric emergencies. *Curr Opin Pediatr*. 2009 Jun;21(3):313-9.
5. Simons FE, Lieberman PL, Read EJ Jr, Edwards ES, Simons FE, Lieberman PL, Read EJ Jr, Edwards ES. Hazards of unintentional injection of epinephrine from autoinjectors: a systematic review. *Ann Allergy Asthma Immunol*. 2009 Apr;102(4):282-7.
6. Myers JB, Slovis CM, Eckstein M, Goodloe JM, Isaacs SM, Loflin JR, Mechem CC, Richmond NJ, Pepe PE; U.S. Metropolitan Municipalities' EMS Medical Directors. Evidence-based performance measures for emergency medical services systems: a model for expanded EMS benchmarking. *Prehosp Emerg Care*. 2008 Apr-Jun;12(2):141-51.
7. Bryson D, Camargo CA, Domeier RM, Gaeta TJ, Hendeles L, Hise S, Nowak RM, Russotti R, Sapien R, Wallace D, Wright JL, Boss L, Greiling A, Redd S, Workgroup on EMS Management of Asthma Exacerbations. A model protocol for emergency medical services management of asthma exacerbations. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):418-429.
8. Rowe BH, Camargo CA Jr. Emergency department treatment of severe acute asthma. *Ann Emerg Med*. 2006 Jun;47(6):564-6.
9. Richmond NJ, Silverman R, Kusick M, Matallana L, Winokur J. Out-of-hospital administration of albuterol for asthma by basic life support providers. *Acad Emerg Med*. 2005 May;12(5):396-403.
10. Thompson M, Wise S, and Rodenberg H. A preliminary comparison of levalbuterol and albuterol in prehospital care. *J Emerg Med*. 2004; 26(3):271-277
11. Markenson D, Foltin G, Tunik M, Cooper A, Treiber M, Caravaglia K. Albuterol sulfate administration by EMT-basics: results of a demonstration project. *Prehosp Emerg Care*. 2004 Jan-Mar;8(1):34-40.
12. Delbridge T, Domeier R, Key CB. Prehospital asthma management. *Prehosp Emerg Care*. 2003 Jan-Mar;7(1):42-7.
13. Meduri GU, Cook TR, Turner RE, Cohen M, Leeper KV. Noninvasive positive pressure ventilation in status asthmaticus. *Chest*. 1996 Sep;110(3):767-74.

# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

## 4J - POST CARDIAC ARREST TREATMENT ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

**TREATMENT PRIORITIES**

1. Support oxygenation/ventilation. Avoid hyperventilation. Avoid hyperoxemia (when possible).
2. Identify & treat underlying cause of cardiopulmonary arrest.
3. Achieve systolic blood pressure  $\geq$  100 mmHg using cold saline and / or vasopressor infusion.
4. Initiate therapeutic induced hypothermia (if applicable – receiving hospital must have capability for same).

<b>EMR</b>	<b>EMT</b>
<p>GENERAL SUPPORTIVE CARE OBTAIN VITAL SIGNS O<sub>2</sub> NRB or BVM AS APPLICABLE APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped) TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT</p> <p><b>IF PATIENT MEETS CRITERIA FOR INDUCED HYPOTHERMIA:</b> EXPOSE PATIENT AND COVER WITH SHEET PACK AXILLA AND GROIN WITH ICE/COLD PACKS</p> <p><b>EMT OR HIGHER LICENSE ONLY:</b> MEASURE END-TIDAL CO<sub>2</sub> &amp; MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if patient intubated) PLACE SUPRAGLOTTIC AIRWAY ONLY IF INDICATED &amp; BVM VENTILATIONS INEFFECTIVE</p>	

<b>EMT-I85</b>	<b>AEMT</b>
<p><b>ADULT:</b> INTUBATE IF INDICATED</p> <p>IV/IO ACCESS <b>IF PATIENT MEETS CRITERIA FOR INDUCED HYPOTHERMIA:</b> IV/IO COLD (4 DEGREE CELSIUS) NS 30 mL/kg BOLUS UP TO 2 LITERS IF NO SIGNS OF PULMONARY EDEMA</p>	

<b>PARAMEDIC</b>
<p><b>ADULT:</b> MEDICATION ASSISTED INTUBATION IF INDICATED INTERPRET ECG/12-LEAD ECG – TREAT PER PROTOCOL 5C - ACUTE CORONARY SYNDROME AND/OR DYSRHYTHMIA PROTOCOL(S) AS APPLICABLE</p> <p><b>ADULT:</b> ACHIEVE SYSTOLIC BLOOD PRESSURE MINIMUM OF 100 mmHg IV FLUID: NS BOLUS (MAY USE COLD SALINE) UP TO 2 LITERS TO ACHIEVE SYS BP <math>\geq</math> 100 mmHg IF NO SIGNS OF PULMONARY EDEMA</p> <p>NOREPINEPHRINE 2-4 mcg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED <b>OR</b> DOPAMINE 5-20 mcg/kg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED</p> <p><b>PEDIATRIC:</b> ACHIEVE MINIMUM SYSTOLIC BLOOD PRESSURE OF (70 + 2 x age in years) mmHg IV FLUID: NS BOLUS OF 20 mL/kg UP TO 60 mL/kg IF NO SIGNS OF PULMONARY EDEMA</p> <p>OLMC CONSULT FOR PHARMACOLOGIC TREATMENT IF IV FLUID INEFFECTIVE OR CONTRAINDICATED</p> <p><b>IF PATIENT MEETS CRITERIA FOR INDUCED HYPOTHERMIA:</b> SHIVERING CONTROL: MIDAZOLAM 0.1 mg/kg IVP/IOP MAXIMUM DOSE 5 mg</p> <p>CONTINUOUS ASSESSMENT &amp; TREATMENT PER APPLICABLE PROTOCOL(S) TRANSPORT ASAP PER DESTINATION PROTOCOL</p>

- INCLUSION CRITERIA FOR INDUCTION OF HYPOTHERMIA**

  - Ø AGE  $\geq$  18 YEARS OF AGE
  - Ø RETURN OF SPONTANEOUS CIRCULATION
  - Ø NON-TRAUMATIC CARDIAC ARREST
  - Ø SUPRAGLOTTIC OR INTUBATION AIRWAY IN PLACE
  - Ø NO PURPOSEFUL RESPONSE TO PAIN

- EXCLUSION CRITERIA FOR INDUCTION OF HYPOTHERMIA**

  - Ø RECEIVING FACILITY DOES NOT PROVIDE COOLING
  - Ø CHRONIC COMA PRIOR TO ARREST
  - Ø SPONTANEOUS HYPOTHERMIA (COLD EXPOSURE)

Medical Literature References

4J – Post Cardiac Arrest Treatment – Adult & Pediatric

1. Fugate JE, Moore SA, Knopman DS, Claassen DO, Wijdicks EF, White RD, Rabinstein AA. Cognitive outcomes of patients undergoing therapeutic hypothermia after cardiac arrest. *Neurology*. 2013 May 17. [Epub ahead of print] PubMed PMID: 23685933.
2. Bernard SA, Smith K, Cameron P, Masci K, Taylor DM, Cooper DJ, Kelly AM, Silvester W; Rapid Infusion of Cold Hartmanns Investigators. Induction of prehospital therapeutic hypothermia after resuscitation from nonventricular fibrillation cardiac arrest. *Crit Care Med*. 2012 Mar;40(3):747-53.
3. Testori C, Sterz F, Behringer W, Haugk M, Uray T, Zeiner A, Janata A, Arrich J, Holzer M, Losert H. Mild therapeutic hypothermia is associated with favourable outcome in patients after cardiac arrest with non-shockable rhythms. *Resuscitation*. 2011 Sep;82(9):1162-7.
4. Cabanas JG, Brice JH, De Maio VJ, Myers B, Hinchey PR. Field-induced therapeutic hypothermia for neuroprotection after out-of hospital cardiac arrest: a systematic review of the literature. *J Emerg Med* 2011 Apr;40(4):400-9.
5. Berg RA, Hemphill R, Abella BS, Aufderheide TP, Cave DM, Hazinski MF, Lerner EB, Rea TD, Sayre MR, Swor RA. Part 5: Adult basic life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S685–S705.
6. Neumar RW, Otto CW, Link MS, Kronick SL, Shuster M, Callaway CW, Kudenchuk PJ, Ornato JP, McNally B, Silvers SM, Passman RS, White RD, Hess EP, Tang W, Davis D, Sinz E, Morrison LJ. Part 8: adult advanced cardiovascular life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S729–S767.
7. Berg MD, Schexnayder SM, Chameides L, Terry M, Donoghue A, Hickey RW, Berg RA, Sutton RM, Hazinski MF. Part 13: pediatric basic life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S862–S875.
8. Kleinman ME, Chameides L, Schexnayder SM, Samson RA, Hazinski MF, Atkins DL, Berg MD, de Caen AR, Fink EL, Freid EB, Hickey RW, Marino BS, Nadkarni VM, Proctor LT, Qureshi FA, Sartorelli K, Topjian A, van der Jagt EW, Zaritsky AL. Part 14: pediatric advanced life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S876–S908.
9. Hinchey PR, Myers JB, Lewis R, De Maio VJ, Reyer E, Licatase D, Zalkin J, Snyder G; Capital County Research Consortium. Improved out-of-hospital cardiac arrest survival after the sequential implementation of 2005 AHA guidelines for compressions, ventilations, and induced hypothermia: the Wake County experience. *Ann Emerg Med*. 2010 Oct;56(4):348-57.
10. Bernard SA, Smith K, Cameron P, Masci K, Taylor DM, Cooper DJ, Kelly AM, Silvester W; Rapid Infusion of Cold Hartmanns (RICH) Investigators. Induction of therapeutic hypothermia by paramedics after resuscitation from out-of-hospital ventricular fibrillation cardiac arrest: a randomized controlled trial. *Circulation*. 2010 Aug 17;122(7):737-42.
11. Mechem CC, Goodloe JM, Richmond NJ, Kaufman BJ, Pepe PE; U.S. Metropolitan Municipalities EMS Medical Directors Consortium. Resuscitation center designation: recommendations for emergency medical services practices. *Prehosp Emerg Care*. 2010 Jan-Mar;14(1):51-61.
12. Pepe PE, Roppolo LP, Fowler RL. The detrimental effects of ventilation during low-blood-flow states. *Curr Opin Crit Care*. 2005 Jun;11(3):212-8.
13. Bernard SA, Gray TW, Buist MD, Jones BM, Silvester W, Gutteridge G, Smith K. Treatment of comatose survivors of out-of-hospital cardiac arrest with induced hypothermia. *N Engl J Med*. 2002 Feb 21;346(8):557-63.
14. Hypothermia after Cardiac Arrest Study Group. Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. *N Engl J Med*. 2002 Feb 21;346(8):549-56. Erratum in *N Engl J Med* 2002 May 30;346(22):1756.

# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

## 5C - ACUTE CORONARY SYNDROME ADULT

### TREATMENT PRIORITIES

- 3 in 5 minutes of patient contact:**
1. Vital signs
  2. O<sub>2</sub> if indicated
  3. ECG rhythm (if paramedic present)
- 5 in 10 minutes of patient contact:**
1. ASA
  2. IV
  3. 12 lead ECG
  4. NTG or fluids (BP/Inf. MI?)
  5. Repeat vital signs

**EMERGENCY MEDICAL  
DISPATCHER**

**EMERGENCY MEDICAL  
RESPONDER**

**EMT**

**EMT-INTERMEDIATE 85**

**ADVANCED EMT**

**PARAMEDIC**

ADVISE TO AVOID PHYSICAL EXERTION  
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).  
ADVISE ASPIRIN (ASA) 324/325 mg CHEWED BY PT  
(unless contraindicated).  
ADVISE NITROGLYCERIN (NTG)  
PT SELF-ADMINISTRATION  
IF PREVIOUSLY PRESCRIBED FOR SIMILAR SYMPTOMS

**EMR**

**EMT**

GENERAL SUPPORTIVE CARE  
OBTAIN VITAL SIGNS  
O<sub>2</sub> VIA NC or NRB IF DYSPNEA or PULSE OX <94% AT ROOM AIR  
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)  
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT  
ASA 324/325 mg CHEWED BY PT (hold if taken < 6 hours or contraindicated)  
ASSIST NTG SELF-ADMINISTRATION 0.4 mg (hold if Sys BP ≤ 100 mmHg)

**EMT-I85**

**AEMT**

IV ACCESS  
IV NS TKO if SYS BP > 100 mmHg  
IV NS 250 mL BOLUS if SYS BP ≤ 100 mmHg IF NO SIGNS OF PULMONARY EDEMA

**PARAMEDIC**

TREAT ANY CARDIAC DYSRHYTHMIAS/SHOCK BY THE RESPECTIVE PROTOCOLS  
ANALYZE 12-LEAD ECG – TREAT PER FOLLOWING FLOWCHART  
NOTIFY RECEIVING HOSPITAL IMMEDIATELY IF SUSPECTED STEMI  
TRANSPORT ASAP PER DESTINATION PROTOCOL

SIGNS OF  
PULMONARY EDEMA?

YES

NOREPINEPHRINE  
2-4 mcg/min IVPB  
TITRATE TO  
SYS BP ≥ 100 mmHg  
**OR**  
DOPAMINE  
5-20 mcg/kg/min IVPB  
TITRATE TO  
SYS BP ≥ 100 mmHg

NO

IV NS 250 mL BOLUS  
REPEAT UNTIL  
SYS BP > 100 mmHg  
IF NO SIGNS OF  
PULMONARY EDEMA

\*ACUTE INFERIOR INFARCT?

NO

SYS BP > 100 mmHg?

YES

\*\*\* NTG 0.4 mg SL.  
MAY REPEAT EVERY 5 MIN  
IF SYS BP > 100 mmHg

OBTAIN/ANALYZE RIGHT-SIDED  
12-LEAD ECG ENROUTE

\*\*ACUTE RIGHT VENTRICULAR INFARCT?

YES

IF SYS BP < 120 mmHg,  
IV NS 250 mL BOLUS  
IF NO SIGNS OF PULMONARY EDEMA

\* ACUTE INFERIOR INFARCT INDICATED BY ST SEGMENT ELEVATION IN AT LEAST 2 OF THESE 3 LEADS: II, III, aVF.

\*\*ACUTE RIGHT VENTRICULAR INFARCT INDICATED BY ST SEGMENT ELEVATION IN AT LEAST 2 OF THESE 4 LEADS: V3R, V4R, V5R, V6R.

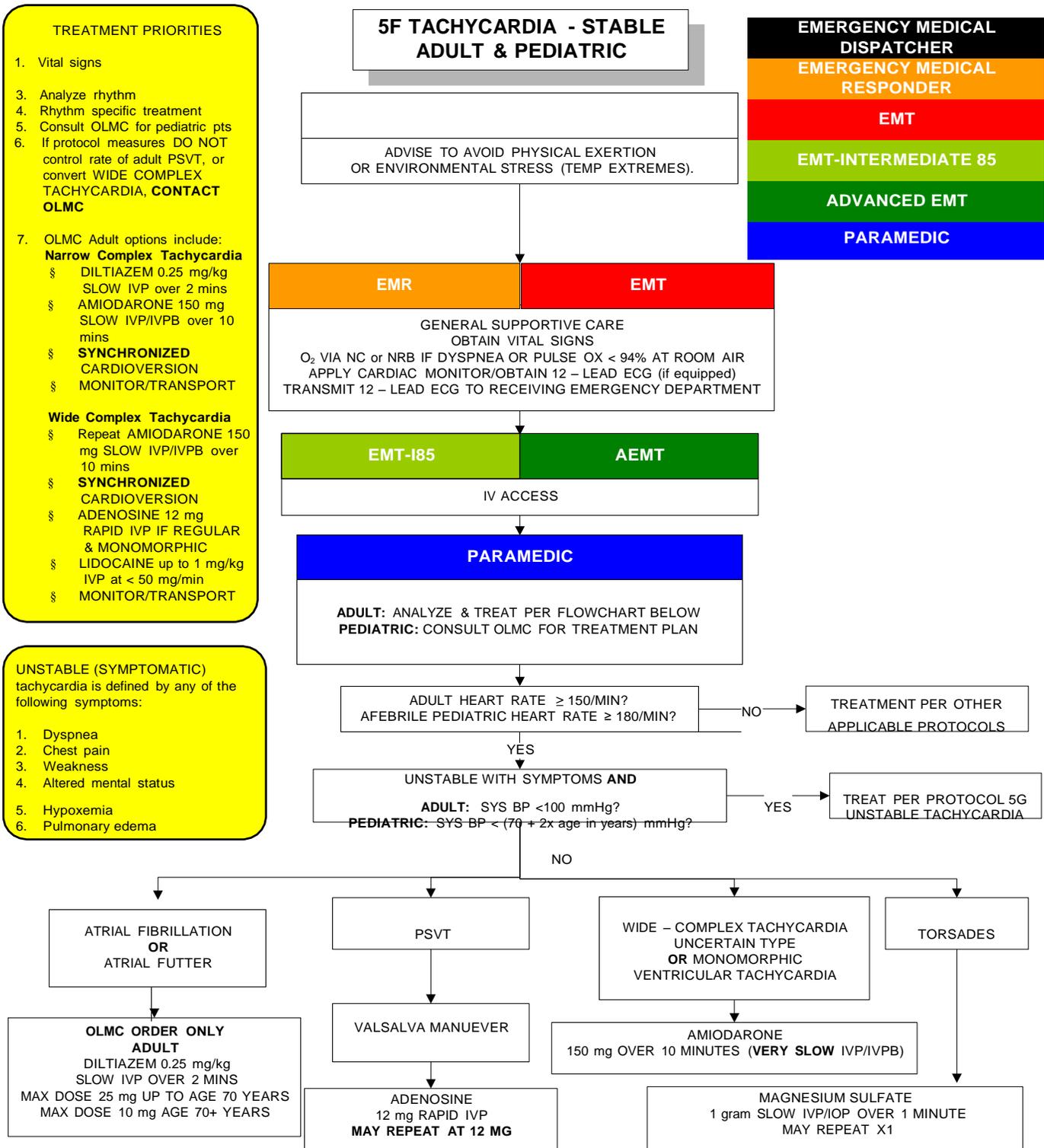
\*\*\*DO NOT GIVE NTG TO PATIENTS TAKING VIAGRA® OR LEVITRA® WITHIN 24 HOURS OR CIALIS® WITHIN 48 HOURS WITHOUT OLMC CONSULT.

IF PT STILL HAVING ACS SYMPTOMS AFTER 3 NTG ADMINISTRATIONS WITH PERSISTENT CHEST PAIN & IF SYS BP > 100 mmHg: ADDITIONAL NITROGLYCERIN PER PROTOCOL 16F  
**AND**  
MORPHINE SULFATE 2 mg SLOW IVP, MAY REPEAT EVERY 5 MIN TO A TOTAL OF 10 mg.  
**OR**  
FENTANYL 0.5 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 50 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 1.5 mcg/kg or 125 mcg WHICHEVER IS LESSER.  
**OR**  
HYDROMORPHONE 0.25 mg SLOW IVP  
MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 1 mg.

STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Medical Literature References  
5C – Acute Coronary Syndromes – Adult

1. Cone DC, Lee CH, Van Gelder C. EMS Activation of the Cardiac Catheterization Laboratory Is Associated with Process Improvements in the Care of Myocardial Infarction Patients. *Prehosp Emerg Care*. 2013 Jul-Sep;17(3):293-8
2. Mencil F, Wilber S, Frey J, Zalewski J, Maiers JF, Bhalla MC. Paramedic ability to recognize ST-segment elevation myocardial infarction on prehospital electrocardiograms. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):203-10.
3. Bhalla MC, Mencil F, Gist MA, Wilber A, Zalewski J. Prehospital electrocardiographic computer identification of ST-segment elevation myocardial infarction. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):211-16.
4. Ryan D, Craig AM, Turner L, Verbeek PR. Clinical events and treatment in prehospital patients with ST-segment elevation myocardial infarction. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):181-86.
5. Cantor WJ, Hoogeveen P, Robert A, Elliott K, Goldman LE, Sanderson E, Plante S, Prabhakar M, Miner S. Prehospital diagnosis and triage of ST-elevation myocardial infarction by paramedics without advanced care training. *Am Heart J*. 2012 Aug;164(2):201-6.
6. Verbeek PR, Ryan D, Turner L, Craig AM. Prehospital 12-lead electrocardiograms increase identification of ST-segment elevation myocardial infarction. *Prehosp Emerg Care*. 2012 Jan-Mar;16(1):109-14.
7. Mathews R, Peterson ED, Li S, Roe MT, Glickman SW, Wiviott SD, Saucedo JF, Antman EM, Jacobs AK, Wang TY. Use of emergency medical service transport among patients with ST-segment-elevation myocardial infarction: findings from the National Cardiovascular Data Registry Acute Coronary Treatment Intervention Outcomes Network Registry-Get With the Guidelines. *Circulation*. 2011 Jul 12;124(2):154-63.
8. Wright RS, Anderson JL, Adams CD, Bridges CR, Casey DE Jr, Ettinger SM, Fesmire FM, Ganiats TG, Jneid H, Lincoff AM, Peterson ED, Philippides GJ, Theroux P, Wenger NK, Zidar JP. 2011 ACCF/AHA focused update of the guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction (updating the 2007 guideline): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol* 2011;57:1920–59.
9. Werman HA, Newland R, Cotton B. Transmission of 12-lead electrocardiographic tracings by Emergency Medical Technician-Basics and Emergency Medical Technician-Intermediates: a feasibility study. *Am J Emerg Med*. 2011 May;29(4):437-40.
10. O'Connor RE, Brady W, Brooks SC, Diercks D, Egan J, Ghaemmaghami C, Menon V, O'Neil BJ, Travers AH, Yannopoulos D. Part 10: acute coronary syndromes: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S787–S817.
11. Kushner FG, Hand M, Smith SC Jr, King SB 3rd, Anderson JL, Antman EM, Bailey SR, Bates ER, Blankenship JC, Casey DJ Jr, Green LA, Hochman JS, Jacobs AK, Krumholz HM, Morrison DA, Ornato JP, Pearle DL, Peterson ED, Sloan MA, Whitlow PL, Williams DO. 2009 Focused updates: ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction (updating the 2004 guideline and 2007 focused update) and ACC/AHA/SCAI guidelines on percutaneous coronary intervention (updating the 2005 guideline and 2007 focused update): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation*. 2009;120:2271–2306.
12. Bradley EH, Herrin J, Wang Y, Barton BA, Webster TR, Mattera JA, Roumanis SA, Curtis JP, Nallamothu BK, Magid DJ, McNamara RL, Parkosewich J, Loeb JM, Krumholz HM. Strategies for reducing the door-to-balloon time in acute myocardial infarction. *N Engl J Med*. 2006 Nov 30;355(22):2308-20.



**STATE OF OKLAHOMA**  
**2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Medical Literature References  
5F – Tachycardia - Stable – Adult & Pediatric

1. Luk JH, Walsh B, Yasbin P. Safety and efficacy of prehospital diltiazem. *West J Emerg Med.* 2013 May;14(3):296-300.
2. Link MS, Atkins DL, Passman RS, Halperin HR, Samson RA, White RD, Cudnik MT, Berg MD, Kudenchuk PJ, Kerber RE. Part 6: electrical therapies: automated external defibrillators, defibrillation, cardioversion, and pacing: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;122(suppl 3):S706–S719.
3. Neumar RW, Otto CW, Link MS, Kronick SL, Shuster M, Callaway CW, Kudenchuk PJ, Ornato JP, McNally B, Silvers SM, Passman RS, White RD, Hess EP, Tang W, Davis D, Sinz E, Morrison LJ. Part 8: adult advanced cardiovascular life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;122(suppl 3):S729–S767.
4. O'Connor RE, Brady W, Brooks SC, Diercks D, Egan J, Ghaemmaghami C, Menon V, O'Neil BJ, Travers AH, Yannopoulos D. Part 10: acute coronary syndromes: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;122(suppl 3):S787–S817.
5. Kleinman ME, Chameides L, Schexnayder SM, Samson RA, Hazinski MF, Atkins DL, Berg MD, de Caen AR, Fink EL, Freid EB, Hickey RW, Marino BS, Nadkarni VM, Proctor LT, Qureshi FA, Sartorelli K, Topjian A, van der Jagt EW, Zaritsky AL. Part 14: pediatric advanced life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;122(suppl 3):S876–S908.
6. Lim SH, Anantharaman V, Teo WS, Chan YH. Slow infusion of calcium channel blockers compared with intravenous adenosine in the emergency treatment of supraventricular tachycardia. *Resuscitation.* 2009 May;80(5):523-8.
7. Riccardi A, Arboscello E, Ghinatti M, Minuto P, Lerza R. Adenosine in the treatment of supraventricular tachycardia: 5 years of experience (2002-2006). *Am J Emerg Med.* 2008 Oct;26(8):879-82.
8. DiMarco JP, Miles W, Akhtar M, Milstein S, Sharma AD, Platia E, McGovern B, Scheinman MM, Govier WC. Adenosine for paroxysmal supraventricular tachycardia: dose ranging and comparison with verapamil. Assessment in placebo-controlled, multicenter trials. The Adenosine for PSVT Study Group. *Ann Intern Med.* 1990 Jul 15;113(2):104-10.

**5M – VENTRICULAR ASSIST DEVICE (VAD) MANAGEMENT  
ADULT**

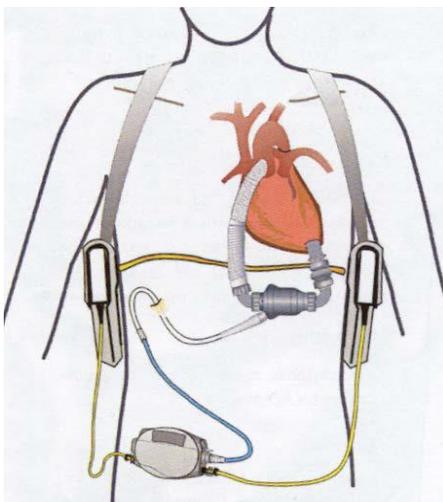
<b>EMERGENCY MEDICAL DISPATCHER</b>
<b>EMERGENCY MEDICAL RESPONDER</b>
<b>EMT</b>
<b>EMT-INTERMEDIATE 85</b>
<b>ADVANCED EMT</b>
<b>PARAMEDIC</b>

A **Ventricular Assist Device**, or **VAD**, is a mechanical device used to support circulation in a patient with significant cardiac ventricular dysfunction. The VAD, most commonly, is used to support the left side of the heart and provide extra cardiac output to the body. This device is called an LVAD or left ventricular assist device. An LVAD can be placed for short term use to bridge patients until they can receive a heart transplant (bridge to transplant) or long term use for those patients that are not candidates for heart transplant (destination therapy). A destination therapy patient will live for months to years at home with the device in place. A VAD is not a total artificial heart (TAH), which completely supports circulation in a patient whose native heart has been removed.

VADs can assist either the right (RVAD) or left (LVAD) ventricle, or both at once (BiVAD). The choice of device depends on underlying heart disease and the function of the right side of the heart. The most common type of device used is an LVAD.

In Oklahoma the most common VAD in use is the HeartMate® II LVAD. The Heart Mate® II uses a continuous flow pumping action to produce forward circulation. Because of the continuous flow nature of the pump, a patient with a HeartMate II® may not have a palpable pulse even though they are alive. The lack of pulse can also make it difficult, or impossible to obtain a blood pressure.

HeartMate II®



- 1) Implanted Pump
- 2) Inflow Cannula
- 3) Outflow Conduit
- 4) Percutaneous Cable
- 5) Controller
- 6) Wearable Battery



6

**PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.**

Hospital Resources in Oklahoma for Patients with a VAD and TAH:

Integrus Baptist Medical Center in Oklahoma City is the only VAD/TAH surgical implant site in Oklahoma at the time of this protocol's release.

Upon arrival to the scene, contact a VAD coordinator for assistance with VAD/TAH related questions. An RN coordinator is available 24-hours a day.

**24-hour Integrus Baptist Medical Center VAD/TAH phone number: 405-713-7040**

Cardiac Arrest Care in Patients with a VAD:

Follow same BLS and ACLS protocols (including defibrillation and cardioversion).

Perform chest compressions only after all other treatments have been applied.

Because of the assistance from the LVAD, patients may not be symptomatic with ventricular arrhythmias. Be sure to assess the patient first prior to intervention.

The LVAD does NOT interfere with the patient's heart rhythm. The native rhythm will appear on the monitor.

