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## Auto Injector Protocol

### Indication

1. Protocol directed medication administration via auto-injector.

### Contraindications

1. None

### Background

The auto-injector delivers a predetermined dose of medication via the intramuscular (IM) route. Use of an auto-injector is indicated as directed or recommended by protocol and when other administration routes are unavailable. The use of an auto-injector is highly recommended for the administration of some high risk medications like epinephrine. Risk of error is greatly decreased by the use of an auto-injector as there is no need to calculate or draw up a dose of medication. Medications commonly administered via auto-injector include epinephrine, and naloxone.

### Procedure

1. Check the label and expiration date on the auto-injector.
2. Confirm the Five "Rs": Right patient, Right medication, Right dose, Right route, and Right time.
3. If applicable, explain the procedure to the patient.
4. Locate the injection site (vastus lateralis located on the lateral aspect of the thigh. Injection is given at the mid-thigh level).
5. If time permits, expose the site and with a circular motion starting from the selected site outward, prepare the site with alcohol or chlorhexidine (auto-injectors are designed to work through clothing).
6. Remove the auto-injector from its storage container.
7. Form a fist around the auto-injector with the black tip facing down. Do NOT place your thumb over either end of the auto-injector.
8. Remove the safety cap from the auto-injector with your other hand.
9. Position the auto-injector at a 90° angle with the black or orange "needle end" cap against the desired injection site and press very firmly listening for an audible click indicating the needle has been deployed.
10. Hold the auto-injector in place for 10 seconds to allow for complete delivery of medication.
11. Remove the auto-injector and dispose of it properly.
12. Massage the injection site for 10 seconds to enhance medication delivery.
13. Observe the patient for response to the medication.
14. All patients receiving medication via auto-injector should be transported to the hospital for further evaluation and observation.



**Brief Resolved Unexplained Event (BRUE)  
Pediatric Apparent Life Threatening Event (ALTE)  
Protocol**

**Purpose**

1. To serve as the treatment standard for treating pediatric patients with a Brief Resolved Unexplained Event (BRUE).

**Definition**

BRUE is defined as an episode involving an infant less than twelve (12) months of age that is frightening to the observer and there is no explanation for a qualifying event after conducting an appropriate history and physical exam. A qualifying event is characterized by one or more of the following:

- Absent, decreased or irregular breathing (Apnea (central or obstructive) including unexplained choking or gagging.
- Color change (cyanosis, pallor, erythema)
- Marked change in muscle tone (flaccid or rigid)
- Altered level of responsiveness

**Excludes**

- Age >12 months
- Seizures
- Respiratory distress
- Cardiopulmonary arrest
- Trauma with known mechanism of injury

**Protocol**

1. EMS personnel shall make every effort to obtain the contact information of the person who witnessed the event-this contact information shall be provided to the receiving hospital upon patient delivery.
2. Perform a comprehensive exam
3. Obtain history of event;
  - Activity at onset,
  - Duration of event with severity
  - What, if any, resuscitative measures were done by the parent or caretaker
  - Pertinent information during event (cyanosis, apnea, coughing, gagging, vomiting)
  - State after the event (normal, not normal)
4. Recent history
  - Illness, injuries, sick contacts, use of OTC medications, recent immunizations, new or different formula
5. Obtain past medical history
  - Gestational age, pre/perinatal history, GERD, seizures, previous BRUE
6. Family history
  - Sudden, unexplained deaths, prolonged QT, arrhythmias
7. Medications in the residence
8. Sleeping position/parent co-sleeping
9. Treatment at scene and/or transport with current Administrative Orders that would apply to your patient.



**Brief Resolved Unexplained Event (BRUE)  
Pediatric Apparent Life Threatening Event (ALTE)  
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10. If treatment/transport is refused by parent or guardian, contact base hospital medical direction to consult prior to leaving and document refusal of care per your protocols.
11. Documentation weather refusal or transport to include
  - Answers to 4-9 above
  - Head to toe exam for trauma, bruising, or skin lesions
  - Check anterior fontanelle: is it bulging, flat or sunken
  - Pupillary exam
  - Respiratory exam for rate, pattern, work of breathing and lung sounds
  - Cardiovascular exam for murmurs and symmetry of brachial and femoral pulses
  - Neuro exam for level of consciousness, responsiveness and any focal weakness

**Pearls**

- BRUE is not a disease, but a symptom. Common etiologies include central apnea (immature respiratory center), obstructive apnea (structural), GERD (laryngospasm, choking, gagging) respiratory (pertussis, RSV) cardiac (CHD, arrhythmia) seizures
- Always consider non-accidental trauma in any infant who presents with BRUE
- Even with a normal physical examination at the time of EMS contract, patients that have experienced BRUE should be transported for further evaluation and work-up



# CENTRAL LINE ACCESS AND LINE MAINTENANCE

## Purpose

Paramedic's may encounter indwelling catheters in both Prehospital and Inter-Facility patients. Catheters may vary in type and use as in tunneled catheters, porta-cath, non-tunneled central lines and peripherally inserted central catheter (PICC) lines.

Paramedics may maintain these lines and use them for vascular access in emergencies. Follow the patient's pre-existing care regimen for flushing and access whenever possible.

## Information

Health-care professionals commonly deliver fluids and/or medications via intravenous (IV) routes. In the prehospital setting, a peripheral IV site may not be obtainable. However, if the patient has a central line and the knowledge and skill to access that IV line has been obtained by the Paramedic, it could provide a lifesaving IV access. A thorough knowledge of applicable anatomy, physiology, technology and proper technique is essential to the safety and effectiveness of IV therapies. This course module is designed to teach paramedic's the proper care and maintenance of central IV lines. To provide safe and effective infusion therapy, the clinician should understand the anatomy and physiology of the vascular system and have knowledge of the patient's past and present medical history, along with patient's current therapy.

## Policy

1. Paramedics may access PICC lines, Groshong (tunneled), central line catheters (i.e. Borviac, Hickman, Hohn, subclavian, etc.) and implanted ports (Port-a-Cath) with training for life saving interventions and/or fluid/medications use. (**NOT** dialysis catheters, arteriovenous fistulas or grafts).
2. Course Requirements:
  - Complete **minimum** two-hour training
  - Skills and post test

## Precaution

1. Use strict aseptic techniques
2. Do not use lines if their distal termination is in an uncertain location
3. Do not use scissors near the indwelling catheter site
4. Use Huber (non-coring) needles to access Porta-Cath ports
5. Long catheters have low flow rates and may not be useful for fluid resuscitation

## Procedure

1. Don clean gloves for all handling of catheters
2. Prepare equipment in advance



## CENTRAL LINE ACCESS AND LINE MAINTENANCE

3. Identify if catheter is accessible by standard prehospital equipment (Implanted ports, should be accessed by special, non-coring [Huber-type] needles.)
4. Identify shut-off, clamps, caps, heparin/saline lock, etc., and clamp line if disconnecting or opening

### Accessing Broviac, Hickman, Leonard and PICC Lines

1. Clamp off the hub line you intend to use.
2. Once the line is clamped off, expose the end of the hub (it may have a cap or be taped over) clean it well with an alcohol prep and put an INT hub on it.
3. With the INT hub in place, unclamp the tubing and let the INT hub seal out air.
4. Clean the INT hub and attach an empty 10-20 ml syringe to the INT hub and aspirate about 5ml of blood and heparin to confirm the line is in place.
5. There should be no resistance to aspiration. If there is resistance, **NEVER** force flushes.
  - Trouble Shooting:
    - ✓ Gently flush with NS/LR and then try to aspirate again
    - ✓ Have the patient cough
    - ✓ Change the position of the patient
    - ✓ Turn the head/neck to the opposite site of the catheter
6. Discard the syringe and contents as biohazard waste.
7. Site may be functional without return. Only use venous access devices that have a blood return unless the patient or family can verify that the device is functional despite the lack of blood return
8. Attach prime ready NS/LR bag and run it into the line at a TKO rate.
9. Use the y-sites on the IV tubing to give meds as needed; make sure to clean the y-site correctly and flush with the NS/LR IV line after each med.
10. Secure connections with Luer lock or tape.
11. Multi-lumen catheters; it is preferable to leave unused ports/ lumens sterile.
12. Establish online medical direction as needed for infrequently used medications or complex situations.

### Accessing Port-a-Caths and Bard Ports

1. Use "Huber" needle, an empty 10-20ml syringe, alcohol preps, INT hub, a saline flush and a primed ready NS/LR IV setup.
2. Locate the port beneath the patient's skin.
3. Clean the skin with LOTS of betadine, giving plenty of sterile field to work in.
4. If the port location is going to be re-palpated, betadine your glove fingers to prevent re-introducing gremage.
5. Clean the INT hub with alcohol prep and attach an empty 10-20 ml syringe. Aspirate about 5 ml of blood and heparin from the port and line.
6. Discard the syringe and contents as biohazard waste.
7. Place tegaderm over the wings of the needle to keep it sterile.



## CENTRAL LINE ACCESS AND LINE MAINTENANCE

8. Attach primed ready NS/LR IV running at a TKO rate.
9. Use the y-sites on the IV tubing to give meds as needed; make sure to clean the y-site correctly and flush with the saline IV line after each med.
10. Establish online medical direction as needed for infrequently used medications or complex situations.

