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U.S. Department of the Interior

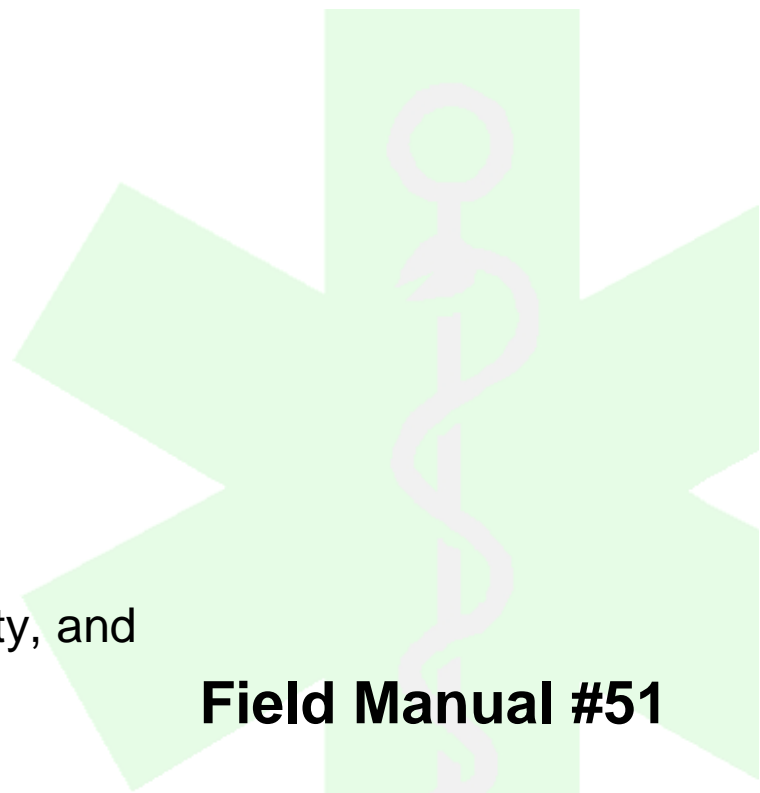
*National Park Service*

# EMERGENCY MEDICAL SERVICES PROTOCOLS AND PROCEDURES

**2018**

Law Enforcement, Security, and  
Emergency Services

**Field Manual #51**



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# GENERAL INFORMATION

## How To Use This Manual

### **Manual Organization.**

Sections: the manual is organized into four sections. Subjects are organized alphabetically within the sections and numbered as follows (see Table of Contents):

General Information Section	0000-0999.
Procedures	1000-1999.
Protocols	2000-2999.
Drugs	3000-3999.

Subject: each individual subject is identified in the subject page header and footer by:

Subject Title:	Header.
Manual Title:	Footer, lower left.
Manual Revision Date:	Footer, lower left.
Manual Section:	Footer, lower right.
Subject Number:	Footer, lower right.

Table of Contents: Each Procedure, Protocol, and Drug is listed by section, in alphabetical and numerical order. Gaps in the number sequence allow future entries to be inserted in the correct order.

### **Protocol Organization and Definitions.**

EMT and Parkmedic Protocols: each protocol is organized into “EMT” and “Parkmedic” sections, each of which contains “Standing Orders” followed by “Base Hospital Orders.” A “Special Considerations” section at the end of the protocol contains background information for the protocol. “Special Considerations” are for reference only.

Standing Orders: items under “Standing Orders” may be done prior to base contact. Unless otherwise stated, they are written to be completed sequentially.

Parks without Base Hospitals: a base hospital is defined as any communications center providing on-line medical direction (i.e. where medical consultation is available in real time by telephone or radio). Providers in a park without a base hospital essentially operate in constant communication failure. Their local medical adviser will establish policies identifying which base order interventions, if any, may be performed under these circumstances.

Base Hospital/Communication Failure Orders: items labeled “Base Hospital/Communication Failure Orders” may be performed by the EMT or Parkmedic only after base hospital contact and approval, OR base contact has been attempted and was unsuccessful. Reasonable attempts to contact base must be made, and communication failure documented.

Base Hospital Orders Only: items listed under “Base Hospital Orders Only” require base hospital approval and may NOT be performed in communication failure.

Treatment Discontinuation: In general, any initiated treatment should remain in place unless discontinued under specific guidance from base hospital. e.g. ET tubes/King tubes, tourniquets; See specific protocols for details.

Navigation: once a protocol is selected, care should be continuous under that protocol. Exceptions to this rule are:

**GO TO:** if an order directs you to “**GO TO PROTOCOL: *XXXXX***” (protocol named in italics), then patient care should continue under the specified protocol, IF the patient meets the stated criteria. If the patient does not meet the criteria, then continue with the original protocol.

**Cardiac Arrest:** if a patient experiences cardiac arrest while being cared for under another protocol, then the Provider may immediately change to the appropriate cardiac arrest protocol without first making base contact. Base contact, however, should be attempted as soon as possible without compromising patient care.

**REFERENCE:** Additional relevant information is available in another protocol or procedure if an order directs you to “**REFERENCE PROTOCOL or PROCEDURE: *XXXXX***” (protocol or procedure named in italics). This information is intended to supplement knowledge, but patient care should continue to follow the original protocol.

# GENERAL INFORMATION

Protocols are chief complaint driven and are designed for patient care. Protocols contain orders for the appropriate care of the patient.

Procedures are step by step instructions in how to carry out a specific action in the care of a patient (e.g. IO needle insertion).

Drug Pages are designed to be informational. Therefore, as drug dosing may vary depending on the selected protocol, the range of dosing used throughout the manual is listed in the drug page; when caring for a specific patient, the administered dose is that designated in the protocol. Depending on the drug, the dose may be listed as mg/kg or ml/kg. Generic names are always used and in cases where the brand name is commonly used, this will also be listed (e.g. Midazolam/Versed).

Pediatric Patients: most protocols and procedures apply to both adults and children. Certain protocols apply only to pediatric patients, and are listed separately under Pediatric. Depending on the procedure, protocol, or drug dose, the age definition of pediatric varies; if age is not specifically defined, then assume that pediatric refers to the age range of 0-14 years.

## **Park Specific Scope of Practice Modifications.**

In general this NPS EMS Field Manual is designed to be used unmodified as it is part of Reference Manual 51 (RM 51) and under Director's Orders 51 (DO 51), and thus carries the weight of NPS Policy. However, given the wide range of needs and unique environments within the NPS, some local modifications may be necessary and appropriate for specific parks or park areas. These modifications will be made and approved by the Local EMS Medical Advisor (LEMA) and are authorized within an individual park or park area under his/her medical license. For example parks with no high altitude areas, may have no need for the Altitude Protocols or Drug pages.

If any local (park specific) modifications are made to the NPS EMS Field Manual:

The Field Manual should contain a copy of the local park's Scope of Practice Modifications (Procedures, Protocols, and Drugs), inserted in the appropriate section(s).

Modified, deleted or added (Procedures, Protocols, and/or Drugs), should be listed and identified as such in the Table of Contents.

Procedures and Protocols removed from Practice at a local park should be included in the General Information section so that EMS Providers have access to the information should they be detailed to or transfer to another park.

If a local park chooses to modify the Field Manual (Procedures, Protocols, and/or Drugs), these steps should be followed:

The modification must be approved in writing by the LEMA.

The modified version will include the local park acronym, e.g., SEKI, and revision date in the version data in the subject footer (i.e. Version SEKI 3/09).

The local version will have the same topic number if it is a modified version of an existing protocol or procedure (e.g. 2010.SEKI).

The modified version should be inserted into the NPS Field Manual, in numerical order, for local use.

The modified version should be listed in appropriate order on the Field Manual contents page.

For procedures or protocols that are additions to the Field Manual, these will be locally designated as above, but given a unique number that places them in appropriate alphabetic order in the local version of the Field Manual.

## **Manual Updates/Modification Guidelines.**

Most organizations update their medical guidelines periodically (e.g. AHA). Although these updates will be reviewed and incorporated into the Field Manual if relevant, these changes will usually be adopted during the normal Field Manual revision cycle.

Submitting suggestions: Comments may be submitted through any local EMS Coordinator to the Branch Chief for EMS Services, WASO. The NPS has National Medical Advisors and maintains an NPS EMS oversight committee that meets periodically to consider recommended changes and updates to the NPS EMS Field Manual.

## **NPS Definitions.**

Refer to RM-51 for provider levels.

# GENERAL INFORMATION

## Terms, Acronyms and Abbreviations

ABCs	Airway, Breathing, Circulation.	MAD	Mucosal Atomizer Device.
ACLS	Advanced Cardiac Life Support.	MCI	Multi-Casualty Incident.
AED	Automated External Defibrillator.	MDI	Metered-Dose Inhaler.
ALOC	Altered Level of Consciousness.	MI	Myocardial Infarction.
ALS	Advanced Life Support.	MOI	Mechanism of Injury.
AMA	Against Medical Advice.	NEMA	National EMS Medical Advisor.
AMS	Acute Mountain Sickness OR Altered Mental Status.	NG	Naso-Gastric.
ASA	Aspirin.	NPS	National Park Service.
BLS	Basic Life Support.	NRM	Non-Rebreather Mask.
BVM	Bag Valve Mask.	NS	Normal Saline.
C/C	Chief Complaint.	NSAID	Non-Steroidal Anti-Inflammatory Drug.
CHF	Congestive Heart Failure.	NTG	Nitroglycerin.
CNS	Central Nervous System.	N/V	Nausea and Vomiting.
CO	Carbon Monoxide.	O <sub>2</sub>	Oxygen.
COPD	Chronic Obstructive Pulmonary Disease.	OTC	Over The Counter.
CO <sub>2</sub>	Carbon Dioxide.	PCR	Patient Care Report.
CPAP	Continuous Positive Air Pressure.	PE	Pulmonary Embolism OR Physical Exam.
CPR	CardioPulmonary Resuscitation.	PMH	Past Medical History.
CSM	Circulation, Sensory, Motor.	PO	<i>Per Os</i> (By Mouth).
D50	Dextrose 50%.	POV	Privately-Owned Vehicle.
DAN	Diver's Alert Network.	PRN	<i>Pro Re Nata</i> (As Needed).
DBP	Diastolic Blood Pressure.	R/O	Rule Out.
DNR	Do Not Resuscitate.	ROM	Range of Motion.
EMS	Emergency Medical Service.	RR	Respiratory Rate.
EMT	Emergency Medical Technician.	SBP	Systolic Blood Pressure.
ETT	Endotracheal Tube.	SC or SQ	Subcutaneous.
FBO	Foreign Body Obstruction.	SCUBA	Self-Contained Underwater Breathing Apparatus.
GCS	Glasgow Coma Score.	SIVP	Slow IV Push.
GSW	Gun Shot Wound.	SL	Sublingual.
GI	Gastro-Intestinal.	SOB	Shortness of Breath.
HACE	High Altitude Cerebral Edema.	S/S	Signs and Symptoms.
HAPE	High Altitude Pulmonary Edema.	STD	Sexually Transmitted Disease.
HHN	Held-Held Nebulizer.	TAR	Treat and Release.
HR	Heart Rate.	TBSA	Total Body Surface Area.
HTN	Hypertension.	TCA	Tricyclic Antidepressant.
IM	Intramuscular.	TIA	Transient Ischemic Attack.
IN	Intra-Nasal.	TKO	To Keep (Vein) Open.
IO	Intraosseous.	T-POD	Traumatic Pelvic Orthotic Device.
IUD	Intrauterine Device.	TTJI	Transtracheal Jet Insufflation.
IV	Intravenous.	UAO	Upper Airway Obstruction.
IVF	IV Fluids.	VS	Vital Signs.
IVP	IV Push.	>	Greater Than.
JVD	Jugular Venous Distention.	≥	Greater Than or Equal To.
LEMA	Local Emergency Medical Advisor.	<	Less Than.
LMP	Last Menstrual Period.	≤	Less Than or Equal To.
LOC	Level of Consciousness OR Loss of Consciousness.		
LR	Lactated Ringers.		

# Automated External Defibrillator (AED)

<b>Scope of Practice</b>	EMR, EMT, Parkmedic, and Paramedic
<b>Indications</b>	<p>Any patient &gt; 28 days old in cardiac arrest (unresponsive, not breathing, and pulseless). If you suspect but cannot confirm arrest for any reason (e.g., possible agonal breathing), attach the pads and turn on the AED.</p> <p>If a non-arrested patient is at risk for arrest, bring the AED to the patient's side. Do not attach the pads to the patient unless the patient becomes unresponsive.</p> <p>Do not delay treatment or transport (per <b>Step 2</b>), in order to bring the AED to the scene.</p>
<b>Contraindications</b>	Patient is not in cardiac arrest; patient is < 28 days old; patient is a victim of obviously fatal trauma, meets the criteria for declaration of death, or has a known DNR.
<b>Equipment</b>	Automated External Defibrillator (AED)
<b>Procedure</b>	<ol style="list-style-type: none"><li>1. <b>FOLLOW PROTOCOL:</b> <i>Cardiac Arrest/Dysrhythmias; Pediatric- Cardiac Arrest/Dysrhythmias</i></li><li>2. Provide 2 minutes of CPR prior to using the AED; if the AED can be applied within 4 minutes of a known sudden collapse, skip initial CPR and proceed to <b>Step 3</b>.</li><li>3. Turn on AED and follow prompts (<i>attach pads, analyzing, shock advised/not advised, etc.</i>)</li><li>4. After each "Shock Delivered" or "No Shock Advised" message, immediately provide CPR until AED prompts for next analysis (approx. two minutes). Check pulse only if prompted by PROTOCOL.</li><li>5. After pulse check: if <u>pulse present</u> turn AED off but leave it attached to the patient in case of re-arrest; continue PROTOCOL. If <u>pulse absent</u> continue CPR until AED prompts for next analysis; continue PROTOCOL.</li></ol>
<b>Notes</b>	<p>Minimize number and duration of interruptions to CPR. No interruption longer than 10 seconds. Provide CPR while AED charges, if possible. Deliver other interventions (airway, IV, medications) during CPR.</p> <p>Before applying pads: move patient from water and dry off wet/sweaty skin. Remove transdermal medication patches and wipe off medication (e.g. Nitropaste). Place pads at least one inch from an implanted pacemaker.</p> <p>For adults, use adult pads with adult energy doses only. For children, (for AED use, defined as age 1 – 8; for CPR, defined as age 1 – 14). Child pads with child energy doses are preferred if available, otherwise use adult pads with adult energy doses. Do not use adult energy doses with child pads or child energy doses with adult pads.</p> <p>Do not allow pads to touch each other. If pads are too large to both fit on the front of the patient without touching, place one pad on right upper chest and the other on the left back (see package for diagram).</p> <p>Do not use AED in moving vehicles. Stop vehicle to prevent interference with AED analysis. Do not focus only on the AED. Monitor patient for signs of resuscitation (e.g. color change, pupil response, spontaneous respirations).</p> <p>AEDs may have different programming. If AED prompts conflict with PROTOCOL, follow the PROTOCOL.</p> <p>If declaration of death, leave pads attached to patient.</p> <p>Save data stored by the AED regardless of patient outcome.</p>

## Cross Reference

### **Protocols:**

Abdominal Pain  
Allergic Reactions  
Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest/Dysrhythmia  
Chest Pain – Cardiac  
Electrical and Lightning Injuries  
Hypothermia

### **Protocols:**

Ingestion/Poisoning  
Pediatric Cardiac Arrest/Dysrhythmia  
Respiratory Distress  
Seizures  
Shock Without Trauma  
Submersion/Near Drowning

# Base Contact Criteria

## General

Base contact is to be made as specified in individual protocols.

Base contact should be attempted if no protocol exists for an individual patient's particular complaint.