Non-Cardiac Arrest Care in Patients with a VAD:

Emergencies in a patient with a VAD can arise due to:

- Problems directly related to the VAD:
  - ⊖ Power Failure
  - ⊖ Suspected mechanical malfunctions characterized by frequent alarms emitting from the system controller, an increase or decrease in flow rates
- **Focus on switching out the system controller. (see directions below)**
- Illness/Injury not related to the VAD - treat per applicable protocol. (i.e. stroke, bleeding, etc.)

Power Failure of a VAD - EMS Assessment & Care:

- A patient experiencing a power failure with their VAD system will present with signs and symptoms of circulatory collapse (dyspnea, hypoxemia, hypotension, dysrhythmias, altered mental status).
- Focus on restoring power to the VAD by switching batteries in the battery pack, connecting to an AC power source, or switching out the system controller.

**PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.**

**TROUBLESHOOTING: Heart Mate® II**

**When the Pump Has Stopped**

- Check the connections between the controller and the pump and the power source and fix any loose connections.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair.
- If pump does not restart, change controllers.

**Changing Controllers:**



1. To insert the driveline, slide the safety tab back to unlock and expose the red button



2. Align the arrow on the controller to the arrow on the driveline cable until they connect, and firmly insert the driveline until it snaps into place



3. Be sure to slide the safety tab back over the red button, locking the driveline in place.



4. Tug gently on the metal portion of the driveline to ensure it is fully engaged.

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Alarms: Emergency Procedures

**Low Battery Alarm**



The red low battery symbol illuminates when less than 5 minutes of battery power remain (applicable only during 14 Volt Lithium-ion battery-powered operation).

This is a **Hazard** alarm. When the red battery symbol illuminates, immediately replace the depleted batteries with a fully-charged pair, or switch to the Power Module.

**Yellow Wrench Alarm**



The yellow wrench symbol illuminates when the System Controller detects a mechanical, electrical, or software issue with the system.

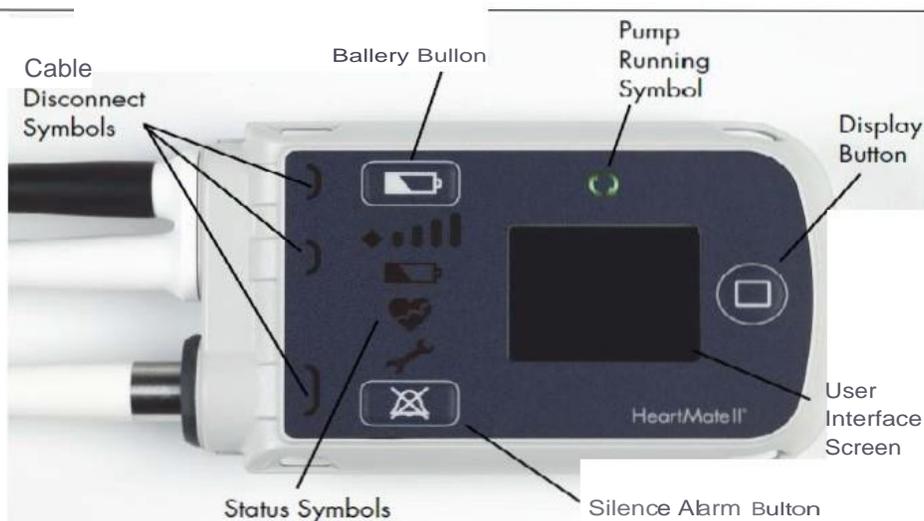
This is an **Advisory** alarm. When the yellow wrench illuminates, check the screen for troubleshooting instructions.

**Rod Heart Alarm**



The red heart symbol illuminates when the System Controller detects a problem that could cause serious injury or death.

This is a **Hazard** alarm. When the red heart illuminates, check the screen for instructions and take immediate action to resolve the problem.



**PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.**

**TROUBLESHOOTING: Heart Mate® II**

**Changing Batteries**

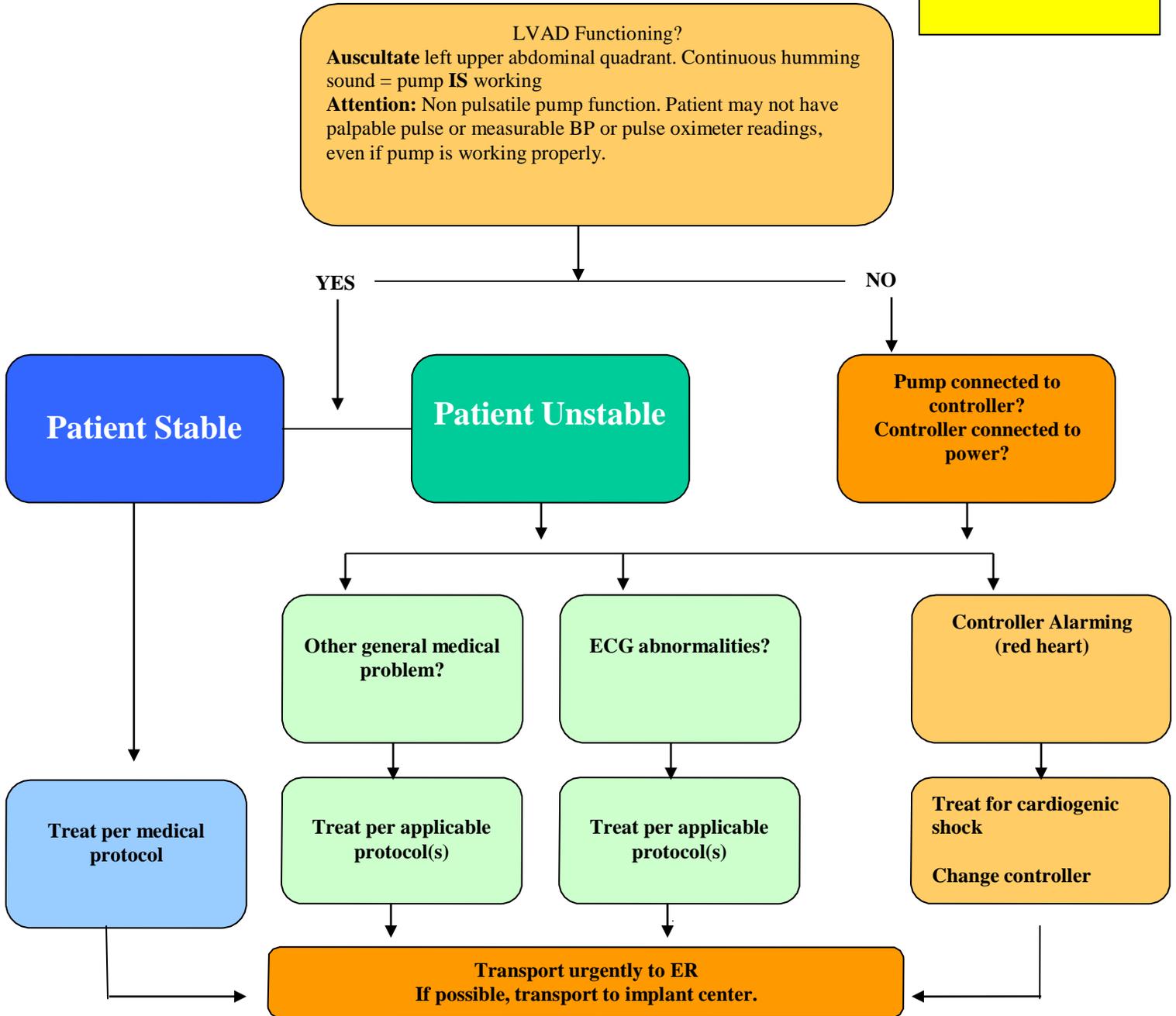
1. Warning: At least one power lead must be connected to a power source at all times.
2. **DO NOT remove both batteries at the same time or the pump will stop.**
3. Obtain two charged batteries from patient's black bag.
4. Check the charge of the battery by pressing the battery gauge button on the end and top of the battery. (Figure 1)
5. Remove **only one battery** from the clip by pressing the tab on the battery clip to release the battery.
6. Controller will start beeping and flashing green lights.
7. Replace with new fully charged battery by lining up the arrows on the battery and the clip and pressing until you hear a "click."
8. Repeat previous steps with the second battery and battery clip. Remove only one battery from the clip by pressing the tab on the battery clip to release the battery.



PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

# HeartMate II<sup>®</sup> LVAD Patient Assessment Protocol

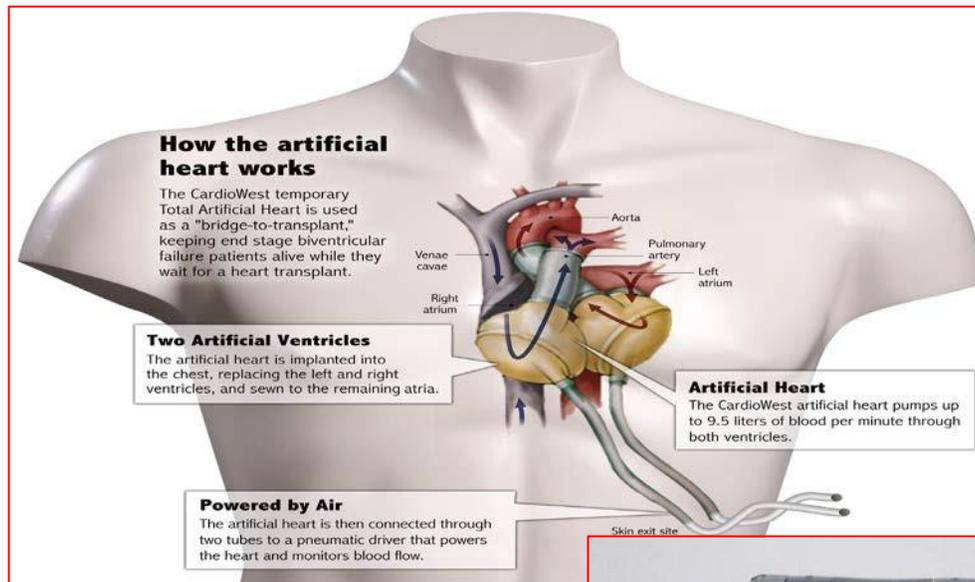
Always call  
**405-713-7040**  
for an LVAD  
Coordinator.  
Press Option #1



PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Total Artificial Heart

Overview:



Basic Operations

1. Pump is connected to 2 drivelines (air lines) that are attached to the driver, which runs the pump
2. Do not kink the drivelines.
3. The electrical conduction system of the heart has been removed so a heart rhythm cannot be viewed on the ECG.
4. Batteries last approximately 2 hours for a set.
5. Plug the driver into an outlet as often as possible for power.

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Total Artificial Heart

**When the Pump Has Stopped:  
Immediately switch to the back-up driver.**

**Changing to the Back-Up Driver**

1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the **red** TAH Cannula to the **red** Freedom Driveline. **DO NOT DISCONNECT THE CANNULA FROM THE DRIVELINE YET.**
2. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the **blue** TAH Cannula to the **blue** Freedom Driveline. **DO NOT DISCONNECT THE CANNULA FROM THE DRIVELINE YET.**



**CAUTION:** Before disconnecting the Drivelines of the primary Freedom Driver, you must have the Drivelines of the backup Freedom Driver within reach. **The backup Driver must be turned on by inserting 2 batteries.** Perform steps 3 and 4 **simultaneously.**

3. Disconnect the **red** Cannula from the **red** Driveline of the primary Freedom Driver.
4. Press and hold down the metal release button. (Fig. 11)
5. Pull the **red** Cannula away from the **red** Driveline (Figure 12). **Immediately** insert the **red** Cannula into the new **red** Driveline from the backup Freedom Driver until you hear a click.
6. **Simultaneously** disconnect the **blue** Cannula from the **blue** Driveline of the primary Freedom Driver.
7. Press and hold down the metal release button.
8. Pull the **blue** Cannula away from the **blue** Driveline.
9. **Immediately** insert the **blue** Cannula into the new **blue** Driveline from the back-up Freedom Driver until you hear a click.

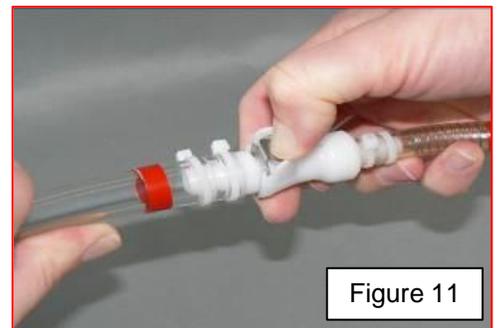


Figure 11

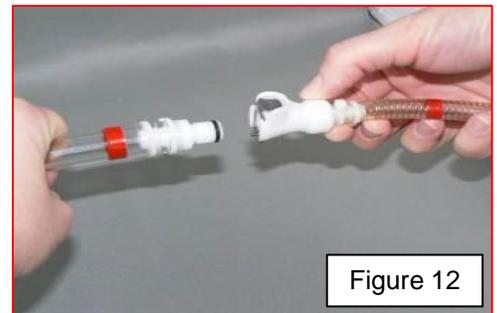


Figure 12

**PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.**

**Total Artificial Heart**

Treatment Considerations:

1. External chest compressions cannot be performed on a patient with a Total Artificial Heart. Changing to the back-up driver is essential to maintaining circulation. There's no "hand-pump" to operate the Total Artificial Heart manually.
2. If the pump stops, a red fault alarm along with a continuous audio tone will sound.
3. All device settings are preset and cannot be changed in the field.
4. Since the electrical conduction system of the heart has been removed the underlying ECG rhythm will show asystole. The patient with a Total Artificial Heart should not be defibrillated.
5. If the driver pump is connected and functioning properly, the patient will have a pulse.
6. A measurable blood pressure is obtainable using a manual or automated blood pressure device.
7. Use alternative ways to assess the adequacy of perfusion such as pale vs. pink, dry vs. diaphoretic, and alert vs. confused.
8. Incorporate device into assessment.
9. General Supportive Care and initiate treatment per applicable protocol.
10. Listen just below the heart to hear if the device is running and assess for a palpable pulse.
11. If there is no palpable pulse detected, consider the following:
  - The device is not running: Troubleshoot the device and treat per protocol.
  - The device is running, but the patient is still unconscious or unstable:
    - Neurological evaluation: Possible Stroke
    - Expose the patient:
      - Be cautious with trauma shears; don't cut a driveline or cable exiting the patient's body that might be hidden under an article of clothing;
      - Assess the dressings over the driveline exit site (found in the abdominal area) for signs of infection.

**STATE OF OKLAHOMA**  
**2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Medical Literature References  
5M – Ventricular Assist Device Management – Adult

1. Mechem CC. Prehospital assessment and management of patients with ventricular-assist devices. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):223-9.
2. Integris Baptist VAD Program Nurse Coordinators - Review of Protocol in June of 2012.
3. Patel P, Williams JG, Brice JH. Sustained ventricular fibrillation in an alert patient: preserved hemodynamics with a left ventricular assist device. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):533-6.
4. Keseg DP. Pumping life into failing hearts. What EMS providers should know about ventricular assist devices. *EMS World*. 2011 Mar;40(3):55-9.
5. Busch MC, Haap M, Kristen A, Haas CS. Asymptomatic sustained ventricular fibrillation in a patient with left ventricular assist device. *Ann Emerg Med*. 2011 Jan;57(1):25-8.
6. Walters WA, Wydro GC, Hollander T, Brister N. Transport of the ventricular assist device-supported patient: a case series. *Prehosp Emerg Care*. 2005 Jan-Mar;9(1):90-7.
7. Bramstedt KA, Simeon DJ. The challenges of responding to "high-tech" cardiac implant patients in crisis. *Prehosp Emerg Care*. 2002 Oct-Dec;6(4):425-32.



Oklahoma State  
Department of Health

# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**TREATMENT PRIORITIES**

3 in 5 minutes of patient contact:

1. Vital signs
2. O<sub>2</sub> if indicated
3. Los Angeles Prehospital Stroke Screen

Early transport & ED notification if symptoms <6 hours

## 6A - STROKE ADULT & PEDIATRIC

**EMERGENCY MEDICAL DISPATCHER**

**EMERGENCY MEDICAL RESPONDER**

**EMT**

**EMT-INTERMEDIATE 85**

**ADVANCED EMT**

**PARAMEDIC**

ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES).  
CONDUCT STROKE SCREENING QUERY IF AUTHORIZED BY LOCAL MEDICAL DISPATCH PROTOCOL.

<b>EMR</b>	<b>EMT</b>
<p>GENERAL SUPPORTIVE CARE OBTAIN VITAL SIGNS O<sub>2</sub> VIA NC, NRB, OR BVM IF DYSPNEA OR PULSE OX &lt;94% AT ROOM AIR</p> <p><b>LOS ANGELES PREHOSPITAL STROKE SCREEN</b> AGE OVER 45 YEARS? NO PRIOR HX OF SEIZURE DISORDER? NEW ONSET OF NEUROLOGIC SYMPTOMS IN LAST 24 HRS? PATIENT AMBULATORY AT BASELINE [PRIOR TO EVENT]? BLOOD GLUCOSE 50 TO 400 mg/dL? FACIAL DROOP; ARM DRIFT; IMPAIRED SPEECH?</p> <p>EARLY "STROKE ALERT" NOTIFICATION TO RECEIVING EMERGENCY DEPARTMENT WITH DEFINITIVE STROKE SYMPTOMS IF LESS THAN 6 HOURS DURATION</p> <p>APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped) TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT</p> <p><b>EMT OR HIGHER LICENSE:</b> MEASURE END-TIDAL CO<sub>2</sub> &amp; MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated) PLACE SUPRAGLOTTIC AIRWAY IF INDICATED &amp; ONLY IF BVM VENTILATIONS ARE INEFFECTIVE</p>	

<b>EMT-I85</b>	<b>AEMT</b>
<p><b>ADULT: INTUBATE IF INDICATED</b></p> <p>IV ACCESS IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS IV NS 250 mL BOLUS IF SYS BP &lt;100 mmHg WITH HYPOTENSIVE SYMPTOMS &amp; NO SIGNS OF PULMONARY EDEMA, REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS &lt; 100 mmHg WITH HYPOTENSIVE SYMPTOMS &amp; NO SIGNS OF PULMONARY EDEMA</p>	

<b>PARAMEDIC</b>
<p><b>ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED</b></p> <p>EVALUATE FOR OTHER ALTERED MENTAL STATUS ETIOLOGIES. TREAT PER APPROPRIATE PROTOCOL(S) CONTINUOUS ASSESSMENT &amp; TREATMENT PER APPLICABLE PROTOCOL(S)</p>

STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Medical Literature References  
6A – Stroke – Adult & Pediatric

1. McKinney JS, Mylavarapu K, Lane J, Roberts V, Ohman-Strickland P, Merlin MA. Hospital prenotification of stroke patients by emergency medical services improves stroke time targets. *J Stroke Cerebrovasc Dis.* 2013 Feb;22(2):113-8.
2. Chenaitia H, Lefevre O, Ho V, Squarcioni C, Pradel V, Fournier M, Toesca R, Michelet P, Auffray JP. Emergency medical service in the stroke chain of survival. *Eur J Emerg Med.* 2013 Feb;20(1):39-44.
3. McKinney JS, Mylavarapu K, Lane J, Roberts V, Ohman-Strickland P, Merlin MA. Hospital Prenotification of Stroke Patients by Emergency Medical Services Improves Stroke Time Targets. *J Stroke Cerebrovasc Dis.* 2013 Feb;22(2):113-8.
4. Lin CB, Peterson ED, Smith EE, Saver JL, Liang L, Xian Y, Olson DM, Shah BR, Hernandez AF, Schwamm LH, Fonarow GC. Emergency medical service hospital prenotification is associated with improved evaluation and treatment of acute ischemic stroke. *Circ Cardiovasc Qual Outcomes.* 2012 Jul 1;5(4):514-22.
5. Protocol expert consultant: Lawrence Davis, MD. Oklahoma City. Board certified in neurology and vascular neurology by the American Board of Psychiatry and Neurology.
6. The ESCORTT group. The identification of acute stroke: an analysis of emergency calls. *Int J Stroke.* 2012 Feb 15. doi: 10.1111/j.1747-4949.2011.00749.x.
7. Jauch EC, Cucchiara B, Adeoye O, Meurer W, Brice J, Chan Y-F, Gentile N, Hazinski MF. Part 11: adult stroke: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;122(suppl 3):S818–S828.
8. Alberts MJ, Latchaw RE, Jagoda A, Wechsler LR, Crocco T, George MG, Connolly ES, Mancini B, Prudhomme S, Gress D, Jensen ME, Bass R, Ruff R, Foell K, Armonda RA, Emr M, Warren M, Baranski J, Walker MD; Brain Attack Coalition. Revised and updated recommendations for the establishment of primary stroke centers: a summary statement from the brain attack coalition. *Stroke.* 2011 Sep;42(9):2651-65.
9. Patel MD, Rose KM, O'Brien EC, Rosamond WD. Prehospital notification by emergency medical services reduces delays in stroke evaluation: findings from the North Carolina stroke care collaborative. *Stroke.* 2011 Aug;42(8):2263-8.
10. Fonarow GC, Smith EE, Saver JL, Reeves MJ, Bhatt DL, Grau-Sepulveda MV, Olson DM, Hernandez AF, Peterson ED, Schwamm LH. Timeliness of tissue-type plasminogen activator therapy in acute ischemic stroke: patient characteristics, hospital factors, and outcomes associated with door-to-needle times within 60 minutes. *Circulation.* 2011 Feb 22;123(7):750-8.
11. Brice JH, Evenson KR, Lellis JC, Rosamond WD, Aytur SA, Christian JB, Morris DL. Emergency medical services education, community outreach, and protocols for stroke and chest pain in North Carolina. *Prehosp Emerg Care.* 2008 Jul-Sep;12(3):366-71.
12. Adams HP Jr, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, Furlan A, Grubb RL, Higashida RT, Jauch EC, Kidwell C, Lyden PD, Morgenstern LB, Qureshi AI, Rosenwasser RH, Scott PA, Wijdicks EF. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups. *Stroke.* 2007 May;38(5):1655-711. Erratum in *Stroke.* 2007 Sep;38(9):e96. *Stroke.* 2007 Jun;38(6):e38.
13. Kidwell CS, Starkman S, Eckstein M, Weems K, Saver JL. Identifying stroke in the field. Prospective validation of the Los Angeles prehospital stroke screen (LAPSS). *Stroke.* 2000 Jan;31(1):71-6.
14. Kidwell CS, Saver JL, Schubert GB, Eckstein M, Starkman S. Design and retrospective analysis of the Los Angeles Prehospital Stroke Screen (LAPSS). *Prehosp Emerg Care.* 1998 Oct-Dec;2(4):267-73.

**TREATMENT PRIORITIES**

1. Vital signs
2. Epinephrine for anaphylaxis  
**\*\* First two epi doses are standing order. Any additional epi dose requires OLMC consult.**
3. Oxygen administration
4. Bronchodilator for bronchospasm

**8D - ACUTE ALLERGIC REACTIONS  
ADULT & PEDIATRIC**

**EMERGENCY MEDICAL DISPATCHER**

**EMERGENCY MEDICAL RESPONDER**

**EMT**

**EMT-INTERMEDIATE 85**

**ADVANCED EMT**

**PARAMEDIC**

**EMD**

ADVISE TO USE EPINEPHRINE AUTOINJECTOR IF AVAILABLE AND PATIENT'S PHYSICIAN HAS PRESCRIBED TO USE FOR SAME SYMPTOMS

ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES). DO NOT MOVE THE PATIENT UNLESS IN DANGER OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

**EMR**

**EMT**

GENERAL SUPPORTIVE CARE  
OBTAIN VITAL SIGNS  
O<sub>2</sub> VIA NC, NRB, OR BVM AS APPROPRIATE  
APPLY CARDIAC MONITOR (if equipped)  
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

**EMT OR HIGHER LICENSE:  
FOR ANAPHYLAXIS ONLY**

**ADULT:** \*\*EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS  
**PEDIATRIC:** \*\*EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS  
**OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg**  
MEASURE END-TIDAL CO<sub>2</sub> & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, \*\* Mandatory use if pt intubated)  
**ADULT:** APPLY Bi/CPAP IF INDICATED (if equipped)  
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE **ADULT & PEDIATRIC WEIGHT ≥15 kg:** NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg  
**PEDIATRIC WEIGHT <15 kg:** NEBULIZED ALBUTEROL 2.5 mg & IPRATROPIUM BROMIDE 0.25 mg  
MAY REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED

**EMT- I85**

**AEMT**

**ADULT:** INTUBATE IF INDICATED  
IV ACCESS

**ADULT:** IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS  
**ADULT:** IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,  
**ADULT:** REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA  
**PEDIATRIC:** IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg  
**PEDIATRIC:** IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA  
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

**AEMT OR HIGHER LICENSE:  
FOR ANAPHYLAXIS ONLY**

**ADULT:** \*\*EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH  
**PEDIATRIC:** \*\*EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH  
**OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg**

**PARAMEDIC**

**MILD REACTION (RASH, ITCH, HIVES) ANTIHISTAMINE**  
**ADULT:** DIPHENHYDRAMINE 50 mg IM/IVP  
**PEDIATRIC:** DIPHENHYDRAMINE 1 mg/kg IM/IVP TO MAX OF 50 mg

**MODERATE REACTION (SOB, WHEEZING) ANTIHISTAMINE + BRONCHODILATOR + STEROID** DIPHENHYDRAMINE ADMINISTRATION AS IN MILD REACTION & BRONCHODILATOR ADMINISTRATION AS IN EMT ABOVE **ADULT:** METHYLPREDNISOLONE 125 mg IM/IVP  
**PEDIATRIC:** METHYLPREDNISOLONE 2 mg/kg IM/IVP, MAX 125 mg

**SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID**  
**ADULT:** \*\*EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH  
**PEDIATRIC:** \*\*EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH DIPHENHYDRAMINE ADMINISTRATION & BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE IF REFRACTORY ANAPHYLAXIS,  
**ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000**  
**ADULT:** \*\*EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES)  
**PEDIATRIC:** \*\*EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg  
**ADULT:** MEDICATION ASSISTED INTUBATION IF INDICATED CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### Medical Literature References 8D – Allergic Reactions - Adult & Pediatric

1. Jacobsen RC, Toy S, Bonham AJ, Salomone JA, Ruthstrom J, Gratton M. Anaphylaxis Knowledge among Paramedics: Results of a National Survey. *Prehosp Emerg Care*. 2012 Oct-Dec;16(4):527-34.
2. Simons FE, Arduzzo LR, Bilò MB, Dimov V, Ebisawa M, El-Gamal YM, Ledford DK, Lockey RF, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong BY, Worm M. 2012 Update: World Allergy Organization guidelines for the assessment and management of anaphylaxis. *Curr Opin Allergy Clin Immunol*. 2012 Aug;12(4):389-99.
3. Jacobsen RC, Millin MG. The use of epinephrine for out-of-hospital treatment of anaphylaxis: resource document for the National Association of EMS Physicians position statement. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):570-6.
4. National Association of EMS Physicians. The use of epinephrine for out-of-hospital treatment of anaphylaxis. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):544.
5. Simons FE, Arduzzo LR, Bilò MB, El-Gamal YM, Ledford DK, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong BY; World Allergy Organization. World Allergy Organization anaphylaxis guidelines: summary. *J Allergy Clin Immunol*. 2011 Mar;127(3):587-93.e1-22.
6. Vanden Hoek TL, Morrison LJ, Shuster M, Donnino M, Sinz E, Lavonas EJ, Jeejeebhoy FM, Gabrielli A. Part 12: cardiac arrest in special situations: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(suppl 3):S829–S861.
7. Walker DM. Update on epinephrine (adrenaline) for pediatric emergencies. *Curr Opin Pediatr*. 2009 Jun;21(3):313-9.
8. Simons FE, Lieberman PL, Read EJ Jr, Edwards ES. Simons FE, Lieberman PL, Read EJ Jr, Edwards ES. Hazards of unintentional injection of epinephrine from autoinjectors: a systematic review. *Ann Allergy Asthma Immunol*. 2009 Apr;102(4):282-7.
9. Myers JB, Slovis CM, Eckstein M, Goodloe JM, Isaacs SM, Loflin JR, Mechem CC, Richmond NJ, Pepe PE; U.S. Metropolitan Municipalities' EMS Medical Directors. Evidence-based performance measures for emergency medical services systems: a model for expanded EMS benchmarking. *Prehosp Emerg Care*. 2008 Apr-Jun;12(2):141-51.
10. Bryson D, Camargo CA, Domeier RM, Gaeta TJ, Hendeles L, Hise S, Nowak RM, Russotti R, Sapien R, Wallace D, Wright JL, Boss L, Greiling A, Redd S, Workgroup on EMS Management of Asthma Exacerbations. A model protocol for emergency medical services management of asthma exacerbations. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):418-429.
11. Richmond NJ, Silverman R, Kusick M, Matallana L, Winokur J. Out-of-hospital administration of albuterol for asthma by basic life support providers. *Acad Emerg Med*. 2005 May;12(5):396-403.
12. Thompson M, Wise S, and Rodenberg H. A preliminary comparison of levalbuterol and albuterol in prehospital care. *J Emerg Med*. 2004; 26(3):271-277
13. Markenson D, Foltin G, Tunik M, Cooper A, Treiber M, Caravaglia K. Albuterol sulfate administration by EMT-basics: results of a demonstration project. *Prehosp Emerg Care*. 2004 Jan-Mar;8(1):34-40.
14. Delbridge T, Domeier R, Key CB. Prehospital asthma management. *Prehosp Emerg Care*. 2003 Jan-Mar;7(1):42-7.
15. Meduri GU, Cook TR, Turner RE, Cohen M, Leeper KV. Noninvasive positive pressure ventilation in status asthmaticus. *Chest*. 1996 Sep;110(3):767-74.

# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

## 8E – SNAKEBITES – PIT VIPERS (RATTLESNAKES, COPPERHEADS, & MOCASSINS) (CROTALINAE ENVENOMATION) ADULT & PEDIATRIC

- TREATMENT PRIORITIES**
1. Vital signs
  2. Epinephrine for anaphylaxis  
**\*\* First two epi doses are standing order. Any additional epi dose requires OLMC consult.**
  3. OK Poison Center consult
  4. Appropriate destination per OK Poison Center consult

ADVISE TO AVOID PHYSICAL EXERTION  
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).  
MOVE AWAY FROM SNAKE(S) IF ABLE  
OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMR	EMT
<p style="text-align: center;">GENERAL SUPPORTIVE CARE – MARK EDGE OF SWELLING/TENDERNESS EVERY 15 MINS TO DETERMINE SYMPTOM PROGRESSION OBTAIN VITAL SIGNS &amp; ADMINISTER O<sub>2</sub> VIA NC, NRB, OR BVM AS APPROPRIATE IMMOBILIZE/ELEVATE AND AVOID JOINT FLEXION IN EXTREMITY BITTEN TO MINIMIZE SWELLING OF EXTREMITY DO NOT CUT THE BITE SITE OR ATTEMPT TO “EXTRACT THE VENOM” FROM BITE SITE WITH SUCTION/VACUUM DEVICES CONSULT OKLAHOMA POISON CONTROL CENTER PER PROTOCOL 8C – DESCRIBE SNAKE APPEARANCE/TYPE AS BEST ABLE APPLY CARDIAC MONITOR (if equipped)</p> <p style="text-align: center; color: red;"><b>EMT OR HIGHER LICENSE:</b></p> <p style="text-align: center;"><b>FOR ANAPHYLAXIS ONLY (ANAPHYLAXIS FROM SNAKEBITE IS RARE):</b></p> <p><b>ADULT:</b> **EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS <b>PEDIATRIC:</b> **EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS <b>OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE &gt; 140/90 mmHg</b> MEASURE END-TIDAL CO<sub>2</sub> &amp; MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated) <b>ADULT:</b> APPLY Bi/CPAP IF INDICATED (if equipped)</p> <p style="text-align: center;">PLACE SUPRAGLOTTIC AIRWAY IF INDICATED &amp; ONLY IF BVM VENTILATIONS INEFFECTIVE</p>	

EMT- 185	AEMT
<p style="text-align: center;"><b>ADULT:</b> INTUBATE IF INDICATED IV ACCESS</p> <p style="text-align: center;"><b>ADULT:</b> IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS <b>ADULT:</b> IV NS 250 mL BOLUS IF SYS BP &lt;100 mmHg WITH HYPOTENSIVE SYMPTOMS &amp; NO SIGNS OF PULMONARY EDEMA <b>ADULT:</b> REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS &lt; 100 mmHg WITH HYPOTENSIVE SYMPTOMS &amp; NO SIGNS OF PULMONARY EDEMA <b>PEDIATRIC:</b> IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg <b>PEDIATRIC:</b> IV NS 20 mL/kg BOLUS IF SYS BP &lt; (70 + 2x age in years) mmHg &amp; NO SIGNS OF PULMONARY EDEMA REPEAT UP TO 60 mL/kg IF SYS BP REMAINS &lt; (70 + 2x age in years) mmHg &amp; NO SIGNS OF PULMONARY EDEMA</p> <p style="text-align: center; color: green;"><b>AEMT OR HIGHER LICENSE:</b></p> <p style="text-align: center;"><b>FOR ANAPHYLAXIS ONLY (ANAPHYLAXIS FROM SNAKEBITE IS RARE):</b></p> <p><b>ADULT:</b> **EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH <b>PEDIATRIC:</b> **EPINEPHRINE 1:1000, 0.01 mg/kg IM NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH <b>OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE &gt; 140/90 mmHg</b></p>	

PARAMEDIC
<p style="text-align: center;">ANTIEMETIC (IF REQUIRED); <b>ADULT:</b> ONDANSETRON 4 mg IVP/ODT. MAY REPEAT ONCE IN 10 MINUTES <b>PEDIATRIC:</b> ONDANSETRON 0.1 mg/kg IVP TO A MAXIMUM SINGLE DOSE OF 4 mg; IF AGE &gt; 2 years, MAY GIVE ONDANSETRON 4 mg ODT</p> <p style="text-align: center;">ANALGESIA (IF REQUIRED); OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg <b>ADULT:</b> FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER. <b>OR</b> <b>ADULT:</b> MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg. <b>OR</b> <b>ADULT:</b> HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg. <b>PEDIATRIC:</b> OLMCP ORDER ONLY FOR OPIATE ANALGESIA</p> <p style="text-align: center;"><b>SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP &lt;100 mmHg ADULT OR &lt; (70 + 2x age in years) mmHg PEDIATRIC</b></p> <p><b>ADULT:</b> **EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH <b>PEDIATRIC:</b> **EPINEPHRINE 1:1000, 0.01 mg/kg IM NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH <b>IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000</b> <b>ADULT:</b> **EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES) <b>PEDIATRIC:</b> **EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg <b>ADULT:</b> MEDICATION ASSISTED INTUBATION IF INDICATED CONTINUOUS ASSESSMENT &amp; TREATMENT PER APPLICABLE PROTOCOL(S)</p>

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

### Medical Literature References

#### 8E – Snakebites (Crotalinae Envenomation)- Adult & Pediatric

1. Simons FE, Arduzzo LR, Bilo MB, Dimov V, Ebisawa M, El-Gamal YM, Ledford DK, Lockey RF, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong BY, Worm M. 2012 Update: World Allergy Organization guidelines for the assessment and management of anaphylaxis. *Curr Opin Allergy Clin Immunol*. 2012 Aug;12(4):389-99.
2. Protocol expert consultant: William Banner, MD, PhD. Medical Director, Oklahoma Poison Control Center, Oklahoma City. Board certified in medical toxicology by the American Board of Medical Toxicology. Board certified in pediatrics and pediatric critical care medicine by the American Board of Pediatrics.
3. Protocol expert consultant: Boyd Burns, DO. Department of Emergency Medicine, University of Oklahoma School of Community Medicine, Tulsa. Board certified in emergency medicine by the American Board of Emergency Medicine.
4. Lavonas EJ, Ruha AM, Banner W, Bebart A, Bernstein JN, Bush SP, Kerns WP 2nd, Richardson WH, Seifert SA, Tanen DA, Curry SC, Dart RC. Unified treatment algorithm for the management of crotaline snakebite in the United States: results of an evidence-informed consensus workshop. *BMC Emerg Med*. 2011 Feb 3;11:2.
5. Spiller HA, Bosse GM, Ryan ML. Use of antivenom for snakebites reported to United States poison centers. *Am J Emerg Med*. 2010 Sep;28(7):780-5.
6. Goto CS, Feng SY. Crotalidae polyvalent immune Fab for the treatment of pediatric crotaline envenomation. *Pediatr Emerg Care*. 2009 Apr;25(4):273-9.
7. Ahmed SM, Ahmed M, Nadeem A, Mahajan J, Choudhary A, Pal J. Emergency treatment of a snake bite: Pearls from literature. *J Emerg Trauma Shock*. 2008 Jul;1(2):97-105.
8. McNally J, Boesen K, Boyer L. Toxicologic information resources for reptile envenomations. *Vet Clin North Am Exot Anim Pract*. 2008 May;11(2):389-401, viii.
9. Wozniak EJ, Wisser J, Schwartz M. Venomous adversaries: a reference to snake identification, field safety, and bite-victim first aid for disaster-response personnel deploying into the hurricane-prone regions of North America. *Wilderness Environ Med*. 2006 Winter;17(4):246-66.
10. Singletary EM, Rochman AS, Bodmer JC, Holstege CP. Envenomations. *Med Clin North Am*. 2005 Nov;89(6):1195-224.



# STATE OF OKLAHOMA 2013 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**TREATMENT PRIORITIES**  
1. Vital signs  
2. Epinephrine for anaphylaxis  
**\*\* First two epi doses are standing order. Any additional epi dose requires OLMC consult.**  
3. Oxygen administration  
4. Bronchodilator for bronchospasm

## 8F – BEE/WASP STINGS & FIRE ANT BITES (HYMENOPTERA ENVENOMATION) ADULT & PEDIATRIC

**EMD**  
ADVISE TO USE EPINEPHRINE AUTOINJECTOR IF AVAILABLE AND PATIENT'S PHYSICIAN HAS PRESCRIBED TO USE FOR SAME SYMPTOMS  
  
ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES). DO NOT MOVE THE PATIENT UNLESS IN DANGER OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

- EMERGENCY MEDICAL DISPATCHER
- EMERGENCY MEDICAL RESPONDER
- EMT
- EMT-INTERMEDIATE 85
- ADVANCED EMT
- PARAMEDIC

EMR	EMT
<p>GENERAL SUPPORTIVE CARE – REMOVE STINGER(S) WITHOUT SQUEEZING IF STILL EMBEDDED IN SKIN OBTAIN VITAL SIGNS O<sub>2</sub> VIA NC, NRB, OR BVM AS APPROPRIATE APPLY CARDIAC MONITOR (if equipped) ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)</p> <p><b>EMT OR HIGHER LICENSE: FOR ANAPHYLAXIS ONLY</b></p> <p><b>ADULT:</b> **EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS <b>PEDIATRIC:</b> **EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS <b>OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE &gt; 140/90 mmHg</b></p> <p>MEASURE END-TIDAL CO<sub>2</sub> &amp; MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated) <b>ADULT:</b> APPLY Bi/CPAP IF INDICATED (if equipped) PLACE SUPRAGLOTTIC AIRWAY IF INDICATED &amp; ONLY IF BVM VENTILATIONS INEFFECTIVE <b>ADULT &amp; PEDIATRIC WEIGHT ≥15 kg:</b> NEBULIZED ALBUTEROL 5 mg &amp; IPRATROPIUM BROMIDE 0.5 mg <b>PEDIATRIC WEIGHT &lt;15 kg:</b> NEBULIZED ALBUTEROL 2.5 mg &amp; IPRATROPIUM BROMIDE 0.25 mg MAY REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED</p>	

EMT- I85	AEMT
<p><b>ADULT:</b> INTUBATE IF INDICATED IV ACCESS</p> <p><b>ADULT:</b> IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS <b>ADULT:</b> IV NS 250 mL BOLUS IF SYS BP &lt;100 mmHg WITH HYPOTENSIVE SYMPTOMS &amp; NO SIGNS OF PULMONARY EDEMA, <b>ADULT:</b> REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS &lt; 100 mmHg WITH HYPOTENSIVE SYMPTOMS &amp; NO SIGNS OF PULMONARY EDEMA <b>PEDIATRIC:</b> IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg <b>PEDIATRIC:</b> IV NS 20 mL/kg BOLUS IF SYS BP &lt; (70 + 2x age in years) mmHg &amp; NO SIGNS OF PULMONARY EDEMA REPEAT UP TO 60 mL/kg IF SYS BP REMAINS &lt; (70 + 2x age in years) mmHg &amp; NO SIGNS OF PULMONARY EDEMA</p> <p><b>AEMT OR HIGHER LICENSE: FOR ANAPHYLAXIS ONLY</b></p> <p><b>ADULT:</b> **EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH <b>PEDIATRIC:</b> **EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH <b>OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE &gt; 140/90 mmHg</b></p>	

PARAMEDIC
<p><b>MILD REACTION (RASH, ITCH, HIVES) ANTIHISTAMINE</b> <b>ADULT:</b> DIPHENHYDRAMINE 50 mg IM/IVP <b>PEDIATRIC:</b> DIPHENHYDRAMINE 1 mg/kg IM/IVP TO MAX OF 50 mg</p> <p><b>MODERATE REACTION (SOB, WHEEZING) ANTIHISTAMINE + BRONCHODILATOR + STEROID</b> DIPHENHYDRAMINE ADMINISTRATION AS IN MILD REACTION &amp; BRONCHODILATOR ADMINISTRATION AS IN EMT ABOVE <b>ADULT:</b> METHYLPREDNISOLONE 125 mg IM/IVP <b>PEDIATRIC:</b> METHYLPREDNISOLONE 2 mg/kg IM/IVP, MAX 125 mg</p> <p><b>SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP &lt;100 mmHg ADULT OR &lt; (70 + 2x age in years) mmHg PEDIATRIC VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID</b> <b>ADULT:</b> **EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH <b>PEDIATRIC:</b> **EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH DIPHENHYDRAMINE ADMINISTRATION &amp; BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE <b>IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000</b> <b>ADULT:</b> **EPINEPHRINE 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES) <b>PEDIATRIC:</b> **EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg <b>ADULT:</b> MEDICATION ASSISTED INTUBATION IF INDICATED CONTINUOUS ASSESSMENT &amp; TREATMENT PER APPLICABLE PROTOCOL(S)</p>

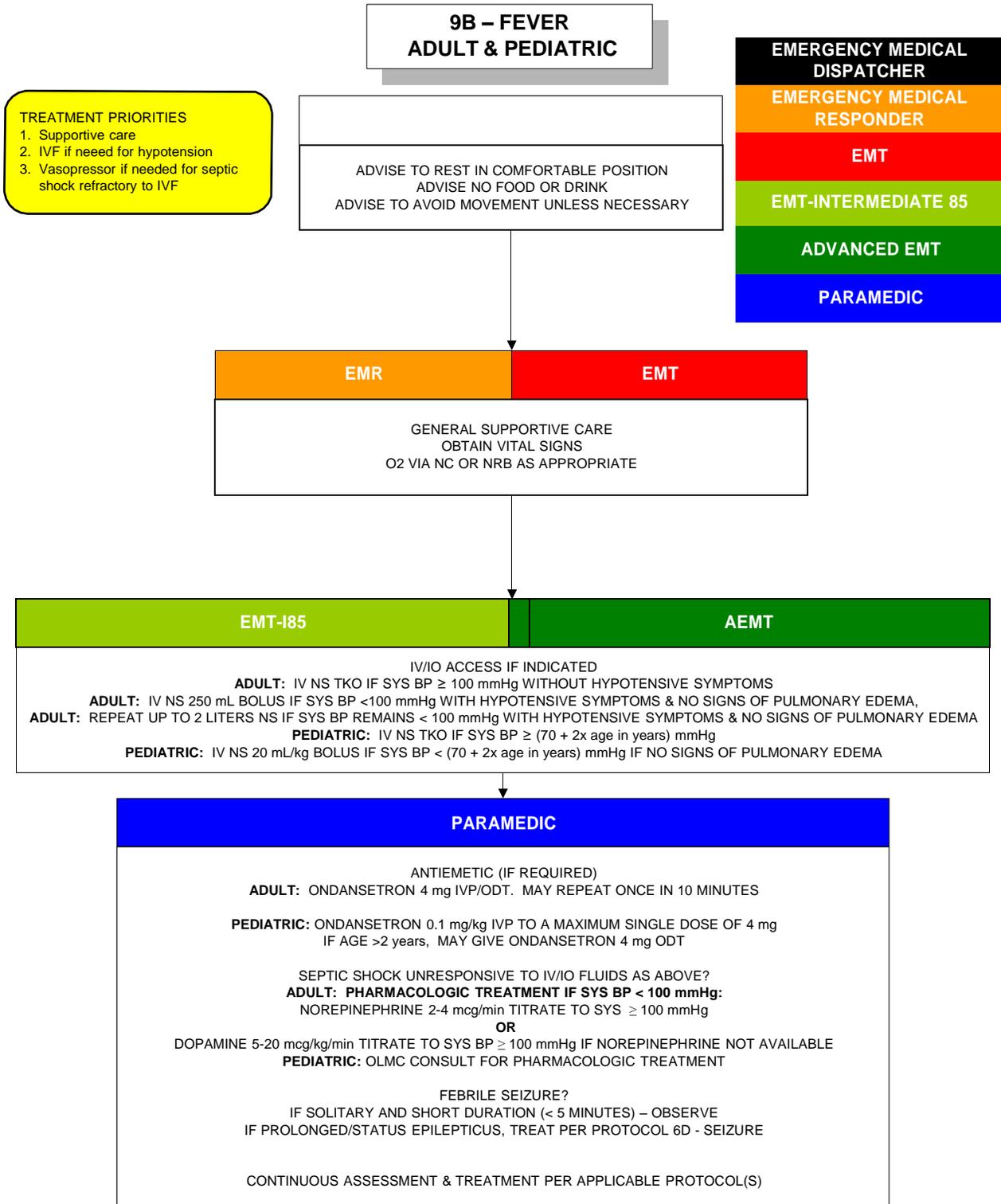
**STATE OF OKLAHOMA**  
**2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

Medical Literature References

8F – Bee/Wasp Stings (Hymenoptera Envenomation)- Adult & Pediatric

1. Jacobsen RC, Toy S, Bonham AJ, Salomone JA, Ruthstrom J, Gratton M. Anaphylaxis Knowledge among Paramedics: Results of a National Survey. *Prehosp Emerg Care*. 2012 Oct-Dec;16(4):527-34.
2. Simons FE, Arduzzo LR, Bilo MB, Dimov V, Ebisawa M, El-Gamal YM, Ledford DK, Lockey RF, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong BY, Worm M. 2012 Update: World Allergy Organization guidelines for the assessment and management of anaphylaxis. *Curr Opin Allergy Clin Immunol*. 2012 Aug;12(4):389-99.
3. Jacobsen RC, Millin MG. The use of epinephrine for out-of-hospital treatment of anaphylaxis: resource document for the National Association of EMS Physicians position statement. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):570-6.
4. National Association of EMS Physicians. The use of epinephrine for out-of-hospital treatment of anaphylaxis. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):544.
5. Simons FE, Arduzzo LR, Bilò MB, El-Gamal YM, Ledford DK, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong BY; World Allergy Organization. World Allergy Organization anaphylaxis guidelines: summary. *J Allergy Clin Immunol*. 2011 Mar;127(3):587-93.e1-22.
6. Vanden Hoek TL, Morrison LJ, Shuster M, Donnino M, Sinz E, Lavonas EJ, Jeejeebhoy FM, Gabrielli A. Part 12: cardiac arrest in special situations: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(suppl 3):S829–S861.
7. Walker DM. Update on epinephrine (adrenaline) for pediatric emergencies. *Curr Opin Pediatr*. 2009 Jun;21(3):313-9.
8. Simons FE, Lieberman PL, Read EJ Jr, Edwards ES. Simons FE, Lieberman PL, Read EJ Jr, Edwards ES. Hazards of unintentional injection of epinephrine from autoinjectors: a systematic review. *Ann Allergy Asthma Immunol*. 2009 Apr;102(4):282-7.
9. Myers JB, Slovis CM, Eckstein M, Goodloe JM, Isaacs SM, Loflin JR, Mechem CC, Richmond NJ, Pepe PE; U.S. Metropolitan Municipalities' EMS Medical Directors. Evidence-based performance measures for emergency medical services systems: a model for expanded EMS benchmarking. *Prehosp Emerg Care*. 2008 Apr-Jun;12(2):141-51.
10. Markenson D, Foltin G, Tunik M, Cooper A, Treiber M, Caravaglia K. Albuterol sulfate administration by EMT-basics: results of a demonstration project. *Prehosp Emerg Care*. 2004 Jan-Mar;8(1):34-40.



**STATE OF OKLAHOMA**  
**2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

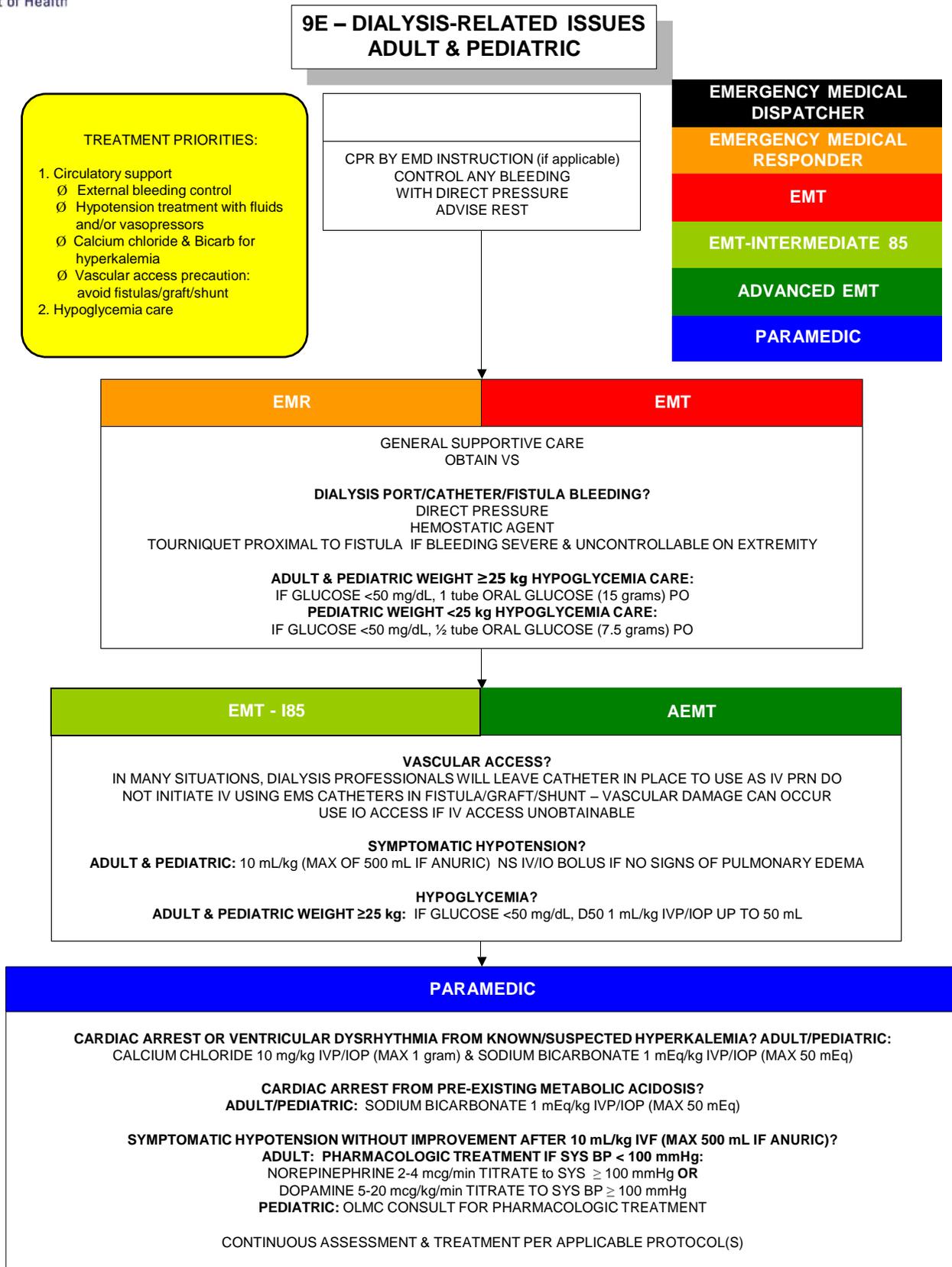
Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

Medical Literature References  
9B – Fever - Adult & Pediatric

1. Ferguson-Myrthil N. Vasopressor use in adult patients. *Cardiol Rev.* 2012 May;20(3):153-8.
2. Vasu TS, Cavallazzi R, Hirani A, Kaplan G, Leiby B, Marik PE. Norepinephrine or dopamine for septic shock: systematic review of randomized clinical trials. *J Intensive Care Med.* 2012 May;27(3):172-8.
3. De Backer D, Aldecoa C, Njimi H, Vincent JL. Dopamine versus norepinephrine in the treatment of septic shock: a meta-analysis. *Crit Care Med.* 2012 Mar;40(3):725-30.
4. Suffoletto B, Frisch A, Prabhu A, Kristan J, Guyette FX, Callaway CW. Prediction of serious infection during prehospital emergency care. *Prehosp Emerg Care.* 2011 Jul-Sep;15(3):325-30.
5. De Backer D, Biston P, Devriendt J, Madl C, Chochrad D, Aldecoa C, Brasseur A, Defrance P, Gottignies P, Vincent JL, SOAP II Investigators. Comparison of dopamine and norepinephrine in the treatment of shock. *N Engl J Med.* 2010 Mar 4;362(9):779-89.
6. De Backer D, Biston P, Devriendt J, Madl C, Chochrad D, Aldecoa C, Brasseur A, Defrance P, Cottignies P, Vincent J for the SOAP II Investigators. Comparison of dopamine and norepinephrine in the treatment of shock. *NEJM.* 2010;362:779-89.
7. Robson W, Nutbeam T, Daniels R. Sepsis: a need for prehospital intervention? *Emerg Med J.* 2009 Jul;26(7):535-8.

# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.



**STATE OF OKLAHOMA**  
**2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Medical Literature References  
9E – Dialysis-Related Issues - Adult & Pediatric

1. Protocol expert consultant: Sunil Agrawal, MD. Nephrology Specialists of Oklahoma, Tulsa. Board certified in nephrology and internal medicine by the American Board of Internal Medicine.
2. Lin CH, Tu YF, Chiang WC, Wu SY, Chang YH, Chi CH. Electrolyte abnormalities and laboratory findings in patients with out-of-hospital cardiac arrest who have kidney disease. *Am J Emerg Med.* 2013 Mar;31(3):487-93
3. De Backer D, Biston P, Devriendt J, Madl C, Chochrad D, Aldecoa C, Brasseur A, Defrance P, Cottignies P, Vincent J for the SOAP II Investigators. Comparison of dopamine and norepinephrine in the treatment of shock. *NEJM.* 2010;362:779-89.
4. Davis TR, Young BA, Eisenberg MS, Rea TD, Copass MK, Cobb LA. Outcome of cardiac arrests attended by emergency medical services staff at community outpatient dialysis centers. *Kidney Int.* 2008 Apr;73(8):933-9.
5. Venkat A, Kaufmann KR, Venkat K. Care of the end-stage renal disease patient on dialysis in the ED. *Am J Emerg Med.* 2006 Nov;24(7):847-58.
6. Lafrance JP, Nolin L, Sénécal L, Leblanc M. Predictors and outcome of cardiopulmonary resuscitation (CPR) calls in a large haemodialysis unit over a seven-year period. *Nephrol Dial Transplant.* 2006 Apr;21(4):1006-12.
7. Wald DA. ECG manifestations of selected metabolic and endocrine disorders. *Emerg Med Clin North Am.* 2006 Feb;24(1):145-57, vii.
8. Loran MJ, McErlean M, Eisele G, Raccio-Robak N, Verdile VP. The emergency department care of hemodialysis patients. *Clin Nephrol.* 2002 Jun;57(6):439-43.

**9I - VASCULAR ACCESS - INTRAOSSEOUS  
ADULT & PEDIATRIC**

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Indications:

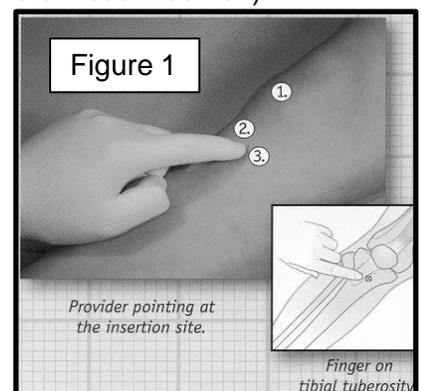
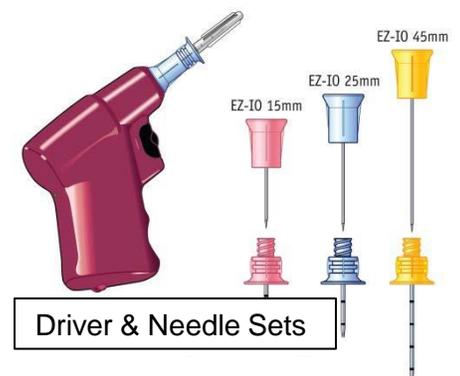
1. First-choice access in cardio/pulmonary arrest (unless IV access can be achieved as timely).
2. Second-choice access in dynamic, life-threatening shock or respiratory failure (if IV access cannot be achieved in clinically needed time).