### Documentation

1. Type of central line, PICC, or Port-a-Cath
2. Location
3. Followed policy for access
4. Fluid use and total amount of infusion during transport
5. All medications giving and how
6. Document any transferring physician orders and medical direction orders in PCR
7. Note any adverse effects and interventions provided

Preventive Maintenance and Troubleshooting Problems	Preventative Measures	Interventions
<b>Erythema</b>	-Infected incision or port pocket, poor healing postoperatively	-Assess redness/drainage. Call - Administrative Base Hospital Medical Direction for use of site
<b>Infection</b>	-Hand washing is the single, most important procedure -All equipment must be checked for expiration date, package integrity, particulate matter, cloudiness or any signs to indicate the presence of contamination	-Notify Administrative Base Hospital as needed
<b>Infiltration/Extravagation</b> -Pain/stinging at or near the insertion site -Swollen neck or arm -Swelling proximal to or distal to the insertion site -Puffiness of the dependent part of the limb/body -Taut, rigid skin around the insertion site -Blanching/coolness of the skin around the insertion site -Damp or wet dressing -Slowed infusion rate, or infusion stops running	-Dilute all medications as indicated in their literature -Secure the catheter so that the site is visible -Avoid the use of high pressure infusion pumps, especially when infusing highly irrigating or vesicant drugs -Educate the patient to report any feelings of burning or pain	-Stop the infusion -Elevate the arm if affected -Notify Administrative Base Hospital as needed



## CENTRAL LINE ACCESS AND LINE MAINTENANCE

<p><b>Dislodgment of Catheter</b> -Leakage from Central Line site -Increase or decrease in external catheter length</p>	<p>-Protect Central Line or Port during transport -Secure loose ends with tape, so -Central Line does not get caught and pulled during loading and unloading</p>	<p>-Secure catheter and extension tubing with tape -Notify Administrative Base Hospital as needed</p>
<p><b>Damaged Catheter</b> -Leakage from external catheter -Broken hub -Broken bifurcation -Pockets of swelling along catheter path -Central Line is damaged</p>	<p><b>ALWAYS</b> use minimum of 10syringe to prevent catheter damage from excess infusion pressure -Do no clamp the catheter -Keep scissors and all sharp objects away from catheter -Access the injection ports with a needleless system or use only small bore needles with a length of on (1) inch or less to access the injection port</p>	<p>-Closed ended catheters (Groshong) will not bleed or cause air embolism if damaged; open ended catheters must be clamped immediately between the skin exit site and the damages area to prevent air embolism or blood loss -Cover the broken part with a sterile gauze and tape securely -Use patient clamp or (nonserrated) padded hemostats if line needs to be clamped -Do not use the catheter -Notify Administrative Base Hospital as needed</p>
<p><b>Catheter Occlusion/Thrombus</b> -Unable to administer IV fluids -No flow -Unable to aspirate -Persistent high pressure alarms on infusion pumps -Visible precipitate/blood in external segment or leaking of fluid from the insertion site -Tenderness and edema of neck, shoulder, and/or arm on catheter side. Impaired movement of neck and jaw Engorged peripheral veins in arm or chest wall</p>	<p>-Comply with established policy. -Flush line after each use -Do not inject medications or fluids if resistance is met -When establishing patency, attempt to aspirate 5 ml first, then push 5 ml and if resistance is met, reclamp catheter and do not use. Dislodging a clot can cause a pulmonary embolus or vascular damage -Mix medications with the appropriate diluents and compatible medication or solutions -Follow medications with 5 ml NS. If open ended catheter/Port a cath, report to ED staff that central line was not flushed with Heparin</p>	<p>-Stop use of Central Line -Rule out mechanical obstruction</p> <ul style="list-style-type: none"> <li>• kinked tubing</li> <li>• empty IV bag</li> <li>• closed clamp</li> <li>• occluded injection cap</li> <li>• occluded IV filter</li> </ul> <p>-Do <b>NOT flush or use force to clear the catheter</b> -Attempt peripheral IV as needed -Notify Administrative Base Hospital as needed</p>
<p><b>Air Embolus</b> -Chest Pain -Cyanosis -Increased blood pressure and/or pulse rate</p>	<p>-Do not remove injection cap -Make sure the catheter is capped if used for intermittent therapy or when not in use -Do not allow IV fluids to run dry -Always expel air from preload syringed prior to administration</p>	<p>-Clamp line -Place patient on left side with head down -Monitor VS, high flow oxygen -Attempt peripheral IV as needed -Notify Administrative Base Hospital as needed</p>





## Cognitive Decision Screening Procedure

**PURPOSE:** To outline a standard method of determining mental capacity for the purpose of prehospital decision-making. This document may be applied alone, or in conjunction with an existing TMC or SAEMS protocol/standing order/administrative where a patient's capacity to decline assessment, treatment, or transportation is in question. It consists of the neurologic assessment component as well as the six-item cognitive screening tool.

Patients being screened for decisional capacity must meet **ALL** of the following criteria:

- Is alert & oriented to person, place, time & event
- Does not demonstrate or verbalize a danger to self or others
- Does not appear impaired by drugs or alcohol
- No obvious evidence of impairment due to mental illness
- No obvious evidence of acute neurologic insult or injury (loss of consciousness)
- No evident impairment from hemodynamic instability, such as:
  - Hypoxia
  - Hypotension/Hypertension
  - Cardiac dysrhythmias
- No evidence of hypoglycemia when indicated (FSBG < 60)
- GCS greater than 13

Confirm decisional capacity as appropriate, with score of 5 or 6 on **Cognitive Screening Tool**:

I'm going to ask you some questions and ask that you remember three words.		
After I say all three words, please repeat them out loud; remember them, because I will ask you to repeat them again in a few minutes. Repeat these words: APPLE, TABLE, PENNY		
	What year is this?	0 1
	What month is this?	0 1
	What day of the week is this?	0 1
What were the three words?	Apple	0 1
	Table	0 1
	Penny	0 1
		Total 6



**Don PPE\***

**Place surgical mask if available on patient (may use NC under mask)**

Initiate Immediate Supportive Care

- Administer oxygen (NC preferred) and titrate to SaO<sub>2</sub> of > 88%
- Complete primary and secondary survey as indicated
- Cardiac monitor, vital signs, fingerstick blood glucose and temperature

**INCLUSION CRITERIA**

Clinical concern for COVID-19 infection and symptoms requiring EMS treatment and transport

Symptoms for COVID-19 include:

- URI symptoms (Cough, Congestion, Fever), Shortness of breath, Respiratory distress, Pneumonia, Tachypnea

Special Consideration for High Risk Groups

- Nursing Facilities with known positive COVID19 patients
- Dialysis Patients
- Close Contact with person with known positive COVID19

All Cardiac Arrests

**ORDERS**

**Limit nebulizer use, including albuterol and ipratropium nebulizers**

- Limit treatment of nebulized medications to patients with known COPD/Asthma with active wheezing
- Consider using patient's own MDI, 1-2 puffs every 5 minutes
- If no MDI available use SVN and enhanced PPE\*\*
- If nebulizer treatment is needed, nebulizer should be attached to a nonbreather mask to minimize exposure
- All Nebulized treatments must be discontinued when traveling through public spaces, **including hospital hallways**
- Consider administer 0.3 mg of IM epinephrine, 1:1000, x 1 dose if needed for respiratory distress, use caution in patients over the age of 50 or with known cardiac disease

**CPAP/BIPAP**

- Avoid positive pressure ventilation (PPV) when not necessary in high risk patients
- Enhanced PPE\*\* must be utilized during PPV
- If available, utilize Bacterial/Viral Filter or HMEF (Heat moisture Exchange Filter)
- When possible, discontinue when traveling through public spaces, **including hospital hallways**

**Basic and Advanced Airway Management**

- Perform all basic and advanced airway procedure in enhanced PPE\*\*
- Maintain O<sub>2</sub> sat >88% using nasal cannula (<6 LPM) with surgical mask placed over NC or Nonbreather (15 LPM) fitted tightly to face
- Early RSI not recommended in prehospital setting
- For Cardiac Arrest, avoid endotracheal intubation and high flow O<sub>2</sub> for intubation
  - Insertion of Supraglottic airways is preferred
  - Passive oxygenation in cardiac arrest may be performed by attaching a BVM to a facemask and allowing oxygen to flow through BVM or passive oxygenation port at 10 lpm without manual ventilation
  - When ventilation is necessary, use available devices to limit exposure to aerosolized particles (i.e. PEEP valves to close exhalation ports when present, viral filters with BVM, IGel or ETT, etc.)

\*\*\*Please notify receiving facility of "Possible COVID19". Advise if patient is unstable and/or an aerosol generating procedure is being performed prior to arrival. Please follow hospital specific protocol for entering their facility\*\*\*

\*Don PPE: Mask, Goggles or Face Shield, Gloves, Gown

\*\*Enhanced PPE: Prioritizes use of masks that block aerosolized particles, ie N95 or P100 (if fit tested) when any medications or procedure is being provided that generates aerosolizing particles such as: nebulizers, positive pressure ventilation, mechanical ventilation, intubation, airway suction, tracheostomy, etc



### **Purpose**

To ensure the patient will receive the most appropriate care possible for their condition in the management of devices in place for either 911 calls or interfacility transports.

### **Guidelines**

1. All Interfacility Transport Protocols will be followed during transport.
2. EMS personnel should be familiar and/or trained on transporting these devices if approved by the Administrative Medical Direction.
3. Training for devices as listed in their guideline with have training every two (2) years or as defined by the Administrative Medical Direction.
4. Consider additional personnel (such as a second paramedic or EMT) because of types of drugs/devices that are require for patient.

### **EMT Monitor Devices**

1. Central Venous Catheters (Caped)
2. Feeding tubes clamped
3. Foley Catheters
4. Heimlich Valve (Prior Insertion)
5. Jackson Pratt Drains (other surgical drains and devices)
6. Medication Infusion Pumps (family or patient in control)
7. Nasogastric Tubes
8. Other tubes (nasoduodenal, nasojejunal, gastrostomy, jejunostomy, percutaneous endoscopic gastrostomy (PEG), Percutaneous endoscopic jejunostomy (PEJ))
9. Tracheostomy Tube
10. Ventricular Assist Devices

### **Paramedics Monitor Devices**

1. Central Venous Catheters
2. Chest Tubes (Management)
3. External Pacemaker Devices
4. Feeding tubes clamped
5. Femoral Lines (not in use)
6. Foley Catheters
7. Heimlich Valve
8. Internal Pace Maker Wires (not in use)
9. Jackson Pratt Drains(other surgical drains and devices)
10. Medication Infusion Pumps
11. Nasogastric Tubes
12. Other tubes (nasoduodenal, nasojejunal, gastrostomy, jejunostomy, percutaneous endoscopic gastrostomy (PEG), Percutaneous endoscopic jejunostomy (PEJ))
13. Tracheostomy Tube
14. Ventilators if trained
15. Ventricular Assist Devices



## Electronic Control Weapon Protocol

Base Hospital

### Purpose

To provide an overview of Electronic Control Weapons and appropriate care of the patient

### Overview

In some situations, state and local law enforcement utilize devices known as electronic control weapons (ECW), such as a TASER®, to assist with controlling persons. When used, the device discharges a wire that, at the distal end, contains an arrow-like barbed projectile that penetrates the suspect's skin and embeds itself, allowing the officer to administer an incapacitating electric shock. In most circumstances, probes can be removed by law enforcement.