Base contact is always an option but is NOT required in the following circumstances:

- ✓ Patients transported with normal vital signs, normal mental status and a non- life-threatening complaint.
- ✓ Patients signed out "Against Medical Advice" with normal vital signs, normal mental status and a non-life-threatening complaint.
- ✓ Patients treated and released (TAR) per criteria in specific PROTOCOL.

*If base contact is indicated but cannot be made, proceed by individual PROTOCOL and use your best judgment. Make base contact as soon as possible. Document inability to contact base.*

# Base Hospital Call In Reporting Format

<b>Scope</b>	EMT, Parkmedic, and Paramedic
<b>Indication</b>	Base contact for non MCI call-ins
<b>Format</b>	<p><u>Identification</u>: unit number (call sign), name, EMS certification.</p> <p><u>Condition</u>:</p> <p>    <i>STAT- UNSTABLE</i>: Unstable vitals or potential threat to life or limb.</p> <p>    <i>STAT – STABLE</i>: Stable vitals with potential threat to life or limb.</p> <p>    <i>NON-STAT</i>: Stable vitals, no threat to life or limb.</p> <p>    <i>MEDICAL</i>: If most severe problem is medically-based.</p> <p>    <i>TRAUMA</i>: If most severe problem is trauma-based.</p> <p><u>Reason for call</u>: e.g. medication request, AMA, ETA call-in, destination, etc</p> <p><u>Location; environment; elevation</u></p> <p><u>ETA: transport type; destination</u></p> <p><u>Patient Profile</u>: age, gender, weight</p> <p><u>Chief Complaint</u>: include mechanism of injury/illness</p> <p><u>Mental Status</u>: i.e. Adult: alert and oriented. Pediatric: playful, interactive, eye contact, consolable</p> <p><u>Glasgow Coma Score</u></p> <p><u>Vital Signs</u>: respiratory rate, lung sounds, respiratory effort; pulse, blood pressure, capillary refill; pupils; skin (cool/warm, pale/pink, dry/clammy)</p> <p><u>Past Medical History</u></p> <p><u>Allergies</u></p> <p><u>Medications</u></p> <p><u>Physical Exam</u>: pertinent positives and negatives only</p> <p><u>Treatment given or interventions completed</u>: include patient response to treatment</p> <p><u>Requests for Additional Therapy or advice</u></p> <p><b>Note</b>: in STAT cases, EMS providers may call in an “incomplete report” if immediate feedback or guidance from base physician is desired.</p> <p>If traumatic injuries sustained, relay base hospital trauma activation code during call-in.</p>



# Blood Glucose Determination

<b>Scope</b>	EMT, Parkmedic, and Paramedic
<b>Indications</b>	Altered mental status in any PROTOCOL Seizure Syncope Patients with symptoms of hypoglycemia, especially those with a history of diabetes Patients with diabetes (in any protocol)
<b>Contraindications</b>	None
<b>Equipment</b>	Glucometer, test strips, cotton ball, lancet, alcohol pad, glucose
<b>Complications</b>	Bleeding, infection
<b>Procedure</b>	<ol style="list-style-type: none"><li>1. Follow instruction manual in conjunction with instructions below.</li><li>2. Venous blood from an IV catheter, before attaching IV tubing, may be used or go to <b>Step 3.</b></li><li>3. Swab finger with an alcohol pad. Allow finger to dry before attempting fingerstick.</li><li>4. Prick the side of the finger with the lancet. Dispose of lancet in sharps container.</li><li>5. Test blood sample in accordance with glucometer instruction manual.</li><li>6. Reassess the patient. If you are unable to obtain an accurate blood glucose reading for any reason, and the patient has ALOC or seizure, administer glucose, dextrose, or glucagon according to PROTOCOL as if the patient were hypoglycemic.</li></ol>
<b>Notes</b>	Device may need calibration or control test before use on patient, per instruction manual. Check expiration date of test strips and control solution (both may have different opened and unopened expiration dates).

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Altitude Illness  
Cardiac Arrest/Dysrhythmias  
Heat Illness  
Hypothermia  
Ingestion/Poisoning  
Major Trauma – Adult  
Near Drowning  
Pediatric – Cardiac Arrest/Dysrhythmias  
Pediatric – Major Trauma  
Seizures  
Shock Without Trauma

# Continuous Positive Airway Pressure (CPAP)

**Scope of Practice** Parkmedic and Paramedic

**Indications** Severe shortness of breath (bronchospasm including COPD and asthma)  
Severe shortness of breath with pulmonary edema (including congestive heart failure)  
Severe shortness of breath with pneumonia  
Severe shortness of breath with HAPE (Base contact)  
Shortness of breath or hypoxia after drowning  
Conscious, breathing spontaneously, and able to follow commands

**Contraindications** Pediatric patients (< 14 years old)  
Actively vomiting  
Hypotensive (systolic blood pressure < 90)  
Suspected of having a pneumothorax  
An inability to achieve a good facial seal with the CPAP mask  
Actively coughing  
Unconscious

**Procedure** The patient must be continuously monitored for development of respiratory failure or Vomiting.  
CPAP will be delivered at a continuous pressure of 5 up to 10 cm H<sub>2</sub>O utilizing 100% oxygen.

- a. Start CPAP at 10 cm H<sub>2</sub>O and decrease if possible.
- b. Start oxygen at 100% and titrate for oxygen saturation greater than 95% if possible.

CPAP may introduce transient hypotension via decreased venous return secondary to elevated intrathoracic pressure.

- a. If systolic blood pressure falls to less than 80 mmHG, remove CPAP.
- b. If systolic blood pressure falls between 80-100 mmHG, decrease CPAP to 5 cm H<sub>2</sub>O if possible.

**Notes** In hypertensive, CHF patients - do not delay initial sublingual nitroglycerin administration to apply CPAP. You may remove mask temporarily for repeated nitroglycerin doses.

If patients vomits, develops respiratory failure, or is persistently coughing, remove the CPAP circuit, clear the airway as necessary to prevent any aspiration, and provide respiratory assistance with either BVM or other advanced airway adjunct.

See specific protocols for recommendations regarding Ondansetron, base contact, and possible resumption of CPAP.

## Cross Reference

**Procedures:**  
Oxygen Administration

**Protocols:**  
Altitude Illness (HAPE)  
Respiratory Distress

**Drugs:**  
Nitroglycerin

# Electronic Control Device (ECD) Dart Removal

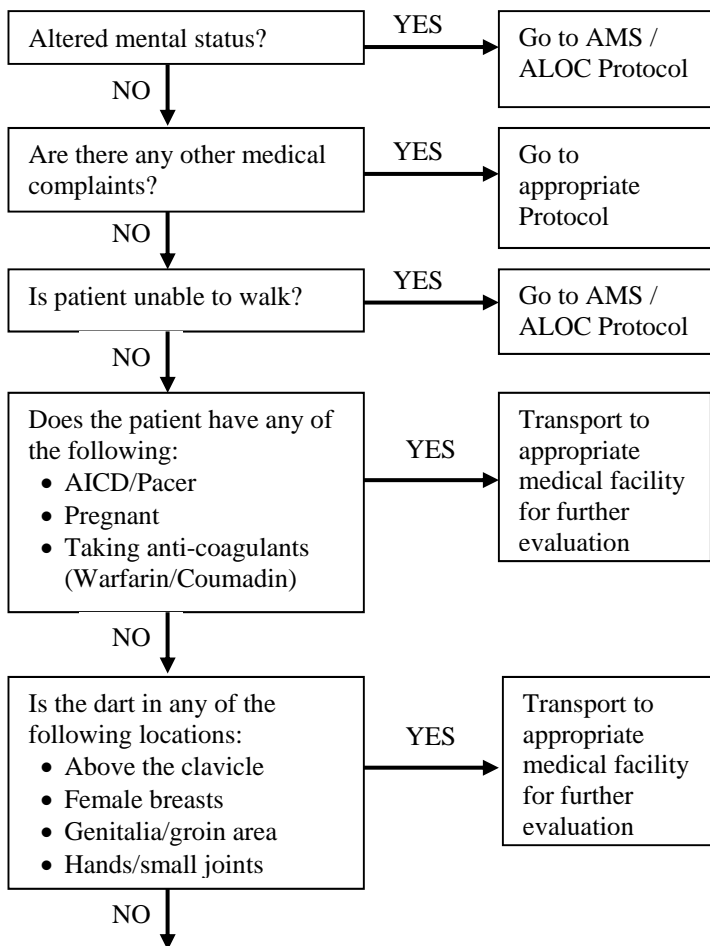
**Scope of Practice** EMT, Parkmedic, and Paramedic

**Indication** Status post electrical control device (ECD) application with retained barbs

**Contraindications** None

**Equipment** Gloves

**Pre-Procedure Assessment**



**ACTUAL SCALE / SIZE:**  
Barb is a straight #8 fishhook with a length of 4mm and the entire dart length is less than 1 cm.

**Procedure**

Use universal precautions.  
 Confirm that wire is cut or disconnected from the ECD device.  
 Use one hand (usually non-dominant) to pull and spread skin around the wound area in a taut manner, while keeping fingers at least one inch away from the puncture site.  
 Use other hand to grasp barb, apply forceful in-line traction and quickly pull out.  
 Clean wound area and apply dressing as needed.  
 Dispose of dart barb as a “contaminated sharp”.  
 Check patient’s tetanus status and advise as needed.  
 Document procedure on Patient or Pre-hospital Care Report (PCR), if “yes” to any of above questions.

**Post-procedure treatment and release vitals:**

- Release if [50 < HR < 110] and [100 < SBP < 160];
- If HR not within normal range, call base hospital. If SBP is between 160-200, wait 10 minutes and repeat vitals. If SBP > 200 or between 160-200 after 10 minute recheck, call base.

# Electronic Control Device (ECD) Dart Removal

## Special Considerations/Notes:

Re-examine patient thoroughly, looking for any other primary or secondary injuries that may have occurred directly from the electrical discharge, from the resulting fall or any physical struggle before or after patient immobilization.

Primary electrical injuries are very rare and there are no confirmed reports of death directly related to ECD induced malignant arrhythmias.

Secondary injuries may include, but are not limited to: (1) fall-related injuries such as fractures, lacerations/abrasions, sprains, and intracranial hemorrhage, (2) muscle contraction related injuries such as rhabdomyolysis, renal failure, and (3) any other injuries related to subduing an agitated individual. Anti-coagulated patients (Warfarin/Coumadin/Pradaxa, etc.) or patients on anti-platelet agents (aspirin, Plavix, etc.) are at increased risk for these secondary injuries.

Review differential (see Behavioral Emergency Section from ALOC protocol) Re: why the patient may have needed the use of an ECD to begin with: causes include drug and alcohol intoxication, psychiatric illness, developmental delay, head injury and any causes of ALOC (e.g. hypoglycemia, hypoxia, infection, etc.)

### **Excited Delirium Syndrome:**

Potentially lethal emergency which may be seen in patients with persistently violent/bizarre/agitated behavior, restraints, and/or drug intoxication. The pathogenesis is not well understood, but is likely multi-factorial, including positional asphyxia, hyperthermia, drug toxicity, and/or catecholamine-induced arrhythmias. Treatment should focus on reduction of stress (minimize noise/light/patient stimulation), pharmacologic therapy (midazolam/Versed and rapid monitored transport. Refer to Behavioral Emergency Section of AMS/ALOC (Protocol 2020).

### **Pregnant Patients:**

Should also be transferred to a medical facility for further medical evaluation. Abdominal palpation of the uterus size/height (umbilicus = 20 weeks) can provide an estimate of gestational age. Size can be misleading in presence of multiple pregnancy, uterine fibroids, or a full bladder.

### **Patients with AICD/Pacer:**

Are potentially at higher risk of cardiac dysrhythmias or damage to the AICD/Pacer. These patients should be transported for evaluation and assessment of AICD/Pacer function.

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered  
Level of Consciousness (ALOC)

### **Drugs:**

Midazolam (Versed)

# Endotracheal Intubation

<b>Scope of Practice</b>	Parkmedic (if approved by local Medical Advisor) and Paramedic
<b>Indications</b>	ALL must be present: GCS $\leq 6$ Apneic or agonal respirations $\leq 6$ per minute
<b>Contraindications</b>	Do not use if ANY are present: Suspected narcotic overdose prior to administration of Naloxone; endotracheal intubation may be attempted in suspected narcotic overdose if unresponsive to Naloxone. The patient has a Do Not Resuscitate (DNR) order Intact gag reflex
<b>Equipment</b>	Cuffed or Un-cuffed Tracheal Tube (size dependent of patient age and height), syringe to inflate balloon (10ml), stylette, laryngoscope handle, laryngoscope blade (Macintosh or Miller blade size dependent on patient age and height), suction, capnography, tube holder, stethoscope and pulse oximetry.
<b>Procedure</b>	<ol style="list-style-type: none"><li>1. Maintain C-spine precautions if indicated.</li><li>2. Have suction equipment available and ready.</li><li>3. Pre-oxygenate with BVM and oxygen at 15 L/min for minimum one minute prior to endotracheal intubation.</li><li>4. Choose appropriate-sized tube based on patient age and size.</li><li>5. Check integrity of balloon by fully inflating it briefly; deflate prior to insertion.</li><li>6. Endotracheal Tube placement:<ul style="list-style-type: none"><li><b>Lubricate</b> tube (optional).</li><li><b>Remove</b> dentures, broken teeth or OPA, if present.</li><li><b>Lift</b> tongue and lower jaw with the laryngoscope blade in Left hand, directing force 45° from the patient with gentle upward and forward lift.</li><li><b>Hold</b> Endotracheal Tube in Right hand so that distal tip curves up.</li><li><b>Visualize</b> the epiglottis and vocal cords.</li><li><b>Introduce</b> Endotracheal Tube tip from the corner of the mouth, careful not to obscure view of the vocal cords, and advance until cuff is past the cords.</li></ul></li><li>7. Fully inflate balloon on Cuffed Endotracheal Tubes.</li><li>8. Ventilate patient with bag-valve and 15L/min oxygen.</li><li>9. Verify ETT placement:<ul style="list-style-type: none"><li><b>Look</b> for chest rise and assess ease of ventilation.</li><li><b>Listen</b> with stethoscope for absence of epigastric air entry while bagging and for breath sounds in both axillae while bagging.</li><li><b>Check</b> for color (purple to yellow) change of End Tidal CO<sub>2</sub> Device or presence of capnography waveform.</li><li><b>Look</b> for fogging of ETT.</li></ul></li><li>10. Secure ETT as soon as possible.</li><li>11. In <b>most</b> patients, a properly placed ETT will have a depth of 3 times the tube size in centimeters (ie: size 7 tube would show the 21cm mark at the level of the teeth).</li><li>12. Reassess adequate tube placement every time patient is moved, per <b>Step 9</b>.</li></ol>
<b>Medications</b>	With base consultation, sedation (Midazolam) and analgesic (Fentanyl, Morphine, Hydromorphone) administration may be indicated for hemodynamically stable patients who become agitated or combative following intubation.
<b>Notes</b>	<p><i>Do not delay BLS airway, CPR, or AED in order to place an ETT.</i></p> <p>Endotracheal intubation should occur within 30 seconds. If unable to properly place tube within 30 seconds, stop, insert OPA/NPA, ventilate for one minute with BVM, and reattempt intubation.</p>

# Endotracheal Intubation

Do not make more than 3 attempts total (including those with Endotracheal Introducer) per patient to place ETT. *An attempt is defined as any cessation in ventilation in order to perform laryngoscopy. If either unsuccessful after 3 attempts, or intubation is not felt possible, proceed to King Tube placement IF patient is >1 year of age. If patient is < 1 year of age, use Bag Valve Mask (BVM) with BLS airway adjuncts.*

If unable to ventilate with ETT, quickly troubleshoot (suction, kinks, biting obstruction) remove tube, insert OPA/NPA, ventilate with BVM and consider placement of King Tube IF patient is > 1 year old.