Contraindications:

1. Inability to locate anatomical landmarks (blind insertion contraindicated).
2. Suspected cellulitis at insertion site.
3. Suspected acute or non-healed fracture proximal to foot in same leg (proximal tibial insertion) or proximal to forearm in same arm (humeral head insertion).
4. Suspected total knee arthroplasty/replacement (proximal tibial insertion).
5. Suspected markedly poor circulation extremity (history of amputation, gangrene, bypass).

Technique (Vidacare® EZ-IO® System – see protocol Special Note):

- A. Assemble following materials:
  1. Driver with Needle Set based on patient size and weight:
    - 15mm 3-39 kg (PINK);
    - 25mm 40 kg and greater (BLUE);
    - 45mm 40 kg and greater (excessive tissue) (YELLOW).
  2. EZ-Connect® 90 degree connection set.
  3. Alcohol wipe (or Chloraprep® or equivalent if available).
  4. Saline flush syringe.
  5. 1 mg/kg Lidocaine (up to 40mg) for intraosseous push if patient responsive.
  6. Pressure infuser.
  7. EZ-IO® Stabilizer (optional if proximal tibia insertion; required if humeral head insertion).
- B. Locate insertion site:
  1. Proximal tibia site (Figure 1).
  2. Palpate patella (1). Palpate tibial tuberosity (2) approximately two fingers widths below patella in adults and adolescents, or one finger width below patella in smaller pediatrics. Insertion (3) at one finger width medial to tibial tuberosity in the tibial plateau.



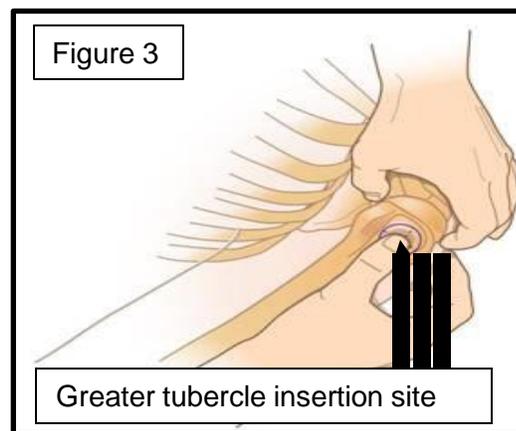
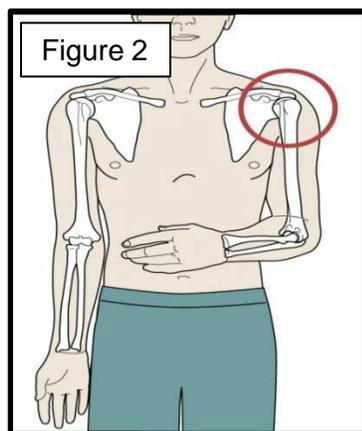
**PROTOCOL 9I: Vascular Access - Intraosseous, Adult & Pediatric, cont.**

**B. Locate insertion site (cont.)**

2. Humeral head site. Extra precision should be taken when utilizing this site. The anatomy proves more difficult to locate, the insertion area is smaller, and the IO needle is more prone to dislodgement due to a thinner bony cortex and higher likelihood of inadvertent EMS provider contact with the IO line.

Position arm in 90 degree flexion, with elbow kept to side of trunk (Figure 2). This position helps to gain maximal “exposure” of the humeral head.

Palpate and identify the mid-shaft humerus and continue palpating with a thumb proximal toward the humeral head. Near the shoulder, note a small protrusion. This is the base of the greater tubercle insertion site. With the opposite hand “pinching” the anterior and inferior aspects of the humeral head, confirm the identification of the greater tubercle in the midline of the humerus. (Figure 3).

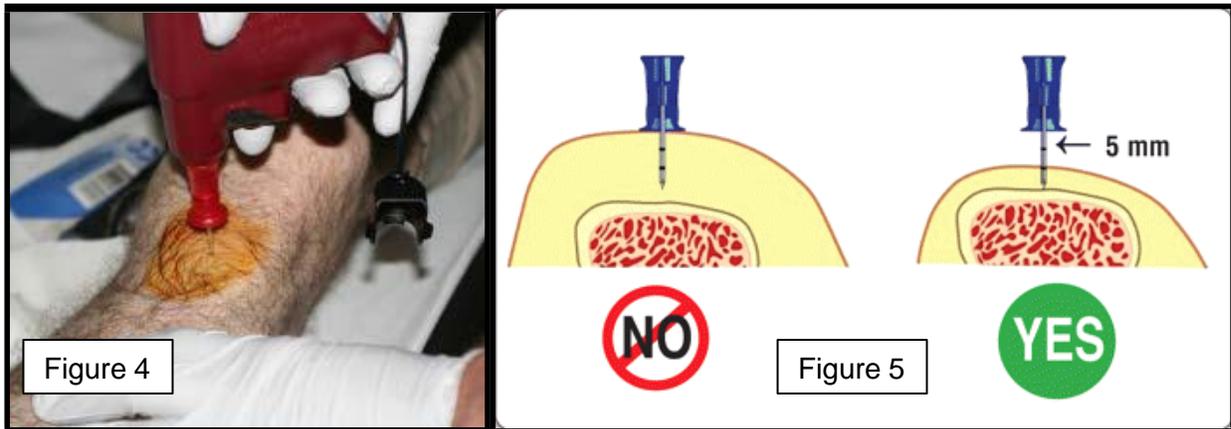


**C. Clean insertion site with alcohol wipe, or preferably with Chloraprep® or equivalent swab.**

**D. Access the intraosseous space.**

1. Stabilize anatomy near the insertion site with non-dominant hand.
2. Position driver at insertion site with needle at 90 degree angle to the surface of the bone. Use driver to insert needle through the skin at the insertion site until you feel the needle tip encounter bone. Allow the driver to perform its function of progressively inserting the needle. Avoid strong, downward pressure on the needle and maintain constant driver drilling speed. (Figure 4 next page – proximal tibia insertion site depicted)
3. Once the bone cortex feels encountered, ensure use of proper sized needle by checking for visualization of at least one 5 mm mark line (solid black circumferential line on the needle). If at least one 5mm mark line is not visible, a longer needle will be required to achieve useable intraosseous access. (Figure 5 next page)

**PROTOCOL 9I: Vascular Access - Intraosseous, Adult & Pediatric, cont.**



4. Resume use of driver to insert a properly-sized needle through the bony cortex and into the bony marrow (evident with a sudden decrease in resistance to needle insertion), maintaining the 90 degree angle to the surface of the skin. Most typically, properly-sized needles will have their hub resting on the skin surface at the time the needle tip is correctly in the marrow space.
- E. While stabilizing the needle hub with a thumb and an index finger, disengage the driver from the needle in a gentle, upward motion.
- F. While still stabilizing the needle hub with a thumb and an index finger, remove the stylet by rotating it counterclockwise until disengaged.
- G. Do NOT attempt aspiration of blood or marrow via the catheter. Pulling marrow into the catheter may clog the catheter and prevent its use for needed fluid and/or medication administration. Do confirm proper EZ-IO<sup>®</sup> catheter placement using a combination of the following signs:
  - a. IO catheter rests at 90 degree angle and feels firmly in bone when grasping hub.
  - b. Blood-tinged marrow oozes spontaneously from hub (may often be absent, yet the catheter is still correctly placed).
  - c. Fluid and medication administration is possible without significant resistance and without extravasation.
- H. When using the proximal tibia insertion site, use of the EZ-Stabilizer<sup>®</sup> (Figure 6 – next page) is optional and its use is determined by the EMT-Intermediate's or EMT-Paramedic's judgment. When using the humeral head insertion site, use of the EZ-Stabilizer<sup>®</sup> is required to reduce the chances of inadvertent dislodgement (refer to earlier discussion of humeral head insertion site). If the EZ-Stabilizer<sup>®</sup> is used, it must be applied prior to connecting the 90 degree connector set to the catheter hub.

**PROTOCOL 9I: Vascular Access - Intraosseous, Adult & Pediatric, cont.**

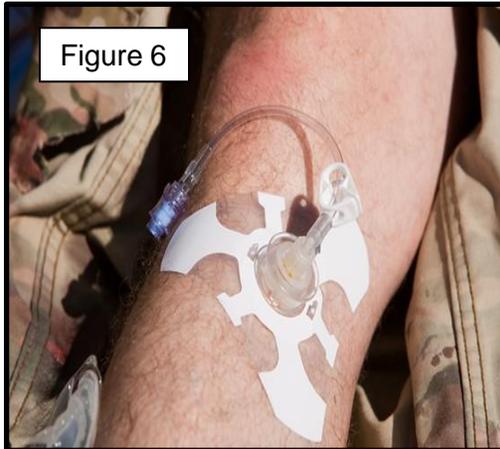


Figure 6

- I. The EZ-Connect<sup>®</sup> 90 degree connector set (also seen in Figure 6) is used to prevent excessive pressure on the catheter when infusing fluids or administering medications. Failure to use the 90 degree connector set can cause inadvertent dislodgement due to excessive pressure down the catheter. Flush the EZ-Connect<sup>®</sup> set with Normal Saline prior to attaching it to the catheter hub and then flush the line to flush the catheter with 10mL Normal Saline if patient unresponsive or Lidocaine 2% 1 mg/kg up to 40mg slow intraosseous push if the patient is responsive and clearly able to sense pain. If using Lidocaine as directed, follow with 10mL Normal Saline flush.
- J. Medication administration is given in the same dosing as with IV administrations.
- K. Fluid administration will require the use of a pressure infuser on the IV fluid bag. Due to the increased pressure of the marrow space, IV fluid will not infuse without assistance of the pressure infuser. Inflate pressure infuser until IV fluid is seen infusing with constant flow. Monitor for extravasation and monitor for need to reinflate pressure infuser. Fluid delivery rate may be as high as 1 liter per hour at tibial site and up to 5 liters per hour at humeral head site.
- L. In determining the site for IO access, consider knowledge of the anatomy, prior training and comfort in accessing that particular site, and how IO access at that site may or may not interfere with other care events (eg. use of the humeral head site for medication administration in cardiac arrest could disrupt the continuity of chest compressions).

Complications of intraosseous line placement attempts:

Through and through bone penetration – avoid by using correct needle and insertion technique.  
Extravasation – avoid by using correct needle and insertion technique. Monitor ongoing use and stop at early signs of extravasation. Fracture of bone – avoid by using correct insertion technique (avoid excessive pressure). Infection – avoid by using aseptic technique and do not insert through suspected cellulitis. Growth plate injury in pediatrics – avoid by choosing correct insertion site.

Special Note:

*This protocol utilizes the Vidacare<sup>®</sup> EZ-IO System<sup>®</sup> to illustrate one method of achieving intraosseous access. The Oklahoma State Department of Health and the University of Oklahoma Department of Emergency Medicine EMS Section do not exclusively endorse the Vidacare<sup>®</sup> EZ-IO System<sup>®</sup> for intraosseous access by EMS professionals. Check with your EMS system's medical oversight physician(s) for specific protocol directions on equipment to be used in establishing and maintaining intraosseous access if not using the Vidacare<sup>®</sup> EZ-IO System<sup>®</sup>.*

**STATE OF OKLAHOMA**  
**2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Medical Literature References

9I - Vascular Access – Intraosseous - Adult & Pediatric

1. Vidacare.com accessed on May 5-6, 2012.
2. Santos D, Carron PN, Yersin B, Pasquier M. EZ-IO(®) intraosseous device implementation in a pre-hospital emergency service: A prospective study and review of the literature. *Resuscitation*. 2013 Apr;84(4):440-5.
3. Wampler D, Schwartz D, Shumaker J, Bolleter S, Beckett R, Manifold C. Paramedics successfully perform humeral EZ-IO intraosseous access in adult out-of-hospital cardiac arrest patients. *Am J Emerg Med*. 2012 Sep;30(7):1095-9.
4. Tan BKK, Chong S, Koh ZX, Ong MEH. EZ-IO in the ED: an observational, prospective study comparing flow rates with proximal and distal tibia intraosseous access in adults. *Am J of Emerg Med*. 2012; doi:10.1016/j.ajem.2011.10.025.
5. Gazin N, Auger H, Jabre P et al. Efficacy and safety of the EZ-IO™ intraosseous device: Out-of-hospital implementation of a management algorithm for difficult vascular access. *Resuscitation* 2011;82(1):126-9.
6. Hoskins SL, Nascimento P Jr., Lima RM, Espana-Tenorio, JM, Kramer GC. Pharmacokinetics of intraosseous and central venous drug delivery during cardiopulmonary resuscitation. *Resuscitation* 2011;doi:10.1016/j.resuscitation.2011.07.041.
7. Reades R, Studneck J, Garrett J, Vandeventer S, Blackwell T. Comparison of first-attempt success between tibial and humeral intraosseous insertions during out-of-hospital cardiac arrest. *Prehosp Emerg Care*. 2011;15(2):278-81.
8. Reades R, Studnek JR, Vandeventer S, Garrett J. Intraosseous versus intravenous vascular access during out-of-hospital cardiac arrest: a randomized controlled trial. *Ann Emerg Med* 2011;doi:10.1016/j.annemergmed.2011.07.020.
9. Wampler D, Schwartz D, Shumaker J, Bolleter S, Beckett R, Manifold C. Paramedics successfully perform humeral EZ-IO intraosseous access in adult out-of-hospital cardiac arrest patients. *Am J of Emerg Med*. 2011; doi:10.1016/j.ajem.2011.07.010.
10. Weiser G, Hoffmann Y, Galbraith R, Shavit I. Current advances in intraosseous infusion - a systematic review. *Resuscitation*. 2011;doi:10.1016/j.resuscitation.2011.07.020.
11. Frascone RJ, Jensen J, Wewerka SS, Salzman JG. Use of the pediatric EZ-IO needle by emergency medical services providers. *Pediatr Emerg Care*. 2009; 25: 329-32.
12. Fowler R, Gallagher JV, Isaacs SM, Ossman E et al. The role of intraosseous vascular access in the out-of-hospital environment (resource document to NAEMSP position statement). *Prehosp Emerg Care*. 2007; 11: 63-6.

STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

100 – SPLINTING OF INJURIES  
ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

100a: Axial/Spine with Selective Spinal Motion Restriction – Adult & Pediatric:

Many patients evaluated by EMS professionals are placed in a cervical collar and onto a long spine backboard for movement and transport based as much upon “tradition” steeped in training that this practice was without risk and the benefit was without question. Like many medical practices scrutinized over time, evidence-based medicine reveals it is with risk (pain, tissue damage leading to pressure sores, and concerns about risks of aspiration and impaired breathing mechanics). Similarly, the benefit is not quite as certain. Few “real” injuries are so unstable that the process of spinal motion restriction as practiced in EMS is the difference- maker between paralysis and ambulation.

This protocol does not seek to avoid spinal motion restriction when clinically indicated. This protocol rather seeks to provide an evidence-based approach that directs the careful practice of spinal “stabilization” in situations where historical characteristics, exam findings, and/or patient interaction limitations make the benefits outweigh the risks. When the benefits do not outweigh the risks, patient should not incur clinically unnecessary collars and boards based upon tradition alone.

When applying spinal motion restriction, include the following:

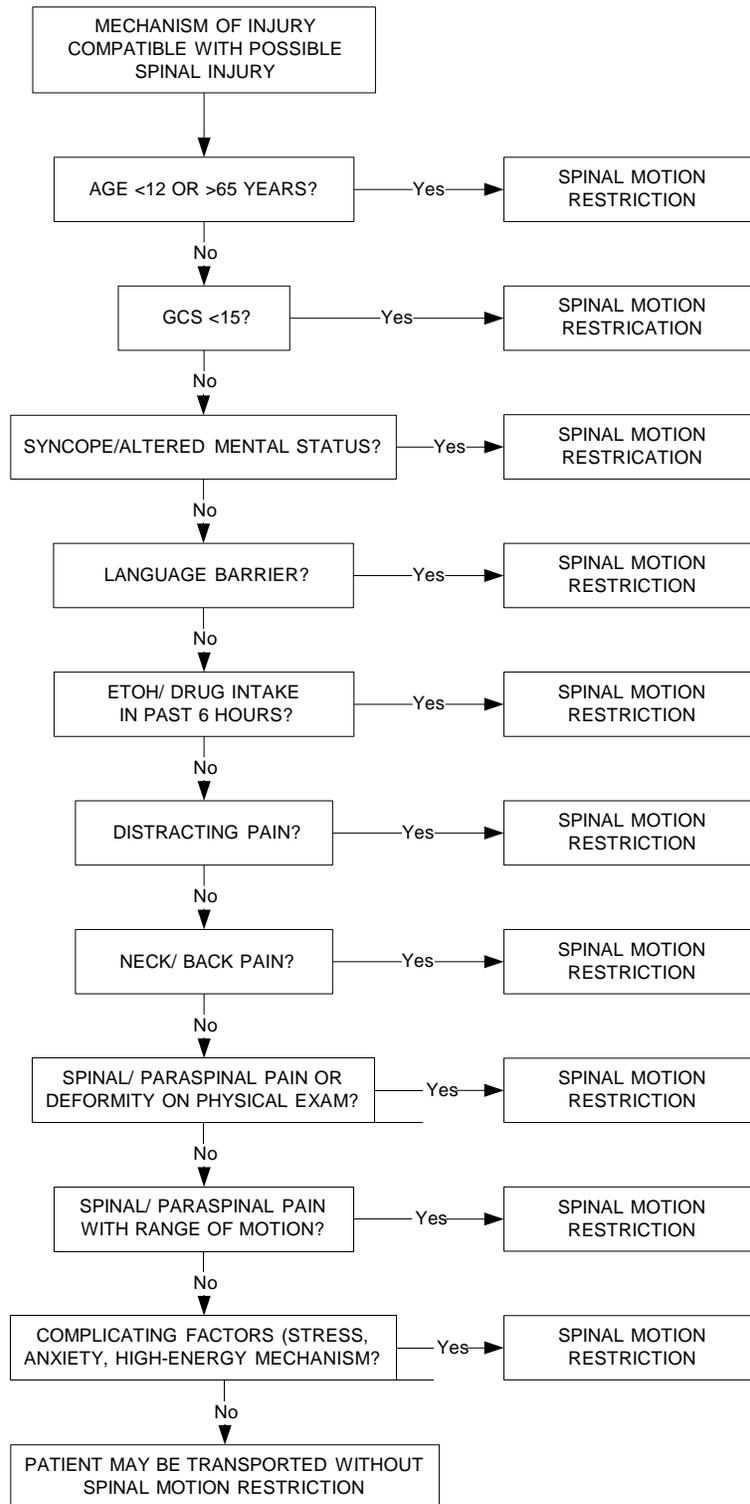
1. Avoid traction being placed on the spine in any direction.
2. Correctly size the cervical collar to additionally avoid traction being placed on the spine.
3. Maintain the spinal column integrity of alignment when rolling the patient onto a long back board, using a scoop stretcher, or placing/moving in any other spinal motion restriction device.
4. Secure the torso and extremities to the backboard first, the head/neck last.
5. Place appropriate straps and tape to achieve desired reduction in motion of spine.

Documentation of spinal motion restriction should include a neurologic assessment before and after the process, which includes the application of a cervical collar, movement onto a backboard/stretcher, and securing the torso/extremities, then the head/neck using a lateral motion reduction device (eg. “headblocks”) to the backboard/stretcher. In the seated patient that is hemodynamically stable and requiring spinal stabilization, use a spinal motion restriction device to help pivot and maneuver to a supine position on a long spine backboard.

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### PROTOCOL 100: Splinting of Injuries, cont. 100a - Axial/Spine with Selective Spinal Motion Restriction – Adult & Pediatric, cont.



STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**PROTOCOL 100: Splinting of Injuries, cont.**

**100a - Axial/Spine with Selective Spinal Motion Restriction – Adult & Pediatric, cont.**

Comments regarding the Selective Spinal Motion Restriction Process:

1. The process of EMS-performed selective spinal motion restriction constitutes a formal step-wise screening of individuals suffering from mechanisms of injury compatible with possible injury to the spine. This process, widely adopted in EMS systems across the United States, is designed from research-verified assessments, identifying individuals that may be safely transported to an emergency department, without spinal immobilization, for further appropriate physician evaluation. IT DOES NOT CONSTITUTE FORMAL “CLEARING” OF THE SPINE.
2. Patients at age extremes are prone to unreliable history and physical assessments. Patients under the age of 12 years or over the age of 65 years, if they have suffered a mechanism of injury compatible with possible spinal injury, are to be placed in spinal motion restriction.
3. The designation of a Glasgow Coma Scale score of 15 includes an assessment that no neurological deficits exist. If a patient is complaining of motor and/or sensory loss following a mechanism of injury compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.
4. At any point from sustaining an acute mechanism of injury compatible with possible spinal injury through EMS care, if the patient has a reported loss of consciousness or altered mental status, regardless of normal mental status upon EMS contact and assessment, that patient is to be placed in spinal motion restriction.
5. A language barrier exists if the EMS professional and the patient cannot fluently communicate. Fragmented communication (“broken” language) or the use of a family member or bystander to communicate with the patient does not constitute fluent communication. If the EMS professional has a language barrier with the patient following an injury involving a mechanism compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.
6. Regardless of apparent “soberness” on assessment, if a patient has ingested ethanol or mental-status altering drugs (e.g. narcotics, benzodiazepines, barbiturates, marijuana, cocaine) within six hours prior to a mechanism of injury compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.
7. Distracting pain or injury is best defined as an injury in which the patient is repetitively fixated upon to the extent the history and physical assessment is frequently interrupted to address that injury. The EMS professional must use his or her best judgment and anytime a concern exists that an injury may prove distracting to a patient with a mechanism of injury compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.

**PROTOCOL 100: Splinting of Injuries, cont.**

**100a - Axial/Spine with Selective Spinal Motion Restriction – Adult & Pediatric, cont.**

Comments regarding the Selective Spinal Motion Restriction Process, cont:

8. If a patient suffering a mechanism of injury compatible with possible spinal injury complains of pain in the spinal or paraspinal area anywhere from the base of the skull to the coccyx, that patient is to be placed in spinal motion restriction.
9. Victims of penetrating trauma (stabbings, gunshot wounds) to the head, neck, and/or torso SHOULD NOT receive spinal motion restriction unless there is one or more of the following:
  - Obvious neurologic deficit to the extremities
  - Significant secondary blunt mechanism of injury (eg. – fell down stairs after getting shot)
  - Priapism
  - Neurogenic shock
  - Anatomic deformity to the spine secondary to injury
10. In the physical examination of a patient suffering a mechanism of injury compatible with possible spinal injury, if the EMS professional discovers spinal or paraspinal pain or deformity upon palpation, that patient is to be placed in spinal motion restriction.
11. In the physical examination of a patient suffering a mechanism of injury compatible with possible spinal injury, if the patient complains of spinal or paraspinal pain with either flexion, extension, or lateral rotation of the neck or back, that patient is to be placed in spinal motion restriction.
12. If the EMS professional judges a complicating factor (e.g. patient stress or anxiety, the energy or nature of the mechanism of injury) to be present or significantly concerning, that patient is to be placed in spinal motion restriction. If any doubt exists in the view of the EMS professional as to whether to spinal motion restrict the patient, that patient is to be placed in spinal motion restriction.
13. An instance may occur when a patient has been deemed safe for transport without spinal motion restriction using this protocol and the patient subsequently develops neck or back pain in the ambulance during transport to an emergency department. The EMS professional must use his or her best judgment factoring the degree of pain verbalized and the remaining transport route and time in deciding when to spinal motion restrict the patient. As a guideline, if the remaining route involves unusually rough highway or will be prolonged beyond several minutes duration, the EMS crew should temporarily stop transportation and apply spinal motion restriction to the patient in the ambulance unless the patient's condition is otherwise unstable and requires continued emergency transport. As a guideline, if the arrival at the destination emergency department is imminent, the patient may be spinal motion restrict upon hospital arrival, using emergency department-based colleagues as available. In each instance, the EMS professional should inform the receiving nurse or physician of the events and timing of spinal motion restriction and appropriately reflect the events in the patient care report.

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

14. Any utilization of the selective spinal motion restriction protocol should be clearly documented in the patient care report, with each requirement in this process denoted.
15. An instance may occur when a patient that is to be spinal motion restriction by this protocol absolutely refuses such immobilization. These are, indeed, difficult circumstances. If repeated attempts to secure the cooperation of the patient fail, guidance from OLMC should be sought. If such a patient is transported without spinal motion restriction by the direction of the OLMC, detailed documentation of the spinal motion restriction attempts, OLMC consultation and direction, and subsequent actions is to be contained in the patient care report.
16. For pediatric patients found in car seats and involved in motor vehicle collisions, use the following if spinal motion restriction indicated:
  - Infants restrained in a rear-facing car seat may be immobilized and extricated in the car seat if the immobilization is secure and his/her condition allows (no signs of respiratory distress or shock)
  - Children restrained in a car seat (with a high back) may be immobilized and extricated in the car seat; however, once removed from the vehicle, the child should be placed in spinal motion restriction.
  - Children restrained in a booster seat (without a back) need to be extricated and immobilized following standard spinal motion restriction procedures.

### **PROTOCOL 100: Splinting of Injuries, cont.**

#### **100b – Extremity – Adult & Pediatric:**

When applying extremity splinting, include the following:

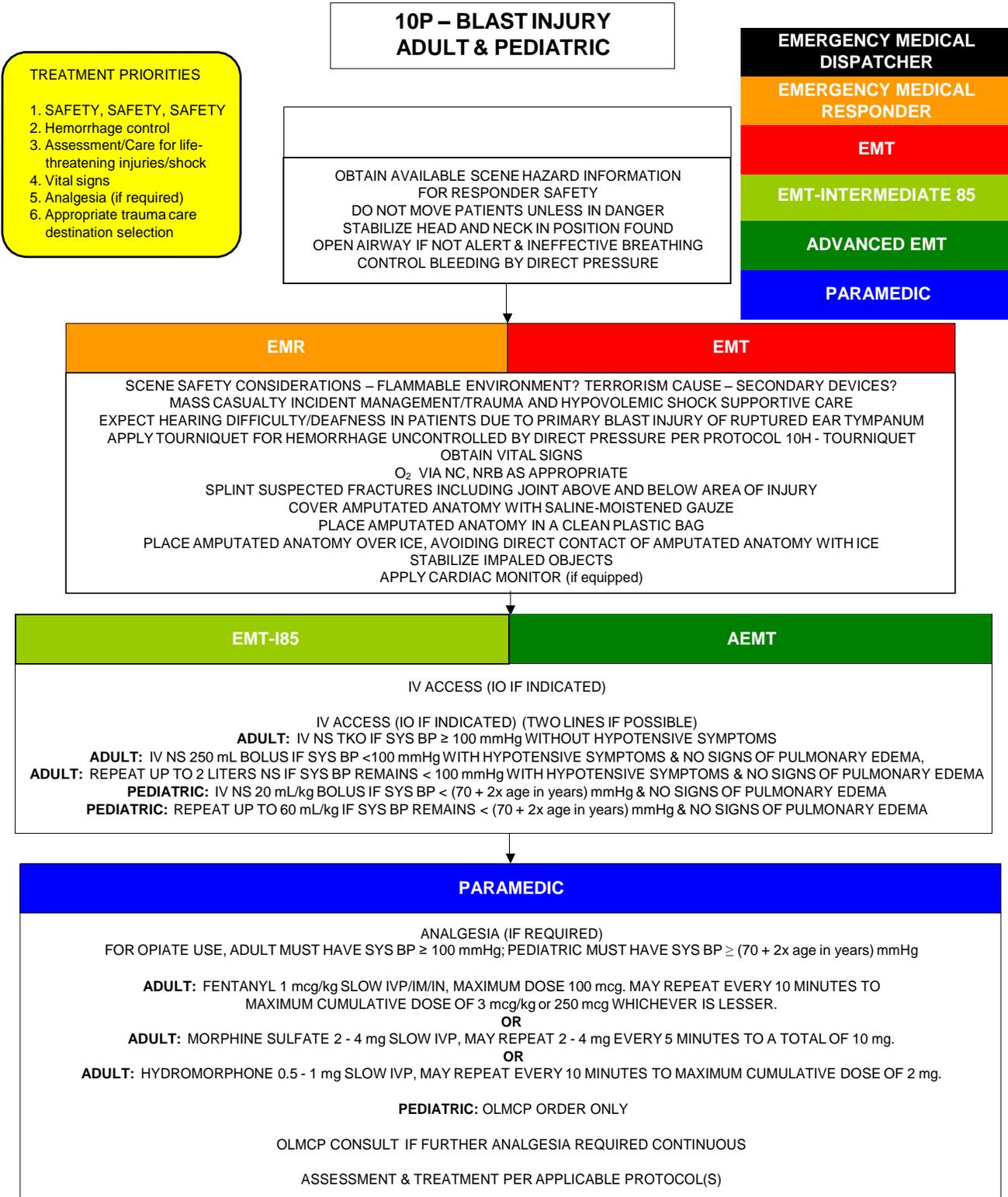
1. Assess and document the assessment of distal vascular (pulse) and nerve (motor/sensation) function, before and after splinting.
2. In general, immobilize the joint on either side of the suspected fracture area.
3. Pad splints whenever possible to avoid tissue pressure from splints.
4. In the setting of that an extremity is pulseless distal to a markedly angulated fracture, make one gentle attempt to place the angulated extremity in near-normal alignment. Document the distal vascular and nerve function before and after any such maneuver.
5. Prioritize timely transport to an appropriate emergency department for extremity injuries with pulselessness distal to the suspected fracture/injury.