### Guidelines

1. When safe to do so, patients should be immediately evaluated, with particular attention to signs and symptoms of excited delirium.
2. Follow Behavioral AO as needed. These patients will most likely need to be restrained for transport. Law Enforcement should ride with the patient in the ambulance.
3. Evaluation of ABCs and vital signs (including cardiac monitoring, if possible).
4. Persons that have been stunned/ stopped by means of an electro-muscular disruption weapon (i.e. Taser) should be evaluated by ALS.
5. If patient is a refusal, call Administrative Medical Direction. An ECG monitor strip and 12 lead ECG, must be evaluated and attached to the chart for any patient situation involving the use of a Taser.
6. If ALS not available, EMTs trained in 12 lead acquisitions may run a strip.
7. It is advised that Taser probes should not be removed by EMS providers unless they interfere with the safe transportation of the patient or in dangerous area.
8. Patients should be transported without probe removal if:
  - Embedded in the eye, genitals, or bone
9. These patients are recommended to be transported for evaluation:
  - Seizure is witnessed after ECW application-follow appropriate Administrative Order
  - There is excessive bleeding from probe site after probe removal
  - Cardiac arrest, complaints of chest pain, palpitations. Call medical direction for orders to follow Chest Pain AO
  - Respiratory distress-follow appropriate Administrative Order
  - Change in mental status after application
  - Pregnancy

### Contraindications to Removal

1. Patients with probe penetration in vulnerable areas of the body as mentioned below should be transported for further evaluation and probe removal:
  - Genitalia, female breast, or skin above the level of clavicles
  - Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.



## EMT Cardiac Monitor Acquisition Policy

### Purpose

Provide clinical guidelines for the management of a patient with possible STEMI and/or other medical issues.

### Policy

The following clinical guidelines will be met by EMTs and agencies utilizing 12 lead ECGs in the prehospital setting.

1. EMTs may acquire prehospital 12 lead ECGs as listed in their AOs as per the ADHS prehospital scope of practice.
2. Before the Base Hospital will authorize an EMT to perform this skill, ensure that the EMT has:
  - a. Completed training specific to this skill, consistent with the knowledge, skills, and competencies of the EMTs scope of practice.
  - b. Every two years assessment of this skill to ensure continued competency.
3. They may not interpret the results of the ECG nor make treatment decisions independently based (i.e. to transport or not transport the patient, give ASA and/or assist with the patient's nitroglycerine based on the results of the ECG).
4. They may not monitor "3-Lead" ECG.
5. If possible should, fax 12 lead ECG to the hospital prior to their arrival if no ALS unit is available for transport.



REFERENCE: AZDHS, NAEMSP

## ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE

### Purpose

Paramedic's IO access protocol for immediate vascular access in emergencies as defined below.

Emergencies are defined in this protocol as:

1. Intravenous fluids or medications are urgently needed and a peripheral IV cannot be established in (2) two attempts or 90 seconds **AND** the patient exhibits one or more of the following:
  - An altered mental status (GCS of 8 or less)
  - Respiratory compromise (SaO<sub>2</sub> 90% after appropriate oxygen therapy, respiratory rate < 10 or > 40 min)
  - Hemodynamic instability (Systolic BP of < 90)
  - Emergent drugs for cardiac issues
  - Emergent drugs for hypoglycemic issues
2. If paramedic's are trained in accessing pre-existing vascular device and time permits consider this prior to IO placement.
3. IO's should be considered **PRIOR** to peripheral IV or pre-existing vascular device attempts in the following situations:
  - Cardiac arrest (medical or traumatic)
  - Profound hypovolemia with alteration of mental status
  - Patient in extremis with immediate need for delivery of medications and or fluids

### CONTRAINDICATIONS

1. Fracture of bone assessed for placement.
2. Prior orthopedic procedure (e.g. Knee replacement).
3. Previous IO or attempt in same extremity within 24 hours.
4. Splint or cast in place proximal/distal to site.
5. Preexisting medical condition involving that extremity, e.g. tumor or significant peripheral vascular disease.
6. Infection or burn at insertion site.
7. Inability to locate landmarks due to :
  - Significant edema
  - Adipose tissue
8. A maximum of two IO attempts shall be made for peripheral placement.



## ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE

### CONSIDERATIONS

1. IO insertion attempts shall not prolong on-scene time or transport time.
2. Follow manufacturer's recommendations for insertion. If an automatic IO device is utilized.
3. Flow rates will be inherently slower than IV access, but will be maximized with a rapid bolus of 5-10 ml prior to infusion.
4. To improve continuous infusion flow rates always use a syringe, pressure bag or infusion pumps.
4. **Pain:** Insertion of an IO in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV). However, IO Infusion for conscious patients has been noted to cause severe discomfort
5. Consider prior to IO syringe bolus (flush) or continuous infusion in alert patients, **SLOWLY administer** Lidocaine 2% (Preservative Free) through the IO HUB **Ensure that the patient has not allergies or sensitivity to Lidocaine. Use attached dosing chart for amounts to administer.**

### PROCEDURE

#### Equipment Required

1. Appropriate PPE for blood-borne pathogens.
2. Appropriate IO needle or automatic IO insertion device.
3. Betadine or alcohol swabs.
4. Sterile gauze pads.
5. Two 5 ml syringes or primed IV line with or without stopcock.
6. IV fluids.
7. Tape.
8. Splinting device (i.e., cardboard splint, SAM splint, long leg splint or Long Back Board).

#### Insertion

1. Assemble needed equipment.
2. Locate and prepare the appropriate insertion site: Non-traumatized proximal tibia. Locate the landmarks 2-3 cm below the tibial tuberosity on the anteromedial flat bony surface of the proximal tibia.
3. Insert the IO needle holding the leg steady:
  - a. Grasp the needle with the obturator still in place and insert it through the skin at the selected site at a 90-degree angle to the skin surface.
4. Remove driver from needle set while stabilizing catheter hub
5. Remove stylet from catheter, place stylet in shuttle or approved sharps container
6. Confirm placement by attaching a primed IV solution set with or without a stopcock.

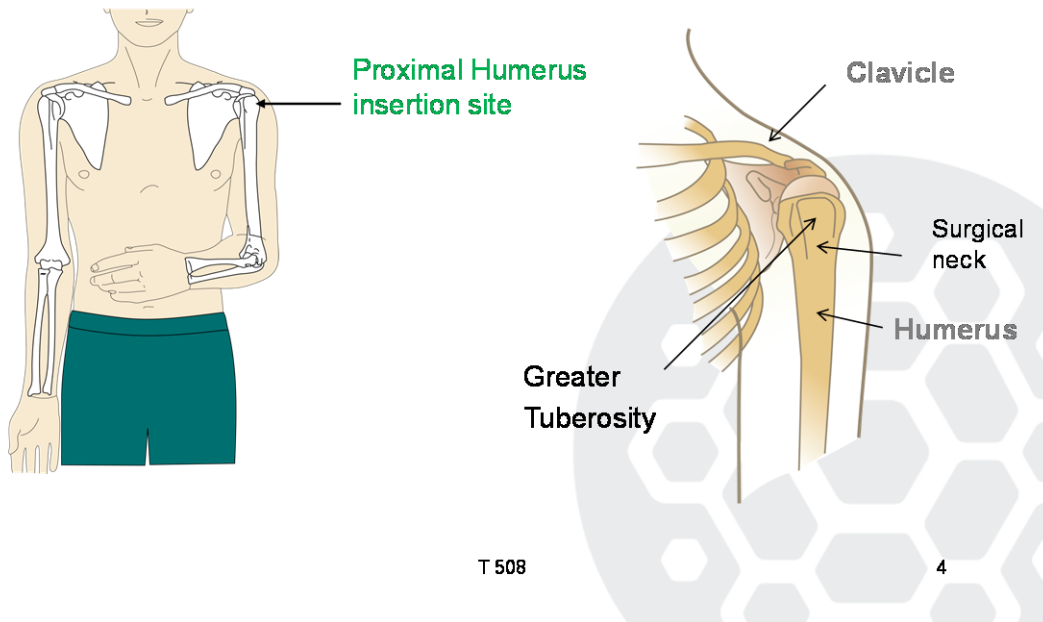
## ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE

7. If unable to flush, continue procedure and watch carefully for extravagation and swelling while infusing fluids and/or medications.
8. Secure the needle by taping and splint the leg.
9. Active pushing of fluids may be more successful than gravity infusion. Use the same size syringe for fluid boluses.
10. If infiltration occurs or needle removed, stop the infusion, remove the needle, and apply a pressure bandage to the IO site if another IO will be attempted, use a different bone.
11. Humerus Insertion: **(only used if trained)**
  - b. The site of optimal insertion is 1 cm above the surgical neck/notch in the greater tubercle. To locate the head, run thumb up humeral shaft, will feel slight outward protrusion at surgical neck. The greater tubercle is above that and the site of insertion. Confirm the site by pronating and supinating the hand and feeling the greater tubercle rotate under your finger.