If still unable to ventilate, consider Transtracheal Jet Insufflation.

Esophageal intubation is common when you do not have direct visualization of the tube passing through the vocal cords. **Failing to recognize esophageal intubation is the most common and dangerous error.** If you cannot verify correct tube placement, remove the tube and oxygenate the patient until another intubation attempt can be made.

Placement of an oversized ETT can lead to subluxation (incomplete or partial dislocation) of the arytenoid cartilage acutely, and subglottic stenosis chronically. If resistance is felt upon inserting the tube through the vocal cords, then the tube is probably too large and should be removed and a smaller size tube placed.

Vomiting and aspiration can occur during intubation of patient with an intact gag reflex. Endotracheal Intubation does not block the esophagus, and allows the insertion of up to an 18 Fr diameter OG tube into the esophagus and stomach.

## Tube Sizing:

Age	ET size	Blade size (Mac & Miller)
Preemie	2.5	0
Neonate	3	0-1
6 mos	3.5	1
1-2 yrs	4	1-2
4-6 yrs	5	2
8-12 yrs	6	2-3
Adult	7-7.5	3-4

## Cross Reference

### Procedures:

Capnography  
Endotracheal Tube  
Introducer King Tube  
Transtracheal Jet  
Insufflation

### Protocols:

Allergic Reactions  
Altered Mental Status/Altered Level of Consciousness (ALOC)  
Altitude Illness Bites and Stings  
Burns  
Cardiac Arrest with AED (Adult Medical) Cardiac Arrest without AED (Adult Medical)  
Electrical and Lightning Injuries  
Heat Illness  
Hypothermia Ingestion/Poisoning  
Major Trauma – Adult Near Drowning  
Pediatric-Medical Arrest with AED  
Pediatric-Medical Arrest without AED Pediatric-Major Trauma

### Drugs:

Fentanyl  
Hydromorphone  
(Dilaudid) Midazolam  
(Versed) Morphine  
Naloxone (Narcan)

# End Tidal CO<sub>2</sub> Monitoring

<b>Scope of Practice</b>	Parkmedic and Paramedic
<b>Indications</b>	Patients with an advanced airway (ET Tube or King Tube)
<b>Contraindications</b>	None
<b>Equipment</b>	Color and Waveform Capnography Device
<b>Procedure</b>	<ol style="list-style-type: none"><li>1. Manage airway according to Procedure 1042 Endotracheal Intubation, Procedure 1085 King Tube, Procedure 1040 CPAP, or Procedure 1130 Oxygen Administration.</li><li>2. Attach color and/or waveform capnography device to ET tube or King tube airway.</li><li>3. Check for color change from purple to yellow on color capnography device. It generally will take 2-6 breaths for color change to take place. If you do not see color change after 6 breaths, remove ETT or King tube and re-insert per procedure.</li><li>4. Maintain EtCO<sub>2</sub> between 35-45 mmHg on waveform capnography device with ventilations. Exception: patients who have presentations consistent with head trauma (posturing, blown pupil, focal motor deficits) should be ventilated to maintain EtCO<sub>2</sub> between 30-35 mmHg.</li><li>5. Continue to monitor and document EtCO<sub>2</sub> throughout pre-hospital care and transport.</li></ol>

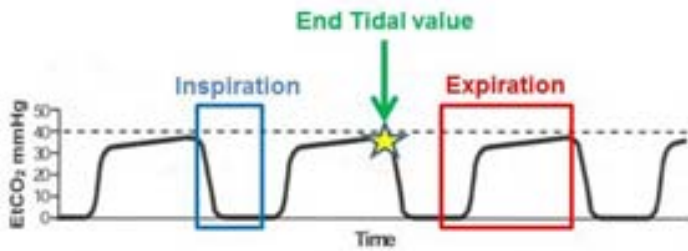
## Interpreting Color Capnography



- Color changes from purple to yellow with ventilation and CO<sub>2</sub> detection
- False positive CO<sub>2</sub> detection can occur with esophageal intubation after consumption of carbonated beverages and exposure to acidic fluid such as stomach contents or epinephrine
- False negatives can occur with cardiac arrest and pulmonary embolism

# End Tidal CO<sub>2</sub> Monitoring

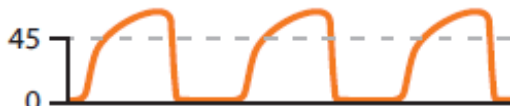
## Interpreting Waveform Capnography



Approximate degree of ventilation:

- > 45 mmHg = Hypoventilation
- 35-45 mmHg = Normal Ventilation
- 30-35 mmHg = Hyperventilation
- < 30 mmHg = Aggressive hyperventilation

### Bronchospasm (shark-fin appearance)



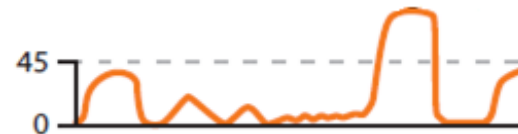
### Hypoventilation



### Hyperventilation

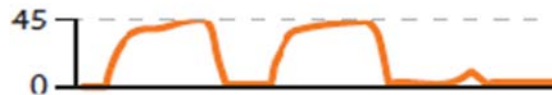


### Decreased EtCO<sub>2</sub> – Apnea, Sedation



### Sudden loss of waveform

ETT disconnected, dislodged, kinked or obstructed, loss of circulatory function



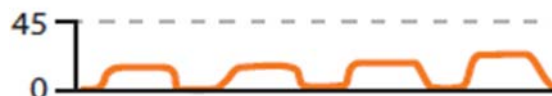
### Decreasing EtCO<sub>2</sub>

ETT cuff leak, ETT in hypopharynx, partial obstruction



### CPR assessment

Attempt to maintain minimum of 10 mmHg



### Sudden increase in EtCO<sub>2</sub>

Return of spontaneous circulation (ROSC)





# End Tidal CO2 Monitoring

## Notes

- In patients who do not require an advanced airway, you may also attach a waveform capnography device to an oxygen delivery device or nasal cannula specific to CO2. This can aid in evaluation and management of patients in respiratory distress, requiring CPAP, or in patients with known respiratory disease (COPD, asthma, etc).
- Do not delay administering medications to apply capnography devices.
- Pulse oximetry does not equate to ventilation. A patient can be poorly ventilated with high PaCO2 levels, and display an oxygen saturation of 100%.
- Do not solely rely on pulse oximetry, color capnography, or ETCO2 monitoring to verify ET tube placement.

## Cross Reference

### **Procedures:**

Endotracheal Intubation  
King Tube  
CPAP  
Oxygen Administration

### **Protocols:**

Altered Mental Status/Altered Level of  
Consciousness (ALOC)  
Cardiac Arrest with AED  
Cardiac Arrest without AED  
Respiratory Distress

# Epinephrine Ampule

<b>Scope</b>	EMT (per Local Medical Advisor approved extended scope of practice), Parkmedic, Paramedic
<b>Indications</b>	Anaphylaxis (allergic reaction with respiratory distress)
<b>Equipment</b>	Epinephrine kit containing: (1) 1 ml ampule of epinephrine 1:1,000 (1) 1 cc tuberculin syringe with needle Alcohol prep
<b>Procedure</b>	Refer to specific PROTOCOL for indications and dosages. <ol style="list-style-type: none"><li>1. Confirm patient is appropriate candidate to receive Epinephrine.</li><li>2. Confirm medication, concentration, dose and clarity of liquid in vial.</li><li>3. Tap ampule to get medicine down from top, break top off ampule with gauze 2x2; place top in sharps container.</li><li>4. Draw up 0.3 ml of epinephrine 1mg/ml 1:1,000, syringe approximately 1/3 full.</li><li>5. Pointing syringe up, expel all air.</li><li>6. Inform patient they will be receiving an injection to make them feel better <i>Advise them it may make them feel shaky and their heart pound.</i></li><li>7. Select and cleanse area for intramuscular injection with alcohol prep. <i>Primary sites are upper arm (Deltoid) or lateral thigh.</i></li><li>8. Using one hand to tent skin, insert needle at 90 degrees into administration site and draw back checking for blood return. If there is blood return, select a different site, and insert needle, again check for blood return.</li><li>9. If no blood, administer 0.3 ml of epinephrine for any patient (EMT), Parkmedic and Paramedic refer to Allergic Reactions Protocol for dosing.</li><li>10. Remove needle. Discard needle properly in sharps container if additional needles are available. If not, retain needle with syringe and remaining epinephrine as additional doses may be required.</li><li>11. Observe patient for improvement or worsening of condition. Repeat exam and vitals after each dose.</li><li>12. Document procedure, vitals and response to treatment.</li><li>13. If an additional dose is required consult Allergic Reactions and Respiratory Distress Protocols.</li><li>14. If indicated by protocol, begin again from step 4.</li></ol>

## Cross Reference

### **Protocols:**

Allergic Reactions  
Respiratory Distress

# Epinephrine Auto-Injector

<b>Scope</b>	EMT (per Local Medical Advisor approved extended scope of practice), Parkmedic, Paramedic
<b>Indications</b>	Anaphylaxis (Allergic reaction and respiratory distress)
<b>Equipment</b>	Epinephrine Auto-Injector Alcohol prep
<b>Procedure</b>	<p>Refer to specific PROTOCOL for indications and dosages.</p> <ol style="list-style-type: none"><li>1. Confirm patient is appropriate candidate to receive Epinephrine.</li><li>2. Inform patient that they will be receiving an injection to make them feel better. <i>Advise them it may make them feel shaky and their heart pound.</i></li><li>3. Clean skin of the outer thigh with alcohol prep.</li><li>4. Familiarize yourself with the unit.</li><li>5. Grasp unit, with the black tip pointing downward.</li><li>6. Form a fist around the auto-injector (black tip down).</li><li>7. With your other hand, pull off the gray activation cap.</li><li>8. Hold black tip near outer thigh.</li><li>9. Jab firmly into outer thigh so that auto-injector is perpendicular (at a 90 degree angle) to the thigh.</li><li>10. Hold firmly in thigh for several seconds.</li><li>11. Remove unit, massage injection area for several seconds.</li><li>12. Check black tip: if needle is exposed the patient received the dose, if not repeat <b>Steps 8 – 11.</b></li><li>13. Note that most of the liquid (~90%) stays in the auto-injector and cannot be reused.</li><li>14. Bend the needle back against a hard surface.</li><li>15. Carefully put the unit (needle first) back into the carrying tube (without the gray activation cap).</li><li>16. Recap the carrying tube.</li><li>17. Observe patient for improvement or worsening of condition. Repeat exam and vitals after each dose.</li><li>18. Document procedure, vitals and response to treatment.</li></ol>
<b>Notes</b>	<p>All Auto-injectors have an activation tip and a needle tip. Providers need to be familiar with the brand/style used at their Park.</p> <p>Parkmedics/Paramedics are approved to use the Epinephrine Auto-Injector per the EMT protocol if their ALS supplies are not immediately available.</p> <p>Never put thumb, fingers, or hand over black tip.</p> <p>Do not remove gray activation cap until ready to use.</p>
<b>Diagrams</b>	See package insert.

## Cross Reference

### **Protocols:**

Allergic Reactions  
Respiratory Distress

# Fracture and Dislocation Management (Reduction and Splinting)

<b>Scope of Practice</b>	EMT, Parkmedic, and Paramedic
<b>Indications</b>	Refer to specific procedure(s) below
<b>Contraindications</b>	Refer to specific procedure(s) below

## PROCEDURE(S)

**Reduction of Fracture** per PROTOCOL: *Minor or Isolated Extremity Trauma, Major Trauma – Adult or Pediatric – Major Trauma.*

1. Identify site of injury.
2. Assess distal circulation, sensation and motor function.
3. Irrigate open fractures per PROCEDURE: *Wound Care*. Use LR/NS or sterile water if available, otherwise potable water.
4. Provide analgesia if available per appropriate PROTOCOL.
5. Grasp extremity above and below injury (use two rescuers if available).
6. Apply steady gentle traction below (distal to) injury in direction of long axis of extremity.
7. Continue until patient complains of intolerable pain, resistance is felt, or reduction is accomplished.
8. Apply splint.
9. Reassess distal circulation, sensation and motor function.
10. Document procedure.

Note: for deformed femur fractures, reduction is best performed with application of a traction splint.

**Splinting** per PROTOCOL: *Minor or Isolated Extremity Trauma, Major Trauma – Adult or Pediatric – Major Trauma.*

1. Assess distal circulation, sensation and motor function.
2. Irrigate and dress open wounds per PROCEDURE: *Wound Care*.
3. Reduce potential fractures if indicated per **Reduction of Fracture**.
4. Immobilize the joint if the joint is the site of primary injury. Immobilize joints above and below long bone injuries.  
Suspected mid-shaft femur fractures are best immobilized with a traction splint.  
Suspected hip fractures may be immobilized on a long board.  
Suspected pelvic fractures may be immobilized per PROCEDURE: *Pelvic Stabilization*.
5. Splint must be well-padded.
6. Toes or fingers must be accessible for repeated assessment.
7. Injury should be elevated above the level of the heart if practical.
8. Reassess distal circulation, sensation and motor function.
9. Document procedure.

**Reduction of Dislocated Digit** (finger or toe) per PROTOCOL: *Minor or Isolated Extremity Trauma, Major Trauma – Adult or Pediatric – Major Trauma.*

1. Assess other injuries, digits and distal circulation, sensation, and motor function.
2. Confirm indications (ALL must be present):  
Greater than two hours transport time to hospital or clinic.  
For all reductions (digit/shoulder/patella), base hospital order or documented communication failure.  
History of “jamming” finger.  
Clear deformity to proximal or distal interphalangeal joint.  
Patient with limited ability to bend finger because of pain.  
Procedure does not delay care or transportation of life-threatening injuries.
3. If laceration or exposed bone irrigate thoroughly per PROCEDURE: *Wound Care*.
4. Grasp distal portion of finger securely with gauze.
5. Stabilize proximal portion of finger and hand per included diagram.
6. Apply gentle, firm, steady, longitudinal traction while gently pushing distal bone back into place.
7. Reduction is confirmed by “clunk”, resolution of deformity and pain, and return of motion.
8. If successful, digit should be buddy taped and padded.
9. If unsuccessful or not attempted, finger should be splinted in the position it was found.
10. Reassess distal circulation, sensation and motor function.
11. Document procedure.

# Fracture and Dislocation Management

## (Reduction and Splinting)

**Reduction of Dislocated Shoulder** per PROTOCOL: *Minor or Isolated Extremity Trauma, Major Trauma – Adult or Pediatric – Major Trauma.*

1. Assess other injuries, shoulder and distal circulation, sensation and motor function.
2. Confirm indications (ALL must be present):
  - Greater than two hours transport time to hospital or clinic.
  - For all reductions (digit/shoulder/patella), base hospital order or documented communication failure.
  - History of indirect “lever-type” trauma to arm rather than blow directly to shoulder.
  - Clear deformity to shoulder (loss of rounded appearance of lateral shoulder).
  - No physical findings of direct shoulder trauma (e.g. shoulder contusions/abrasions).
  - No other suspected fractures to same arm.
  - Patient with limited ability to move shoulder because of pain.
  - Procedure does not delay care or transportation of life-threatening injuries.
3. Place patient on unaffected side.
4. Provide analgesia if available per appropriate PROTOCOL.
5. Continually remind patient to relax shoulder muscles.
6. Apply gentle steady traction away from shoulder by grasping wrist and slowly lifting entire arm away from body to 90 degrees per attached diagram. Slowly lift patient using their body weight for counter-traction. This may take several minutes. Maintain traction at all times.
7. Continue steady traction until reduction is felt/heard, patient reports relief, or 5 minutes have elapsed.
8. If reduction is accomplished, arm should be easily moveable into position against body. Apply sling and swath per attached diagram.
9. If reduction is not accomplished, arm should be slowly moved into original position, padding applied in space between arm and body, and arm secured in position for transport.
10. Reassess distal circulation, sensation and motor function.
11. Document procedure.