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### Medical Literature References 100 – Splinting of Injuries– Adult & Pediatric

1. National Association of EMS Physicians and American College of Surgeons Committee on Trauma. Position Statement: EMS spinal precautions and the use of the long backboard. *Prehosp Emerg Care*. 2013 Jul-Sep;17(3):392-3.
2. Kim EG, Brown KM, Leonard JC, Jaffe DM, Olsen CS, Kuppermann AN; C-Spine Study Group of the Pediatric Emergency Care Applied Research Network (PECARN). Variability of prehospital spinal immobilization in children at risk for cervical spine injury. *Pediatr Emerg Care*. 2013 Apr;29(4):413-8.
3. Stuke LE, Pons PT, Guy JS, Chapleau WP, Butler FK, McSwain NE. Prehospital spine immobilization for penetrating trauma--review and recommendations from the Prehospital Trauma Life Support Executive Committee. *J Trauma*. 2011 Sep;71(3):763-9; discussion 769-70.
4. Horodyski M, Conrad BP, Del Rossi G, DiPaola CP, Rehtine GR 2nd. Removing a patient from the spine board: is the lift and slide safer than the log roll? *J Trauma*. 2011 May;70(5):1282-5; discussion 1285.
5. Lador R, Ben-Galim P, Hipp JA. Motion within the unstable cervical spine during patient maneuvering: the neck pivot-shift phenomenon. *J Trauma*. 2011 Jan;70(1):247-50; discussion 250-1.
6. Del Rossi G, Rehtine GR, Conrad BP, Horodyski M. Are scoop stretchers suitable for use on spine-injured patients? *Am J Emerg Med*. 2010 Sep;28(7):751-6.
7. Ben-Galim P, Dreiangel N, Mattox KL, Reitman CA, Kalantar SB, Hipp JA. Extrication collars can result in abnormal separation between vertebrae in the presence of a dissociative injury. *J Trauma*. 2010 Aug;69(2):447-50.
8. Haut ER, Kalish BT, Efron DT, Haider AH, Stevens KA, Kieninger AN, Cornwell EE 3rd, Chang DC. Spine immobilization in penetrating trauma: more harm than good? *J Trauma*. 2010 Jan;68(1):115-20; discussion 120-1.
9. Burton JH, Dunn MG, Harmon NR, Hermanson TA, Bradshaw JR. A statewide, prehospital emergency medical service selective patient spine immobilization protocol. *J Trauma*. 2006 Jul;61(1):161-7.
10. Burton JH, Harmon NR, Dunn MG, Bradshaw JR. EMS provider findings and interventions with a statewide EMS spine-assessment protocol. *Prehosp Emerg Care*. 2005 Jul-Sep;9(3):303-9.
11. Del Rossi G, Horodyski M, Heffernan TP, Powers ME, Siders R, Brunt D, Rehtine GR. Spine-board transfer techniques and the unstable cervical spine. *Spine*. 2004 Apr 1;29(7):E134-8.
12. Stiell IG, Clement CM, McKnight RD, Brison R, Schull MJ, Rowe BH, Worthington JR, Eisenhauer MA, Cass D, Greenberg G, MacPhail I, Dreyer J, Lee JS, Bandiera G, Reardon M, Holroyd B, Lesiuk H, Wells GA. The Canadian C-spine rule versus the NEXUS low-risk criteria in patients with trauma. *N Engl J Med*. 2003 Dec 25;349(26):2510-8.
13. Domeier RM, Swor RA, Evans RW, Hancock JB, Fales W, Krohmer J, Frederiksen SM, Rivera-Rivera EJ, Schork MA. Multicenter prospective validation of prehospital clinical spinal clearance criteria. *J Trauma*. 2002 Oct;53(4):744-50.
14. Viccellio P, Simon H, Pressman BD, Shah MN, Mower WR, Hoffman JR; NEXUS Group. A prospective multicenter study of cervical spine injury in children. *Pediatrics*. 2001 Aug;108(2):E20.
15. Goldberg W, Mueller C, Panacek E, Tigges S, Hoffman JR, Mower WR; NEXUS Group. Distribution and patterns of blunt traumatic cervical spine injury. *Ann Emerg Med*. 2001 Jul;38(1):17-21.
16. Hauswald M, McNally T. Confusing extrication with immobilization: the inappropriate use of hard spine boards for interhospital transfers. *Air Med J*. 2000 Oct-Dec;19(4):126-7.
17. Perry SD, McLellan B, McLlroy WE, Maki BE, Schwartz M, Fernie GR. The efficacy of head immobilization techniques during simulated vehicle motion. *Spine*. 1999 Sep 1;24(17):1839-44.
18. McHugh TP, Taylor JP. Unnecessary out-of-hospital use of full spinal immobilization. *Acad Emerg Med*. 1998 Mar;5(3):278-80.
19. Chan D, Goldberg RM, Mason J, Chan L. Backboard versus mattress splint immobilization: a comparison of symptoms generated. *J Emerg Med*. 1996 May-Jun;14(3):293-8.





## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### Medical Literature References 10P – Blast Injury – Adult & Pediatric

1. Biddinger PD, Baggish A, Harrington L, d'Hemecourt P, Hooley J, Jones J, Kue R, Troyanos C, Dyer KS. Be prepared--the Boston Marathon and mass-casualty events. *NEJM*. 2013 May 23;368(21):1958-60.
2. Kapur GB, Pillow MT, Nemeth I. Prehospital care algorithm for blast injuries due to bombing incidents. *Prehosp Disaster Med*. 2010 Nov-Dec;25(6):595-600.
3. Cain JS. Lethal detonation: responding to scenes involving blast injuries. *JEMS*. 2010 Aug;35(8):64-68
4. Sambasivan CN, Schreiber MA. Emerging therapies in traumatic hemorrhage control. *Curr Opin Crit Care*. 2009 Dec;15(6):560-8.
5. Kragh JF Jr, Walters TJ, Baer DG, Fox CJ, Wade CE, Salinas J, Holcomb JB. Survival with emergency tourniquet use to stop bleeding in major limb trauma. *Ann Surg*. 2009 Jan;249(1):1-7.
6. Mabry R, McManus JG. Prehospital advances in the management of severe penetrating trauma. *Crit Care Med*. 2008 Jul;36(7 Suppl):S258-66.
7. Lerner EB, O'Connor RE, Schwartz R, Brinsfield K, Ashkenazi I, Degutis LC, Dionne JP, Hines S, Hunter S, O'Reilly G, Sattin RW. Blast-related injuries from terrorism: an international perspective. *Prehosp Emerg Care*. 2007 Apr-Jun;11(2):137-53.

15E - NERVE AGENTS

EMERGENCY MEDICAL DISPATCH
EMERGENCY MEDICAL RESPONDER
EMT-BASIC
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

## NERVE AGENT EXPOSURES

### Comments

1. Nerve agent exposure should be considered at multiple causality incidents in which patients are exhibiting the DUMBELS constellation of symptoms and signs. In particular, nerve agent exposure should be considered while responding to any reports of multiple casualties at a location of high occupancy (shopping malls, stadiums, etc), high visibility (crowds gathered for public speeches, protests, etc), or high political symbolism (places of worship, governmental offices, etc).
2. Immediate countermeasures to nerve agent exposure with developing DUMBELS symptoms and signs are administration of the DuoDote<sup>®</sup> auto-injectors, auto-injector-as indicated and evacuation from the exposure area for decontamination.
3. Any personnel exposed to a nerve agent and requiring treatment with the DuoDote<sup>®</sup> auto-injectors is restricted from providing patient care and should be promptly transported for emergency physician evaluation.
4. Atropine is utilized in nerve agent exposure treatment to dry secretions, reduce bronchospasm, and decrease gastrointestinal motility. If significant bronchorrhea continues after three DuoDote<sup>®</sup> auto-injectors have been administered in the adult patient, further atropine may be given by paramedic as follows until the bronchorrhea subsides:

Adult – 1 mg atropine IVP every 3-5 minutes

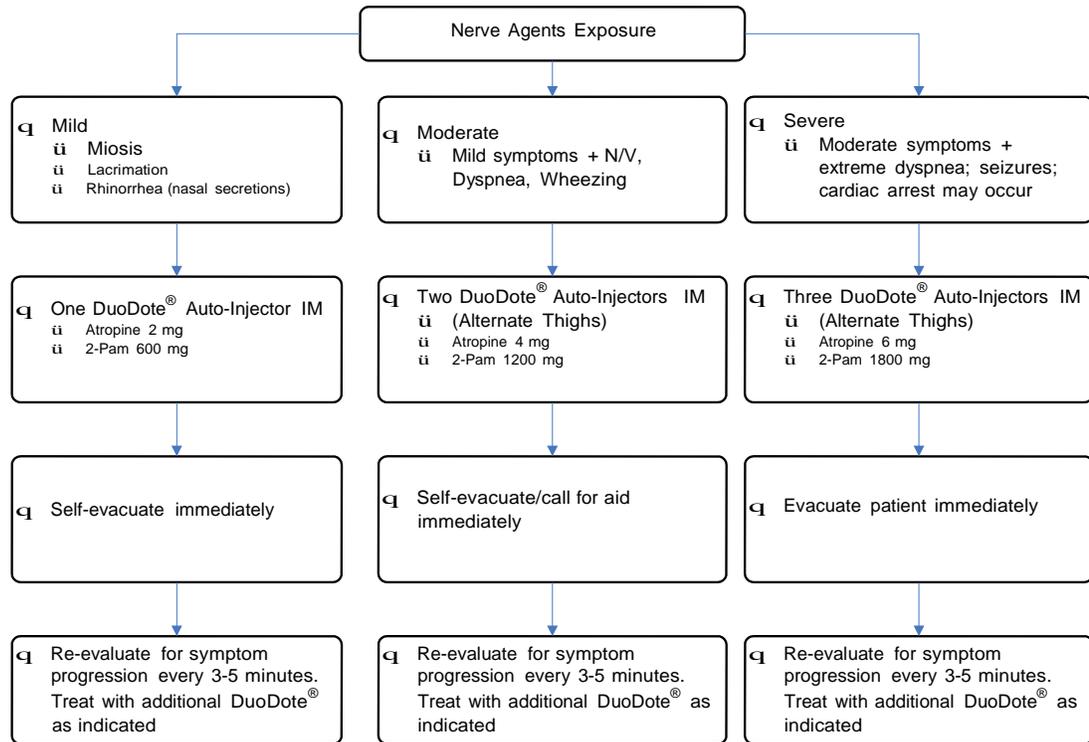
Adult – 2 mg atropine IM every 5 minutes

5. In the case of nerve agent exposure with bronchorrhea, there is no maximum atropine dosing in the adult patient, though atropine should be withheld in the case of developing ventricular tachydysrhythmias. In this case, treat the ventricular tachydysrhythmia according to 5G Tachycardia – Unstable – Adult & Pediatric or 4G Ventricular Fibrillation/Pulseless Ventricular Tachycardia – Adult & Pediatric as applicable.

**PROTOCOL 15E: Nerve Agents, cont.**

6. DuoDote<sup>®</sup> is utilized in nerve agent exposure to reverse the nerve agent effect on acetylcholinesterase, the enzyme responsible for neurotransmitter regulation. Refer also to Protocol 16M for self/buddy care using DuoDote<sup>®</sup>.
7. Patients contaminated by vapor-only nerve agent exposures should be decontaminated by clothing removal (dry decon). Patients contaminated by liquid nerve agent exposures should be decontaminated by clothing removal and thoroughly washed with soap and water (wet decon).
8. In the absence of DUMBELS symptoms and signs, nerve agent exposure has not occurred. The DuoDote<sup>®</sup> auto-injectors are not authorized for patients not exhibiting DUMBELS symptoms and signs.
9. Pediatric patients (<25 kg) with DUMBELS symptoms and signs in the setting of suspected nerve agent exposures should be treated with one DuoDote<sup>®</sup> auto-injector kit and OLMCP should be contacted for further direction in relation to any further atropine and/or 2-PAM usage.
10. Patients treated with DuoDote<sup>®</sup> auto-injector kits should either have the auto-injector hooked to their clothing or a prominent vertical mark on their forehead for each kit administered to indicate to further healthcare providers the number of DuoDote<sup>®</sup> auto-injector kits the patient has received.

**PROTOCOL 15E: Nerve Agents, cont.**



**LOOK FOR “DUMBELS” SIGNS AND SYMPTOMS**

- D: DIARRHEA
- U: URINATION
- M: MIOSIS (PINPOINT PUPILS)
- B: BRONCHOSPASM, BRONCHORRHEA (COPIOUS RESPIRATORY SECRETIONS)
- E: EMESIS (NAUSEA/VOMITING)
- L: LACRIMATION (TEARING)
- S: SALIVATION

Additional resources regarding nerve agents can primarily be accessed through the Centers for Disease Control at [www.bt.cdc.gov/agent/nerve](http://www.bt.cdc.gov/agent/nerve).

National Disaster Life Support training also includes nerve agent education in:  
 Basic Disaster Life Support (one day classroom course)  
 Advanced Disaster Life Support (two day classroom/practical exercise course)  
 Courses are available statewide through OU Department of Emergency Medicine  
[www.oudem.org/oklahoma-disaster-institute/national-disaster-life-support.cfm](http://www.oudem.org/oklahoma-disaster-institute/national-disaster-life-support.cfm)

16A – ACTIVATED CHARCOAL

EMT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

**Class:** Adsorbant

**Actions/Pharmacodynamics:** Activated charcoal is a liquid suspension that adsorbs many drugs and chemicals. It acts by binding / adsorbing toxic substances, thereby inhibiting their GI absorption, uptake into the liver, and thus, their presence in the bloodstream for action, also called "bioavailability". Activated charcoal has a tremendous surface area, allowing for a large amount of adsorption. The combined complex formed by the adsorption process is excreted from the body in the feces. It is a general purpose emergency treatment of poisoning by most drugs and chemicals, e.g., acetaminophen, aspirin, atropine, barbiturates, digitalis, glycosides, phenytoin, propoxyphene, strychnine, and tricyclic antidepressants, among many others.

**Indications:** Poisonings - General Management (8A)

**Contraindications:** Activated charcoal is contraindicated for treatment of poisoning by cyanide, mineral acids, caustic alkalis, organic solvents, iron, ethanol, and methanol. Activated charcoal may not be administered in patients with current or suspected imminent altered mental status, dysphagia, or vomiting to prevent elevated risk of aspiration of charcoal.

**Pharmacokinetics:** Nonabsorbed; onset immediate; peak, duration, and half – life: unknown.

**Side Effects:** GI: vomiting following rapid ingestion of high doses, abdominal cramping, abdominal bloating, constipation (diarrhea from sorbitol additive).

**Dosage:** **Poisonings - General Management - Adult & Pediatric (8A)**  
1 gram/kg PO (OLMC or OK Poison Center order required; Consult for order only if transport time estimated to exceed 30 mins)

**How Supplied:** 25 grams of activated charcoal in aqueous suspension in bottle.  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Activated charcoal, while historically often administered in the setting of ingested poisonings, is no longer utilized with frequency. The American Board of Medical Toxicology does not recommend administering activated charcoal to all suspected ingested poisonings. The purpose of OLMC or OK Poison Center order requirement is to prevent unnecessary use of activated charcoal and the side effects its use can create - especially vomiting and aspiration.

**16B – ADENOSINE (ADENOCARD®)**

**PARAMEDIC**

**Class:** Anti-Tachydysrhythmic (Purine Nucleoside)

**Actions/Pharmacodynamics:** Slows electrical conduction through the cardiac atrioventricular (AV) node, with ability to interrupt reentry pathways through the AV and sinoatrial (SA) nodes. Adenosine is administered to convert paroxysmal supraventricular tachycardia (PSVT) to normal sinus rhythm.

**Indications:** Tachycardia - Stable (5F)  
PSVT (sustained regular, narrow-complex tachycardia >150 bpm in adults) & systolic BP  $\geq$  100mmHg, failed valsalva maneuver.

**Contraindications:** 2<sup>nd</sup>/3<sup>rd</sup> degree AV Blocks (may induce asystole)  
Known Wolff-Parkinson-White Syndrome (may increase heart rate)  
Known Sick Sinus Syndrome (may induce asystole)  
Bradycardia (may induce symptomatic hypotension)

**Pharmacokinetics:** Onset of action within 10-20 seconds after IV administration. Very rapid metabolism (and duration of effect) within 10-20 seconds after IV administration.

**Side Effects:** Common, though transient, symptoms include chest pain, palpitations of irregular bradycardia, dyspnea, lightheadedness, numbness, and sweating. A constellation of these side effects may produce significant patient apprehension and/or sense of impending doom. The patient should be advised of these possibilities prior to adenosine administration and given reassurance such symptoms will be short-lived in duration of seconds. Transient asystolic or profound, irregular bradycardic rhythms may be observed on ECG monitoring.

**Dosage:** Tachycardia - Stable - Adult (5F) (PSVT as described above)  
12 mg rapid IVP (1 – 2 seconds) followed rapidly by 10 mL saline flush.  
May repeat once at 12 mg.

**\*\*OLMC Order Only for use in pediatric patients.**

**OLMC may direct use of adenosine in evaluating etiology of regular, monomorphic wide complex tachycardia.**

**How Supplied:** 12 mg/4 mL in prefilled syringe.  
(Always check concentration and dose per container at time of patient medication administration)

16C – ALBUTEROL (PROVENTIL<sup>®</sup>, VENTOLIN<sup>®</sup>)

EMERGENCY MEDICAL DISPATCHER	Self-Administration Phone Directive - 3B 3C 3D 12B
EMERGENCY MEDICAL RESPONDER	Assist Pt with Self Administration - 3B 3C 3D 12B
EMT	
EMT-INTERMEDIATE 85	
ADVANCED EMT	
PARAMEDIC	

**Class:** Sympathomimetic Bronchodilator

**Actions/Pharmacodynamics:** Albuterol is a relatively selective beta<sub>2</sub> adrenergic stimulant. Albuterol causes relaxation of the smooth muscles of the bronchial tree thus decreasing airway resistance, facilitating mucus drainage, and increasing vital capacity. It exerts mild effects on beta<sub>1</sub> (heart) or alpha (peripheral vasculature) receptors. In therapeutic doses, albuterol, by inhibiting histamine release from mast cells, also reduces the mucus secretion, capillary leaking, and mucosal edema caused by an allergic response in the lungs.

**Indications:** Dyspnea - Uncertain Etiology (3B)  
Dyspnea - Asthma (3C)  
Dyspnea - Chronic Obstructive Pulmonary Disease (3D)  
Acute Allergic Reactions (8D)  
Bee/Wasp Stings (8F)  
Smoke Inhalation (12B)

**Contraindications:** Known hypersensitivity to albuterol. Albuterol should not be used if the sole etiology of dyspnea is strongly suspected to be CHF, as albuterol-induced tachycardia may worsen the compromised cardiac output in CHF.

**Pharmacokinetics:** Onset within 5 – 15 minutes; peak effect in 1 – 1.5 hours; duration of effect is up to 3 – 6 hours; half – life is less than 3 hours. Distribution: When inhaled, albuterol is distributed to muscle cells along the bronchial tree. Very little is systemically absorbed and distributed.

**Side Effects:** Tremors, anxiety, dizziness, headache, cough, reflex bronchospasm, palpitations, tachycardia, and hypertension.



Oklahoma State  
Department of Health

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### **PROTOCOL 16C: Albuterol (Proventil<sup>®</sup>, Ventolin<sup>®</sup>)**

- Dosage:**
- Dyspnea - Uncertain Etiology - Adult & Pediatric Weight  $\geq$  15kg (3B)**  
**Smoke Inhalation - Adult & Pediatric Weight  $\geq$  15kg (12B)**  
5 mg nebulized, may repeat once
  
  - Dyspnea - Uncertain Etiology - Pediatric Weight < 15kg (3B)**  
**Smoke Inhalation - Pediatric Weight < 15kg (12B)**  
2.5 mg nebulized, may repeat once
  
  - Dyspnea - Asthma - Adult & Pediatric Weight  $\geq$  15kg (3C)**  
**Dyspnea - Chronic Obstructive Pulmonary Disease - Adult (3D)**  
**Acute Allergic Reactions - Adult & Pediatric Weight  $\geq$  15kg (8D)**  
**Bee/Wasp Stings - Adult & Pediatric Weight  $\geq$  15kg (8F)**  
5 mg nebulized (with ipratropium bromide 0.5 mg), may repeat twice
  
  - Dyspnea - Asthma - Pediatric Weight < 15kg (3C)**  
**Acute Allergic Reactions - Pediatric Weight < 15kg (8D)**  
**Bee/Wasp Stings - Pediatric Weight < 15kg (8F)**  
2.5 mg nebulized (with ipratropium bromide 0.25 mg), may repeat twice
- How Supplied:** 2.5 mg/3 mL (0.083%) in nebulizer vials.  
(Always check concentration and dose per container at time of patient medication administration)

**16D – AMIODARONE (CORDARONE®, NEXTERONE®)**

**PARAMEDIC**

**Class:** Class III Anti-Dysrhythmic (Vaughn William Classification)

**Actions/Pharmacodynamics:** Prolongs the cardiac action potential's refractory period, slowing conduction through the heart. Amiodarone also has secondary actions in the other three classifications of anti-dysrhythmics. Amiodarone blocks sodium channels (class I) which can prevent cardiac action potentials. It is a non-competitive anti-sympathetic (class II) which slows cardiac action potentials. Amiodarone also slows conduction through the cardiac atrioventricular (AV) node (class IV). In sum, all of these actions lead to slowing of conduction and prolongation of refractoriness in the cardiac conduction system.

**Indications:** Ventricular Fibrillation/Pulseless Ventricular Tachycardia (4G)  
Tachycardia - Stable (5F)  
    Wide-Complex Tachycardia of Uncertain Type or  
        Monomorphic Ventricular Tachycardia (if heart rate  $\geq$  150 beats per minute with systolic BP  $\geq$  100 mmHg in adults)  
    Narrow-Complex Tachycardia (if heart rate  $\geq$  150 beats per minute with systolic BP  $\geq$  100 mmHg in adults) **\*\*OLMC Order Only**  
Tachycardia - Unstable (5G)  
    Post-Cardioversion of Ventricular Tachycardia  
Premature Ventricular Contractions (5K)  
    Symptomatic Premature Ventricular Contractions (with BP  $<$  100mmHg in adults due to frequent non-conducted ventricular impulses and in absence of 2nd/3rd degree AV blocks)

**Contraindications:** 2nd/3rd degree AV blocks (may induce asystole)  
Bradycardia (may induce symptomatic hypotension)

**Pharmacokinetics:** Onset of action within 60 seconds after IV administration, with effects lasting up to 20-25 minutes.

**Side Effects:** Hypotension is the most common side effect, requiring treatment in less than 20% of patients (transient effect). Bradycardia and AV Block may also result, requiring treatment in less than 10% of patients (transient effect). In a very rare circumstance, as with all anti-dysrhythmics which can have pro-dysrhythmic effects, torsades may result from excessive prolongation of the cardiac action potential. When indicated by protocol, the benefits of amiodarone administration exceed these risks of side effects.



STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

**PROTOCOL 16D: Amiodarone (Cordarone<sup>®</sup>, Nexterone<sup>®</sup>), cont.**

**Dosage: Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)  
(refractory to initial defibrillation attempt)**

300 mg IVP/IOP. Repeat at 150 mg IVP/IOP in 5 minutes to maximum cumulative dose of 450 mg. Epinephrine 1 mg (1:10,000) IVP/IOP is to be given with every amiodarone administration.

**Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric (4G)  
(refractory to initial defibrillation attempts)**

5 mg/kg IVP/IOP in single dose. Epinephrine 0.01 mg/kg (1:10,000, 0.1 mL/kg) IVP/IOP is to be given with every amiodarone administration.

**Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)  
(post return of sustained spontaneous circulation)**

150 mg over 10 minutes (15 mg/minute or 0.3 mL/minute very slow IVP/IOP/IVPB) IF maximum cumulative dose of 450 mg has not been achieved.

**Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric (4G)  
(post return of sustained spontaneous circulation)**

**Tachycardia - Stable - Pediatric (5F)**

(wide-complex tachycardia of uncertain type or monomorphic ventricular tachycardia; narrow-complex tachycardia)

**Tachycardia - Unstable - Pediatric (5G)**

**Premature Ventricular Contractions - Pediatric (5K)**

**\*\*OLMC Consult & Order Only**

**Tachycardia - Stable - Adult (5F)**

(wide-complex tachycardia of uncertain type - standing order;  
monomorphic ventricular tachycardia - standing order;  
narrow complex - \*\*OLMC order only)

**Tachycardia - Unstable - Adult (5G)**

(post cardioversion of ventricular tachycardia)

**Premature Ventricular Contractions - Adult (5K)**

150 mg over 10 minutes (15 mg/minute or 0.3 mL/minute very slow IVP/IOP/IVPB).

**How Supplied:** 150 mg/3 mL in vial, ampule, or pre-filled syringe.  
150 mg/100 mL pre-mixed infusion.  
(Always check concentration and dose per container at time of patient medication administration)

16E – ASPIRIN

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Self-Administration Phone Directive - 5A 5C

Assist Pt with Self Administration - 5A 5C

**Class:** Anti-Platelet

**Actions/Pharmacodynamics:** Inhibits platelet aggregation (and thereby, further clot formation). This action results in an overall increase in survival from acute myocardial infarction.

**Indications:** Chest Pain - Uncertain Etiology (5A)  
Acute Coronary Syndrome (5C)

**Contraindications:** Active gastrointestinal bleeding  
History of aspirin allergy including angioedema and/or anaphylaxis  
History of asthma with aspirin-induced exacerbation

**Pharmacokinetics:** Absorption in stomach and small intestine, with onset of action within 30 minutes and duration of action for several hours.

**Side Effects:** Typically none from single EMS dosing. Rare instances of nausea or allergic reaction could be encountered. Treat allergic reaction per Protocol 8D - Acute Allergic Reactions.

**Dosage:** **Chest Pain - Uncertain Etiology - Adult (5A)**  
**Acute Coronary Syndrome - Adult (5C)**  
324 OR 325 mg chewed by patient (hold if taken 324+mg within 6 hours)

**How Supplied:** 81 mg tablets  
325 mg tablets  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Aspirin is indicated even if the patient is taking warfarin sodium (Coumadin<sup>®</sup>), clopidogrel (Plavix<sup>®</sup>), or other anticoagulant or antiplatelet agents on a daily basis.

16F – ATROPINE SULFATE

PARAMEDIC

**Class:** Parasympatholytic

**Actions/Pharmacodynamics:** Blocks parasympathetic impulses to the heart via the vagus nerve. Atropine increases the rate of cardiac sinoatrial (SA) node discharges, enhances conduction through the atrioventricular (AV) node, and by increasing heart rate, increases the cardiac output and blood pressure. Additionally, in the treatment of indicated poisonings (organophosphates) atropine reverses muscarinic effects of acetylcholine, including diaphoresis, diarrhea, urination, bronchorrhea (secretions from the lower respiratory tract), emesis, lacrimation (tearing), and salivation. Atropine produces dilation of pupils by blocking stimulation of the ciliary muscle surrounding the pupils.

**Indications:** Bradycardia (5D)  
Poisonings – General Management (Organophosphate) (8A)

**Contraindications:** None absolute in indicated situations.

**Pharmacokinetics:** Typical onset within 60 seconds given IV. Effects can persist in excess of 1 hour.

**Side Effects:** Tachycardia (either supraventricular or ventricular), hypertension, palpitations, blurred vision due to pupillary dilation, photophobia, dry mouth.