Immediate Vascular Access... When You Need It.<sup>SM</sup>

## Proximal Humerus



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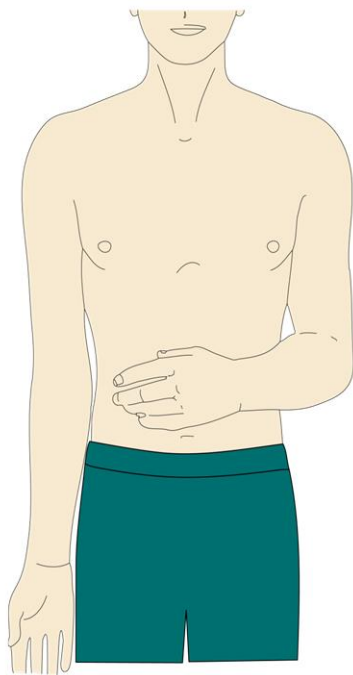




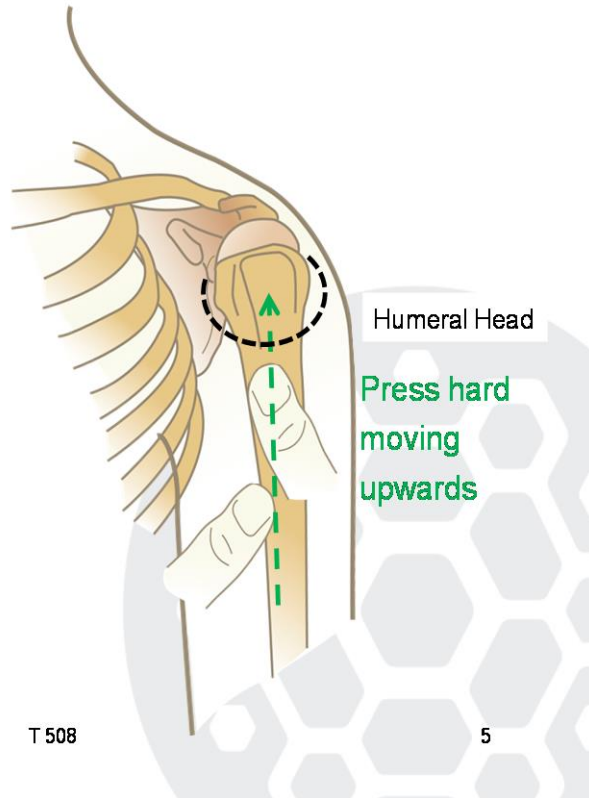
# ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE



Immediate Vascular Access... When You Need It.<sup>SM</sup>



Hand over Umbilicus

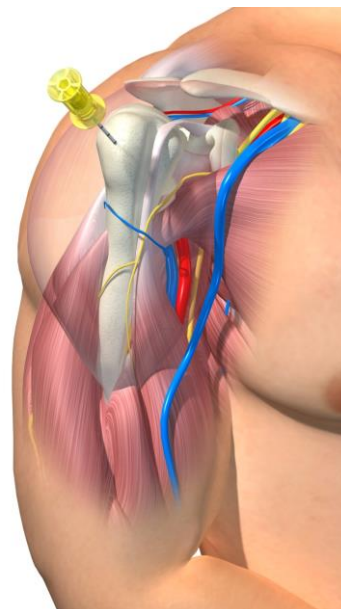


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Immediate Vascular Access... When You Need It.<sup>SM</sup>



Note slight angle

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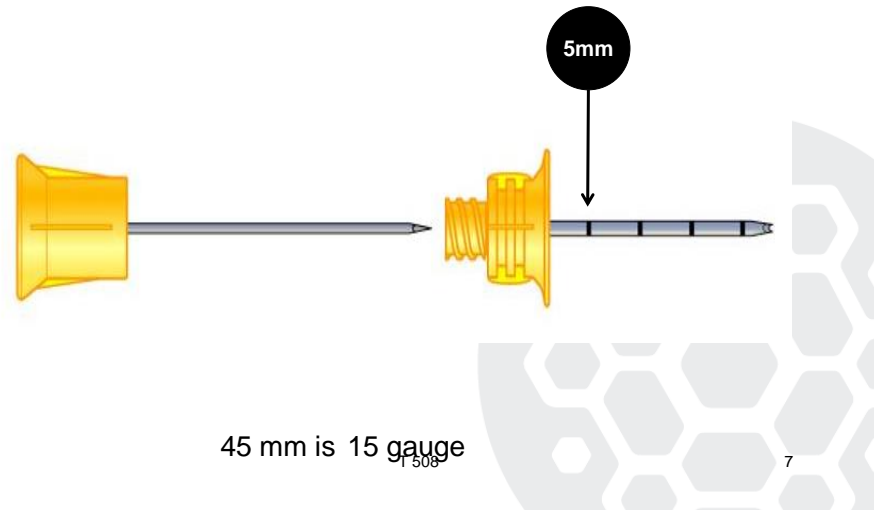


## ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE



Immediate Vascular Access... When You Need It.<sup>SM</sup>

### Needle | Needle Features



12. Then follow steps 4-12 above.

### DOCUMENTATION

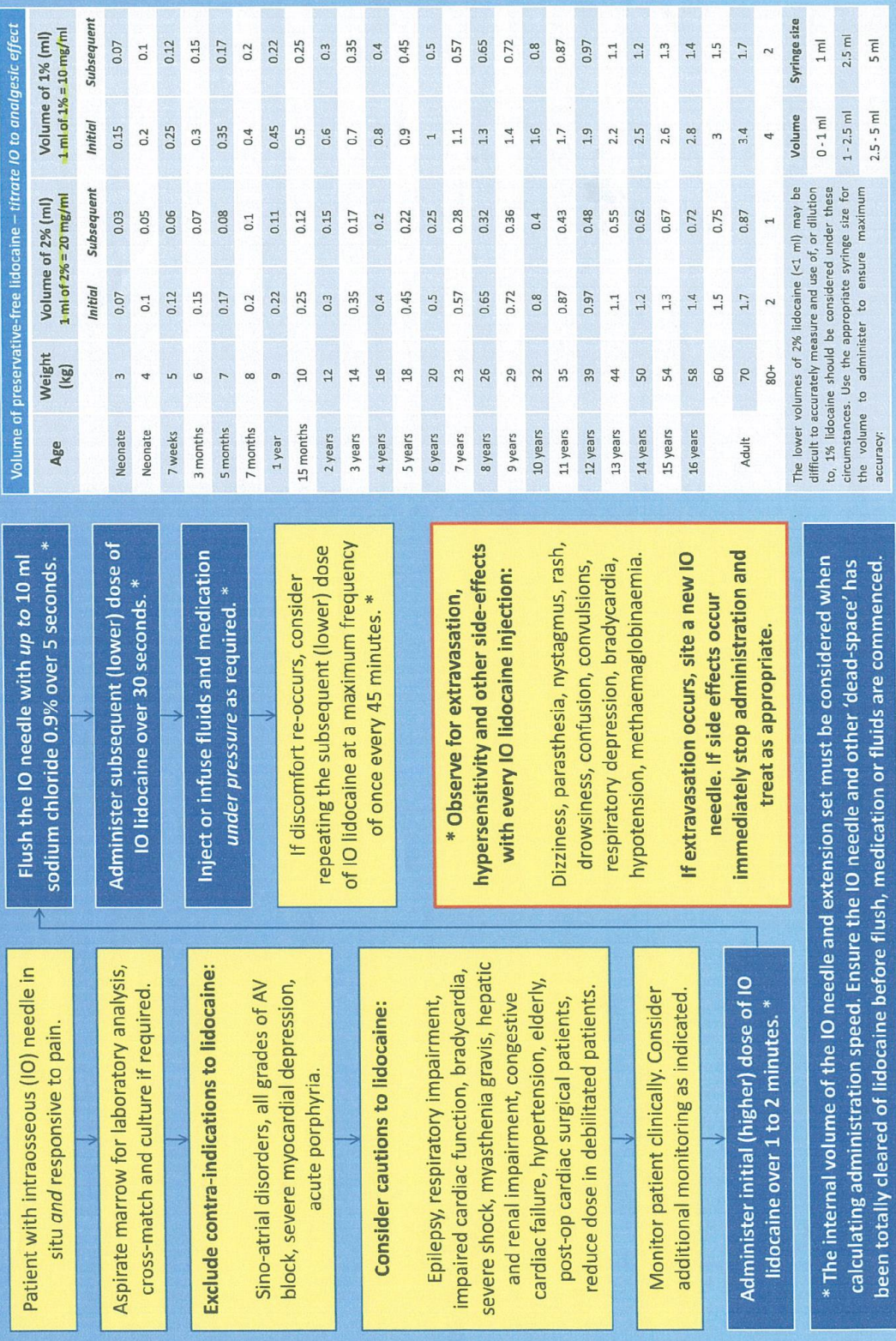
1. Document each IO insertion attempt (successful or unsuccessful) on patient care report.
2. Include details about procedures used for site preparation, placement, methods for securing the device and assessment of patency.
3. Document CSM in extremities bilaterally before and after IO procedure.



## ADULT AND PEDIATRIC VASCULAR ACCESS WITH INTRAOSSEOUS (IO) DEVICE

### Intraosseous administration of preservative-free lidocaine

Read this guideline fully before use - if in doubt seek senior medical advice



Volume of preservative-free lidocaine – titrate IO to analgesic effect

Age	Weight (kg)	Volume of 2% (ml) 1 ml of 2% = 20 mg/ml		Volume of 1% (ml) 1 ml of 1% = 10 mg/ml	
		Initial	Subsequent	Initial	Subsequent
Neonate	3	0.07	0.03	0.15	0.07
Neonate	4	0.1	0.05	0.2	0.1
7 weeks	5	0.12	0.06	0.25	0.12
3 months	6	0.15	0.07	0.3	0.15
5 months	7	0.17	0.08	0.35	0.17
7 months	8	0.2	0.1	0.4	0.2
1 year	9	0.22	0.11	0.45	0.22
15 months	10	0.25	0.12	0.5	0.25
2 years	12	0.3	0.15	0.6	0.3
3 years	14	0.35	0.17	0.7	0.35
4 years	16	0.4	0.2	0.8	0.4
5 years	18	0.45	0.22	0.9	0.45
6 years	20	0.5	0.25	1	0.5
7 years	23	0.57	0.28	1.1	0.57
8 years	26	0.65	0.32	1.3	0.65
9 years	29	0.72	0.36	1.4	0.72
10 years	32	0.8	0.4	1.6	0.8
11 years	35	0.87	0.43	1.7	0.87
12 years	39	0.97	0.48	1.9	0.97
13 years	44	1.1	0.55	2.2	1.1
14 years	50	1.2	0.62	2.5	1.2
15 years	54	1.3	0.67	2.6	1.3
16 years	58	1.4	0.72	2.8	1.4
Adult	60	1.5	0.75	3	1.5
	70	1.7	0.87	3.4	1.7
	80+	2	1	4	2

The lower volumes of 2% lidocaine (<1 ml) may be difficult to accurately measure and use of, or dilution to, 1% lidocaine should be considered under these circumstances. Use the appropriate syringe size for the volume to administer to ensure maximum accuracy.