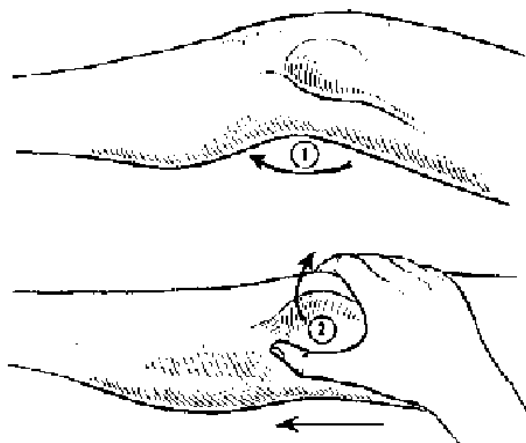
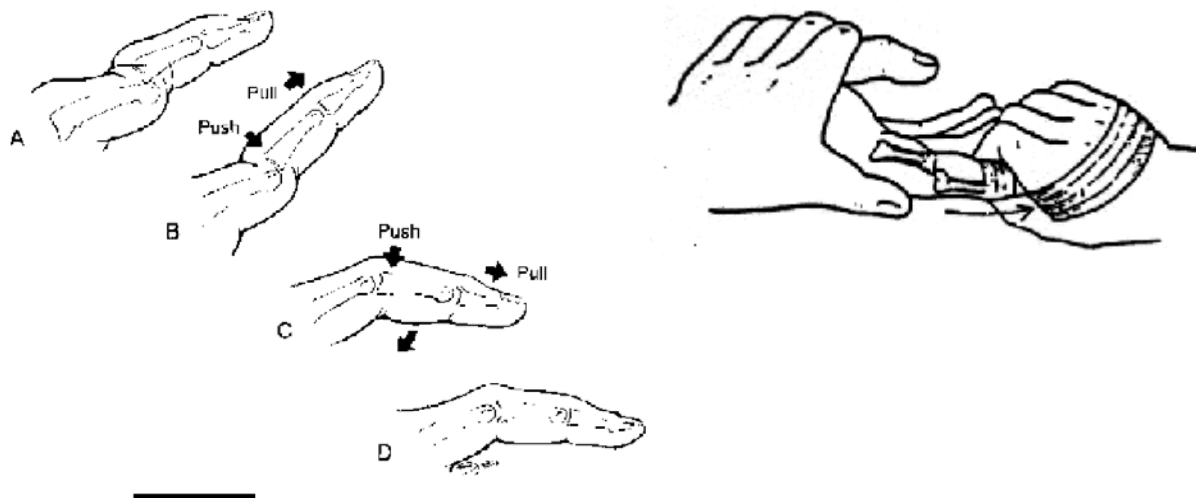
**Reduction of Dislocated Patella (kneecap)** per PROTOCOL: *Minor or Isolated Extremity Trauma, Major Trauma – Adult or Pediatric – Major Trauma.*

1. Assess other injuries, knee and distal circulation, sensation and motor function.
2. Confirm indications (ALL must be present):
  - Greater than two hours transport time to hospital or clinic.
  - For all reductions (digit/shoulder/patella), base hospital order or documented communication failure.
  - History of indirect “lever-type” trauma to knee rather than direct blow.
  - Obvious lateral displacement of knee cap to outside.
  - Knee held flexed (bent) and patient with limited ability to straighten knee voluntarily because of pain.
  - No physical findings of direct knee trauma (e.g. knee lacerations/contusions/abrasions).
  - Procedure does not delay care and transportation of life-threatening injuries.
3. Apply steady, gentle pressure from lateral (outside) to medial patella and simultaneously straighten leg.
4. If successful, knee should be immobilized in extension (straight).
5. If there are no other extremity injuries that prevent walking, patient may ambulate with immobilization (e.g. ensolite pad wrapped and secured around leg). Minimize walking unless necessary to facilitate evacuation and patient states there is no significant pain.
6. If unsuccessful, time/injuries do not permit reduction, or all indications not met, knee should be immobilized in the position it was found.
7. Reassess distal circulation, sensation and motor function.
8. Document procedure.

### Notes

Deformities (fractures and/or dislocations) with distal neurovascular compromise should be reduced ASAP in an attempt to regain circulation.  
For dislocated joints listed above (patella, digit, shoulder), reduction attempts are permissible even with intact distal neurovascular exams.

# Fracture and Dislocation Management (Reduction and Splinting)



**Figure 52-44** Manipulative reduction of a lateral patellar dislocation. Extend the knee gradually (1) while medially directed pressure is applied on the patella (2), pushing it over the lateral femoral condyle. (From DePalma AF: Management of Fractures and Dislocations. Philadelphia, WB Saunders, 1970, p 1665. Reproduced by permission.)

*Pictures courtesy of Harcourt Health Sciences/Clinical Procedures in Emergency Medicine, 3<sup>rd</sup> Ed.*

# Fracture and Dislocation Management (Reduction and Splinting)



Note deformity



## Cross Reference

### **Procedures:**

Pelvic Stabilization  
Wound Care

### **Protocols:**

Bites and Stings  
Electrical and Lightning Injuries  
Major Trauma – Adult  
Minor or Isolated Extremity Trauma  
Pediatric – Major Trauma

# Gamow Bag

<b>Scope of Practice</b>	EMT, Parkmedic, and Paramedic (per Local Medical Advisor approved extended scope of practice)
<b>Indications</b>	High Altitude Illness (HACE, HAPE)
<b>Contraindications</b>	Patient unable to protect their airway
<b>Equipment</b>	Gamow Bag
<b>Procedure</b>	<p>Confirm indication for Gamow Bag use per PROTOCOL: <i>Altitude Illness</i>.</p> <ol style="list-style-type: none"><li>1. Confirm that descent is not immediately available. <u>Confirm that patient can protect their own airway.</u></li><li>2. Explain procedure to patient. Establish an emergency signal indicating need to get out of bag. Tell patient to notify you of ear or facial pain (because of increased pressure).</li><li>3. Have patient void if able.</li><li>4. Place bag on as smooth a surface as possible. If patient has orthopnea, bag can be situated with the head propped up.</li><li>5. Attach pump to gray intake Valve.</li><li>6. Ensure valve stem is in closed position.</li><li>7. Place patient in bag. Use clothing and/or sleeping bag to ensure warmth.</li><li>8. If patient is in severe distress, they may be placed on low-flow oxygen per PROCEDURE: <i>Oxygen Administration</i> while in the bag.<ol style="list-style-type: none"><li>a. Place the oxygen tank inside the bag with the patient, with the regulator dial visible.</li><li>b. If pulse oximeter is available titrate oxygen delivery to saturation &gt; 94%. NOTE: The enriched oxygen supply inside the bag increases the risk of combustion. <u>Maintain meticulous precautions against sparks and fire.</u></li></ol></li><li>9. Tell patient to breath normally. Have them clear their ears by swallowing. Advise them that if the bag should accidentally deflate they should exhale.</li><li>10. Pull zipper completely closed.</li><li>11. Begin inflation with foot pump.</li><li>12. Check that nylon straps are not twisted and are in proper location.</li><li>13. Inflate to 2 PSI on gauge, or until valve releases. <u>Maintain eye contact with patient at ALL times.</u></li><li>14. <u>Continue pumping 15 times per minute at ALL times to clear excess CO2.</u></li></ol> <p>Continue treatment until patient has returned to baseline or is being evacuated. Patient may be removed from the bag for a few minutes every hour to allow them to void and have vitals reassessed.</p> <ol style="list-style-type: none"><li>1. To deflate, depress and turn valve stem to locked down position, and allow air escape.</li><li>2. Undo zipper.</li><li>3. Re-evaluate patient.</li><li>4. Return valve stem to closed position.</li><li>5. Document procedure (indications, duration, pressure, etc.), vital signs and response to treatment.</li></ol>

## Cross Reference

### **Protocols:**

Altitude Illness



# Intraosseous Access

<b>Scope of Practice</b>	Parkmedic and Paramedic
<b>Indications</b>	All ages: IV and IO should be considered equivalent (see specific protocols). <b>In cardiac arrest situations begin with IO.</b>
<b>Contraindications</b>	Do not place IO in a bone that is known to be fractured. Do not place IO if the site of insertion is grossly contaminated.
<b>Relative Contraindications</b>	Placement in a bone that is suspected to contain a fracture. Previous orthopedic surgery on the leg being considered for IO insertion. Areas that are burned. An IO or EZ-IO placed in the same bone within the past 24 hours. Inability to locate anatomical landmarks due to significant edema at the site. Excessive tissue at insertion site (obese or excessive muscle tissue). Infection: Obvious skin infection or suspected bone infection, osteomyelitis, at site Osteogenesis imperfecta (a genetic abnormality resulting in extremely brittle bones).  <b>Note:</b> fracture of another bone (e.g. femur) proximal to the bone being considered as the insertion site is not a contraindication to use of the site as long as perfusion distal to the fracture site can be confirmed.
<b>Complications</b>	Fracture of bone or damage to the growth plate; bleeding from insertion site; neurovascular injury; infection of skin or bone. Misplacement of IO through bone. Compartment syndrome especially if unrecognized fluid extravasation.
<b>Equipment</b>	<u>Manual IO:</u> 16 or 18 gauge IO needle, 10ml syringe, 60ml syringe, IV fluid, extension set, 15 gtt drip set, pressure bag  <u>EZ-IO:</u> EZ-IO Insertion kit, 60 ml syringe, IV fluid, 15 gtt drip set, pressure bag
<b>Sites (Images can be seen below)</b>	<u>Proximal Tibia:</u> (preferred choice in children) support the leg with towel under, the knee. Identify the target area. Mark 2cm below and medial to the tibial tuberosity so you are on the flat, medial aspect of the bone.  <u>Distal Anterior Femur:</u> insertion point is 3cm above the patella on the anterior midline above the knee with needle directly slightly superior to avoid growth plates.  <u>Humerus:</u> (preferred choice in adults, last choice in children) insertion site is slightly anterior to the lateral midline of the arm at the greater tubercle. Keep patient supine with the elbow bent and shoulder exposed. Adduct the patient's arm so that their hand is resting on their umbilicus. Firmly palpate the humeral shaft, progressing superiorly toward the humeral head until the greater tubercle is palpated. Insertion site is slightly anterior to the lateral midline of the arm at the greater tubercle.  Enter the bone with the needle at perpendicular angle if humerus, slightly superior if anterior femur or slightly inferior if tibia to avoid growth plates Advance the needle firmly with a twisting motion until you feel a decrease in resistance and a crunching, indicating penetration into the bone marrow cavity.

# Intraosseous Access

## Procedure

### Manual IO:

1. Clean the skin with alcohol pad or Betadine.
2. Flush extension set.
3. Prep fluids.
4. Locate appropriate insertion site (reference attached diagrams).
5. Stabilize the 16 or 18 gauge IO needle in your palm with your index finger on the skin.
6. Distance from skin surface to marrow cavity varies but is usually greater than 1cm.
7. Remove the stylet and see if the needle stands without support. If it does, use a 5ml syringe to aspirate. Aspiration of blood indicates successful placement, but this may not occur. If blood is not aspirated, try infusing with syringe 2-3ml of NS/LR.
8. Proper placement of the catheter is confirmed by any of the following:
  - I. Catheter stands at 90° angle to the skin and is firmly seated.
  - II. Blood at hub of catheter.
  - III. Free flow of fluid with no evidence of extravasation (skin swelling)

If proper insertion cannot be confirmed or catheter appears to be blocked and cannot flush, repeat procedure at another site; do not remove existing IO until successful IV/IO has been established.

If resistance is met to fluid infusion, advancing and/or withdrawing the needle 1– 5mm may improve flow.

9. If fluid pushes easily, continue with manual bolus or medications per specific PROTOCOL.

If patient conscious, consider administration of 2% lidocaine flush to prevent pain during medication and/or fluid administration see LIDOCAINE below. Secure needle with tape, dressing (leg board in children). Reassess frequently.

### EZ-IO:

1. Prepare EZ-IO driver and needle set.
2. Open EZ-IO cartridge and attach needle set to driver; a “snap” should be felt as magnet connects.
3. Remove needle set from cartridge.
4. Remove safety cap from needle set. Grasp and rotate clockwise to remove.
5. Clean the skin with alcohol pad or Betadine.
6. Stabilize the patient’s leg/arm as appropriate near insertion site.
7. Position EZ-IO driver at insertion site with needle at 90° angle to the surface of the bone and power needle through skin until bone is encountered.
8. Verify that 5mm mark on catheter is visible. If mark is not visible there may be excessive tissue at the site making needle too short to penetrate the IO space.
9. Continue insertion at 90° angle to bone surface and applying firm steady pressure as the needle is powered through the outer surface of the bone. Stop when the needle flange contacts skin, or when a sudden decrease in resistance is felt.
10. Remove stylet from catheter by grasping hub with one hand and rotating stylet counterclockwise to unscrew it from the catheter.
11. Proper placement of the catheter is confirmed by any of the following:
  - I. Catheter stands at 90° angle to the skin and is firmly seated.
  - II. Blood at hub of catheter.
  - III. Free flow of fluid with no evidence of extravasation under the skin.

If resistance is met to fluid infusion, advancing and/or withdrawing the needle 1– 5mm may improve flow.

If proper insertion cannot be confirmed or catheter appears to be blocked and cannot flush, repeat procedure at another site; do not remove existing EZ-IO until successful IV/IO has been established.

# Intraosseous Access

12. Connect primed extension set to EZ-IO hub. Do not attach syringe or flow set directly to EZ-IO catheter.
13. Using a 10ml syringe, rapidly flush catheter with 5-10ml NS/LR.  
If patient conscious, consider administration of 2% lidocaine flush to prevent pain during medication and/or fluid administration see LIDOCAINE 2%
14. Connect primed flow set to begin infusion. Use only for IV push and not drips.
15. Properly dress and secure catheter with bulky gauze and cross-tape.

## Lidocaine

Adults: 40mg (2ml) of 2% Lidocaine, slow IO push, once, if conscious or significant pain

Children: 0.5 mg/kg, slow IO push once, if conscious or significant pain

**Medication and Fluid delivery** passive gravity infusions will not work with IO lines.

Pressure bags may be used to facilitate infusion boluses. Use a 60ml syringe to give fluid/boluses. All IV medications can be administered through the IO line. Flush all medications with 10ml NS/LR.

## Notes

The “Needle” is the hollow, steel needle that is left in place, and also the needle/stylet combination. The “Stylet” is the solid wire core trocar that is removed after placement. The term “Catheter” is sometimes used to refer to the “Needle.”

Once needle is in place, secure or it may become dislodged.

Avoid placing your hand directly behind the bone you are targeting to prevent accidental needle stick.

Successful placement often does not require the entire length of the needle to be inserted, over insertion may lead to placement of the IO entirely through the bone.