**Adult organophosphate poisoning:** 2 mg IVP/IOP/IM. Use IVP for more severe presentations. May repeat as often as every 3-5 minutes if symptoms progressive or persistent.

**Dosage:** **Bradycardia – Symptomatic & Systolic BP < 100 mmHg  
(Sinus, First Degree, 2nd Degree Type I) - Adult (5D)**  
In Non-Acute Coronary Syndrome, 0.5 mg IVP/IOP.  
May repeat every 5 minutes to cumulative maximum dose of 3 mg

**Bradycardia - Symptomatic & Systolic BP < 70 + (2 x age in years) mmHg  
(Sinus, First Degree, 2nd Degree Type I) - Pediatric (5D)**  
Unresponsive to Epinephrine, 0.02 mg/kg IVP/IOP; minimum dose 0.1 mg  
Max. single dose 0.5 mg  
May repeat once.

**Poisonings – General Management (Organophosphate) – Adult (8A)**  
2 mg IVP/IOP/IM. Use IVP for more severe presentation.  
Repeat every 3-5 minutes if symptoms progressive.



**STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**PROTOCOL 16F: Atropine Sulfate, cont.**

**Dosage, cont:**

**Poisonings – General Management (Organophosphate) – Pediatric (8A)**

0.05 mg/kg IVP/IOP/IM. Use IVP for more severe presentation.

Minimum dose 0.1 mg.

Consult with OLMCP for repeat dosing needs.

**How Supplied:** 1 mg/10 mL prefilled syringe  
1 mg/1 mL vial  
0.25 mg/5 mL prefilled syringe for pediatric use  
(Always check concentration and dose per container at time of patient medication administration)

16G – CALCIUM CHLORIDE

PARAMEDIC

**Class:** Electrolyte

**Actions/Pharmacodynamics:** Calcium causes a significant increase in myocardial contractility and in ventricular automaticity. It is used as an antidote for some electrolyte imbalances (eg. stabilizing cardiac rhythm in the setting of hyperkalemia) and to minimize the side effects from calcium channel blocker overdose. The actions of calcium chloride are similar to those of calcium gluconate but, since it ionizes more readily, it is more potent than calcium gluconate.

**Indications:** Specific Causes of Cardiac Arrest (Hyperkalemia) (4I)  
Poisonings - General Management (Calcium Channel Blocker Overdose) (8A)  
Dialysis-Related Issues (Hyperkalemia) (9E)  
Crush Injury Syndrome (Hyperkalemia Prophylaxis) (10K)

**Contraindications:** Calcium chloride is contraindicated in ventricular fibrillation unless known hyperkalemia, in known hypercalcemia, and in suspected digitalis toxicity. It should be used with caution in patients taking digoxin as it may precipitate toxicity. Safe use in pregnancy and in children has not been established, though in indicated conditions, benefits outweigh risks.

**Pharmacokinetics:** Onset nearly immediate when given IVP/IOP. The peak effect time frame and duration of effect is not well established.

**Side Effects:** Paresthesias (tingling), syncope, sensations of heat waves (peripheral vasodilation), pain and burning at IV site, skin necrosis and sloughing (with extravasation), hypotension, bradycardia, cardiac dysrhythmias, cardiac arrest.

**Dosage:** **Specific Causes of Cardiac Arrest (Hyperkalemia) - Adult & Pediatric (4I)**  
**Poisonings - General Management (Calcium Channel Blocker Overdose) - Adult & Pediatric (8A)**  
**Dialysis-Related Issues (Hyperkalemia) - Adult & Pediatric (9E)**  
**Crush Injury Syndrome (Hyperkalemia Prophylaxis) - Adult & Pediatric (10K)**  
10 mg/kg (10% solution) IVP/IOP, maximum dose of 1 gram

**How Supplied:** 1 gram in a 10 mL prefilled syringe (100 mg/mL)  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comments:** Calcium chloride will interact with sodium bicarbonate and form a precipitate. Do not give both medications via the same vascular access line unless giving a copious flush of NS - approximately 50+ mL - between medications. In general, use an 18-20 gauge angiocatheter in a proximal IV site or use an IO line and test line patency before administration. In non-cardiac arrest or non-impending cardiac arrest settings, administer at 0.5 -1.0 mL per minute to reduce chances of venous irritation and extravasation.



# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

## 16H DEXTROSE (50% as D50 and 25% as D25)

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

**Class:** Carbohydrate

**Actions/Pharmacodynamics:** Dextrose is the principal form of glucose (sugar) used by the body to create energy and support critical metabolic processes. Since serious brain injury can occur in prolonged hypoglycemia, the timely administration of glucose is essential in treating hypoglycemia (blood glucose < 50 mg/dL). Dextrose 50% IV is the treatment of choice for hypoglycemic patients of adult age or of pediatric age with weight at or exceeding 25 kg. Dextrose 25% IV is the treatment of choice for hypoglycemic patients of pediatric age with weight less than 25 kg.

**Indications:** Respiratory Arrest (3A)  
Specific Cause of Cardiac Arrest (4I)  
Altered Mental Status (6B)  
Seizure (6D)  
Syncope (6E)  
Dystonic Reaction (6F)  
Behavioral Disorder (7A)  
Poisonings - General Management (8A)  
Dialysis -Related Issues (9E)  
Complications of Pregnancy (13D)  
For all listed situations, indication is hypoglycemia (blood glucose < 50 mg/dL).

**Contraindications:** Hyperglycemia (blood glucose > 100 mg/dL)  
Normoglycemia in the setting of suspected cerebral ischemia.

**Pharmacokinetics:** Onset with 60 seconds after IVP with peak effect and duration of action dependent upon degree and cause of hypoglycemia. Usually effective duration in excess of 30 minutes.

**Side Effects:** Warmth, pain, or burning at the injection site. D50 extravasation can cause tissue necrosis (requiring skin graft surgery), phlebitis, sclerosis, or thrombosis at the injection site.



**STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**PROTOCOL 16H: Dextrose (50% as D50 and 25% as D25)**

**Dosage:**

- Respiratory Arrest - Adult & Pediatric weight  $\geq$  25 kg (3A)**
- Specific Cause of Cardiac Arrest - Adult & Pediatric weight  $\geq$  25 kg (4I)**
- Altered Mental Status - Adult & Pediatric weight  $\geq$  25 kg (6B)**
- Seizure - Adult & Pediatric weight  $\geq$  25 kg (6D)**
- Syncope - Adult & Pediatric weight  $\geq$  25 kg (6E)**
- Dystonic Reaction - Adult & Pediatric weight  $\geq$  25 kg (6F)**
- Behavioral Disorder - Adult & Pediatric weight  $\geq$  25 kg (7A)**
- Poisonings - General Management - Adult & Pediatric weight  $\geq$  25 kg (8A)**
- Dialysis -Related Issues - Adult & Pediatric weight  $\geq$  25 kg (9E)**
- Complications of Pregnancy - Adult & Pediatric weight  $\geq$  25 kg (13D)**
- For hypoglycemia (blood glucose  $<$  50 mg/dL):**  
Dextrose 50% (D50) 1 mL/kg IVP up to 50 mL

- Respiratory Arrest - Pediatric weight  $<$  25 kg (3A)**
- Specific Cause of Cardiac Arrest - Pediatric weight  $<$  25 kg (4I)**
- Altered Mental Status - Pediatric weight  $<$  25 kg (6B)**
- Seizure - Pediatric weight  $<$  25 kg (6D)**
- Syncope - Pediatric weight  $<$  25 kg (6E)**
- Dystonic Reaction - Pediatric weight  $<$  25 kg (6F)**
- Behavioral Disorder - Pediatric weight  $<$  25 kg (7A)**
- Poisonings - General Management - Pediatric weight  $<$  25 kg (8A)**
- Dialysis -Related Issues - Pediatric weight  $<$  25 kg (9E)**
- For hypoglycemia (blood glucose  $<$  50 mg/dL)**  
Dextrose 25% (D25) 2 mL/kg IVP up to 50 mL

**How Supplied:** Prefilled syringes of D50 - 25 grams dextrose in 50 mL of water (0.5 gram/mL)  
Prefilled syringes of D25 - 2.5 grams dextrose in 10 mL of water (0.25 gram/mL)

**Special Comments:** D50 should be administered using an infusing IV, **NOT** a saline lock. The tissue caustic nature of D50 can be decreased by performing a slow and non-forceful IV push through the side port of an IV line that is flowing with normal saline into the patient's vein. Because of the risk of extravasation and the consequences of local tissue damage from extravasation, neither D50 nor D25 should be administered through an external jugular IV. High concentrations of dextrose can lead to cerebral edema in younger/smaller pediatric patients, requiring 1:1 dilution of D50 with normal saline to make D25 or using prefilled D25. A repeat determination of blood glucose level is to be performed post D50 or D25 administration.

**16I – DIAZEPAM (VALIUM®)**

**PARAMEDIC**

**Class:** Sedative; Anticonvulsant; Muscle Relaxant; Anxiolytic (Benzodiazepine)

**Actions/Pharmacodynamics:** Intermediate - acting benzodiazepine with central nervous system depressant, anticonvulsant, muscle relaxant, and anxiolytic effects. Like the other benzodiazepines, it has no effect on pain. Diazepam has considerably more muscle relaxant properties than midazolam, though no substantial amnestic effects as with midazolam.

**Indications:** Medication Assisted Intubation (2G)  
Post-intubation sedation - onset delay does not favor pre-intubation use  
Seizure (6D)  
(Midazolam preferred benzodiazepine due to faster onset of action)  
Dystonic Reactions (6F)  
Chemical Restraint (7C)  
(Midazolam preferred benzodiazepine due to faster onset of action)  
Poisonings - General Management (8A)  
Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis  
Head/Neck/Spine Injury (10A)  
Heat Illness (11A)

**Contraindications:** Patients with intolerance to benzodiazepines, acute narrow - angle glaucoma, shock, or coma. Caution with use in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

**Pharmacokinetics:** Onset is 3-5 minutes, IVP/IOP; 15-30 minutes IM with erratic absorption, mandating IM dosing only utilized as a last option in adults; peak effects in 15-45 minutes. Duration is 2+ hours IVP/IOP/IM; half – life can reach 20 – 50 hours.

**Side Effects:** Headache, euphoria, drowsiness, excessive sedation, confusion, dizziness, blurred vision, diplopia, nystagmus, respiratory arrest, hypotension, nausea, vomiting.

**Dosage:** **Medication Assisted Intubation (Post Intubation Sedation) - Adult (2G)**  
0.1 mg/kg to max 5 mg IVP/IOP, may repeat once if systolic BP > 100 mmHg

**Seizure - Adult (6D)**

**Head/Neck/Spine Injury - Adult (10A)**

**Heat Illness - Adult (11A)**

5 mg IVP/IOP or 10 mg IM for active seizure  
May repeat once in 5 minutes if still seizing.



**STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**PROTOCOL 16I: Diazepam (Valium®), cont.**

**Dosage, cont.:**

**Seizure - Pediatric (6D)**

**Head/Neck/Spine Injury - Pediatric (10A)**

**Heat Illness - Pediatric (11A)**

0.1 mg/kg to max 5 mg IVP/IOP/IM for active seizure

May repeat once in 5 minutes if still seizing.

**Dystonic Reactions - Adult (6F)**

5 mg IVP

**Dystonic Reactions - Pediatric (6F)**

0.1 mg/kg to max 5 mg IVP/IM

**Chemical Restraint - Adult (7C)**

5 mg IVP/IOP or 10 mg IM

**Chemical Restraint - Pediatric (7C)**

0.1 mg/kg to max 5 mg IVP/IOP/IM

**Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)**

2.5 mg - 5 mg IVP

**Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)**

**\*\*OLMC Order Only**

**How Supplied:** 10 mg/2 mL in vials, ampules, or pre-filled syringes.  
(Always check concentration and dose per container at time of patient medication administration)

16J – DILTIAZEM (CARDIZEM<sup>®</sup>)

PARAMEDIC

**Class:** Calcium Channel Blocker

**Actions/Pharmacodynamics:** Diltiazem is a slow calcium channel blocker with pharmacologic actions similar to those of verapamil. It inhibits calcium ion influx through slow channels into cells of myocardial and arterial smooth muscle (both coronary and peripheral blood vessels). As a result, intracellular calcium remains at sub-threshold levels insufficient to stimulate cell excitation and contraction. Diltiazem slows SA and AV node conduction (antidysrhythmic effect) without affecting normal atrial action potential or intraventricular conduction.

**Indications:** Tachycardia - Stable (5F)  
Sustained narrow-complex tachycardia > 150 bpm in adults  
with systolic BP  $\geq$  100 mmHg  
**\*\*OLMC Order Only**

**Contraindications:** Known hypersensitivity to diltiazem  
2nd/3rd degree AV Blocks (may induce asystole)  
Known Wolff-Parkinson-White Syndrome (may increase heart rate)  
Known Sick Sinus Syndrome (may induce asystole)  
Hypotension  
Bradycardia

Safe use in pregnancy and in children has not been established. Use with caution in CHF (especially if patient is also receiving a beta-blocker), conduction abnormalities, renal or hepatic impairment and the elderly due to exaggerated degree of effect.

**Pharmacokinetics:** Onset is 3 minutes; peak effect in 7 minutes; duration is 1-3 hours; half-life is 2 hours.

**Side Effects:** Headache, fatigue, dizziness, dysrhythmias, 2nd/3rd degree AV block, bradycardia, CHF, hypotension, syncope, palpitations.

**Dosage:** **Tachycardia - Stable - Adult (5F)**  
Sustained narrow-complex tachycardia > 150 bpm in adults  
with systolic BP  $\geq$  100mmHg  
**\*\*OLMC Order Only**  
Usual adult dose is 0.25 mg/kg slow IVP over 2 minutes

**How Supplied:** 25 mg in 5 mL vial (5 mg/mL)  
(Always check concentration and dose per container at time of patient medication administration)

**16K – DIPHENHYDRAMINE (BENADRYL<sup>®</sup>)**

**PARAMEDIC**

**Class:** Antihistamine, Anticholinergic

**Actions/Pharmacodynamics:** Diphenhydramine competes for H1 – histamine receptor sites on effector cells, thus blocking histamine release. Histamine release creates some of the common signs and symptoms of an allergic response: pruritis (itching), mucus secretion, and capillary leaking, which contributes to the formation of urticaria (hives), erythematous skin, and mucosal edema. In the setting of a dystonic reaction, the balance of dopamine and choline must be changed within the brain. The most clinically feasible method of reversing a dystonic reaction, though inhibiting the enzyme acetylcholinesterase, is through the anti-cholinergic effect of a medication like diphenhydramine.

**Indications:** Dystonic Reactions (6F)  
Acute Allergic Reactions (8D)  
Bee/Wasp Stings (8F)

**Contraindications:** Known hypersensitivity to diphenhydramine. While rare, allergic reaction to diphenhydramine is possible and should be considered valid if stated or documented in a patient's medical history.

**Pharmacokinetics:** Onset within 15 – 30 minutes; duration is approximately 6 hours.

**Side Effects:** Drowsiness, dizziness, disturbed coordination.

**Dosage:** **Dystonic Reactions - Adult (6F)**  
**Acute Allergic Reactions- Adult (8D)**  
**Bee/Wasp Stings - Adult (8F)**  
50 mg IM/IVP

**Dystonic Reactions - Pediatric (6F)**  
**Acute Allergic Reactions- Pediatric (8D)**  
**Bee/Wasp Stings - Pediatric (8F)**  
1 mg/kg IM/IVP to maximum of 50 mg

**How Supplied:** 50 mg/1 mL in vial, ampule, or pre-filled syringe.  
(Always check concentration and dose per container at time of patient medication administration)

16L – DOPAMINE (INTROPIN<sup>®</sup>)

PARAMEDIC

**Class:** Vasoconstrictor

**Actions/Pharmacodynamics:** Dose dependent. Higher doses (5+ mcg/kg/min) increasingly stimulate alpha receptors in the peripheral vasculature, producing vasoconstriction-related increases in system blood pressure. Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation. Lower doses (<5 mcg/kg/min), as may be encountered infrequently in interhospital transfers, produce mesenteric (intestinal) and renal vascular dilation to ensure continued perfusion to these organ systems in complicated medical illness that would otherwise sacrifice such circulation.

**Indications:** Dyspnea - Congestive Heart Failure (Cardiogenic Shock) (3E)  
Post Cardiac Arrest Treatment (Cardiogenic Shock) (4J)  
Acute Coronary Syndrome (Cardiogenic Shock) (5C)  
Fever (Septic Shock) (9B)  
Dialysis-Related Issues (9E)  
For all listed situations, indication is hypotension (adult = systolic < 100 mmHg) due to cardiogenic, septic, or neurogenic shock either refractory to intravascular fluid boluses or in which intravascular fluid bolusing is contraindicated (eg. pulmonary edema).

**Contraindications:** Hypertension

**Pharmacokinetics:** Onset of action within 5 minutes after IV/IO infusion initiated. Rapid metabolism, requiring ongoing IV/IO infusion to maintain clinical effects.

**Side Effects:** Palpitations, tachycardia, chest pain, and hypertension if not titrated.

**Dosage:** **Dyspnea - Congestive Heart Failure (Cardiogenic Shock) - Adult (3E)**  
**Post Cardiac Arrest Treatment (Cardiogenic Shock) - Adult (4J)**  
**Acute Coronary Syndrome (Cardiogenic Shock) - Adult (5C)**  
**Fever (Septic Shock) - Adult (9B)**  
**Dialysis-Related Issues - Adult (9E)**  
For hypotension (shock) refractory to fluids or fluids contraindicated  
5 – 20 mcg/kg/minute - see dosage chart - titrate to a sys B/P ≥ 100 mmHg.

**Dyspnea - Congestive Heart Failure (Cardiogenic Shock) - Pediatric (3E)**  
**Post Cardiac Arrest Treatment (Cardiogenic Shock) - Pediatric (4J)**  
**Fever (Septic Shock) - Pediatric (9B)**  
**Dialysis-Related Issues - Pediatric (9E)**  
For hypotension (shock) refractory to fluids or fluids contraindicated  
**\*\*OLMC Order Only.**

**PROTOCOL 16L: Dopamine (Intropin®), cont**

**Dopamine Infusion Adult Dosage Chart**

Dopamine		Dose in mcg			
		5	10	15	20
Patient Weight in Kilograms	40	8	15	23	30
	50	9	19	28	38
	60	11	23	34	45
	70	13	26	39	53
	80	15	30	45	60
	90	17	34	51	68
	100	19	38	56	75
	110	21	41	62	83
	120	23	45	68	90
	130	24	49	73	98
	140	26	53	79	105
	150	28	56	84	113
	160	30	60	90	120
	170	32	64	96	128
	180	34	68	101	135
	190	36	71	107	143
	200	38	75	113	150
	210	39	79	118	158
	220	41	83	124	165
	230	43	86	129	173
240	45	90	135	180	
250	47	94	141	188	

mL/hr or drips/minute (for 1600 mcg concentration only)

**How Supplied:** 400 mg/10 mL vial to be mixed into 250 mL D5W. (1600 mcg/mL concentration)  
OR pre-mixed dopamine infusion at 1600 mcg/mL concentration.  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comments:** Relative caution should be exercised prior to use in the setting of marked tachydysrhythmias, due to the potential for further increase in heart rates. In the setting of tachydysrhythmia-induced cardiogenic shock, treat per Protocol 5G - Tachycardia - Unstable. Ensure aggressive fluid resuscitation is accomplished (unless contraindicated) prior to dopamine use.

16M – DUODOTE™ AUTOINJECTOR

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

**Class:** Parasympatholytic & Cholinesterase Reactivator

**Actions/Pharmacodynamics:**

**Atropine** Blocks parasympathetic impulses to the heart via the vagus nerve. Atropine increases the rate of cardiac sinoatrial (SA) node discharges, enhances conduction through the atrioventricular (AV) node, and by increasing heart rate, increases the cardiac output and blood pressure. Additionally, in the treatment of indicated poisonings (organophosphates, nerve agents), atropine reverses muscarinic effects of acetylcholine, including diaphoresis, diarrhea, urination, bronchorrhea (secretions from the lower respiratory tract), emesis, lacrimation (tearing), and salivation. Atropine produces dilation of pupils by blocking stimulation of the ciliary muscle surrounding the pupils.

**Pralidoxime chloride** reactivates cholinesterase (mainly outside the central nervous system) which has been inactivated by an organophosphate pesticide. The destruction of accumulated acetylcholine can then proceed and neuromuscular junctions will regain function. Pralidoxime chloride has its most critical effect in reversing paralysis of the muscles of respiration. Because Pralidoxime Chloride is less effective in relieving depression of the respiratory center, atropine is always required concomitantly to block the effect of accumulated acetylcholine at the site. Pralidoxime Chloride is short acting and repeated doses may be needed, especially when there is evidence of continuing toxicity.

**Indications:** Nerve Agents (15E)

**Contraindications:** None

**Pharmacokinetics:** With IM autoinjector use in nerve agent poisoning, effects may not be observed for 3-5+ minutes. Beneficial effects can persist in excess of 1 hour.

**Side Effects:** Headache, dizziness, vision changes (blurry vision and photophobia) due to papillary dilation, loss of coordination, laryngospasm, tachycardia, hypertension, palpitations, dry mouth.

**PROTOCOL 16M: DuoDote<sup>®</sup> Autoinjector, cont.**

**Dosage: Nerve Agents - Adult & Pediatric > 12 years of age (15E)**  
2.1 mg atropine/ 600 mg pralidoxime IM  
May repeat every 5-15 minutes to cumulative maximum dose of 6.3 mg/1800 mg.  
In the setting of serious symptoms (cardiopulmonary distress), repeat doses in rapid succession.

**Nerve Agents - Pediatric ≤ 12 years of age (15E)**

**\*\*OLMC Order Only**

Typical pediatric dose is 0.05 mg/kg atropine & 15 mg/kg pralidoxime IM per dose, max single dose of 2.1 mg atropine/600 mg pralidoxime

**How Supplied:** DuoDote<sup>®</sup> autoinjector  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comments:** Ideally, every public safety professional should have ready access to three DuoDote<sup>®</sup> autoinjectors for self/buddy use should emergent conditions warrant. In the setting of suspected/actual nerve agent exposure, administration of the DuoDote<sup>®</sup> autoinjector(s) must occur within minutes of exposure for clinically effective results.

**16N – EPINEPHRINE 1:1000 & 1:10,000**

**ADVANCED EMT**

**PARAMEDIC**

**IM Administration 1:1000 Only – 3C 8D 8E 8F**

**Class:** Vasoconstrictor, Bronchodilator (Catecholamine)

**Actions/Pharmacodynamics:** Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increases in systemic blood pressure. Stimulates beta-1 receptors in the myocardium, producing increases in heart rate, myocardial contraction, and as a result, cardiac output. Stimulates beta-2 receptors in the lower respiratory tract smooth musculature, producing bronchodilation.

**Indications:**

- Dyspnea - Asthma (Severe & Refractory to Nebulization) (3C)
- Asystole (4F)
- Ventricular Fibrillation/Pulseless Ventricular Tachycardia (4G)
- Pulseless Electrical Activity (4H)
- Bradycardia (Pediatric) (5D)
- Acute Allergic Reactions (Anaphylaxis) (8D)
- Snakebites (Anaphylaxis) (8E)
- Bee/Wasp Stings (Anaphylaxis) (8F)

**Contraindications:** None absolute in indications above.

Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks.

**Pharmacokinetics:** Onset of action within 2 minutes after IVP/IOP; within 5-10 minutes after IM. Duration of effect ranges from 3-5 minutes after IVP/IOP to upwards of 30 minutes after IM.

**Side Effects:** Restlessness, anxiety, generalized tremors, headache, dizziness, chest pain, palpitations, hypertension, premature ventricular contractions, tachycardia.

**Dosage:** **Dyspnea - Asthma (Severe & Refractory to Nebulization) - Adult (3C)**  
1:1000 0.3 mg IM

**\*\*OLMC Order Required if pt ≥ 50 years old, heart illness history, or blood pressure > 140/90 mmHg.**

**Dyspnea - Asthma (Severe & Refractory to Nebulization) - Pediatric (3C)**  
1:1000 0.01 mg/kg (0.01 mL/kg) not to exceed 0.3 mg (0.3 mL) IM

**\*\*OLMC Order required if heart illness history or blood pressure > 140/90 mmHg.**

**PROTOCOL 16N: Epinephrine 1:1000 & 1:10,000, cont**

**Dosage, cont:**

**Asystole - Adult (4F)**

**Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)**

**Pulseless Electrical Activity - Adult (4H)**

1:10,000 1 mg IVP/IOP

Repeat every 3 - 5 minutes while resuscitating cardiac arrest

**Asystole - Pediatric (4F)**

**Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric (4G)**

**Pulseless Electrical Activity - Pediatric (4H)**

1:10,000 0.01 mg/kg (0.1 mL/kg) IVP/IOP

Repeat every 3 - 5 minutes while resuscitating cardiac arrest

**Bradycardia - Symptomatic & Systolic BP < 70 + (2 x age in years) mmHg  
(Sinus, First Degree, 2nd Degree Type I) - Pediatric (5D)**

1:10,000 0.01 mg/kg (0.1 mL/kg) IVP/IOP

May repeat once.

**Acute Allergic Reactions (Anaphylaxis) - Adult (8D)**

**Snakebites (Anaphylaxis) - Adult (8E)**

**Bee/Wasp Stings (Anaphylaxis) - Adult (8F)**

1:1000 0.5 mg IM

If anaphylaxis refractory to above IM dose:

1:10,000 1 mg slow IVP/IOP over 3 minutes

**Acute Allergic Reactions (Anaphylaxis) - Pediatric (8D)**

**Snakebites (Anaphylaxis) - Pediatric (8E)**

**Bee/Wasp Stings (Anaphylaxis) - Pediatric (8F)**

1:1000 0.01 mg/kg (0.01 mL/kg) not to exceed 0.3 mg (0.3 mL) IM

If anaphylaxis refractory to above IM dose:

1:10,000 0.01 mg/kg slow IVP/IOP over 3 minutes

**How Supplied:**

**Epinephrine 1:1000** in 1 mg/1mL ampules or 30 mg/30 mL vial

(Always check concentration and dose per container at time of patient medication administration)

**Epinephrine 1:10,000** in 1 mg/10 mL prefilled syringes

(Always check concentration and dose per container at time of patient medication administration)

**Special Comments: Be sure to administer correct concentration.** Pulsatile patients ages 35 years or greater, particularly those with known coronary artery disease, receiving epinephrine should have ECG monitoring initiated and continued as soon as an ECG monitor is available.

160 – EPINEPHRINE AUTOINJECTOR (EPIPEN<sup>®</sup>, Auvi-Q<sup>®</sup>)

EMT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

**Class:** Vasoconstrictor, Bronchodilator (Catecholamine)

**Actions/Pharmacodynamics:** Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increases in systemic blood pressure. Stimulates beta-1 receptors in the myocardium, producing increases in heart rate, myocardial contraction, and as a result, cardiac output. Stimulates beta-2 receptors in the lower respiratory tract smooth musculature, producing bronchodilation.

**Indications:** Dyspnea - Asthma (Severe - Refractory to Inhaler/Nebulization) (3C)  
Acute Allergic Reactions (Anaphylaxis) (8D)  
Snakebites (Anaphylaxis) (8E)  
Bee/Wasp Stings (Anaphylaxis) (8F)

**Contraindications:** None in indications above.

**Pharmacokinetics:** Onset of action within 5-10 minutes after IM administration. Duration of effect may range upwards of 30 minutes intramuscularly.

**Adverse/Side Effects:** Restlessness, anxiety, generalized tremors, headache, dizziness, chest pain, palpitations, hypertension, premature ventricular contractions, tachycardia. Pulsatile patients ages 35 years or greater, particularly those with known coronary artery disease, receiving epinephrine should have ECG monitoring initiated and continued as soon as an ECG monitor is available. Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks and should not deter clinically necessary usage.