Volume	Syringe size
0-1 ml	1 ml
1-2.5 ml	2.5 ml
2.5-5 ml	5 ml

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### Indication

1. Ocular irrigation after chemical exposure/thermal injury.
2. Facilitate removal of non-embedded foreign material from the eye.

### Contraindications

1. Patient  $\leq 8$  years of age.

### Background

The Morgan Lens© is a sterile plastic device resembling a contact lens that fits over the eye similar to a contact lens. The device connects to irrigation tubing. The device allows for copious irrigation of the eye(s).

### Procedure

2. Instill topical ophthalmic anesthetic in to the affected eye(s).
3. Mix 100 mg of LIDOCAINE (5ml of a 2% solution) in 1000 ml LACTATED RINGER'S SOLUTION.
4. Attach the Morgan Lens© to a delivery set equipped with a macro drip chamber and open the flow control to start flow.
5. Instruct the patient to look down and insert the upper portion of the lens under the upper eye lid.
6. Instruct the patient to look up and retract the lower lid allowing placement of the lower portion of the lens under the lower lid.
7. Continue irrigation of the affected eye(s) using caution to ensure run off does not enter the unaffected eye. Do not allow the irrigation solution to run dry.
8. Tape the tubing to the patient's face to prevent inadvertent removal.
9. Consider additional pain management as indicated.
10. To remove the lens, continue the flow of irrigation solution while instructing the patient to look up. Retract the lower lid and slide the lens from the upper lid.
11. All patients should be transported for evaluation for corneal injury.



## Mucosal Atomization Device (MAD)

### Purpose

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Tucson Medical Center Base Hospital Administration.

### General Information

1. Physiology
  - Membranes of the nose are in direct contact with the brain and CSF. Therefore, meds absorbed across the membranes directly enter the CSF. Review MAD power point for initial training and as need.
2. Amount of drug absorbed
  - IV meds = 1--%
  - Oral meds 5-10%
  - IN (intra-nasal) vary, very near to 100%
3. Factors affecting absorption
  - Vasoconstrictors
  - Epistaxis, nasal congestion, mucous discharge
  - Destruction of mucosa from surgery or past cocaine use
  - Particles 10-50 microns adhere best to the mucosa
4. Contraindications
  - Epistaxis, trauma, septal abnormality, nasal congestion, mucous discharge
  - Destruction of nasal mucosa from surgery
5. Advantages
  - Avoid needle sticks injuries
  - Needle less solution to drug delivery
  - Easy/convenient, painless
  - Nose is a rapid access point
  - EMT Naloxone Administration
6. Paramedics
  - IN use of Atropine, Fentanyl, Naloxone, Midazolam; dosing per SO/AOs
7. EMTs
  - Only administration of Nalaxone
8. Maximum volume 1 ml per nostril

### Procedure

#### Paramedic Medication Administration

1. Aspirate the proper volume of highly concentrated medication required to treat the patient (an extra 0.1 ml of medication should be drawn up to account for the dead space within the atomizer at the end of the procedure.
2. Twist off and remove the syringe from the needle/needleless device
3. Attach the atomizer tip via Luer lock mechanism-it twists into place. Slip Luer is also effective as long as the tip is firmly seated on the syringe tip.
4. Using your free hand to hold the crown of the head stable, place the tip of the atomizer snugly against the nostril aiming slightly up and inward (towards the top of the opposite ear).



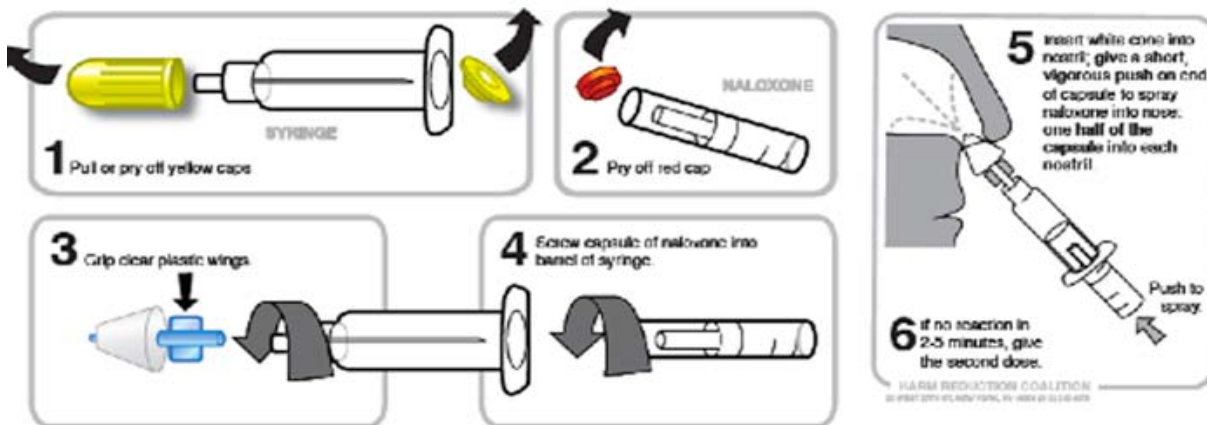
## Mucosal Atomization Device (MAD)

5. Briskly compress the syringe plunger to deliver half of the medication into the nostril (1.0 ml into each nostril).
6. Move the device over to the opposite nostril and administer the remaining medication into that nostril.

### EMT MAD Naloxone Administration

1. Take cap off medication
2. Remove the two caps from each end of the needleless applicator
3. Apply atomizer onto the end of the applicator
4. Tightly screw the medication into the applicator
5. Using your free hand to hold the crown of the head stable, place the tip of the atomizer snugly against the nostril aiming slightly up and inward (towards the top of the opposite ear).

### HOW TO GIVE NASAL SPRAY NARCAN



## Pediatric Normal Vital Signs Table

<b>Normal Heart Rate by Age (beats/minute)</b> Reference: PALS Guidelines, 2015			
Age	Awake Rate	Sleeping Rate	
Neonate (<28 d)	100-205	90-160	
Infant (1 mo-1 y)	100-190	90-160	
Toddler (1-2 y)	98-140	80-120	
Preschool (3-5 y)	80-120	65-100	
School-age (6-11 y)	75-118	58-90	
Adolescent (12-15 y)	60-100	50-90	
<b>Normal Respiratory Rate by Age (breaths/minute)</b> Reference: PALS Guidelines, 2015			
Age	Normal Respiratory Rate		
Infants (<1 y)	30-53		
Toddler (1-2 y)	22-37		
Preschool (3-5 y)	20-28		
School-age (6-11 y)	18-25		
Adolescent (12-15 y)	12-20		
<b>Normal Blood Pressure by Age (mm Hg)</b> Reference: PALS Guidelines, 2015			
Age	Systolic Pressure	Diastolic Pressure	Systolic Hypotension
Birth (12 h, <1000 g)	39-59	16-36	<40-50
Birth (12 h, 3 kg)	60-76	31-45	<50
Neonate (96 h)	67-84	35-53	<60
Infant (1-12 mo)	72-104	37-56	<70
Toddler (1-2 y)	86-106	42-63	<70 + (age in years x 2)
Preschooler (3-5 y)	89-112	46-72	<70 + (age in years x 2)
School-age (6-9 y)	97-115	57-76	<70 + (age in years x 2)
Preadolescent (10-11y)	102-120	61-80	<90
Adolescent (12-15 y)	110-131	64-83	<90
<b>Normal Temperature Range by Method</b> Reference: CPS Position Statement on Temperature Measurement in Pediatrics, 2015			
Method	Normal Range		
Rectal	C 36.6°-38°	F 97.8°-100.4°	
Ear	C 35.8°-38°	F 96.4°-100.4°	
Oral	C 35.5°-37.5°	F 95°-99.5°	
Axillary	C 36.5°-37.5°	F 97.7°-99.5°	

Temperature ranges do not vary with age. Axillary, tympanic and temporal temps for screening (less accurate). Rectal and oral temps for definitive measurement (unless contraindication).

### Oxygen Saturation

Pulse Oximetry Normal pediatric pulse oximetry (SPO<sub>2</sub>) values have not yet been firmly established. SPO<sub>2</sub> is lower in the immediate newborn period. Beyond this period, normal levels are stable with age. Generally, a SPO<sub>2</sub> of <92% should be a cause of concern and may suggest a respiratory disease or cyanotic heart disease.



**KEY:**

X = May be performed

X-T-May be performed with training

<b>AIRWAY/VENTILATION/OXGYENATION</b>	<b>EMT</b>	<b>PARAMEDIC</b>
Airway- esophageal (ETT)	X-T	X-T
Airway –supraglottic (Combi Tube, King Airway)	X	X
Airway- nasal	X	X
Airway- oral	X	X
Automated transport ventilator		X
Bag-valve-mask (BVM)	X	X
BiPAP/CPAP		X-T
Chest decompression- needle		X-T
Chest tube placement- assist only		X-T
Chest tube monitoring and management		X-T
Cricoid pressure (Sellick’s maneuver)	X	X
Cricothyrotomy- needle		X-T
Cricothyrotomy- percutaneous		X-T
Cricothyrotomy- surgical		X-T
End tidal CO <sup>2</sup> monitoring/capnography		X-T
Gastric decompression- NG tube		X
Gastric decompression- OG tube		X
Head-tilt chin lift	X	X
Intubation- nasotracheal		X
Intubation- orotracheal		X
Intubation with supraglottic tube (King Airway, Combi)	X-T	X-T
Jaw-thrust and modified (trauma)	X	X
Mouth-to-barrier, mask, nose, stoma	X	X
Obstruction- direct laryngoscopy		X
Obstruction- manual	X	X
Oxygen therapy- humidifiers, nasal cannula and all masks	X	X
PEEP- therapeutic		X
Pulse oximetry	X	X
Suctioning- upper airway	X	X
Suctioning- tracheobronchial		X
<b>CARDIOVASCULAR/CIRCULATION</b>	<b>EMT</b>	<b>PARAMEDIC</b>
Cardiac monitoring- multiple lead (interpretive)		X
Cardiac monitoring- single lead (interpretive)		X
Cardiac - multiple lead acquisition (non-interpretive)	X-T	X
Cardiopulmonary resuscitation	X	X
Cardioversion- electrical		X
Carotid massage – (≤17 years)		X
Defibrillation- automatic/semi-automatic	X	X
Defibrillation- manual		X