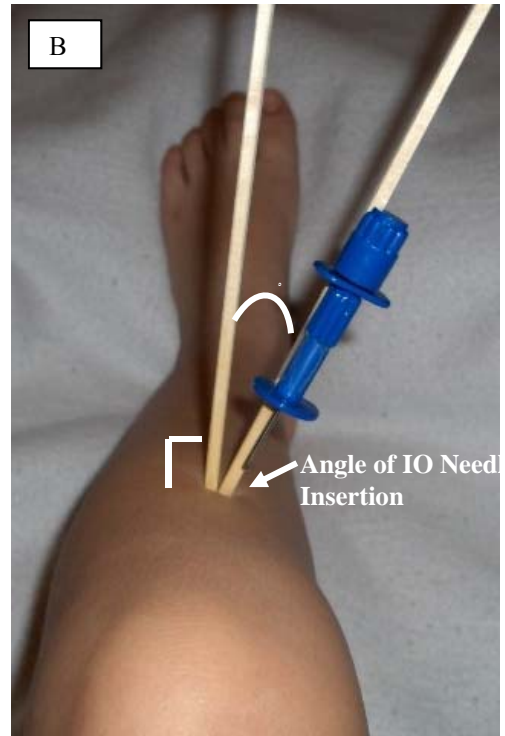
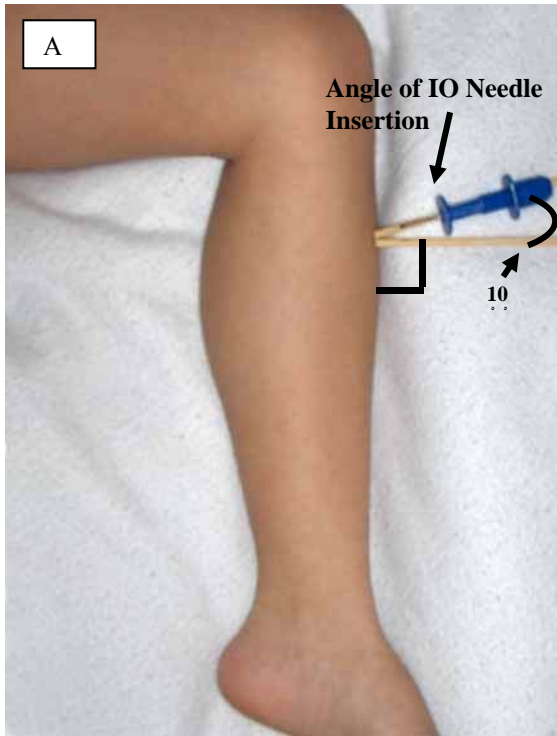
Continue attempts at IV access. If IV established, use it for fluids and medications, but keep IO backup.

## INTRAOSSIOUS ACCESS INSERTION IMAGES



These images are intended to show the angle at which the IO needle should be inserted into the humerus.

## Intraosseous Access



These images are intended to show the angle at which the IO needle should be inserted into the tibia.

Diagram A demonstrates that the angle of the needle should be approximately 10 degrees off perpendicular to angle the needle tip away from the growth plate.

Diagram B demonstrates that the angle of the needle should be approximately 10 degrees off perpendicular to allow penetration directly through the flat surface of the anterior tibia.



These images are intended to show the angle at which the IO needle should be inserted into the femur.

# Intraosseous Access

## Cross Reference

### **Procedures:**

IV Access and IV Fluid  
Administration  
Pelvic Stabilization  
Transcutaneous Pacing

### **Protocols:**

Abdominal Pain  
Allergic Reactions  
Altered Mental Status/Altered Level  
of Consciousness  
Bites and Stings  
Burns  
Chest Pain (Cardiac)  
Childbirth  
Frostbite  
General Medical Illness – Adult  
Heat Illness  
Hypothermia  
Ingestion/Poisoning  
Major Trauma (Adult)  
Near Drowning  
Pediatric – Major Trauma  
Pediatric – Medical Illness/Fever  
Respiratory Distress  
SCUBA/Dive Injury  
Shock without Trauma  
Trauma Arrest (Adult and Pediatric)  
Vaginal Bleeding

### **Drugs:**

Amiodarone  
Cefazolin (Ancef)  
Diltiazam  
Lidocaine 2%

# IV Access and IV Fluid Administration

<b>Scope of Practice</b>	Parkmedic and Paramedic
<b>Indications</b>	Administration of IV fluids and certain medications
<b>Contraindications</b>	None
<b>Relative Contraindications</b>	IV placement in an extremity with a <u>suspected</u> fractured bone
<b>Complications</b>	Bleeding, infection, vein or tissue damage from extravasation
<b>Vascular Access</b>	<p>Adults: TKO or maintenance fluids: one 18–20 gauge IV catheter. Signs/symptoms/high risk for shock: two 14–18 gauge IV catheters.</p> <p>Pediatrics: Medications: One IV catheter appropriate size for vein. Volume resuscitation: Two largest age-appropriate IV catheters.</p>
<b>Fluid Delivery</b>	<p>Adults: All IV's: macrodrip set (10–15 drops/ml). All IO's: Use a 60ml syringe to give fluid/boluses.</p> <p>Pediatrics: All IV's: measured-volume solution administration set (Volutrol). All IO's: Use a 60ml syringe to give fluid/boluses, not Volutrol.</p>
<b>IV Fluid</b>	<p><u>Saline lock or TKO</u>: may generally use interchangeably if fluid or medication not currently required but may be needed in the future (exceptions are noted in specific PROTOCOLS). Saline lock avoids IV line entanglement during complex extrications, however TKO allows for immediate administration of fluids as needed.</p> <p><u>Maintenance fluids</u>: stable patients with no contraindications to fluid (pulmonary edema):            Adults: 120ml/hr (macrodrip 1 drop every 2-3 seconds).            Pediatrics: 2 ml/kg/hr or reference NPS Pediatric Resuscitation Tape / Broselow tape.</p> <p><u>Fluid challenge</u>:            Adults (SBP 80-100 or HR &gt;100): 500ml bolus (recheck vitals after bolus).            Pediatrics: Bolus only - no challenge indicated.</p> <p><u>Fluid bolus</u>:            Adults: (SBP &lt; 80): 1-L bolus wide open under pressure.            Repeat SBP &lt; 80: Repeat bolus once, then contact base.            Pediatrics: Shock, indicated by protocol: 20ml/kg bolus.            If no improvement: Repeat bolus once then contact base.            Pediatric Shock: SBP &lt; (70 + 2x age in years) per PROTOCOL: <i>Pediatric Parameters</i>.</p> <p>In the case of fluid challenge or bolus: Contact base as soon as possible. If communication failure, continue per guidelines to a <u>maximum of 3-L in adults and 60ml/kg in pediatrics</u>.</p>

	<u>TKO</u> Stable	<u>Maintenance</u> Stable	<u>Challenge</u> At risk	<u>Bolus</u> Shock	<u>Maximum</u> Shock
<b>ADULT</b>	TKO	120ml/hr	SBP80–100 or HR > 100 500ml bolus	SBP < 80 1-L bolus	3-L
<b>0-14 yrs</b>	TKO	2 ml/kg/hr or NPS/Broselow	No challenge; use bolus	SBP < (70+2x age in years) 20ml/kg	60ml/kg

# IV Access and IV Fluid Administration

## **Fluid Challenge or Bolus Procedure**

Check vitals and lung exam after each fluid challenge/bolus.  
As vitals change refer back to the table above for fluid guidelines (i.e. initial SBP=80, give 1-L bolus; recheck SBP=90, give 500ml bolus; recheck.)  
If signs of pulmonary edema (crackles, respiratory distress, increased respiratory rate) develop during IV fluid administration, decrease to TKO and contact base for fluid orders.

## **Notes**

If PROTOCOL orders IV fluid, refer to this PROCEDURE for gauge, number of IV's, and fluid rate. If IV fluid orders differ from this it will be indicated in the specific PROTOCOL.  
If it is likely that patient will not be transported, contact base prior to IV attempts.

## **Cross Reference**

### **Procedures:**

Intraosseous (IO) Access

### **Protocols:**

Abdominal Pain  
Allergic Reactions  
Altered Mental Status/Altered Level of Consciousness (ALOC)  
Altitude Illness  
Bites and Stings  
Burns  
Cardiac Arrest /Dysrhythmias  
Chest Pain – Cardiac  
Childbirth  
Electrical and Lightning Injuries  
Eye Trauma  
Frostbite  
Heat Illness  
Hypothermia  
Ingestion/Poisoning  
Major Trauma – Adult  
Minor or Isolated Extremity Trauma  
Near Drowning  
Pediatric – Cardiac Arrest/Dysrhythmias  
Pediatric – Medical Illness/Fever  
Pediatric – Major Trauma  
Pediatric – Newborn Resuscitation  
Respiratory Distress  
Seizures  
Shock Without Trauma  
Trauma Arrest (Adult and Pediatric)  
Vaginal Bleeding

# King Tube

<b>Scope of Practice</b>	EMT (per Local Medical Advisor approved extended scope of practice), Paramedic, and Paramedic
<b>Indications</b>	<p><b>ALL</b> must be present:</p> <ul style="list-style-type: none"><li>Unable to place endotracheal tube/ failed endotracheal tube attempt.</li><li>GCS <math>\leq</math> 6</li><li>Apneic or agonal respirations <math>\leq</math> 6 per minute</li></ul> <p><b>Note:</b> You may go directly to King tube during CPR in an attempt to minimize interruptions in compressions.</p>
<b>Contraindications</b>	<p>Do not use if ANY are present:</p> <ul style="list-style-type: none"><li>Known esophageal pathology (e.g. cancer)</li><li>Suspected hydrocarbon or caustic ingestion</li><li>Suspected narcotic overdose prior to administration of Naloxone; King Tube may be attempted in suspected narcotics overdose if unresponsive to Naloxone</li><li>Upper airway obstruction</li></ul>
<b>Equipment</b>	<p>King LT(S)-D Tube (size, 3, 4 or 5) or King LTD Tube (size 2 or 2.5) Appropriately sized syringe to inflate balloon Suction End Tidal CO<sub>2</sub> monitoring device, if available KY Jelly</p>
<b>Procedure</b>	<ol style="list-style-type: none"><li>Maintain C-spine precautions if indicated</li><li>Have suction equipment available and ready</li><li>Pre-oxygenate with BVM and oxygen at 15 L/min for minimum one minute prior to King Tube placement</li><li>Choose appropriate-sized tube based on patient height:<ul style="list-style-type: none"><li>35 – 45in. Size 2 LTD</li><li>41 – 51 in. Size 2.5 LTD</li><li>4–5 ft: Size 3 LT(S)-D</li><li>5-6 ft: Size 4 LT(S)-D</li><li>&gt; 6 ft: Size 5 LT(S)-D</li></ul></li><li>Check integrity of balloon by fully inflating it briefly</li><li>King Tube placement:<ol style="list-style-type: none"><li>Lubricate tube with KY jelly or water. If present, remove dentures, broken teeth or OPA.</li><li>Lift tongue and lower jaw with non-dominant hand (grip tongue with gauze). Hold King Tube in dominant hand so that distal tip curves up.</li><li>With the King Tube rotated laterally 45-90° such that the blue orientation line is touching the right corner of the mouth, introduce tip into mouth and advance behind the base of the tongue.</li><li>As the King Tube tip passes over and behind the tongue, rotate the tube back to midline (blue orientation line faces chin).</li><li>Advance King Tube until base of connector aligns with teeth or gums. King Tube should be placed within 30 seconds. If unable to properly place tube within 30 seconds, stop, insert OPA/NPA, pre-oxygenate for one minute, and reattempt tube placement.</li></ol></li></ol> <p><b>Note:</b> If during placement of king tube, patient begins gagging, and/or vomiting remove king tube, suction as needed, and reassess mental status prior to further attempts.</p>



# King Tube

7. Fully inflate balloon using the maximal volume of the syringe included in the kit. King Tube may retract ½ to 1 cm during this process or tube may be manually retracted approximately 1 cm to ensure proper “seat”.
8. Ventilate patient with bag-valve and 15L/min oxygen.
9. Verify King Tube placement:
  - Look for chest rise.
  - Listen with stethoscope for absence of epigastric air entry while bagging.
  - Listen with stethoscope for breath sounds in both axillae while bagging.
  - If air is leaking around balloon and out of patient’s mouth, add small quantities of air to the balloon (5-10ml at a time) to ensure oropharyngeal seal.If unable to ventilate with King Tube, remove tube, insert OPA/NPA and ventilate with BVM.  
If still unable to ventilate, consider TTJI per PROCEDURE: *Transtracheal Jet Insufflation*.  
If available, attach End Tidal CO<sub>2</sub>.
10. Secure King Tube as soon as possible.
11. Reassess adequate tube placement every time patient is moved, per **Step 9**.

## Medications:

With base consultation, sedation (Midazolam) and analgesic (Fentanyl, Morphine, Hydromorphone) administration may be indicated for hemodynamically stable patients who become agitated or combative post King Tube placement.

## Notes

Do not delay BLS airway, ventilations, CPR, or AED in order to place King Tube.

The gastric access lumen allows the insertion of up to an 18 Fr diameter OG tube into the esophagus and stomach.

If unable to fully insert the King Tube despite changing the angle of insertion, remove the tube, coil it tightly to increase its curvature, and then reinsert it quickly before it fully uncoils.

If narcotic overdose is suspected as the cause of ALOC, give Naloxone (Narcan) per PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)* prior to inserting the King Tube. If no effect, insert tube as indicated.

## Cross Reference

### Procedures:

Endotracheal Intubation  
Transtracheal Jet Insufflation

### Protocols:

Allergic Reactions  
Altered Mental Status/Altered Level of Consciousness (ALOC)  
Altitude Illness  
Bites and Stings  
Burns  
Cardiac Arrest with AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
Electrical and Lightning Injuries  
Heat Illness  
Hypothermia  
Ingestion/Poisoning  
Major Trauma – Adult  
Near Drowning  
Pediatric –Medical Arrest with AED  
Pediatric – Medical Arrest without AED  
Pediatric – Major Trauma  
Respiratory Distress  
Seizures  
Shock Without Trauma  
Trauma Arrest (Adult and Pediatric)

### Drugs:

Naloxone (Narcan)

# Mucosal Atomizer Device (MAD)

<b>Scope of Practice</b>	EMR, EMT, Parkmedic and Paramedic
<b>Indications</b>	Administration of approved medications intranasally
<b>Contraindications</b>	None, although administration may be less effective with nasal obstruction
<b>Side Effects</b>	Possible choking
<b>Equipment</b>	Mucosal Atomizer Device; 3ml syringe, medication, small gauge needle, alcohol swab
<b>Procedure</b>	Fill syringe with desired medication. Attach Mucosal Atomizer Device to tip of syringe. Insert Mucosal Atomizer Device into nostril and depress syringe with sufficient force to atomize medication. Dose may be administered 50% in each nostril if total volume is over 1 milliliter.
<b>Notes</b>	The Mucosal Atomizer Device may be used in all body positions. If giving multiple doses, repeat the dose in the other nostril unless obviously obstructed. Administration is limited to no more than 1 ml per nare per dose.

## Cross Reference

### **Protocols:**

Abdominal Pain  
Altered Mental Status/Altered Level of Consciousness (ALOC)  
Bites and Stings  
Burns  
Chest Pain (Cardiac)  
Electrical and Lightning Injuries  
Eye Trauma  
Frostbite  
Hypothermia  
Ingestion/Poisoning  
Major Trauma  
Minor and Isolated Extremity Trauma  
Pediatric – Major Trauma  
SCUBA/Dive Injury  
Seizures  
Vaginal Bleeding

### **Procedures:**

Electronic Control Device  
Transcutaneous Pacing

### **Drugs:**

Fentanyl  
Midazolam (Versed)  
Naloxone (Narcan)

# Multi-Casualty Reporting Format

## **I. INDICATION:**

An MCI is where the number of patients cannot be fully managed by the on-scene personnel (in many parks this policy is implemented at five or more patients).

## **II. INITIAL MULTI-CASUALTY SCENE SIZE UP:**

Relayed to dispatch by the first EMS provider on the scene.