**Dosage:** Dyspnea - Asthma (Severe - Refractory to Inhaler/Nebulization) - Adult (3C)  
Acute Allergic Reactions (Anaphylaxis) - Adult (8D)  
Snakebites (Anaphylaxis) - Adult (8E)  
Bee/Wasp Stings (Anaphylaxis) - Adult (8F)  
Adult Epinephrine Autoinjector (0.3 mg of Epinephrine 1:1000) IM lateral thigh

**\*\*OLMC Order required if pt ≥ 50 years old, heart illness history, or blood pressure > 140/90 mmHg.**

**PROTOCOL 160: Epinephrine Autoinjector (EpiPen<sup>®</sup>, Auvi-Q<sup>®</sup>)**

**Dosage, cont.:**

**Dyspnea- Asthma (Severe-Refractory to Inhaler/Nebulization)-Pediatric (3C)**

**Acute Allergic Reactions (Anaphylaxis) - Pediatric (8D)**

**Snakebites (Anaphylaxis) - Pediatric (8E)**

**Bee/Wasp Stings (Anaphylaxis) - Pediatric (8F)**

Pediatric Epinephrine Autoinjector (0.15 mg of Epinephrine 1:1000) IM lateral thigh

**\*\*OLMC Order required if heart illness history or blood pressure > 140/90 mmHg.**

**How Supplied:** 0.3 mg Adult Epinephrine Autoinjector

0.15 mg Pediatric Epinephrine Autoinjector

(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** For autoinjector medication administration, expose and wipe the mid-lateral thigh with Chloraprep<sup>®</sup>, Betadine<sup>®</sup>, or an alcohol wipe. When handling the autoinjector for dosing, grasp the autoinjector with a fist, and remove the trigger safety cap. DO NOT place fingers or hand over the injection tip once the trigger safety cap is being removed.

Place the injection tip on the desired injection skin area and push the entire autoinjector into the thigh, using firm and continuous pressure, until a click is heard (patient will exhibit evidence of feeling spring-loaded needle activation) and hold in place for 10 seconds while medication is being delivered intramuscular.

Use caution when withdrawing the autoinjector to avoid needlestick injury. Dispose of whole autoinjector in a sharps container.

After autoinjector is complete, massage injection site for 15 to 30 seconds to improve epinephrine absorption.

**16P – ETOMIDATE (AMIDATE®)**

**PARAMEDIC**

**Class:** Sedative - Hypnotic (non-narcotic/opiate; non-benzodiazepine; non-barbiturate)

**Actions/Pharmacodynamics:** Etomidate is an intravenous hypnotic drug without analgesia. Etomidate is safe to use in patients with cardiac illness and patients with traumatic injuries. Etomidate has little to no effect upon myocardial metabolism, cardiac output, or peripheral circulation. Etomidate has been shown to reduce cerebral blood flow, cerebral oxygen consumption, and intracranial pressure – helpful in head injury situations.

**Indications:** Medication Assisted Intubation (2G)

**Contraindications:** Known hypersensitivity to etomidate.

**Pharmacokinetics:** Rapid onset of action, seen as desired sedation within as little as 10-15 seconds, but nearly always within less than 1 minute. Duration of action, based upon a standard dose of 0.3 mg/kg (70 kg adult dose of 20 mg) is 5-15 minutes.

**Side Effects:** 1) Transient skeletal muscle movements, called myoclonus, have been reported in 10-80% of patients. Most of these movements are mild to moderate in severity. Rarely, these movements are severe in motion and force, though transient. Most movements are bilateral and can involve any part of the body. Results of electroencephalographic studies taken during periods when these muscle movements were observed have failed to reveal true seizure activity. 2) Transient venous pain at injection site, due to propylene glycol, a solvent in Etomidate preparations. 3) Nausea and/or vomiting. 4) Very rarely, hypoventilation and apnea, though Etomidate generally preserves the baseline respiratory activity. 5) Very rarely, hypotension and when seen, usually is due to too rapid IVP administration.

**Dosage:** **Medication Assisted Intubation - Adult (2G)**  
0.3 mg/kg IVP/IOP over 15-30 seconds, given just prior to intubation.

**How Supplied:** 40 mg/20 mL (2 mg/mL) vial or pre-filled syringe  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Repeated doses of etomidate should be avoided to minimize its effect upon adrenal function. Repeated doses and continuous infusions of etomidate have been linked to adrenal suppression.

16Q – FENTANYL (SUBLIMAZE®)

PARAMEDIC

**Class:** Narcotic analgesic

**Actions/Pharmacodynamics:** Stimulates central nervous system opiate receptors, producing systemic analgesia. On a milligram weight basis, fentanyl is 50-100 times more potent than morphine. Its duration of action is shorter than morphine or hydromorphone. An IV dose of 100 mcg of fentanyl is roughly equivalent to an IV dose of 10 mg of morphine. Fentanyl has less emetic effects than other narcotic analgesics.

**Indications:**

- Chest Pain – Uncertain Etiology (5A)
- Acute Coronary Syndrome (5C)
- Snakebites (8E)
- Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
- Pain Management (Acute Onset & Chronic Type) (9D)
- Eye Injury (10B)
- Dental Injury/Pain (10C)
- Chest/Abdomen/Pelvis Injury (10D)
- Extremity/Amputation Injury (10G)
- Compartment Syndrome (10J)
- Crush Injury Syndrome (10K)
- Burns (10L)
- Lightning/Electrical Injury (11C)
- Pelvic Pain (13E)

For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.

**Contraindications:**

- Hypotension
- Respiratory Depression
- Minor Degrees of Pain
- Pain Assessed as Factitious

**Side Effects:** Hypotension, respiratory depression, euphoria, dizziness. Nausea and/or vomiting are rarely seen if administration is slow IVP.

**Pharmacokinetics:** Onset of action nearly immediate after IV administration. Peak effects occur within 3 – 5 minutes. Duration of effect is 30 - 60 minutes, with a half-life of 6 – 8 hours.

**PROTOCOL 16Q: Fentanyl (Sublimaze®), cont.**

**Dosage:**      **Chest Pain – Uncertain Etiology – Adult (5A)**  
                  **Acute Coronary Syndrome – Adult (5C)**  
                  0.5 mcg/kg slow IVP/IM/IN, maximum single dose of 50 mcg  
                  May repeat every 10 minutes to a maximum cumulative dose of 1.5 mcg/kg or  
                  125 mcg, whichever is lesser

**Snakebites – Adult (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)**  
**Pain Management (Acute Onset &Chronic Type) – Adult (9D)**  
**Eye Injury – Adult (10B)**  
**Dental Injury/Pain – Adult (10C)**  
**Chest/Abdomen/Pelvis Injury – Adult (10D)**  
**Extremity/Amputation Injury – Adult (10G)**  
**Compartment Syndrome – Adult (10J)**  
**Crush Injury Syndrome – Adult (10K)**  
**Burns – Adult (10L)**  
**Lightning/Electrical Injury – Adult (11C)**  
**Pelvic Pain – Adult (13E)**

**For all listed situations, indication is acute pain control in alert,  
hemodynamically stable patient.**

1 mcg/kg slow IVP/IM/IN, maximum single dose of 100 mcg  
May repeat every 10 minutes to a maximum cumulative dose of 3 mcg/kg or  
250 mcg, whichever is lesser

**Chest Pain – Uncertain Etiology – Pediatric (5A)**  
**Snakebites – Pediatric (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)**  
**Pain Management (Acute Onset &Chronic Type) – Pediatric (9D)**  
**Eye Injury – Pediatric (10B)**  
**Dental Injury/Pain – Pediatric (10C)**  
**Chest/Abdomen/Pelvis Injury – Pediatric (10D)**  
**Extremity/Amputation Injury – Pediatric (10G)**  
**Compartment Syndrome – Pediatric (10J)**  
**Crush Injury Syndrome – Pediatric (10K)**  
**Burns – Pediatric (10L)**  
**Lightning/Electrical Injury – Pediatric (11C)**  
**Pelvic Pain – Pediatric (13E)**

**For all listed situations, indication is acute pain control in alert,  
hemodynamically stable patient**

**\*\*OLMC Order Only** – Typical dose is 1 mcg/kg up to 50 mcg per dose.

**How Supplied:**      100 mcg/2 mL (50 mcg/mL) ampule, vial, or pre-filled syringe  
                                 250 mcg/5 mL (50 mcg/mL) ampule or vial  
                                 500 mcg/10 mL (50 mcg/mL) vial  
                                 (Always check concentration and dose per container at time of patient  
                                 medication administration)

16R – GLUCAGON

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Intramuscular use only – 3A 4I 6B 6D 6E 6F 7A 8A 13D

Intramuscular use only – 3A 4I 6B 6D 6E 6F 7A 8A 13D

**Class:** Hormone

**Actions/Pharmacodynamics:** Glucagon is a hormone produced in the pancreas. When released in times of hypoglycemia, it causes a breakdown of glycogen (stored in the liver) to glucose and inhibits the subsequent synthesis of glycogen from circulating glucose. Both actions increase the blood levels of glucose. Given via the IM route, it is a useful drug in hypoglycemia when IV access is unsuccessful. Glucagon also increases heart rate, myocardial contractility and improves AV conduction in a manner similar to that produced by catecholamines. Its actions are independent of beta blockade and therefore may be useful via IV/IO administration by paramedics for reversing cardiovascular collapse effects of suspected beta blocker toxicity.

**Indications:** Respiratory Arrest (3A)  
Specific Causes of Cardiac Arrest (4I)  
Altered Mental Status (6B)  
Seizure (6D)  
Syncope (6E)  
Dystonic Reactions (6F)  
Behavioral Disorder (7A)  
Poisonings – General Management (8A)  
Complications of Pregnancy (13D)

For all listed situations, indication is hypoglycemia (blood glucose <50 mg/dL) without ability to safely administer oral glucose (due to aspiration concern) and without ability to establish IV access in EMT-I85, AEMT, and Paramedic Scopes of Practice.

Additional indication for beta blocker toxicity with hypotension and bradycardia in Paramedic Scope of Practice.

**Contraindications:** None

**Pharmacokinetics:** Onset 5 – 20 minutes; peak effects in 30 minutes; duration is 1 – 1.5 hours.

**Side Effects:** Dizziness, headache, nausea/vomiting, hyperglycemia.



**STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS**

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**PROTOCOL 16R: Glucagon, cont.**

**Dosage:**      **Respiratory Arrest – Adult & Pediatric weight  $\geq$  25 kg (3A)**  
                  **Specific Causes of Cardiac Arrest - Adult & Pediatric weight  $\geq$  25 kg (4I)**  
                  **Altered Mental Status – Adult & Pediatric weight  $\geq$  25 kg (6B)**  
                  **Seizure – Adult & Pediatric weight  $\geq$  25 kg (6D)**  
                  **Syncope – Adult & Pediatric weight  $\geq$  25 kg (6E)**  
                  **Dystonic Reactions – Adult & Pediatric weight  $\geq$  25 kg (6F)**  
                  **Behavioral Disorder – Adult & Pediatric weight  $\geq$  25 kg (7A)**  
                  **Poisonings – General Management – Adult & Pediatric weight  $\geq$  25 kg (8A)**  
                  **Complications of Pregnancy – Adult & Pediatric weight  $\geq$  25 kg (13D)**  
                  **All indicate hypoglycemia without safe PO access and without IV access**  
                  1 mg IM

**Respiratory Arrest - Pediatric weight < 25 kg (3A)**  
**Specific Causes of Cardiac Arrest – Pediatric weight < 25 kg (4I)**  
**Altered Mental Status – Pediatric weight < 25 kg (6B)**  
**Seizure – Pediatric weight < 25 kg (6D)**  
**Syncope – Pediatric weight < 25 kg (6E)**  
**Dystonic Reactions – Pediatric weight < 25 kg (6F)**  
**Behavioral Disorder – Pediatric weight < 25 kg (7A)**  
**Poisonings – General Management – Pediatric weight < 25 kg (8A)**  
**Complications of Pregnancy – Pediatric weight < 25 kg (13D)**  
**All indicate hypoglycemia without safe PO access and without IV access**  
0.5 mg IM

**Specific Causes of Cardiac Arrest - Adult (4I)**  
**Poisonings – General Management - Adult (8A)**  
**Suspected beta blocker toxicity with arrest or hypotension/bradycardia (Paramedic only)**  
1 mg IVP/IOP; May be given IM if no IV access obtainable

**Specific Causes of Cardiac Arrest - Pediatric (4I)**  
**Poisonings – General Management – Pediatric (8A)**  
**Suspected beta blocker toxicity with arrest or hypotension/bradycardia (Paramedic only)**  
0.5 mg IVP/IOP; May be given IM if no IV access obtainable

**How Supplied:**      1 mg dry powder in vial with 1 mL of diluting solute for reconstitution  
                                  (Always check concentration and dose per container at time of patient  
                                  medication administration)

16S – GLUCOSE (ORAL)

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

**Class:** Carbohydrate

**Actions/Pharmacodynamics:** Increases blood sugar level.

**Indications:** Altered Mental Status (Hypoglycemia) (6B)  
Syncope (Hypoglycemia) (6E)  
Dystonic Reaction (Hypoglycemia) (6F)  
Behavioral Disorder (Hypoglycemia) (7A) Dialysis-Related Issues (Hypoglycemia) (9E) Complications of Pregnancy (Hypoglycemia) (13D)

**Contraindications:** Unconscious or semi-conscious and unable to follow simple commands. Care should be taken to prevent choking or aspiration of medication in semi-conscious patient.

**Pharmacokinetics:** Rapid oral absorption uptake to increase circulating blood sugar levels. Onset of effect within several minutes of oral dosing. Duration of effect up to 30+ minutes, but patient should be advised to consume complex carbohydrates within minutes of restoration of normal blood sugar, unless otherwise contraindicated.

**Side Effects:** None

**Dosage:** Altered Mental Status (Hypoglycemia) - Adult & Pediatric Weight  $\geq$  25 kg (6B)  
Syncope (Hypoglycemia) - Adult & Pediatric Weight  $\geq$  25 kg (6E)  
Dystonic Reaction (Hypoglycemia) - Adult & Pediatric Weight  $\geq$  25 kg (6F)  
Behavioral Disorder (Hypoglycemia) - Adult & Pediatric Weight  $\geq$  25 kg (7A)  
Dialysis-Related Issues (Hypoglycemia) - Adult & Pediatric Weight  $\geq$  25 kg (9E)  
Complications of Pregnancy (Hypoglycemia) - Adult (13D)  
15 grams (1 tube) PO or SL for blood glucose  $<$  50 mg/dL



## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### PROTOCOL16S: Glucose (Oral), cont.

#### Dosage, cont.

**Altered Mental Status (Hypoglycemia) - Pediatric Weight < 25 kg (6B)**  
**Syncope (Hypoglycemia) - Pediatric Weight < 25 kg (6E)**  
**Dystonic Reaction (Hypoglycemia) - Pediatric Weight < 25 kg (6F)**  
**Behavioral Disorder (Hypoglycemia) - Pediatric Weight < 25 kg (7A)**  
**Dialysis-Related Issues (Hypoglycemia) - Pediatric Weight < 25 kg (9E)**  
7.5 grams (1/2 tube) PO or SL for blood glucose < 50 mg/dL

**How Supplied:** 15 grams of glucose for oral administration in a squeeze tube container.  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Medical grade glucose should be utilized in place of sodas, candy, and other carbohydrate-heavy solid food. In many cases, the carbohydrate grams cannot be measured.

16T – HALOPERIDOL (HALDOL<sup>®</sup>)

PARAMEDIC

**Class:** Antipsychotic

**Therapeutic Action/Pharmacodynamics:** Haloperidol is a potent, long – acting antipsychotic agent. While its exact mechanism is unclear, it appears to block the dopamine receptors in the brain associated with mood and behavior. It exerts strong antiemetic effects and impairs central thermoregulation. It also produces weak central anticholinergic effects and transient orthostatic hypotension

**Indications:** Chemical Restraint (7C)

**Contraindications:** Known hypersensitivity  
Behavioral disorder etiology easily reversed (eg. hypoglycemia)  
Minor degrees of agitation  
Parkinson's disease  
Known seizure disorders (lowers seizure threshold)

CNS depressants, opiates, and alcohol may increase the CNS depression effect of haloperidol. Use with caution in elderly or debilitated patients due to exaggerated effect. Safe use in pregnancy has not been established, though in the indicated setting, benefit outweighs risks.

**Pharmacokinetics:** Onset is within 10-20 minutes IM; peak effect in 30-45 minutes; duration is 3+ hours, reported up to 35 hours.

**Side Effects:** CNS depression, seizure, dystonic reactions, dry mouth, blurry vision, bronchospasm, tachycardia, hypertension, hypotension, dysrhythmias, hyperpyrexia, diaphoresis, urinary retention.

**Dosage:** **Chemical Restraint - Adult (7C)**  
5 mg IM (use deep IM injection in large muscle - lateral thigh if possible)

**Chemical Restraint - Pediatric (7C)**  
**\*\* OLMC Order Only**

**How Supplied:** 5 mg/1 mL vial.  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comments:** In emergency situations where the patient's behavior poses an immediate risk to rescuers and bystanders, the IM injection may be given through the patient's clothing to minimize risk of needlestick injuries to rescuers. Dystonic reactions are common with haloperidol; diphenhydramine should be readily available - see Protocol 6F - Dystonic Reactions.

**16U – HYDRALAZINE (APRESOLINE®)**

**PARAMEDIC**

**Class:** Anti-Hypertensive

**Actions/Pharmacodynamics:** Reduces blood pressure via relaxation of arterial smooth muscle, resulting in vasodilation, decreasing peripheral resistance. Alters vascular smooth muscle cellular metabolism of calcium, leading to reduction of vascular muscle contraction.

**Indications:** Hypertensive Emergency (5L)  
Complications of Pregnancy (Hypertensive Emergency) (13D)

**Contraindications:** Known hypersensitivity to hydralazine.  
Cardiogenic shock  
Mitral valvular rheumatic heart disease  
Acute coronary syndrome

Safe use during pregnancy and children is not firmly established in pharmaceutical studies, though hydralazine has been used effectively in pregnancy and in pediatrics.

**Pharmacokinetics:** Onset is within 10 minutes IV; peak effects between 10-80 minutes.

**Side Effects:** Dizziness, headache, transient paresthesias (eg. scalp tingling), numbness, postural hypotension, angina, palpitations, tachycardia, syncope, pulmonary edema, dysrhythmias (tachycardias) following IV administration, dyspnea, nausea, vomiting.

**Dosage:** **Hypertensive Emergency - Adult (5L)**  
**Complications of Pregnancy (Hypertensive Emergency) - Adult (13D)**  
10 mg Slow IVP. May repeat 10 mg every 30 minutes as needed up to cumulative maximum dose of 30 mg.

**Hypertensive Emergency - Pediatric (5L)**  
**\*\*OLMC Order Only.** Rarely required.  
Typical pediatric dose is 0.5 mg/kg up to 0.9 mg/kg, with a max single dose 10 mg.

**How Supplied:** 20 mg/1 mL in a 1 mL vial  
(Always check concentration and dose per container at time of patient medication administration)

**16V – HYDROMORPHONE (DILAUDID<sup>®</sup>)**

**PARAMEDIC**

**Class:** Narcotic analgesic

**Actions/Pharmacodynamics:** Stimulates central nervous system opiate receptors, producing systemic analgesia. Modest vasodilation effects increase peripheral venous capacitance, and reduce venous return, myocardial workload, and myocardial oxygen demand. Hydromorphone is roughly 10 times more potent than morphine. An IV dose of 1 mg of hydromorphone is equivalent to an IV dose of 10 mg of morphine.

**Indications:**

- Chest Pain – Uncertain Etiology (5A)
- Acute Coronary Syndrome (5C)
- Snakebites (8E)
- Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
- Pain Management (Acute Onset & Chronic Type) (9D)
- Eye Injury (10B)
- Dental Injury/Pain (10C)
- Chest/Abdomen/Pelvis Injury (10D)
- Extremity/Amputation Injury (10G)
- Compartment Syndrome (10J)
- Crush Injury Syndrome (10K)
- Burns (10L)
- Lightning/Electrical Injury (11C)
- Pelvic Pain (13E)

For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.

**Contraindications:**

- Hypotension
- Respiratory Depression
- Minor Degrees of Pain
- Pain Assessed as Factitious

**Side Effects:** Hypotension, respiratory depression, euphoria, dizziness. Nausea and/or vomiting are rarely seen if administration is slow IVP. Rapid IVP will lead to an accompanying histamine release, producing the nausea and/or vomiting often erroneously attributed to hydromorphone itself.

**Pharmacokinetics:** Onset of action within 5-10 minutes after IV administration. Duration of effect can reach 4 - 6 hours depending upon end-organ function.

**PROTOCOL 16V: Hydromorphone (Dilaudid®), cont.**

**Dosage:**      **Chest Pain – Uncertain Etiology – Adult (5A)**  
                  **Acute Coronary Syndrome – Adult (5C)**  
                  0.25 mg slow IVP  
                  May repeat every 10 minutes to a maximum cumulative dose of 1 mg

**Snakebites – Adult (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)**  
**Pain Management (Acute Onset &Chronic Type) – Adult (9D)**  
**Eye Injury – Adult (10B)**  
**Dental Injury/Pain – Adult (10C)**  
**Chest/Abdomen/Pelvis Injury – Adult (10D)**  
**Extremity/Amputation Injury – Adult (10G)**  
**Compartment Syndrome – Adult (10J)**  
**Crush Injury Syndrome – Adult (10K)**  
**Burns – Adult (10L)**  
**Lightning/Electrical Injury – Adult (11C)**  
**Pelvic Pain – Adult (13E)**  
**For all listed situations, indication is acute pain control in alert,  
hemodynamically stable patient.**

0.5 – 1 mg slow IVP  
May repeat every 10 minutes to a maximum cumulative dose of 2 mg

**Chest Pain – Uncertain Etiology – Pediatric (5A)**  
**Snakebites – Pediatric (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)**  
**Pain Management (Acute Onset &Chronic Type) – Pediatric (9D)**  
**Eye Injury – Pediatric (10B)**  
**Dental Injury/Pain – Pediatric (10C)**  
**Chest/Abdomen/Pelvis Injury – Pediatric (10D)**  
**Extremity/Amputation Injury – Pediatric (10G)**  
**Compartment Syndrome – Pediatric (10J)**  
**Crush Injury Syndrome – Pediatric (10K)**  
**Burns – Pediatric (10L)**  
**Lightning/Electrical Injury – Pediatric (11C)**  
**Pelvic Pain – Pediatric (13E)**

**For all listed situations, indication is acute pain control in alert,  
hemodynamically stable patient**

**\*\*OLMC Order Only** – Typical dose is 0.01 mg/kg up to 0.5 mg per dose.

**How Supplied:**      2 mg/1 mL vial or pre-filled syringe  
                                  (Always check concentration and dose per container at time of patient  
                                  medication administration)

16W – HYDROXOCOBALAMIN (CYANOKIT<sup>®</sup>)

PARAMEDIC

**Class:** Cyanide Antidote

**Actions/Pharmacodynamics:** Hydroxocobalamin binds cyanide, forming cyanocobalamin for urinary excretion.

**Indications:** Cyanide (12E)

**Contraindications:** None in the setting of suspected cyanide toxicity.

**Pharmacokinetics:** Near immediate onset of action following IVPB initiation. Effect is seen for hours, with duration of action seen predominantly in the first 24 hours following administration, but measurable for days.

**Side Effects:** Redness of skin and mucous membranes may be prominently noted. Additional side effects include headache, dizziness, restlessness, eye irritation, throat irritation, dyspnea, pulmonary edema, chest tightness, hypertension, tachycardia, palpitations, nausea, vomiting, diarrhea, abdominal pain, dysphagia, red urine, and hives.

**Dosage:**       **Cyanide - Adult (12E)**  
5 grams IVPB in 15 minutes

**Cyanide - Pediatric (12E)**  
Safe use in children has not been firmly established, though in indicated clinical situation, benefit outweighs risk. Contact OLMC for consult and order. The pediatric dose used in most situations is 70 mg/kg IVPB in 15 minutes.

**How Supplied:**       CYANOKIT<sup>®</sup> preparations include either one glass vial containing 5 grams of hydroxocobalamin as a dark red crystalline powder for reconstitution with 200 mL normal saline or a set of two glass vials, each containing 2.5 grams of hydroxocobalamin as a dark red crystalline powder for reconstitution with 100 mL normal saline per vial. Follow full instructions accompanying CYANOKIT<sup>®</sup> for preparation and administration, including use of transfer spike for normal saline addition to the vial(s), rocking, but not shaking the vial for 60 seconds prior to administration, and administering the infusion from the vial(s). (Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Multiple drug-drug incompatibilities exist with hydroxocobalamin. Use a separate IV line for the administration of hydroxocobalamin.

**16BB – LORAZEPAM (ATIVAN<sup>®</sup>)**

**PARAMEDIC**

**Class:** Sedative; Anticonvulsant; Muscle Relaxant; Anxiolytic (Benzodiazepine)

**Actions/Pharmacodynamics:** Long - acting benzodiazepine with central nervous system depressant, anticonvulsant, muscle relaxant, and anxiolytic effects. Like the other benzodiazepines, it has no effect on pain. Ativan has less muscle relaxant properties than diazepam, though no substantial amnestic effects as with midazolam.

**Indications:** Medication Assisted Intubation (2G)  
Post-intubation sedation - onset delay does not favor pre-intubation use  
Seizure (6D)  
(Midazolam preferred benzodiazepine due to faster onset of action)  
Dystonic Reactions (6F)  
Chemical Restraint (7C)  
(Midazolam preferred benzodiazepine due to faster onset of action)  
Poisonings - General Management (8A)  
Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis  
Head/Neck/Spine Injury (10A)  
(Midazolam preferred benzodiazepine due to faster onset of action)  
Heat Illness (11A)  
(Midazolam preferred benzodiazepine due to faster onset of action)

**Contraindications:** Patients with intolerance to benzodiazepines, acute narrow - angle glaucoma, shock, or coma. Caution with use in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

**Pharmacokinetics:** Onset is 5-10 minutes, IVP/IOP; up to 30 minutes IM; peak effects in 2-3 hours. Duration is 3-6+ hours IVP/IOP/IM; half – life can reach 20 – 50 hours.

**Side Effects:** Headache, euphoria, drowsiness, excessive sedation, confusion, dizziness, blurred vision, diplopia, nystagmus, respiratory arrest, hypotension, nausea, vomiting.

**Dosage:** **Medication Assisted Intubation (Post Intubation Sedation) - Adult (2G)**  
0.1 mg/kg to max 2 mg IVP/IOP, may repeat once if systolic BP > 100 mmHg

**Seizure - Adult (6D)**

**Heat Illness - Adult (11A)**

2 mg IVP/IOP/IM for active seizure

May repeat once in 10 minutes if still seizing.



STATE OF OKLAHOMA  
2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

**PROTOCOL 16BB: Lorazepam (Ativan®), cont.**

**Dosage, cont.:**

**Seizure - Pediatric (6D)**

**Heat Illness - Pediatric (11A)**

0.1 mg/kg to max 2 mg IVP/IOP/IM for active seizure  
May repeat once in 5 minutes if still seizing.

**Dystonic Reactions - Adult (6F)**

2 mg IVP/IM

**Dystonic Reactions - Pediatric (6F)**

0.1 mg/kg to max 2 mg IVP/IM

**Chemical Restraint - Adult (7C)**

2 mg IVP/IOP/IM  
May repeat once.

**Chemical Restraint - Pediatric (7C)**

0.1 mg/kg to max 2 mg IVP/IOP/IM

**Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)**

1 -2 mg IVP/IM

**Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)**

**\*\*OLMC Order Only**

**Head/Neck/Spine Injury - Adult (10A)**

1 mg IVP/IM/IOP for active seizure.  
May repeat once in 5 minutes if still seizing.

**Head/Neck/Spine Injury - Pediatric (10A)**

0.1 mg/kg IVP/IM/IOP for active seizure.  
May repeat once in 5 minutes if still seizing.

**How Supplied:** 2 mg/1 mL or 4 mg/1 mL in vials, ampules, or pre-filled syringes.  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Lorazepam must be kept refrigerated.

**16CC – MAGNESIUM SULFATE**

**PARAMEDIC**

**Class:** Electrolyte

**Therapeutic Actions/Pharmacodynamics:** As a bronchial smooth muscle relaxant, contributes to reduction of bronchospasm in asthma. As an antidysrhythmic, reverses low circulating magnesium levels associated with ventricular arrhythmias, particularly polymorphic ventricular tachycardia, commonly called torsades des pointes. It is the anticonvulsant of greatest benefit for eclampsia.

**Indications:**

- Dyspnea - Asthma (3C)
- Ventricular Fibrillation/Pulseless Ventricular Tachycardia (Torsades) (4G)
- Tachycardia - Stable (Torsades) (5F)
- Childbirth - Complicated (Eclampsia) (13B)
- Complications of Pregnancy (Eclampsia) (13D)

**Contraindications:** Hypotension or Known Renal Failure (when treating asthma)

**Pharmacokinetics:** Onset of action typically within 1-2 minutes after IVP/IOP. Effects persist for up to 30 minutes.

**Side Effects:** None expected in indicated dosing. High doses (exceeding 4-6 grams) may cause sedation, muscle weakness, depressed reflexes, hypotension, bradycardia, and respiratory depression.