**KEY:**

X = May be performed

X-T-May be performed with training

Hemorrhage control- direct pressure, hemostatic agent tourniquet	X-T	X
Internal; cardiac pacing- monitoring only		X
Transcutaneous pacing- manual		X
<b>IMMOBILIZATION</b>	<b>EMT</b>	<b>PARAMEDIC</b>
Spinal immobilization- cervical collar, long board, manual, seated patient (Ked, etc.), rapid manual extrication	X	X
Extremity stabilization- manual, splinting, traction	X	X
Mechanical patient restraint	X	X
Chemical Restraint (see protocol)		X-T
Emergency moves for endangered patients	X	X
<b>MEDICATION-ROUTES</b>	<b>EMT</b>	<b>PARAMEDIC</b>
Aerosolized/nebulized (beta agonist)	X-T	X
Assisting patient with his/her own prescribed medications (aerosolized/nebulized)	X	X
Assisting patient with his/her own prescribed medications (ASA/Nitro)	X	X
Assisting patient with his/her own prescribed medications (autoinjector)	X	X
Auto-injector	X-T	X
Buccal, Endotracheal tube, Intramuscular, Subcutaneous, Intranasal, Intravenous push, Intravenous push, Intraosseous, Nasogastric, Rectal, Subcutaneous, Sublingual		X
Oral, Small volume nebulizer		X
MAD aerosol	X-T	X
<b>IV INITIATION/MAINTENANCE FLUIDS</b>	<b>EMT</b>	<b>PARAMEDIC</b>
Access indwelling catheters and implanted central IV ports (training required-ask)		X-T
Central line (femoral, PICC, indwelling portacaths, etc.)- monitoring/with fluids		X
Intraosseous- initiation		X
Intravenous access		X
Intravenous- maintenance of medicated IV fluids		X
Intravenous initiation- peripheral	X-T	X
Intravenous- maintenance of non-medicated IV fluids (NS,LR,D5W,or any combination of) or capped access	X	X
<b>MISALLIANCE</b>	<b>EMT</b>	<b>PARAMEDIC</b>
Assisted delivery (childbirth)	X	X
Assisted complicated delivery (childbirth)	X	X



**KEY:**

X = May be performed

X-T-May be performed with training

Blood glucose monitoring	X	X
Blood pressure- automated, Manual	X	X
Eye irrigation	X	X
Foley monitoring	X	X
Gastric Tube monitoring	X	X
Gastric Suctioning		X
Permanent indwelling infusion pumps can be monitored in the stable patient with the patient and/or caregiver is in charge of the pump	X	X
Urinary catheterization		X
Venous blood sampling		X
Use/monitor of agents <b>Table 5.2</b>	-	-
Use/monitoring of agents specified in <b>Table 5.3</b> during interfacility transports	-	-
Use/monitoring of infusion pump for agent administration during interfacility transports <b>Table 5.3</b>	-	-



**Patient Care Goals**

1. Initiate early fluid resuscitation and vasopressors to maintain/restore adequate perfusion to vital organs
2. Differentiate between possible underlying causes of shock in order to promptly initiate additional therapy

**Criteria**

- A. Hypoperfusion of body organs is characterized by alterations in mental status from baseline, pallor, diaphoresis, tachypnea, tachycardia, poor capillary refill, and hypotension.
  1. Septic Shock-signs or symptoms of hypoperfusion from a suspected infectious source (e.g. urosepsis, pneumonia, bacteremia/septicemia). These patients may present with a fever or preceding infectious illness.
  2. SIRS is a systemic inflammatory response that may be a precursor to septic shock in a patient that is not yet hypotensive. Consider SIRS in a patient with generalized weakness, hypoxia, or suspected infection like pneumonia. SIRS can be recognized in adults when there is a possible infection with at least two of the following:
    - Temperature (oral/temporal)  $\geq 38^{\circ}\text{C}$  ( $100.4^{\circ}\text{F}$ ) or  $\leq 36^{\circ}\text{C}$  ( $96.8^{\circ}\text{F}$ )
    - Heart Rate  $\geq 90$  bpm
    - Tachypnea  $\geq 20$  bpm
    - $\text{ETCO}_2 \leq 32$  mmHg
  3. Hypoperfusion manifested by one of the following:
    - $\text{SBP} \leq 90$  mmHg
    - $\text{MAP} \leq 65$  mmHg
    - Hypoxemia:  $\text{SpO}_2 \leq 90\%$  on RA
    - Cool/mottled or flushed/ruddy skin, capillary refill  $\geq 3$  seconds
    - Altered mental state or restlessness, anxiety
  4. Hypovolemia shock from repetitive vomiting/diarrhea in infants/children.
  5. Hypoperfusion of unknown etiology.
- B. Pediatric patient may present hemodynamically unstable or with hypoperfusion evidence by:
  - Hypotension for age (lowest acceptable SBP)
    - $\leq 1$  year: 60
    - 1-10 years:  $(\text{age in years})(2)+70$
    - $\geq 10$  years: 90
  - Tachycardia out of proportion to temperature, rapid pulse (see pediatric normal vital signs table)
  - Restlessness, anxiety, confusion
  - Pale, cool, clammy, cyanosis (peripheral, perioral)
  - Cool/mottled or flushed/ruddy skin, capillary refill  $\geq 3$  seconds
  - Rapid shallow respiration progressing to slow, labored respirations

**Exclusion**

1. Cardiogenic Shock-hypotension with suspected pulmonary edema.
2. Currently receiving treatment for heart failure.
3. History of renal failure or on dialysis.
4. Hypovolemia/Traumatic Shock of traumatic etiology (follow Stabilization AO).
5. Neurogenic Shock due to spinal cord injury (follow Stabilization AO).



## Protocol for large Vessel Occlusion

### Purpose

Patients with large vessel occlusion strokes (LVOS) may be better served by direct transfer to endovascular capable centers avoiding hazardous delays between acute stroke ready hospital, primary and comprehensive stroke centers

### Guidelines

1. These guidelines are to be used on patients 18 years or older with these symptoms: (may be transient or persistent) along with SAEMS Standing Order:
  - Facial palsy, arm weakness, speech changes, eye deviation, denial/neglect
  - Change in mental status -as documented by friend or family member – not related to drugs, alcohol, trauma, seizure or diabetes
  - Sudden loss of vision (complete or a portion of a visual field)
  - Ataxia [dramatic, acute changes in coordination (arms, legs, or gait) or inability to make smooth, intentional movements in a patient with *normal* mental status]
  - Sudden, severe, atypical headache
2. Always attempt to identify possible stroke mimics such as:
  - Seizure, migraine, stroke
3. If clear, acute neurologic changes meeting **Large Vessel Occlusion-CRITERIA** are present
  - Initiate IV NS/LR TKO or saline lock
4. Large Vessel Occlusion suspected:
  - Less than 6 hours
  - Consider direct transport to a Comprehensive Stroke Center (CSC), if this will not preclude use of IV Alteplase
5. **No** Large Vessel Occlusion suspected:
  - Transport to the nearest Primary Stroke Center
  - If symptom onset > 6 hours or unknown transport to closest facility
6. Establish and relay “STROKE ALERT” with time LAST SEEN NORMAL and time of symptom discovery
7. In outlying areas with a transport interval of > 30 minutes to a Comprehensive/Primary Stroke Center who are eligible for IV Alteplase consider transport to nearest
  - Acute Stroke Ready Hospital (ASRH)
  - Closest facility, or consider air transport to a Comprehensive/Primary Stroke Center

### Special Notes

1. Encourage family to go directly to the emergency department if not transported with patient and obtain mobile number of next of kin and witnesses
2. Patients who are eligible for IV Alteplase if transported to nearest ASRH or PSC **should not be rerouted to a CSC** if doing so would result in a delay that would make them ineligible for IV Alteplase
3. A Comprehensive Stroke Center in Southern Arizona is Tucson Medical Center
4. A Primary Stroke Center in Southern Arizona is BUMC-T, NMC, OVH, SJH, SMH and VA
5. No Acute Stroke Ready Hospitals



## Tracheostomy Tube Management Protocol

### Purpose

To provide guidelines for the care of tracheostomy tube and patients with respiratory distress

### History

- Birth defect
- Surgical complications (accidental damage to phrenic nerve)
- Trauma (post-traumatic brain or spinal cord injury)
- Medical condition (bronchial or pulmonary dysplasia, muscular dystrophy)

### Signs and Symptoms

- Nasal flaring
- Chest wall retractions (with or without abnormal breath sounds)
- Attempts to cough
- Copious secretions noted coming out of the tube
- Faint breath sounds on both sides of chest despite significant respiratory effort
- Altered Mental Status
- Cyanosis

### Differential

- Allergic reaction, asthma, aspiration, foreign body, medication or toxin, trauma, blocked or displaced

### Tracheostomy Tube

- **DOPE** for trouble shooting
  - Dislodged/displaced/disconnected
  - Obstruction
  - Pneumothorax
  - Equipment; malfunction of mechanical ventilator or loss of O2 supply
- Is the tube cuffed or cuffless
  - Cuffed tubes are needed for airway protection and positive pressure ventilation
  - A cuff leak may be present

### Procedures

In the patient with an obstructed tracheostomy tube, in whom no effective ventilation/oxygenation is possible, the following are to be considered Administrative Orders:

#### Bronchodilator Administration EMT or Paramedic

- Assemble nebulizer assembly as usual
- Attach trach collar to reservoir tubing
- Connect to oxygen source at a flow rate sufficient to produce misting
- Fit trach collar over stoma and have patient breathe slowly and deeply

#### EMT

1. Assess ABCs
2. Administer high flow oxygen to the mouth/nose and to the stoma site
3. If tracheostomy tube is blocked or displaced
  - Clearing of the tube and re-insertion
  - Have care giver insert tracheostomy tube
4. Once airway is open, begin ventilations as possible/necessary



## Tracheostomy Tube Management Protocol

### Paramedic

1. Assess ABCs, use EtCO<sub>2</sub>
2. If tracheostomy tube is blocked or displaced
  - Clearing of the tube and re-insertion (can have care giver help with this procedure)
  - Wipe neck opening with gauze
  - Remove Obturator is needed
  - Remove tracheostomy tube
  - If mucus plugs/thick secretions-may instill 3-5 mL sterile saline
  - Once airway is open, begin ventilations as possible/necessary
  - If speaking valve decannulation plugged, remove, suction tracheostomy tube
3. In patients not able to be oxygenated and ventilated by the above criteria, may attempt to intubate the patient.