Includes the following items **only**:

1. Mobile unit, provider level (Paramedic/Parkmedic/EMT/EMR) and identification (radio call sign)
2. Exact Location/ Environment/ Elevation
3. Type of Incident
4. Hazards
5. Estimate of Casualties (Color Code/Triage designation if known) triage category
6. Request additional help as needed

## **III. MULTI-CASUALTY PATIENT REPORT:**

To be called in by the Incident Commander or designee to base or designated disaster control facility, once patients are ready for transport. Information is to be utilized to help determine patient destination. **Do not include specifics on physical exam, nor requests for additional therapy, unless transport will be delayed.**

1. Mobile unit, provider level (Paramedic/Parkmedic/EMT/EMR) and identification (radio call sign)
2. Triage Tag number
3. Patient Profile (Age and sex ONLY)
4. Color Priority Code/ Triage destination
5. Primary Injury (chief complaint)
6. Destination unless redirected by Base Hospital
7. Transporting Unit and Type (air/ground)
8. Departure Time/ETA

## **IV. MULTI-CASUALTY PATIENT REPORT (LARGE DISASTERS):**

Shorted report given during large disaster (with Base Hospital permission).

1. Mobile unit, provider level (Paramedic/Parkmedic/EMT/EMR) and identification (radio call sign)
2. Triage Tag number
3. Color Priority Code/ Triage destination
4. Destination
5. Transporting Unit and Type (air/ground)

## **V. DEFINITIONS:**

**Acuity** – severity of illness or injury

**Dispatch Leader**- Reports to the IC and is responsible for taking the initial MCI report from the IC and then relaying that information to the Base Hospital. Dispatch also helps organize requested resources, coordinate transportation and identify potential hazards or access route limitations.

**Extrication Leader**- Reports to the IC, facilitates movement of triaged patients from the scene of the incident to designated color-coded treatment areas. Responsible for initial C-spine precautions and patient safety during extrication. Assignment of this role is dependent on need for significant extrication and sufficient manpower.

**Futility** – when a patients condition is so critical that their chance of survival despite maximal intervention is remote.

# Multi-Casualty Reporting Format

**Incident Commander (IC)** - The first rescuer on scene and individual in charge of the overall incident, responsible for commanding and coordinating the disaster site response in its entirety and requesting additional resources as needed. The Triage Leader, Extrication Leader, Treatment Leader, Transport Leader and Dispatch all report to the IC.

**Incident Command System (ICS)** - A nationally recognized approach to MCI's using common terminology and procedures. It is a modular organization providing the framework for agencies to respond in a coordinated effort to incidents regardless of size.

**Jump START** - A complementary triage system to START designed to be used with children (defined as shorter than the NPS Pediatric Resuscitation Tape and/or Broselow tape, generally 8 years old or less).

**Multi-Casualty Incident (MCI)** - any incident with five or more patients, or when the number and acuity of patients overwhelms the rescuer's ability to provide care in the usual manner.

**START Triage** - A specific triage system (Simple Triage and Rapid Treatment) designed for very large-scale disasters. Adult patients are each given a triage tag (METTAG) and assigned to a severity group (Minor/Green, Delayed/Yellow, Immediate/Red or Morgue/Black) representing acuity on the basis of a 30 second or less assessment of airway, respiratory rate, capillary refill (or radial pulse for Jump START) and mental status only. Categories currently are:

*Immediate/Red*- designated for patients who are critically ill but potentially salvageable if given top priority for treatment and transport.

- When using the START triage system, this includes patients requiring airway maneuvers but who are still breathing spontaneously, respiratory rate greater than 30, altered mental status, or capillary refill greater than 2 seconds.
- When NOT using the START/Jump START system, this category would include patients with respiratory distress, shock, altered mental status, multi-system trauma, severe chest or abdominal pain or tenderness, suspected spinal cord injury, hypothermia, fractures with vascular compromise and significant burns.

*Delayed/Yellow*- designation for delayed care. This category includes patients with significant injury who will require further care and transport to the hospital but whose injuries are unlikely to result in immediate loss of life or limb.

- Using START triage, this would include any patient who does not meet the criteria for either the green, red or black categories.
- When not using the START/Jump START system, this category would include patients with isolated femur fractures or dislocations with normal circulation, mild chest pain or abdominal pain or tenderness with normal vital signs, possible neck or back injuries without neurological deficit, and a history of loss of consciousness but normal mental status.

*Minor/Green*- designation for ambulatory patients with minor complaints such as simple closed fractures and lacerations and abrasions with bleeding controlled, aka the "walking wounded".

*Deceased/Black*- designation for patients who are dead or determined to have no reasonable chance of survival despite airway intervention.

**Transport Leader**- Reports to the IC, responsible for the coordination, with dispatch, of patient transportation by ambulance or helicopter and maintenance of records pertaining to patient identification number (METTAG), injuries, mode of transport, and destination. Transport Leader may also need to fill the role of Extrication Leader if manpower is limited. The Transportation Leader will also be in contact with the Base Hospital to provide the Multi-Casualty Patient Report.

**Transportation Log**- Form kept by the Transportation Leader which helps keep accurate data on each patient's Triage Tag number, age, gender, chief complaint, priority, destination, ambulance and time of departure.

# Multi-Casualty Reporting Format

**Treatment Leader-** Reports to the IC, assumes responsibility for treatment of patients in each of the color-coded treatment areas. If more assistance is available, the Treatment Leader may *coordinate* patient treatment by overseeing personnel who are each assigned a specific color coded treatment area. The Treatment Leader also directs movement of patients to the loading location(s) for transport.

**Triage-** To sort.

- The separation of large numbers of patients into smaller groups for the purpose of organization and estimation of the severity of illness/injury.
- The prioritization of care based on either acuity or need to provide the most benefit for the greatest number of patients.

**Triage Tag (METTAG)-** Cards designed to be used with the START/Jump START system, but may be used with any triage system. One tag is placed on each patient. Each tag has a number by which patients may be identified and has removable color strips corresponding to the severity group.

**Victim-** Person who is involved in an event or incident who has no medical complaints.

## VI. PROCEDURE:

1. “Size Up.” The first rescuer on scene shall make a rapid assessment of scene safety, the number and acuity of patients, and a “reasonable overestimation” of the number of resources needed. This information shall be conveyed immediately to dispatch.

*Note: Triage tags and the MCI call-in format will be used whenever there are more than five patients.*

2. If overwhelmed, the rescuer shall either take a purely command role as Incident Commander (IC) or shall begin triage based on START/Jump START criteria, stopping only to make simple life saving interventions such as opening an airway or controlling bleeding. Bystanders and Minor/Green patients should be utilized to help when needed (e.g. hold pressure on a wound, comfort a child) or segregated to a specific area.
3. If not overwhelmed, the rescuer shall address each patient individually. Triage (including the assignment of color) shall be performed on the basis of a routine primary and secondary survey and consideration of specific injuries and vital signs. Treatment shall proceed according to standard treatment protocols.
4. Patients shall be separated into distinct treatment areas according to color designation when practical, based on number of patients/rescuers and geography.
5. As additional rescuers arrive on scene, a reassignment of the IC may be made based on rank, experience, and medical training.
6. The IC, using the incident command system, shall either assume responsibility for, or delegate someone to be responsible for, the following roles as needed depending on the size and complexity of the incident:

Operations Section Chief  
Triage Leader  
Extrication Leader  
Treatment Team Leader(s) (green, yellow, and red)  
Transportation Leader  
Dispatch Leader

Depending on the scope and duration of the MCI, these individuals may be present as well:

EMS Branch Director  
Staging Area Manager  
Communications Officer  
Public Relations Officer  
Morgue Coordinator  
Food Supplier  
Law Enforcement/Traffic Group Supervisor  
Fire Suppression Group Supervisor  
Liaison Officer (outside agencies)

Importantly, each individual must know who reports to them and to whom they report. If there is not enough manpower to cover each role, the IC may need to assign multiple roles to each available person.

# Multi-Casualty Reporting Format

7. Base contact should be made as soon as possible and prior to patients being transported. Early notification of base hospital allows them to initiate their MCI plan and will assist with patient distribution to the available hospitals in an effort to avoid relocating the disaster to one hospital.
8. The Treatment Leader or each treatment color group leader shall try to reassess each patient at least every fifteen minutes. Patients who are re-triaged and determined to be a higher priority or lower priority than their initial assessment, shall be re-tagged with a new Triage Tag, noting the time, and initials of the person making the assessment. That person is then responsible for making sure the patient is moved to the appropriate color treatment area.
9. Performing CPR should NOT be done unless adequate manpower allows for immediate treatment of all critical Immediate/Red AND Delayed/Yellow priority patients.
10. All Immediate/Red priority patients should be transported from the scene first, Delayed/Yellow priority next, and last Minor/Green priority patients. Each transport unit should contain two patients, except in unusual circumstances. Depending on the number of patients in each group, there may be an occasion for a Delayed/Yellow priority patient to accompany either an Immediate/Red priority, or a Minor/Green priority patient. Attempts should be made to keep family members together and dispatched to the same hospital. Some Minor/Green priority patients may be “Treated and Released” (TAR) or released “Against Medical Advice” (AMA). Minor/Green priority patients can be transported by van or bus to an appropriate medical facility.

## **VII. USING THE JUMP-START ALGORITHM:**

**Step 1** – All children who are able to walk are directed to the area designated for Minor/Green patients, where they will undergo secondary (more involved) triage. At a minimum, secondary triage should consist of the respirations, pulse and mental status components of the Jump START algorithm. Infants who are developmentally unable to walk should be screened at the initial site (or at the secondary triage site for Minor/Green patients if carried there by others), using the Jump START algorithm. If they satisfy all of the physiologic “delayed” criteria (i.e., fulfill no “Immediate/Red” criteria) and appear to have no significant external injury, infants may be triaged to the Minor/Green category.

**NOTE:** Children with special health care needs are often chronically unable to ambulate. These children can be triaged similarly to infants who are developmentally unable to walk. Respiratory and circulatory parameters remain unchanged, although those with chronic respiratory problems may routinely have elevated respiratory rates. Neurological status may be difficult to judge due to lack of knowledge of a given patient’s baseline function. A caregiver with knowledge of the children involved would be of invaluable assistance in this case, usually in the secondary triage stage. If a caregiver is unavailable, err on the side of caution and triage as if baseline function is normal for age.

**NOTE:** Be on the lookout for information about special needs children; there is a trend favoring brief medical data cards to be stored in the driver’s area of buses and other vehicles routinely transporting children with special health care needs.

**Step 2A** – Nonambulatory pediatric patients are initially assessed for presence/absence of spontaneous breathing. Any patient with spontaneous respirations is then assessed for respiratory rate (see **Step 3**). Any patient with absolute apnea or intermittent apnea (periods of more than 10 secs) must have their airway opened by conventional positional techniques, including (limited) BLS airway foreign body (FB) clearance *only* if there is an obvious FB. If the patient resumes spontaneous respirations, an Immediate/Red priority is given and the triage officer moves on.

**Step 2B** – If upper airway opening does not trigger spontaneous respirations, the rescuer palpates for a pulse (carotid, radial, brachial or pedal). If there is **no** pulse, the patient is tagged as Deceased/Black and the triage officer moves on.

# Multi-Casualty Reporting Format

**Step 2C** – If there is a palpable pulse, the rescuer gives 5 breaths (about 15 sec.) using mouth-to-mask/barrier technique. This is the pediatric “jumpstart.” One mask (with one-way valve) should be available on every potential first-in EMS unit. If necessary, an inverted adult mask may be used for a child. Ventilatory face shields such as those marketed for CPR classes and public use may also be used. Cross-contamination is a minimal issue, as this is already occurring because triage personnel do not change gloves between patients. Also, children are somewhat less likely to have dangerous transmissible diseases and the number of children satisfying the criteria for a ventilatory trial will be relatively small. If the ventilatory trial fails to trigger spontaneous respirations, the child is classified as Deceased/Black. If spontaneous respirations resume, the patient is tagged as Immediate/Red and the triage officer moves on without providing further ventilations. The child may or may not still be breathing on arrival of other non-triage personnel. Appropriate intervention can then be determined based upon the resources available at the designated treatment site.

**Step 3** – All patients at this point have spontaneous respirations. If the respiratory rate is roughly 15 – 45 breaths/min proceed to **Step 4** (assess perfusion).

If the respiratory rate is less than 15 (slower than one breath every 4 seconds) or faster than 45 or very irregular, the patient is classified as Immediate/Red and the triage officer moves on.

**Step 4** – All patients at this point have been judged to have “adequate” respirations. Assess perfusion by palpating pulses on an (apparently) uninjured limb. This has been substituted for capillary refill (CR) in the adult START Triage because of the variation in children’s CR with body and environmental temperature.

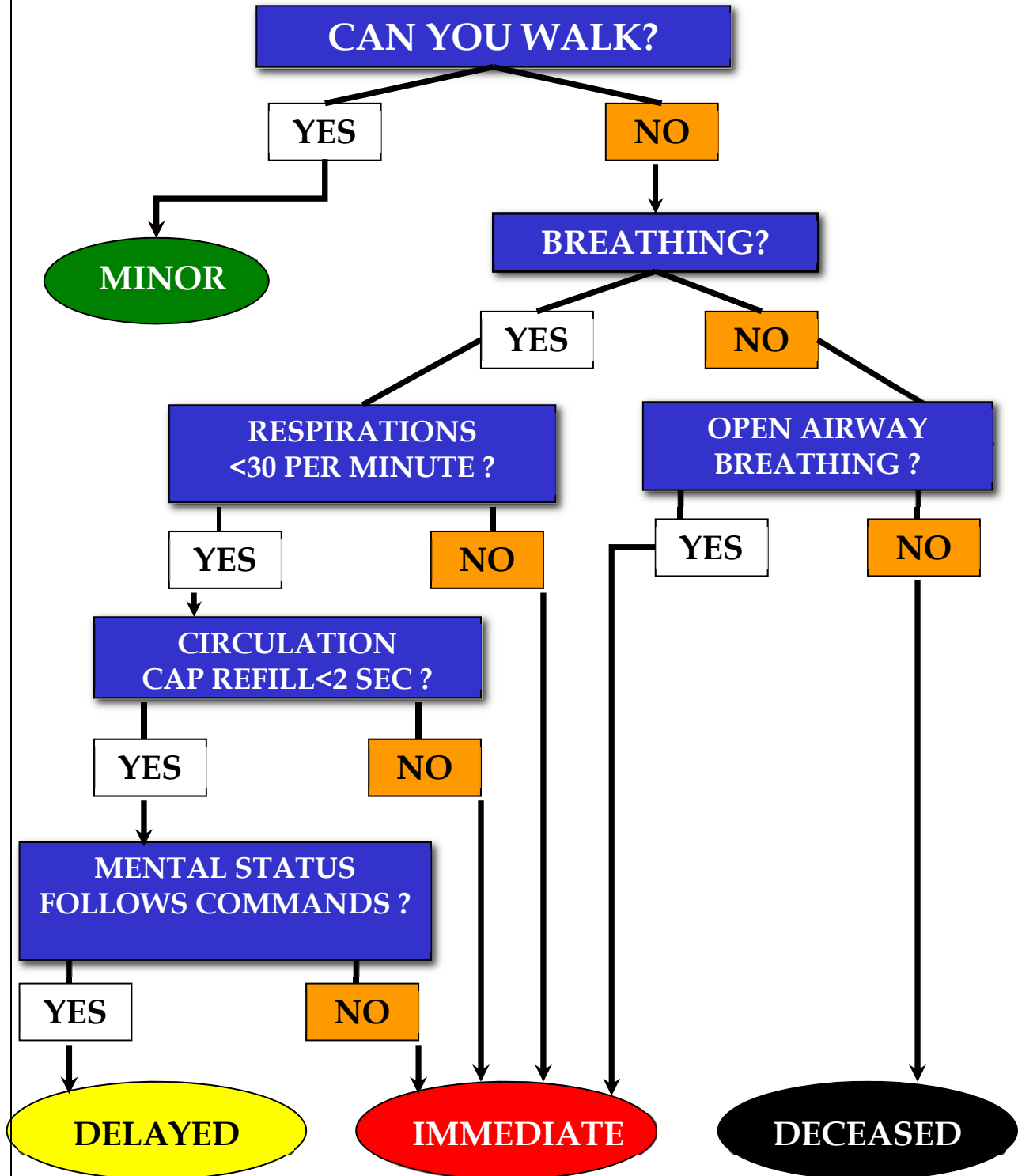
If there are palpable pulses, the rescuer assesses mental status (**Step 5**). If there are no pulses, the patient is categorized as an Immediate/Red patient and the triage officer moves on.