**Dosage:** **Dyspnea - Asthma - (Severe & Refractory to Nebulization) - Adult (3C)**  
2 grams very slow IVP over 10 minutes

**Ventricular Fibrillation/Pulseless Ventricular Tachycardia (Torsades) - Adult (4G)**  
1 gram IVP/IOP

**Tachycardia - Stable (Torsades) - Adult (5F)**  
1 gram slow IVP/IOP over 1 minute.  
May repeat once.

**Tachycardia - Stable (Torsades) - Pediatric (5F)**  
Consult with OLMCP for use and dosing.

**Childbirth - Complicated (Eclampsia) (13B)**  
**Complications of Pregnancy (Eclampsia) (13D)**  
1 gram IVP/IOP. May repeat every 2-3 mins until seizure abates. Maximum cumulative dose is 4 grams.



Oklahoma State  
Department of Health

## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### **PROTOCOL 16CC: Magnesium Sulfate, cont.**

**How Supplied:** 1 gram/2 mL (500 mg/mL in 50% solution) vials  
5 grams/10 mL (500 mg/mL in a 50% solution) vials  
5 grams/10 mL (50% mg/mL in a 50% solution) pre-filled syringes  
(Always check concentration and dose per container at time of patient medication administration)

**16DD – METHYLPREDNISOLONE (SOLU-MEDROL®)**

**PARAMEDIC**

**Class:** Steroid

**Actions/Pharmacodynamics:** Methylprednisolone is an intermediate-acting synthetic adrenal corticosteroid with glucocorticoid activity. It exerts anti-inflammatory effects in the setting of inflammatory-mediated illness.

**Indications:** Dyspnea - Asthma (3C)  
Dyspnea - Chronic Obstructive Pulmonary Disease (3D)  
Acute Allergic Reactions (8A)  
Bee/Wasp Stings (8F)

**Contraindications and Precautions:** Known hypersensitivity to methylprednisolone. In the setting of anaphylaxis, the only true contraindication is prior severe allergy (anaphylaxis) caused by methylprednisolone.

**Pharmacokinetics:** Onset of action within 4 – 6 hours, may have effect in excess of 24 hours.

**Side Effects:** None expected immediately. May occasionally see any of the following effects with onset of action: euphoria, insomnia, confusion, psychosis, edema, hypertension, nausea/vomiting, hyperglycemia.

**Dosage:** **Dyspnea - Asthma - Adult (3C)**  
**Dyspnea - Chronic Obstructive Pulmonary Disease - Adult (3D)**  
**Acute Allergic Reactions - Adult (8A)**  
**Bee/Wasp Stings - Adult (8F)**  
125 mg IVP. Give IM if no IV access obtainable.

**Dyspnea - Asthma - Pediatric (3C)**  
**Acute Allergic Reactions - Pediatric (8A)**  
**Bee/Wasp Stings - Pediatric (8F)**  
2 mg/kg not to exceed 125 mg IVP. Give IM if no IV access obtainable.

**How Supplied:** 125 mg Act-O-Vial™ System (Single Dose Vial)  
(Always check concentration and dose per container at time of patient medication administration)

**16EE – MIDAZOLAM (VERSED<sup>®</sup>)**

**PARAMEDIC**

**Class:** Sedative; Anticonvulsant; Amnestic; Muscle Relaxant, Anxiolytic (Benzodiazepine)

**Actions/Pharmacodynamics:** Short - acting benzodiazepine with central nervous system depressant, anticonvulsant, anterograde amnestic, muscle relaxant, and anxiolytic effects. Like the other benzodiazepines, it has no effect on pain.

**Indications:** Medication Assisted Intubation (Pre & Post Intubation Sedation) (2G)  
Post Cardiac Arrest Treatment (Hypothermia Induced Shivering Control) (4J)  
Transcutaneous Pacing (Sedation) (5E)  
Synchronized Cardioversion (Sedation) (5G)  
Seizure (6D)  
Dystonic Reactions (6F)  
Chemical Restraint (7C)  
Poisonings - General Management (8A)  
    Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis  
Head/Neck/Spine Injury (10A)  
Heat Illness (11A)

**Contraindications:** Patients with intolerance to benzodiazepines, acute narrow - angle glaucoma, shock, or coma. Caution with use in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

**Pharmacokinetics:** Onset is 3-5 minutes, IVP/IOP; 6-14 minutes IN; up to 15 minutes IM (though clinically evident much faster); peak effects in 20-60 minutes. Duration is 2 hours IVP/IOP/IN; 1-6 hours IM; half – life is 1-4 hours.

**Side Effects:** Retrograde amnesia, headache, euphoria, drowsiness, weakness, excessive sedation, confusion, dizziness, blurred vision, diplopia, nystagmus, respiratory arrest, tachypnea, hypotension, nausea, vomiting.

**Dosage:**       **Medication Assisted Intubation (Pre & Post Intubation Sedation) - Adult (2G)**  
0.1 mg/kg to max 5 mg IVP/IOP, may repeat once if systolic BP > 100 mmHg

**Post Cardiac Arrest Treatment (Hypothermia Induced Shivering Control) -  
                  Adult & Pediatric (4J)**  
0.1 mg/kg to max 5 mg IVP/IOP

**Transcutaneous Pacing (Sedation) - Adult (5E)**  
2 - 5 mg IVP based upon weight and hemodynamics (0.1 mg/kg to max 5 mg)

**PROTOCOL 16EE: Midazolam (Versed®), cont.**

**Dosage, cont.:**

**Synchronized Cardioversion (Sedation) - Adult (5G)**

0.1 mg/kg to max 5 mg IVP/IOP/INP

**Seizure - Adult (6D)**

**Heat Illness - Adult (11A)**

0.1 mg/kg to max 5 mg IM/IVP/IN/IOP for active seizure.  
May repeat once in 5 minutes if still seizing.

**Seizure - Pediatric (6D)**

**Head/Neck/Spine Injury - Pediatric (10A)**

**Heat Illness - Pediatric (11A)**

0.1 mg/kg to max 5 mg IM/IVP/IN/IOP for active seizure  
May repeat once in 5 minutes if still seizing.

**Dystonic Reactions - Adult (6F)**

2.5 mg IVP/IM/IN

**Dystonic Reactions - Pediatric (6F)**

0.1 mg/kg to max 2.5 mg IM/IVP/IN

**Chemical Restraint - Adult (7C)**

0.1 mg/kg to max 5 mg IM/IVP/IN/IOP.  
May repeat once.

**Chemical Restraint - Pediatric (7C)**

0.1 mg/kg to max 5 mg IM/IVP/IN/IOP

**Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)**

0.1 mg/kg to max 5 mg IVP/IN/IM

**Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)**

**\*\*OLMC Order Only**

**Head/Neck/Spine Injury - Adult (10A)**

5 mg IM/IVP/IN/IOP for active seizure.  
May repeat once in 5 minutes if still seizing.

**How Supplied:** 5 mg/1 mL in vials, ampules, or pre-filled syringes.  
(Always check concentration and dose per container at time of patient medication administration)

16FF – MORPHINE SULFATE

PARAMEDIC

**Class:** Narcotic analgesic

**Actions/Pharmacodynamics:** Stimulates central nervous system opiate receptors, producing systemic analgesia. Modest vasodilation effects increase peripheral venous capacitance, and reduce venous return, myocardial workload, and myocardial oxygen demand.

**Indications:**

- Chest Pain – Uncertain Etiology (5A)
- Acute Coronary Syndrome (5C)
- Snakebites (8E)
- Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
- Pain Management (Acute Onset & Chronic Type) (9D)
- Eye Injury (10B)
- Dental Injury/Pain (10C)
- Chest/Abdomen/Pelvis Injury (10D)
- Extremity/Amputation Injury (10G)
- Compartment Syndrome (10J)
- Crush Injury Syndrome (10K)
- Burns (10L)
- Lightning/Electrical Injury (11C)
- Pelvic Pain (13E)

For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.

**Contraindications:**

- Hypotension
- Respiratory Depression
- Minor Degrees of Pain
- Pain Assessed as Factitious

**Side Effects:** Hypotension, respiratory depression, euphoria, dizziness. Nausea and/or vomiting are rarely seen if administration is slow IVP. Rapid IVP will lead to an accompanying histamine release, producing the nausea and/or vomiting often erroneously attributed to morphine itself.

**Pharmacokinetics:** Onset of action within 3-5 minutes after IV administration. Duration of effect can reach 4 hours depending upon end-organ function.

**PROTOCOL 16FF: Morphine Sulfate, cont.**

**Dosage:**      **Chest Pain – Uncertain Etiology – Adult (5A)**  
                  **Acute Coronary Syndrome – Adult (5C)**  
                  2 mg slow IVP  
                  May repeat every 5 minutes to a maximum cumulative dose of 10 mg

**Snakebites – Adult (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)**  
**Pain Management (Acute Onset & Chronic Type) – Adult (9D)**  
**Eye Injury – Adult (10B)**  
**Dental Injury/Pain – Adult (10C)**  
**Chest/Abdomen/Pelvis Injury – Adult (10D)**  
**Extremity/Amputation Injury – Adult (10G)**  
**Compartment Syndrome – Adult (10J)**  
**Crush Injury Syndrome – Adult (10K)**  
**Burns – Adult (10L)**  
**Lightning/Electrical Injury – Adult (11C)**  
**Pelvic Pain – Adult (13E)**

**For all listed situations, indication is acute pain control in alert,  
hemodynamically stable patient.**

2 – 4 mg slow IVP  
May repeat every 5 minutes to a maximum cumulative dose of 10 mg

**Chest Pain – Uncertain Etiology – Pediatric (5A)**  
**Snakebites – Pediatric (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)**  
**Pain Management (Acute Onset & Chronic Type) – Pediatric (9D)**  
**Eye Injury – Pediatric (10B)**  
**Dental Injury/Pain – Pediatric (10C)**  
**Chest/Abdomen/Pelvis Injury – Pediatric (10D)**  
**Extremity/Amputation Injury – Pediatric (10G)**  
**Compartment Syndrome – Pediatric (10J)**  
**Crush Injury Syndrome – Pediatric (10K)**  
**Burns – Pediatric (10L)**  
**Lightning/Electrical Injury – Pediatric (11C)**  
**Pelvic Pain – Pediatric (13E)**

**For all listed situations, indication is acute pain control in alert,  
hemodynamically stable patient**

**\*\*OLMC Order Only** – Typical dose is 0.1 mg/kg up to 2 mg per dose.

**How Supplied:**      2 mg/1 mL pre-filled syringe  
                              4 mg/1 mL vial, ampule, or pre-filled syringe  
                              8 mg/1 mL pre-filled syringe  
                              10 mg/1 mL vial  
                              10 mg/10 mL vial  
                              (Always check concentration and dose per container at time of patient  
                              medication administration)

16GG – NALOXONE (NARCAN®)

ADVANCED EMT

PARAMEDIC

**Class:** Narcotic antagonist

**Actions/Pharmacodynamics:** The primary action of interest is reversal of respiratory depression associated with narcotic agents. Naloxone competes with and displaces narcotic substances from opiate receptors.

**Indications:**

- Respiratory Arrest (3A)
- Specific Causes of Cardiac Arrest (4I)
- Altered Mental Status (6B)
- Syncope (6E)
- Poisonings – General Management (8A)

**Contraindications:** Known or suspected narcotic substance use or abuse without cardiopulmonary compromise. Post-intubation in known or suspected narcotic substance use or abuse situations. Avoid whenever possible in known or suspected narcotic addicts. In these patients, use the smallest clinically effective dose possible (titrating administration slowly) to avoid acute narcotic withdrawal.

**Pharmacokinetics:** Onset of action within 2 minutes after IVP/IOP/IN administration with duration of effect up to 2 hours.

**Side Effects:** Agitation, anxiety, diaphoresis, tachycardia, nausea, vomiting, headache, hypertension, hypotension, seizures.

**Dosage:**

- Respiratory Arrest - Adult (3A)**
- Specific Causes of Cardiac Arrest - Adult (4I)**
- Altered Mental Status – Adult (6B)**
- Syncope – Adult (6E)**
- Poisonings – General Management – Adult (8A)**
  - In Apnea/Agonal Breathing, 2 mg IVP/IOP/IN.  
May repeat once to maximum cumulative dose of 4 mg.
  - In Ineffective Breathing Activity, 0.5 mg IVP/IOP/IN.  
May repeat to a maximum cumulative dose of 4 mg.

**PROTOCOL 16GG: Naloxone (Narcan®), cont.**

**Dosage, cont.:**            **Respiratory Arrest - Pediatric (3A)**  
                                 **Specific Causes of Cardiac Arrest - Pediatric (4I)**  
                                 **Altered Mental Status – Pediatric (6B)**  
                                 **Syncope – Pediatric (6E)**  
                                 **Poisonings – General Management – Pediatric (8A)**  
                                 In Apnea/Agonal Breathing, 0.5 mg IVP/IOP/IN.  
                                 May repeat to a maximum cumulative dose of 2 mg.

                                 In Ineffective Breathing Activity, 0.5 mg IVP/IOP/IN.  
                                 May repeat to a maximum cumulative dose of 2 mg.

**How Supplied:**            0.4 mg/1 mL vial  
                                 0.4 mg/1 mL prefilled syringe  
                                 2 mg/2 mL prefilled syringe  
                                 4 mg/10 mL vial  
                                 (Always check concentration and dose per container at time of patient  
                                 medication administration)

**Special Comment:** In non-respiratory arrest or non-cardiac arrest situations, always titrate administration slowly, using the lowest clinically effective amount of naloxone possible to avoid inadvertent acute narcotic withdrawal and/or other side effects.

**16HH – NITROGLYCERIN (NITROLINGUAL<sup>®</sup>, NITROMIST<sup>®</sup>, NITROSTAT<sup>®</sup>,  
NITROQUICK<sup>®</sup>, TRIDIL (IV INFUSION), NITRO-BID<sup>®</sup> - DERMAL)**

<b>EMERGENCY MEDICAL DISPATCHER</b>	Sublingual Dosing - Own Self-Administration Phone Directive - 3E 5A 5C
<b>EMERGENCY MEDICAL RESPONDER</b>	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
<b>EMT</b>	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
<b>EMT-INTERMEDIATE 85</b>	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
<b>ADVANCED EMT</b>	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
<b>PARAMEDIC</b>	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C

**Class:** Anti-Anginal, Vasodilator, Anti-Hypertensive (Nitrate)

**Actions/Pharmacodynamics:** Arterial and venous vasodilator through relaxing vascular smooth muscle. Reduces cardiac afterload resistance and cardiac preload volume respectively. Myocardial oxygen consumption/demand is decreased. Systemic blood pressure is decreased.

**Indications:** Dyspnea - Congestive Heart Failure (3E)  
Chest Pain - Uncertain Etiology (5A)  
Acute Coronary Syndrome (5C)  
Hypertensive Emergency (5L)  
Complications of Pregnancy (Hypertensive Emergency) (13D)

**Contraindications:** Hypotension  
Asymptomatic Hypertension  
Erectile Dysfunction Medications (**\*\*Requires OLMC Order Only**)  
Sildenafil (Viagra<sup>®</sup>) or Vardenafil (Levitra<sup>®</sup>) use within 24 hours  
Tadalafil (Cialis<sup>®</sup>) use within 48 hours

**Pharmacokinetics:** Rapid vascular uptake within 3 minutes of sublingual dosing, with duration of effect up to 30 minutes. Rapid vascular effect within 1-3 minutes of intravenous dosing, with ongoing effect while continuous infusion. Vascular effect within 15-30 minutes of transdermal dosing, with ongoing effect while continued transdermal absorption.

**Side Effects:** The most serious side effect is hypotension, usually transient and responsive to supine positioning and intravenous fluid bolusing. Common, though non-serious, symptoms include: headache due to vasodilation, blurred vision, and dizziness. Paramedics should exercise caution when applying transdermal nitroglycerin ointment, avoiding contact with bare hands to avoid experiencing personal side effects, typically headache and dizziness.

**PROTOCOL 16HH: Nitroglycerin (Nitrolingual<sup>®</sup>, NitroMist<sup>®</sup>, NitroStat<sup>®</sup>, NitroQuick<sup>®</sup>, Tridil - Intravenous, Nitro-BID<sup>®</sup> - Transdermal), cont.**

**Dosage: Dyspnea - Congestive Heart Failure - Adult (3E)  
Acute Coronary Syndrome - Adult (5C)**

0.4 mg sublingual spray or tablet if systolic BP > 100 mmHg. Single dose unless by Paramedic. May repeat 0.4 mg sublingual spray or tablet every 5 minutes if systolic BP >100 mmHg until chest pain and/or respiratory distress resolves.

Following initial sublingual use, may utilize intravenous infusion start at 10 mcg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 mcg/min.

Following initial sublingual use, may utilize transdermal application of 1½ inches ointment to chest wall.

**Chest Pain - Uncertain Etiology - Adult (5A)**

0.4 mg sublingual spray or tablet if systolic BP >100 mmHg. Single dose unless by Paramedic. If chest pain improved with initial dose, 0.4 mg sublingual spray or tablet every 5 minutes until chest pain and/or respiratory distress resolves.

Following initial sublingual use, may utilize intravenous infusion start at 10 mcg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 mcg/min.

Following initial sublingual use, may utilize transdermal application of 1½ inches ointment to chest wall.

**Hypertensive Emergency - Adult (5L)**

**Complications of Pregnancy (Hypertensive Emergency) - Adult (13D)**

0.4mg sublingual spray or tablet every 5 minutes until BP symptoms resolve or BP is reduced by 10%.

In place of or following initial sublingual use, may utilize intravenous infusion start at 10 mcg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 mcg/min.

In place of or following initial sublingual use, may utilize transdermal application of 1½ inches ointment to chest wall.

**How Supplied:**

Metered dose spray 0.4 mg/spray.

Tablets for sublingual absorption 0.4 mg.

Intravenous infusion - Mix 50 mg into 250 mL D5W (200 mcg/mL)

10 mcg/min using microdrip infusion set is 3 mL/hour rate

20 mcg/min using microdrip infusion set is 6 mL/hour rate

Transdermal ointment in 2% nitroglycerin concentration

1½ inches = 22.5 mg of nitroglycerin

(Always check concentration and dose per container at time of patient medication administration)

**16II – NOREPINEPHRINE (LEVOPHED®)**

**PARAMEDIC**

**Class:** Vasoconstrictor

**Actions/Pharmacodynamics:** Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increase in systemic blood pressure. Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation, though norepinephrine is a weaker beta stimulator than dopamine.

**Indications:**                   Dyspnea – Congestive Heart Failure (Cardiogenic Shock) (3E)  
   Post Cardiac Arrest Treatment (Cardiogenic Shock) (4J)  
   Acute Coronary Syndrome (Cardiogenic Shock) (5C)  
   Fever (Septic Shock) (9B)  
   Dialysis-Related Issues (9E)  
   For all listed situations, indication is hypotension (adult = systolic < 100 mmHg) due to cardiogenic, septic, or neurogenic shock either refractory to intravascular fluid boluses or in which intravascular fluid bolusing is contraindicated (eg. pulmonary edema).

**Contraindications:** Hypertension

**Pharmacokinetics:** Onset of action within 5 minutes after IV/IO infusion initiated. Rapid metabolism, requiring ongoing IV/IO infusion to maintain clinical effects.

**Side Effects:** Few, though at higher doses, symptoms may include headache, palpitations, tachycardia, chest pain, and eventual hypertension. Bradycardia can result reflexively from an increase in blood pressure.

**Dosage:**                         **Dyspnea – Congestive Heart Failure (CHF) – Adult (3E)**  
   **Post Cardiac Arrest Treatment - Cardiogenic Shock - Adult (4J)**  
   **Acute Coronary Syndrome – Adult (5C)**  
   **Fever - Septic Shock - Adult (9B)**  
   **Dialysis-Related Issues - Adult (9E)**  
   **For hypotension (shock) refractory to fluids or fluids contraindicated**  
   Start at 2-4 mcg/minute - see dosage chart - titrated to a systolic B/P ≥ 100 mmHg. Maximum infusion rate is 12 mcg/minute.

**Norepinephrine Infusion Adult Dosage Chart**  
**rates reflect using a microdrip (60 drops/mL) set:**

mcg/min	2	3	4	5	6	7	8	9	10	11	12
drops/min	15	22	30	37	45	52	60	67	75	82	90

**PROTOCOL 16II: Norepinephrine (Levophed®), cont.**

**Dosage, cont.:**        **Dyspnea – Congestive Heart Failure (CHF) - Pediatric (3E)**  
                                 **Post Cardiac Arrest Treatment - Cardiogenic Shock - Pediatric (4J)**  
                                 **Fever - Septic Shock - Pediatric (9B)**  
                                 **Dialysis-Related Issues - Pediatric (9E)**  
                                 **For hypotension (shock) refractory to fluids or fluids contraindicated**  
                                 **\*\*OLMC Order Only**

**How Supplied:**        4 mg/4 mL ampule or vial.  
                                 **Use only 2 mL in a 250 mL bag of D5W.**  
                                 (8 mcg/mL concentration)  
                                 (Always check concentration and dose per container at time of patient  
                                 medication administration)

**Special Comments:** In the setting of tachydysrhythmia-induced cardiogenic shock, treat per Protocol 5G – Tachycardia - Unstable. Ensure aggressive fluid resuscitation is accomplished (unless contraindicated) prior to norepinephrine use.

Norepinephrine should be given into a large, patent vein. The vein of choice for EMS use is the antecubital vein, as this will decrease the risk of overlying skin necrosis. Do not administer norepinephrine through an IV in the hand or leg. These veins are more likely to be affected by vaso-occlusive diseases and more prone to ischemic complications. Administration through IO in the proximal tibia or humeral head is permitted.

If local extravasation occurs, notify the receiving physician of the following FDA advisement of antidote to extravasation ischemia:

"To prevent sloughing/necrosis in peripheral ischemic areas promptly use syringe w/ fine hypodermic needle to liberally infiltrate area w/ 10-15 mL saline solution containing 5-10 mg phentolamine; sympathetic blockade causes immediate conspicuous local hyperemic changes if area infiltrated within 12 hours."

Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks. Safety in pediatrics not firmly established and OLMC is to be consulted prior to pediatric usage.

Avoid mixing in normal saline, as NS promotes loss of potency through oxidation of norepinephrine.

16JJ – ONDANSETRON (ZOFRAN®)

PARAMEDIC

**Class:** Antiemetic

**Actions/Pharmacodynamics:** 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.

**Indications:** Snakebites (8E)  
Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)  
Fever (9B)  
Pelvic Pain (13E)  
For all listed situations, indication is for impending/active vomiting.

**Contraindications:** Known hypersensitivity to ondansetron  
Current use of Apomorphine (Apokyn®), an anti – parkinsonian drug

Use with caution with patients currently using medications which effect QT interval (eg. procainamide, amiodarone, tricyclic antidepressants, haloperidol)

**Side Effects:** Sedation, dystonic reactions (rare), hypotension, tachycardia, angina, torsades (rare).

**Dosage:** **Snakebites - Adult (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea - Adult (9A)**  
**Fever - Adult (9B)**  
**Pelvic Pain - Adult (13E)**  
**For all listed situations, indication is for impending/active vomiting.**  
4 mg oral dissolving tablet on tongue, may repeat once in 10 minutes  
4 mg slow IVP over 60 seconds, may repeat once in 10 minutes

**Snakebites - Pediatric (8E)**  
**Abdominal Pain/Nausea/Vomiting/Diarrhea - Pediatric (9A)**  
**Fever - Pediatric (9B)**  
**Pelvic Pain - Pediatric (13E)**  
**For all listed situations, indication is for impending/active vomiting.**  
If age > 2 years, 4 mg oral dissolving tablet on tongue  
0.1 mg/kg to max of 4 mg slow IVP over 60 seconds

**How Supplied:** 4 mg/2 mL (2 mg/mL) vial.  
4 mg rapid oral dissolving tablet (ODT)  
(Always check concentration and dose per container at time of patient medication administration)



# STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

## 16KK – PHENYLEPHRINE 2% (NEOSYNEPHRINE<sup>®</sup>)

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Active epistaxis only - 9C

**Class:** Topical Nasal Vasoconstrictor

**Actions/Pharmacodynamics:** Phenylephrine is a direct-acting sympathomimetic amine. It stimulates alpha receptors in the blood vessels of the nasal mucosa which causes their constriction, thereby decreasing the risk of subsequent nasal bleeding.

**Indications:** Nasal Intubation (2H)  
Epistaxis (9C)

**Contraindications:** None in the indicated settings.

**Pharmacokinetics:** Onset of action is within seconds.

**Side Effects:** Rare with single dose. It is rarely absorbed systemically from nasal instillation.

**Dosage:** **Nasal Intubation - Adult (2H)**  
2 sprays in each nostril

**Epistaxis - Adult & Pediatric (9C)**  
2 - 4 sprays in affected nostril(s) for control of epistaxis (with compression of nose immediately after administration)

**How Supplied:** Phenylephrine Nasal Spray 1% solution, 15 mL squeeze bottle for single patient use only.  
(Always check concentration and dose per container at time of patient medication administration)



## STATE OF OKLAHOMA 2014 EMERGENCY MEDICAL SERVICES PROTOCOLS

Effective Date – May 1, 2014  
Previous editions of the  
State Approved Protocols are  
obsolete.

### 16LL – PRALIDOXIME CHLORIDE (2PAM)

#### PARAMEDIC

**Class:** Cholinesterase Reactivator

**Actions/Pharmacodynamics:** **Pralidoxime chloride** reactivates cholinesterase (mainly outside the central nervous system) which has been inactivated by an organophosphate pesticide. The destruction of accumulated acetylcholine can then proceed and neuromuscular junctions will regain function. Pralidoxime chloride has its most critical effect in reversing paralysis of the muscles of respiration. Because Pralidoxime Chloride is less effective in relieving depression of the respiratory center, atropine is always required concomitantly to block the effect of accumulated acetylcholine at the site. Pralidoxime Chloride is short acting and repeated doses may be needed, especially when there is evidence of continuing toxicity.

**Indications:** Poisonings – General Management (8A)

**Contraindications:** None

**Pharmacokinetics:** With IM autoinjector use, effects may not be observed for up to 15 minutes. Beneficial effects can persist in excess of 1 hour.

**Side Effects:** Headache, dizziness, vision changes, loss of coordination, laryngospasm, tachycardia, palpitations.

**Dosage:** **Poisonings – General Management - Adult & Pediatric > 12 years of age (8A)**  
600 mg IM  
May repeat every 15 minutes to cumulative maximum dose of 1800 mg.  
In the setting of serious symptoms (cardiopulmonary distress), repeat doses in rapid succession.

**Poisonings – General Management - Pediatric ≤ 12 years of age (8A)**  
**\*\*OLMC Order Only**  
Typical pediatric dose is 15 mg/kg IM per dose, max single dose 600 mg

**How Supplied:** 600 mg/2 mL autoinjector  
(Always check concentration and dose per container at time of patient medication administration)

16MM – SODIUM BICARBONATE

PARAMEDIC

**Class:** Alkalinizing agent

**Actions/Pharmacodynamics:** Raises the pH of blood by buffering excess hydrogen ions that are present in acidotic states. The role of sodium bicarbonate is limited in cardiac arrest. Because ventilation is an effective tool in managing respiratory acidosis, sodium bicarbonate should rarely be administered for cardiac arrest, unless the arrest is suspected to be secondary to hyperkalemia, a preexisting metabolic acidosis, or a tricyclic antidepressant over ingestion.

**Indications:** Specific Causes of Cardiac Arrest (Hyperkalemia) (4I)  
Poisonings – General Management (Tricyclic Antidepressant) (8A) Dialysis-Related Issues (Hyperkalemia) (9E)  
Crush Injury Syndrome (Hyperkalemia Prophylaxis) (10K)

**Contraindications:** Known metabolic alkalosis.

**Pharmacokinetics:** Onset of effect is observed within 3-5 minutes after IVP/IOP administration.

**Side Effects:** Sodium bicarbonate may inhibit oxygen release secondary to a shift in oxyhemoglobin saturation. It also may produce a paradoxical acidosis that can depress cerebral and cardiac function. Severe soft tissue damage can occur in extravasated administrations.

**Dosage:** Specific Causes of Cardiac Arrest – Hyperkalemia - Adult & Pediatric (4I) Poisonings – General Management – Tricyclic Antidepressants - Adult & Pediatric (8A)  
Dialysis-Related Issues – Hyperkalemia - Adult & Pediatric (9E)  
Crush Injury Syndrome – Hyperkalemia Prophylaxis - Adult & Pediatric (10K)  
1 mEq/kg IVP/IOP with maximum dose of 50mEq

**How Supplied:** 50 mEq/50 mL (1 mEq/mL) prefilled syringe.  
(Always check concentration and dose per container at time of patient medication administration)

**Special Comment:** Do not administer with calcium chloride. A precipitate will form and obstruct the vascular access being utilized.