### Stoma Intubation

1. Paramedics may attempt intubation of the patient if no other means of ventilating/oxygenating the patient are possible.
  - Select largest tube able to fit in stoma without force; cuffed for adult, uncuffed for pediatric
  - Hyperventilate with 100% O<sub>2</sub> by mouth, if unsuccessful attempt oxygenation and ventilation via stoma ( use a pediatric mask)
  - Suction, if necessary
  - Pass the ET tube and inflate the cuff. The tube will protrude several inches. Hold the tube and watch for chest rise with ventilation; secure the tube
  - Auscultate the lung fields. Check for subcutaneous emphysema
  - Allow no longer than 30 seconds for the procedure

### Special Considerations

- Always talk to family/caregivers as they have specific knowledge and skills
- Use patients equipment if available and functioning properly
- Estimate suction catheter size by doubling the inner tracheostomy tube diameter and rounding down
- Suction depth: Ask family/caregiver. No more than 3-6 cm typically. Should instill 2-3 mL of NS before suctioning
- Do not suction more than 10 seconds each attempt and pre-oxygenate before and between attempts.
- DO NOT force suction catheter. If unable to pass, then tracheostomy tube should be changed
- Only safe to reinsert tracheostomy tube if >7 days



## Guidelines for All-Hazard Medical Responders, Mass Gathering, Disaster, Wildland Fire, Wilderness Response

### Introduction

TMC Base Hospital recognizes that EMCT's will be called upon to provide medical care in a wide variety of environments and on occasion, with limited response resources. Whether responding to a wildland fire, disaster, or large scale sporting event, responders will likely face unique questions regarding the provision of medical care as well as medical oversight and authority. This document should be used to guide agencies as they plan to respond to such events, to allow a smooth transition from normal EMS operations to an all-hazards approach.

### Background

As recently as 2008, national standards and procedures for emergency medical and occupational health specialist roles at wildland fire incidents did not exist and a task group, Incident Emergency Medical Task Group (IEMTG), was formed to develop them. The National Wildfire Coordinating Group (NWCG) has published the task group recommendations: "Interim NWCG Minimum Standards for Medical Units Managed by NWCG member agencies". (<http://www.nwcg.gov/general/memos/nwcg-040-a-2010.pdf>)

The NWCG member agencies are comprised of nine of the largest land management, forest service, and park service agencies in the United States. The NWCG see their document as being utilized as a baseline or as minimum expectations for EMS personnel associated with wildland fire incidents managed by member agencies. However, the document recognizes that medical directors of agencies may identify alternative standards for use within their jurisdictional purview, and should be consulted along with state EMS authorities if discrepancies are found.

### Scope of Practice

The National EMS Scope of Practice Model, [www.EMS.gov](http://www.EMS.gov), is recognized by NWCG as the baseline standard for the following three EMS provider levels: Emergency Medical Technician (EMT), Advanced EMT (AEMT), and Paramedic. The mission of wildland EMS providers has evolved into a complex service that provides both emergency medical treatment and occupational health and preventive measures for incident personnel. The occupational health and preventive measures function is important in that EMS providers make commonly available over-the-counter (OTC), medications and supplies available to incident personnel. Currently, the Arizona Department of Health Services Bureau of Emergency Services and Trauma Systems (Bureau) does not regulate EMS storage, distribution or administration of common OTC medications.

Incident EMS personnel must be licensed or certified by their home state's EMS licensing authority. All incident EMS personnel are required to carry proof of current state certification or licensure. EMS personnel working at an incident that is outside of the jurisdiction in which they are credentialed must obtain recognition from the EMS credentialing authority within which the incident is bordered. If the incident crosses state borders, recognition must be obtained from each state credentialing authority. An incident Medical Unit Leader (MEDL) is typically responsible for coordinating recognition for the EMS personnel under his/her supervision.

### Communication

Due to the remote nature of wildland fire incidents, direct medical control from the fire line is sometimes nonexistent. EMS providers need to be as self sufficient as possible. Paramedics must carry a written copy of their established off-line administrative, standing orders and protocols under which they operate in their home response area.



## Guidelines for All-Hazard Medical Responders, Mass Gathering, Disaster, Wildland Fire, Wilderness Response

### Equipment, Supplies and Drugs

The “Interim NWCG Minimum Standards for Medical Units Managed by NWCG Member Agencies” document lists recommended equipment, supplies and drugs for EMT through Paramedic. The selection of items that should be carried by a fire line EMT would be determined by the remoteness of the assignment, makeup of the crew, ability to resupply, and the working environment. It is up to the individual provider to establish packaging suitable for their assignment. The NWCG document also has a list of over-the-counter (OTC) products that would commonly be carried by EMS providers.

### BLS or ALS Fire Line Medical Supplies & Jump Bag

A Basic Life Support (BLS) medical kit contains items that allow fundamental, non-invasive interventions appropriate to the EMT scope of practice. Advanced Life Support (ALS) providers responding as part of a wildland fire response team or other wilderness response team should take all of the medical supplies which they would use during normal EMS ALS operations to deliver ALS level care. Given that it may not be possible to carry all the necessary supplies to the fire line or other remote response areas; we have provided several lists of equipment which can be used to guide appropriate wilderness response kit preparation. (Appendix A).

Many of the items in the ALS medical kit require a physician sponsor and/or prescription, which may make replacing items difficult or impossible through normal requisition processes. It may therefore be necessary to rely on a vendor to provide some, if not all, of the replacement items for the ALS medical kit.

Several vendors offer limited resource response kits. The Common, Basic First Aid Medications/Equipment list below can be used to determine if a commercial kit will meet the recommended Base Hospital standards.

When preparing for a medical response to a wilderness or other limited resource environment we recommend that responders use a bag within a bag technique (Jump Bag), to allow for some items to be taken with the responder at all times while other items may be kept a short distance from the area of operations. A small inner bag should contain the bare essentials for initial patient care. This bag should be kept in a larger medical response bag stored in the response vehicle. Please refer to the Common Basic First Aid Medications/Equipment list below for more information on these items.

### General Medical Direction Information

#### Medical Direction and Medical Oversight

Medical Direction or Medical Oversight is required for any EMCT to deliver medical care. When EMCT's operate within their normal jurisdiction or state boundaries, the agency medical director fulfills this role. However, because the license of a physician is limited to the state in which they practice, medical directors cannot provide medical oversight to providers that cross state lines. Any off-line orders used outside of the state of AZ must be approved by that state's local medical direction authority.

#### Off-line Medical Direction and Oversight:

- Responding within the State of Arizona: TMC Base Hospital–will provide off-line medical direction and oversight.
- Responding outside the State of Arizona:





## Guidelines for All-Hazard Medical Responders, Mass Gathering, Disaster, Wildland Fire, Wilderness Response

- EMCT's must identify a medical director in the state that patient care is, or will be provided.
- This process will commonly be part of the check-in procedure at the assigned locations.

### On-line Medical Direction:

- Provision of prehospital medical care requires access to local on-line medical direction to assist with patient care and disposition decisions.
- Before starting operations in a new area, determine the procedures for obtaining on-line medical direction in the area of operations, and how to access on-line medical direction when needed.

### Common OTC Products/Basic First Aid Medications/Equipment

Many first aid supplies/OTC medications are used at home by an individual without medical oversight. During EMS support of events in limited resource areas, or areas in which access to OTC medications are limited, individuals may ask EMS providers for these medications. Currently, there are no state rules or regulations regarding the provision of these medications by EMCTs. In the absence of state regulation, the agency/provider may consider the following steps:

- OTC medications may be carried by individuals or at the discretion of the responding agency.
- OTC medications should be supplied in sealed single dose packaging units with complete instruction on the use of the medication as well as precautions regarding the use of the medication.
- OTC medications may only be supplied as part of the EMS response to a special event in which individuals do not have easy access OTC medications, a limited resource environment, or a wilderness area.
- Items may be provided when an individual requests the medication directly for self-treatment as they would under normal circumstances at home.
- OTC medications appropriate for EMTC's to carry include acetaminophen, ibuprofen, antacids, and topical antibiotics.
- Examples of first aid supplies that may be carried and provided for individual use at the discretion of the responding agency are moleskin, band aid, etc.

**Advanced medical care items** that fall within the scope of practice of an EMCT in the State of Arizona should only be utilized for a medical emergency (as opposed to personal use). Use of any of these items requires medical oversight (AO, SO or on-line medical direction), and generation of a patient care record. Items which require medical oversight are marked with an \* in the Appendices.

**Pediatric Medical Care Items:** We recommend that responders take all equipment necessary to care for children and adults. If responding to a remote location with adults only, pediatric items can be left in the response vehicle.