**Step 5** – All patients at this point have “adequate” ABC’s. The rescuer now performs a rapid “AVPU” assessment, keeping in mind the apparent developmental stage of the child. If the patient is *Alert*, reponds to *Voice*, or responds appropriately to *Pain* (localized stimulus and withdraws or pushes it away), the patient is triaged in the Delayed/Yellow category.

If the child does not repond to voice and responds inappropriately to pain (only makes a noise or moves in a nonlocalizing fashion), has decorticate or decerebrate posturing, or is truly *Unresponsive*, an Immediate/Red priority is given and the triage officer moves on.

# Multi-Casualty Reporting Format

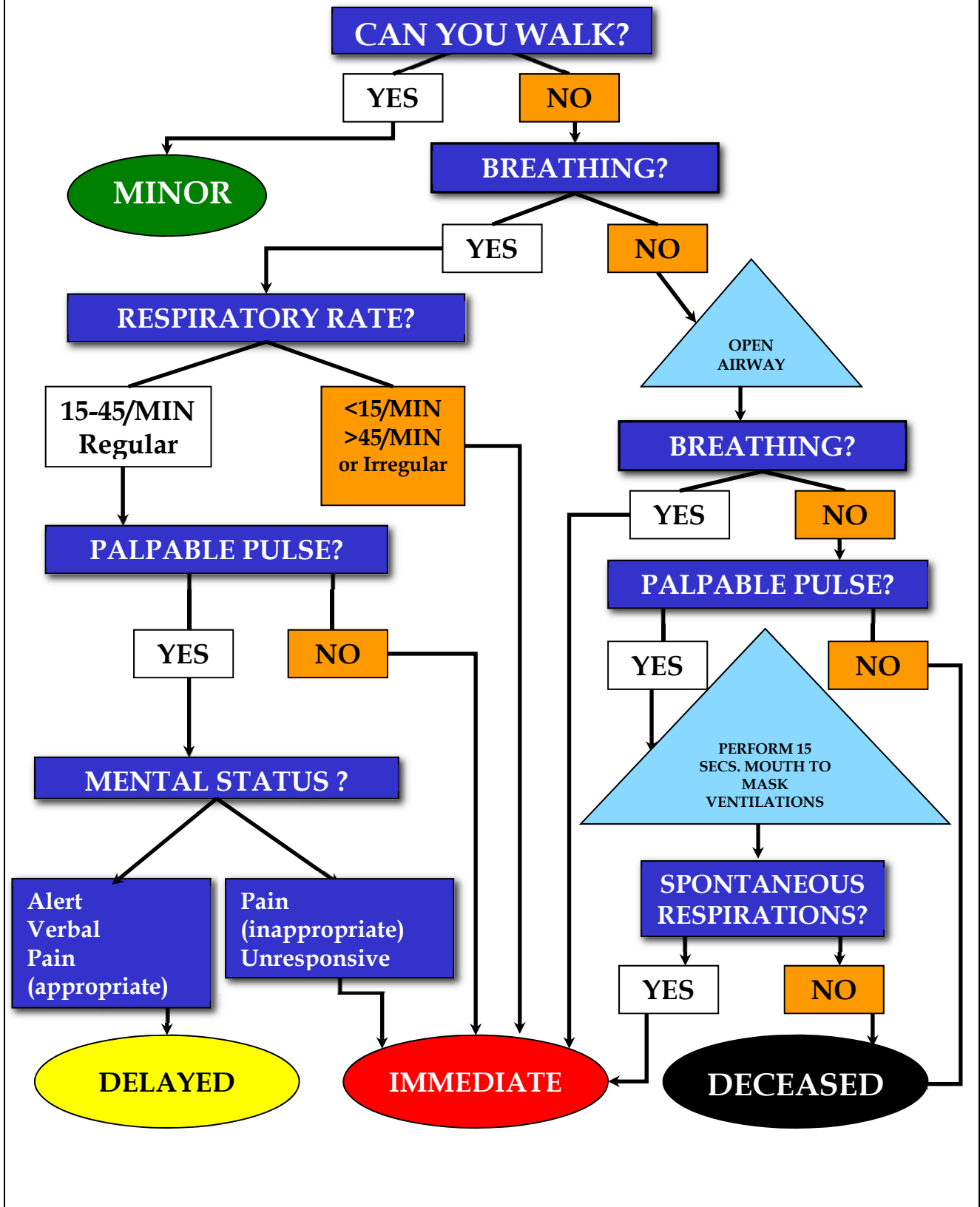
## Simple Triage And Rapid Treatment





# Multi-Casualty Reporting Format

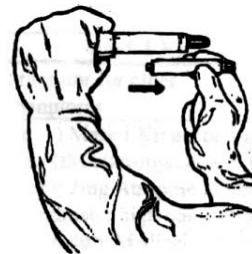
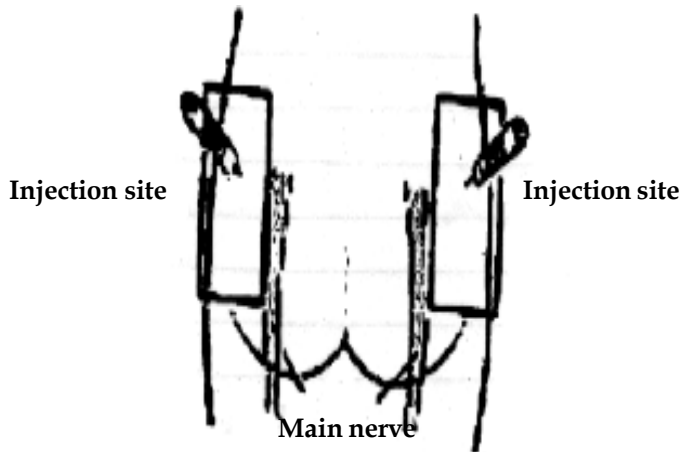
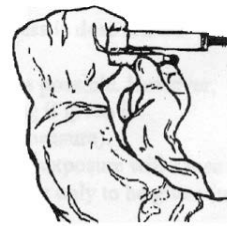
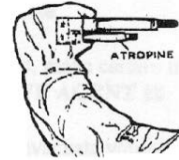
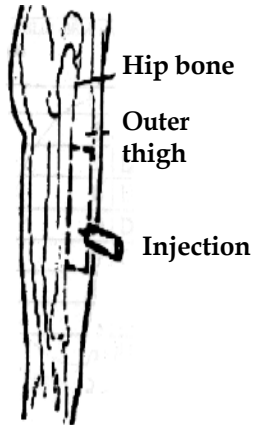
## Jump **START** (Pediatric)



# NAAK/MARK I

<b>Scope of Practice</b>	EMT, Parkmedic, and Paramedic
<b>Indications</b>	<p>Patient or provider who is exposed to <u>and</u> symptomatic from nerve agent or organophosphate with multiple symptoms of the toxidrome: AB-SLUDGEM (Altered mental status; Bronchorrhea, Breathing difficulty or Bradycardia; Salivation, Sweating or Seizures; Lacrimation; Urination; Defecation or Diarrhea; GI upset (abdominal cramps); Emesis; Miosis/Muscle twitching).</p> <p><i>Multiple patients with multiple symptoms makes the diagnosis more likely.</i></p>
<b>Contraindications</b>	<p>Use of NAAK/Mark I kit in patients who do not have nerve agent/organophosphate exposure.</p> <p>A single symptom of AB-SLUDGEM is most likely <i>not due</i> to a poisoning.</p> <p>As prophylaxis against suspected nerve agents/organophosphate exposure (The kit will <u>not</u> protect from an anticipated exposure).</p>
<b>Equipment</b>	<p>NAAK/Mark I kit:    Atropine 2mg (one dose/auto-injector).                           2 PAM (Pralidoxime Chloride), 600mg (one dose/auto-injector).</p>
<b>Complications</b>	<p>Atropine: tachycardia, headache, ALOC, agitation, hypertension, fever, blurred vision. 2 PAM: dizziness, weakness, tachycardia, headache, hypertension, nausea, blurred vision.</p>
<b>Procedure</b>	<p>Referencing attached diagram, remove NAAK/Mark I from its storage location. With the NON-DOMINANT HAND, hold the auto-injectors by the plastic clip so the large auto-injector is on top and the kit is positioned in front at eye level.</p> <p>With the other hand, check the injection site (buttocks or thigh) for buttons or other objects that might interfere with injections.</p> <p>Grasp the Atropine auto-injector (green-tipped, marked with “1”) with the thumb and first two fingers of the dominant hand then pull the auto-injector away from the plastic clip in a smooth motion.</p> <p>Hold the auto-injector like a pen or pencil (between the thumb and first two fingers). Position the green tip of the auto-injector against the injection site (thigh or buttocks). Holding injector in dominant hand, apply firm, even pressure (not a jabbing motion) to the injector until it pushes the needle into the thigh or buttocks. Hold the injector in place for at least ten (10) seconds (estimated by counting “one-one-thousand, two-one-thousand” and so forth). Carefully remove the auto-injector from the injection site and place into a sharps container.</p> <p>Pull the 2-PAM auto-injector out of the plastic clip and inject using the procedure described for Atropine.</p> <p>For moderate symptoms give two stacked doses of both components of Mark I kit. For severe symptoms give three stacked doses of both components of Mark I kit.</p> <p>Return to PROTOCOL: <i>Ingestion/Poisoning</i>. Do not administer charcoal in PROTOCOL: <i>Ingestion/Poisoning</i>.</p>
<b>Notes</b>	<p>Attempt base contact for all suspected nerve agent/organophosphate exposures.</p> <p>For persistent symptoms, certified providers should give Atropine (preferably IV, alternatively IM) 2mg every 5 minutes until no respiratory secretions per PROTOCOL: <i>Ingestion/Poisoning</i>.</p> <p>Attend to scene safety. Do not enter any area where nerve agent or massive quantity of organophosphate is suspected/present without proper personal protection.</p> <p>If you or your partner are exposed AND symptomatic, evacuate from the area.</p> <p>Remove all clothing from any symptomatic person.</p> <p>NAAK = Nerve Agent Antidote Kit</p>

# NAAK/MARK I



## Cross Reference

**Protocols:**  
Ingestion/Poisoning

**Drugs:**  
Atropine  
Pralidoxime Chloride (2 PAM)

# Nasogastric/Orogastric Tube Insertion

**Scope of Practice** Parkmedic and Paramedic (per Local Medical Advisor approved extended scope of practice)

**Indications** Administration of charcoal in ingestion/poisoning patients with base hospital approval. For stomach deflation, if king tube in use (Place through gastric port in the King tube).

**Contraindications**

1. GCS < 14
2. Severe facial trauma
3. Anterior neck surgery, tumors, injuries, etc.
4. Known caustic or hydrocarbon ingestion
5. Known esophageal pathology

**Note** Contraindications # 1 - 4 do not apply to patients who have a King tube in place and the OGT is being passed through the gastric port in the King tube. Those with known esophageal pathology # 5, should not have NGT or OGT passed, even through a King tube.

**Equipment** Nasogastric tube, lubricant, 30 ml syringe

**Complications** Misplacement into trachea  
Possible misplacement into cranial vault (brain) if facial trauma

**Procedure** Measure the length of tube to be inserted by placing the tip of the tube over the approximate area of the stomach and extending it to the patient's ear and from the ear to the tip of the nose. Note the marks on the tube used for measurement. Lubricate the tip and the first 2–3 inches of the tube with a water-soluble lubricant.

**Nasogastric Insertion:** Place the patient in a high Fowler's position and instruct the patient to lean forward and to flex his or her neck (chin to chest).  
Instruct the patient to swallow on command during the procedure. This assists passage of the tube.  
Insert the tube along the floor of an unobstructed nostril. The tube passes straight into the nostril perpendicular to the face. Do not pass the tube in an upward direction. If the patient has a deviated septum, choose the nostril with the most open channel.  
Gently and slowly advance the tube while having the patient continue to swallow until the tube is at a level previously noted by the marks.  
After the tube has been fully inserted to its predetermined length, verify placement in the stomach by injecting 20–30ml of air into the tube while auscultating the epigastric region for the sound of air movement (gurgling).  
Secure the tube with tape to the nose and forehead/cheek.  
Aspirate with syringe any stomach contents.  
Administer Activated Charcoal slowly, using a large syringe attached to the NG tube.

**Notes** Tube placement is uncomfortable for awake patients. Pass tube gently and stop if patient coughs, chokes, or cannot speak. Resume attempts once patient can speak and is not coughing or choking.

**Orogastric Insertion:** Only approved via Orogastric port on King Tube

## Cross Reference

**Protocols:**  
Ingestion/Poisoning  
Cardiac Arrest (Adult Medical)

**Drugs:**  
Activated Charcoal

**Procedure:**  
King Tube

# Needle Thoracostomy

<b>Scope of Practice</b>	Parkmedic, Paramedic (EMT /EMR per Local EMS Medical Advisor approved extended scope of practice with TEMS training).
<b>Indication</b>	<p>Traumatic cardiac arrest: perform bilateral needle thoracostomies.</p> <p>If not in traumatic arrest, you should suspect tension pneumothorax in the following situations:</p> <ul style="list-style-type: none"><li>*Penetrating Chest Trauma or<ul style="list-style-type: none"><li>Suspected pneumothorax from blunt trauma or</li><li>Suspected spontaneous pneumothorax from COPD/Asthma</li><li>Progressive difficulty in bagging</li><li>Distended neck veins (may be absent in severe hypovolemia)</li><li>Trachea deviated to one side when palpated in the sternal notch (late finding in tension pneumothorax)</li></ul></li><li>*NOTE: For EMT/EMR penetrating chest trauma is the only indication in which needle thoracostomy is an approved scope of practice.</li></ul> <p>If you suspect a tension pneumothorax and the patient has all of the signs and symptoms listed below, perform needle thoracostomy on the affected side: <u>(all of the following must be present)</u></p> <ul style="list-style-type: none"><li>Severe respiratory distress (&gt;8yrs–Adults: RR&lt;10 or &gt;24; 0-8yrs: RR&lt;10 or &gt;40).</li><li>Decreased or absent breath sounds on one side.</li><li>Hemodynamic compromise, (loss of radial pulse or SBP &lt; 80).</li></ul>
<b>Contraindications</b>	None, if above conditions are satisfied.
<b>Equipment</b>	10-14 gauge IV catheter $\geq$ 3.25 inches long (adult); consider one-way flutter device or valve constructed with finger of a glove. (pediatric - <8 yrs use appropriate weight based size and length).
<b>Procedure</b>	<p>Prep site with aseptic agent unless patient in traumatic arrest.</p> <p>If using glove fingertip for one-way valve, place on IV catheter prior to insertion.</p> <p>Preferred site: Insert the catheter immediately above the rib (fifth intercostal space), mid-axillary line, on the side of the decreased breath sounds and hyper resonance.</p> <p>Secondary site: Insert the catheter immediately above the third rib (second intercostal space), mid-clavicular line (<i>lateral to the nipple line</i>), on the side of the decreased breath sounds</p> <p>Once air returns, simultaneously remove the needle and advance catheter only to the hub. If catheter hub reaches chest wall without an air rush, remove needle and leave catheter in place. Needle thoracostomy may be attempted additional times, with manual displacement of chest wall tissue (may occur with obese or extremely muscular patients). Site of additional attempts should be within 1cm of original site.</p> <p>Stabilize the catheter perpendicular to the chest. Consider flutter valve constructed of glove finger.</p> <p>Reassess the patient, including distress, breath sounds and vital signs.</p>
<b>Notes</b>	Use caution when placing catheter thru either intercostal space to avoid nerve, vein, and artery on the underside of the rib. Keep catheter as close to the upper edge of the rib as possible.