## Guidelines for All-Hazard Medical Responders, Mass Gathering, Disaster, Wildland Fire, Wilderness Response

### Appendix A: Medical Kits

#### BLS

- Items with expiration dates should be good for >2 months
- Items with an (+) should be kept with responder or in a Jump Bag
- Items with an (\*) require medical oversight for use

#### Item

1 bt	Oxygen cylinder, appropriate small cylinder
1 ea	Regulator, 0-25 LPM
2 ea	Mask, oxygen, non-rebreather, 1 adult, 1 child
2 ea	Cannula, 1 adult, 1 child
1 ea	Resuscitator, BVM, Adult, with reservoir & tubing
1 ea	Suction unit, hand-powered
1 ea	Backboard
1 set	Restraint Strap(s) suggest Spider strap-color coded or four 7 foot straps for backboard
1 ea	Head Bed
1 ea	Collar, adult, adjustable C-Collar, Stiffness No-Neck or like
1 ea	Splint, traction bilateral, Sager S-304 or like
2 ea	Splint, Sam-Splint
1 ea	Splint, Pelvic Binder, T-POD or like

#### Airway/Breathing

1set	Airway, oropharyngeal, size 3, 4 & 5 (+)
1set	Airway, oropharyngeal, size 30, 32, 34 & 36 FR(*)
1set	BVM (ambu) with face mask, 1 adult, 1 pediatric (*)
1set	Alternative airway, King size 2,4 & 5 (+,*), Combitue Tube (*)

#### Trauma/Dressings

10 ea	Gauze bandages 4x4 (+)
10 ea	Gauze bandages 2x2 (+)
1 ea	Tourniquet, SAWT-T or C-A-T (+)
20 ea	Dressing, knuckle, cloth
20 ea	Dressing, "Band-Aid, cloth, 1'x 3"
20 ea	Dressing Finger Tip, cloth
6 pks	Dressing, "2 <sup>nd</sup> skin"
4 ea	Dressing, No-Adhering, 2"x3"
1 ea	Burn sheet
4 ea	Burn dressing, 4"x4"
1 ea	Water get burn dressing (fact)
1 ea	Trauma pad, 6x9
2 ea	Trauma pad, 6x9
2 pks	Moleskin
2 pks	Second skin
2 rls	Coban/Koflex or like 1" & 3";
2 rls	Tape, Porous 2"
2 rls	Tape, Transpore, 2 "



## Guidelines for All-Hazard Medical Responders, Mass Gathering, Disaster, Wildland Fire, Wilderness Response

2 rls	Bandage, "Kerlix", 4.5 x 5yds
1 rls	Bandage, Elastic, 3" & 4"
4 ea	Triangle bandage
1 ea	Chest seal

### PPE

10 pr	Glove, non-latex exam, large and med
4 ea	Face shield
1 bt	Hand sanitize. 4 oz.

### Equipment/Instruments

1 set	Stethoscope & adult BP cuff
1 ea	Trauma sheers, 7 1/2"
1 ea	Scalpel with #11 blade
1 ea	Tweezers with magnifier
1 ea	Finger nail clippers
8 ea	Q-tips
1 ea	Thermometer, digital with 10 covers
6 ea	Safety pins
2 ea	Parachute cord, 3 ft
1 ea	Bag, Bio-Hazard, 5 gal
1 ea	Penlight/flashlight/headlight
2 ea	Emergency blanket/space blanket
2ea	Cold Pack
1 ea	Suction device, manual
1 ea	Note Pad, "BLS Vital pad", meum or like
1 ea	Pen, writing

### BLS medications approved by Base Hospital Medical Director (Recommend) Minimum List

- Epi-Pen 2 x 2 packs (\*)
- Albuterol 2.5mg ampules x 3 (\*)
- 1 tube Oral Glucose

### ALS

#### All BLS items plus the following:

- Items with expiration dates should be good for more than 2 months
- Items with an (+) should be kept with responder or in a jump bag
- Items with an (\*) require medical oversight for use

#### Item

1	Advanced airway kit (*)
1 kit	Glucometer with lancets and test strips for 25 tests
4 bt	Eyewash, 4 oz
1 kit	Finger SpO2 monitor (optional)
1 ea	Sharps container, 1 qt
1 ea	Nebulizer chamber
2 ea	IV starting kits 2 ea
2 ea	IV fluid administration set, 10/15 drops per min
8 ea	IV catheter (2each 16,18, 20 & 22 ga



**Guidelines for All-Hazard Medical Responders, Mass Gathering,  
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4 ea	Tegaderm transparent IV dressing
20 ea	Prep pad, alcohol
20 ea	Prep pad, providone iodine

**ALS medications approved by Base Hospital Medical Director  
(Recommended Minimum List)**

- Morphine 20mg (\*)
- Narcan 4mg (\*)
- Normal Saline, 500cc bags, 2 liters (\*)
- Epi-Pen 2 x 2 packs (\*)
- Benadryl 50mg (\*)
- Solu-Medrol 125mg (\*)
- Albuterol 2.5mg ampules x 3 (\*)
- 1 tube Oral Glucose

Syringes and needles as needed for approved drugs

Fill needle x 10 (4 in jump bag)

18 ga needle x 10 (4 in jump bag)

**Information & References**

[www.nwccg.gov/filebrowser/download/769149](http://www.nwccg.gov/filebrowser/download/769149)

<https://www.nasemso.org/Projects/RuralEMS/StateProcesses.asp>

[www.nwccg.gov/sites/default/files/memos/eb-m-12-009a.pdf](http://www.nwccg.gov/sites/default/files/memos/eb-m-12-009a.pdf)



## Management of Ventricular Assist Devices (VADs) Protocol

Base Hospital

### Purpose

To provide an overview of how Left Ventricular Assist Device (LVAD) works and how EMS provider assessment and treatment differs for a patient with an LVAD.

### Highlights of Assessing and Treating an LVAD patient

- Recognize that you have a patient with an LVAD .
- Determine if your patient has an LVAD problem, or an unrelated illness or injury
- A completely stable patient may have no palpable pulse or measurable blood pressure
- Mental status and skin color must be used to determine patient stability
- CPR should almost never be performed on an LVAD patient
- Patients with an LVAD should almost never be pronounced dead at the scene
- Overview of an LVAD

### Overview of LVAD

The LVAD, or Left Ventricular Assist Device, is a mechanical device that takes over some or all of the pumping function of the heart's left ventricle. This device is used for patients of any age or gender with advanced heart failure who would not otherwise survive without this device. Heart failure can result from chronic/long-term hypertension and heart disease, congenital heart defects, mechanical damage to the heart, infection, postpartum complications and many other reasons.

Some LVAD patients will have an LVAD while they are waiting for a heart transplant (called Bridge-to-Transplant). Other LVAD patients, who are not eligible for a heart transplant for some reason, will live with the device for the rest of their lives (called Destination Therapy, or Lifetime use)

### How the Heart Works versus How LVAD Works

The normal pumping function of the heart is achieved by the contraction of the left ventricular muscle, which pushes a bolus of blood forward in the cardiovascular system with each contraction. This contraction is what we feel when checking a pulse, and what we hear when taking a blood pressure. If the heart is not contracting, blood is not moving forward in the system, and we don't feel or hear a pulse. The LVAD, in contrast, flows constantly and therefore creates no "pulse" to feel or hear.

The LVAD is a tube that is about 1/2 -1 inch in diameter with a pump in the middle. One end of the tube (inflow) is surgically inserted into the left ventricle, and the other end (outflow) is sewn into the aorta, just above where it exits the heart.

The pump on the LVAD spins constantly. The right side of the heart still pushes blood through the lungs and back to the left ventricle, but then the LVAD pump pulls the blood out of the left ventricle and pumps it out to the body, taking over most or all of the failed pumping action of the left ventricle.



## Management of Ventricular Assist Devices (VADs) Protocol

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The drive unit for the pump, which includes the power source and programming controls, is outside of the body and connects to the LVAD by a cord that exits the body through the abdomen, usually in the right upper quadrant.

### NOTE

The important part to us as EMS providers is that the pump is a constant flow pump. There is no rhythmic pumping as there is with the ventricle, and therefore there is little to no pulse. This means you can have a perfectly stable and healthy looking person who has no palpable pulse and whom you may or may not be able to take a blood pressure!

### Assessing the LVAD Patient

1. **Recognize** you have an LVAD patient. The LVAD patient has a control unit attached to their waist, or in a shoulder bag. The control unit is attached to a power cord exiting from the patients' abdomen. The control unit will be attached to batteries mounted to the belt, in shoulder holsters, or in a shoulder bag. At home, it could be attached to a long cord that connects to a large power unit.
2. **Decide** if you have a patient with an LVAD problem, or a patient with a medical problem who just happens to have an LVAD. Patients with LVADS will have all the same illnesses and injuries as any other patient you see. Their LVAD may have nothing to do with the reason you were called.
3. **Look:** Alarms on the control unit will most likely indicate an LVAD problem. Follow resource guides with the patient to trouble shoot. Skin color and mental status are the most reliable indicators of patient stability for the LVAD patient.
4. **Listen:** Listen over the LVAD pump location to make sure you can hear it running. This will be just to the left of the epigastrium, immediately below the base of the heart. You should hear a low hum with a stethoscope if the pump is running. Don't assume the pump is running just because the control unit looks OK. **The patient and their family are experts on this device.** Listen to what they have to say about any problems with the LVAD.
5. **Feel:** Feel the control unit. A hot control unit indicates the pump is working harder than it should and often indicates a pump problem such as a thrombosis (clot) in the pump. The use of pulse and blood pressure to assess stability can be unreliable in an LVAD patient, even if they are very stable.
6. **Vitals:**
  - Pulse:** generally, you will be unable to feel a pulse.
  - Blood Pressure:** you may or may not be able to obtain one, standard readings are unreliable and may vary from attempt to attempt. If NIBP machine can detect a blood pressure, adjust it to display Mean Arterial Pressure (MAP). This is a more reliable measure of perfusion and the calculation for MAP can overcome variations in standard readings. A MAP of 60-70 is normal.
  - Pulse-oximetry:** readings seem to be fairly accurate and consistent, according to data, despite the manufacturer stating that pulse oximetry often doesn't work.
  - Quantitative Continuous Waveform Capnography:** This should remain accurate, as it relies on respiration, not pulse. Normal (printed) waveform shape



## Management of Ventricular Assist Devices (VADs) Protocol

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with a normal respiratory rate and low CO<sub>2</sub> readings (<30) can indicate low perfusion = poor pump function.

**Temperature:** infection and sepsis are common, check temperatures!

7. If **Interfacility Transports**, request from the transferring facility, specific guidelines in the event of cardiac arrest. With some VAD it is inadvisable to perform CPR. Treatment of arrhythmias either pharmacologically or with defibrillation is typically attempted before consideration of CPR.