## Cross Reference

### **Protocols:**

Trauma Arrest  
Trauma (Non-Penetrating) - Parkmedic scope only  
Trauma (Penetrating)

# Oxygen Administration

<b>Scope of Practice</b>	EMT and Parkmedic
<b>Indications</b>	<p>Abnormal respiratory rate:            Adult: RR &lt; 10 or RR &gt; 24.            Pediatric: Per PROTOCOL: <i>Pediatric Parameters</i>.</p> <p>Respiratory distress, cyanosis, inhalation injuries, or aerosol exposure.            Chest pain of possible cardiac or pulmonary cause.            An irregular heart rhythm (pulse) or <u>abnormal</u> heart rate.            Adults: HR &lt; 50 or HR &gt; 120.            Pediatric: Per PROTOCOL: <i>Pediatric Parameters</i>.</p> <p>Shock from any cause.            Significant multiple system trauma.            Acute altered mental status or any acute neurologic symptom (syncope, seizure, stroke, numbness, etc.).            Any other indication specifically covered in applicable PROTOCOL.</p>
<b>Contraindications</b>	None.
<b>Equipment</b>	Oxygen tank, nasal cannula, nonrebreather oxygen mask.
<b>Complications</b>	In COPD patients, may cause sleepiness (from carbon dioxide narcosis/retention) and respiratory depression. <b>However, do not withhold oxygen from patients in respiratory distress.</b> If a COPD patient develops respiratory depression after receiving oxygen, assist respiration with BVM.
<b>Dosage/Route</b>	<p>Mild distress or stable vitals: <u>Low Flow nasal cannula (2 – 6 L/min)</u>.            Severe distress, unstable vitals, or ALOC: <u>High Flow nonrebreather mask (10 – 15 L/min)</u>. Start with reservoir bag inflated.            Apnea or respiratory depression (too slow, too shallow): <b>assist respirations : BVM with supplemental oxygen (15 liters/min). Too shallow respirations may be difficult to detect. Pay close attention to Tidal volume (depth of respiration).</b>            COPD patients (by history/exam or on home oxygen):            Start oxygen at 2 liters/min by nasal cannula.            If patient is still cyanotic or markedly dyspneic, gradually increase oxygen until cyanosis clears. If still cyanotic or markedly dyspneic on 6 liters/min by nasal cannula, change to high flow. Prepare to assist with BVM.</p>
<b>Notes</b>	<p>In every PROTOCOL where oxygen is indicated, use dosage/route above to determine proper oxygen administration.            Exceptions will be noted in each individual PROTOCOL.            In every PROTOCOL, if pulse oximetry available, titrate oxygen to keep saturation &gt; 94%.            Exception: If a patient requires assistance by BVM, the target saturation is 100%.</p>

## Cross Reference

### **Protocols:**

Allergic Reactions	Childbirth	Pediatric – Major Trauma
Altered Mental Status/Altered Level of Consciousness (ALOC)	Electrical and Lightning Injuries	Pediatric – Newborn Resuscitation
Altitude Illness	Heat Illness	Respiratory Distress
Bites and Stings	Ingestion/Poisoning	Scuba/Dive Injury
Burns	Major Trauma – Adult	Seizures
Cardiac Arrest with/without AED	Near Drowning	Shock Without Trauma
Chest Pain – Cardiac	Pediatric – Medical Arrest with/without AED	Trauma Arrest (Adult and Pediatric)
		Vaginal Bleeding

# Pain Management

**Scope of Practice** EMT, Paramedic, and Paramedic

**Indications** This protocol addresses the use of non-opiate and opiate medication for pain management in the pre hospital setting. For mild pain (e.g. abrasions, bruises), use the non-opiate/non-sedating analgesics acetaminophen and ibuprofen. For more severe pain (e.g. chest pain, isolated extremity fractures), use opiate medication (Fentanyl, Morphine, Dilaudid) as long as SBP (systolic blood pressure) is >100. For trauma patients with SBP <100 with severe pain requiring extrication, or pain control in the setting of multisystem trauma, use Ketamine. EMT scope of practice is limited to acetaminophen and ibuprofen in Base Hospital/Communication failure and in specific protocols, e.g. Eye trauma, Frostbite and Minor or isolated trauma

**Dosing** See Table below for specific dosing;

- For patients with SBP >100, Fentanyl is the first choice medication.
- If a long acting medication is indicated, medics should pick either Dilaudid (preferred choice) or Morphine, but not both.
- Regardless of the route of administration, an individual patient may receive a maximum of 2 doses of Fentanyl and subsequently 2 doses of a long acting agent, following the appropriate time limitations.
- Base contact is advised for all patients requiring Ketamine or narcotic analgesics and required for any narcotic medication administration beyond 2 doses of Fentanyl and 2 doses of either long acting agent, i.e. maximum dosing prior to base contact is 2 doses of Fentanyl plus 2 doses of a long acting agent.
- Ketamine should be used in the following two circumstances:
  1. Multi-system trauma with a normal mental status and SBP <100 or
  2. Patients requiring prolonged extrication
- Any combination of Ketamine and narcotic medication or additional dosing beyond the limits in this protocol requires base contact.

<b>1. Non-opiate Analgesics (Mild Pain)</b>					
<b>Medication</b>	<b>Age</b>	<b>Route</b>	<b>Initial Dose</b>	<b>Frequency</b>	<b>Max Total Dose w/o base contact</b>
<b>Acetaminophen</b>	Pediatric (0-10 yrs)	PO	15mg/kg	Every 6 hrs	60 mg/kg
	Adult (>10 yrs)	PO	1000mg	Every 6 hrs	4,000 mg
<b>Ibuprofen</b>	Pediatric (0-10 yrs)	PO	10mg/kg	Every 6 hrs	40 mg/kg
	Adult (>10 yrs)	PO	600mg	Every 6 hrs	2,400 mg

# Pain Management

<b>2. Opiate Analgesics (Moderate to Severe Pain), Normal mental status, SBP &gt;100</b>					
<b>Medication</b>	<b>Age</b>	<b>Route</b>	<b>Initial Dose</b>	<b>Frequency</b>	<b>Max Total Dose w/o base contact</b>
<b>Fentanyl (Short Acting)</b>	Pediatric (0-10 yrs)	IV/IN/IO	1 mcg/kg (50 mcg max single dose)	repeat prn in 15min x 1	100 mcg*
		IM	2 mcg/kg (100 mcg max single dose)	repeat prn in 15min x 1	200 mcg*
	Adult (>10 yrs)	IV/IN/IO	50 mcg	repeat prn in 15min x 1	100 mcg
		IM	100 mcg	repeat prn in 15min x 1	200 mcg
<b>Dilaudid (Long Acting)</b>	Pediatric (0-10 yrs)	IV/IO	0.015 mg/kg	repeat prn in 15min x 1	1 mg*
		IM	0.015 mg/kg	repeat prn in 15min x 1	1 mg*
	Adult (>10 yrs)	IV/IO	1 mg	repeat prn in 15min x 1	2 mg
		IM	1 mg	repeat prn in 15min x 1	2 mg
<b>Morphine (Long Acting)</b>	Pediatric (0-10 yrs)	IV/IO	0.1 mg/kg (5 mg max single dose)	repeat prn in 15min x 1	10 mg*
		IM	0.1 mg/kg (5 mg max single dose)	repeat prn in 15min x 1	10 mg*
	Adult (>10 yrs)	IV/IO	10 mg	repeat prn in 15min x 1	20 mg
		IM	10 mg	repeat prn in 15min x 1	20 mg

*Recheck vitals and mental status before and after each dose. Administer ONLY if SBP > 100 and normal mental status.*

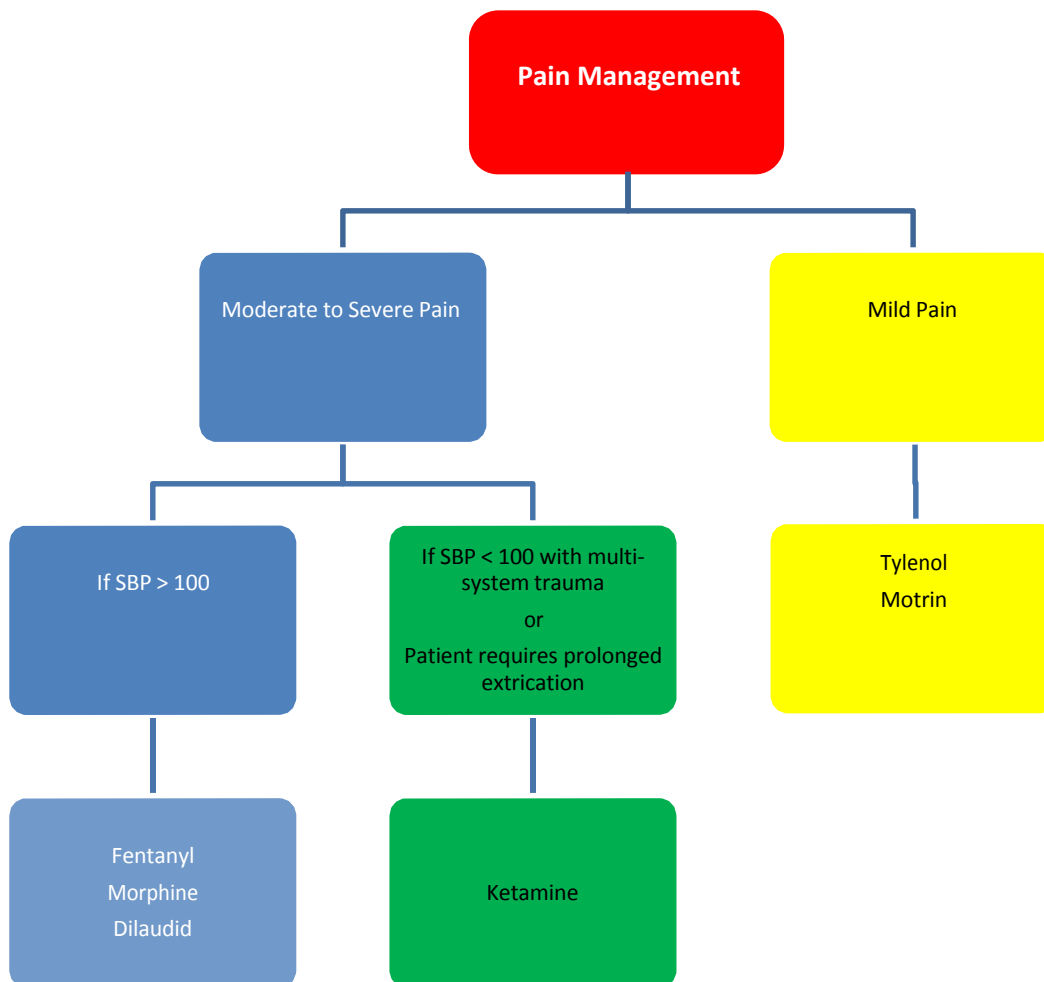
*\*Pediatric dosing of opiate pain medication is weight based and single dose should not be larger than the max single dose. Max total dose is maximum allowable per patient without base hospital contact.*

<b>3. Non-opiate, Sedating Analgesic (Moderate to Severe Pain), Multisystem trauma with SBP &lt; 100, or patients requiring prolonged extrication</b>					
<b>Medication</b>	<b>Age</b>	<b>Route</b>	<b>Initial Dose</b>	<b>Frequency</b>	<b>Max Total Dose w/o base contact</b>
<b>Ketamine (Short Acting)</b>	Pediatric (0-10 yrs)	IV/IN/IO	0.5 mg/kg	repeat prn in 15min x 1	1 mg/kg**
		IM	1 mg/kg	repeat prn in 15min x 1	2 mg/kg**
	Adult (>10 yrs)	IV/IN/IO	0.5 mg/kg	repeat prn in 15min x 1	1 mg/kg**
		IM	1 mg/kg	repeat prn in 15min x 1	2 mg/kg**

*\*\*Doses above max total dose listed for ketamine requires base hospital contact*



# Pain Management



## Cross Reference

### **Protocols:**

Abdominal Pain  
Bites and Stings  
Burns  
Chest Pain – Cardiac  
Childbirth  
Electrical and Lightning Injuries  
Eye Trauma  
Frostbite  
Major Trauma – Adult  
Minor or Isolated Extremity Trauma  
Pediatric – Major Trauma  
Scuba/Dive Injury  
Vaginal Bleeding

### **Procedures:**

Mucosal Atomizer Device

### **Drugs:**

Acetaminophen  
Ibuprofen Fentanyl  
Morphine Dilaudid  
Ketamine

# Pelvic Stabilization

<b>Scope of Practice</b>	EMT, Paramedic, and Paramedic
<b>Indications</b>	Splinting of suspected open book pelvic fracture in a patient with or without shock
<b>Contraindications</b>	None with suspected open book fracture Caution if vertical shear fracture or dislocation suspected
<b>Equipment</b>	A commercially available pelvic binder such as T-POD (Traumatic Pelvic Orthotic Device) or sheet
<b>Procedure(s)</b>	Maintain spinal precautions if indicated. Establish IV/IO access, continue IV fluids per <i>PROCEDURE: IV Access and IV Fluid Administration</i> .

**T-POD:** Log roll patient onto open T-POD, wrapping the fabric belt around the supine patient. Fit T-POD around the pelvis (ideally top edge of T-POD is even with the iliac crest, bottom edge should be just below the greater trochanters [hip bone]) Belt should cover the buttocks. Cut or fold excess belt in front leaving a 6-8 inch gap of exposed abdomen.  
Apply pulley system/power unit to each side of the belt and slowly draw tension until snug, providing simultaneous circumferential compression of the pelvic region.  
**NOTE:** in male patients make certain genitalia are elevated out of groin area.  
Care provider should be able to insert two fingers between the patient and T-POD.  
Document \_\_\_\_\_ time device was applied.

**Notes** If an obese patient requires a T-POD, two belts may be affixed together using one power unit as an extender and the other as the pulley.  
  
If T-POD remains on the patient longer than 24 hours, skin integrity should be checked and evaluated every 12 hours.  
Children < 50lbs (23 Kg) may be too small to obtain the 6 inch gap needed for closure.

**Sheet:** Log roll patient onto prepared sheet.  
Prepare sheet: fold into long narrow rectangle wrapping the sheet around the supine patient.  
Fit sheet around the pelvis (ideally top edge of the sheet is even with the iliac crest, bottom edge should be just below the greater trochanters [hip bone]) Sheet should cover the buttocks.  
Cross tails of sheet over anterior pelvis and apply slow, steady force to the tails of the sheet by pulling them away from each other while centered over the patient's pelvis. This should provide simultaneous circumferential compression of the pelvic region. Tie sheet tails in square knot snugly.  
**NOTE:** in male patients make certain genitalia are elevated out of groin area.  
Document time and date sheet was applied.

**Notes** If sheet remains on the patient longer than 24 hours, skin integrity should be checked and evaluated every 12 hours.

### Cross Reference

**Procedures:**  
IV Access and IV Fluid Administration  
Intraosseous Access

**Protocols:**  
Major Trauma – Adult  
Pediatric – Major Trauma

# Rectal Drug Administration (Acetaminophen)

<b>Scope of Practice</b>	Parkmedic and Paramedic
<b>Indications</b>	Pediatric fever: not tolerating oral Pediatric febrile seizures
<b>Equipment</b>	Syringe, 14G IV catheter with needle removed, lubricant, liquid form of medication
<b>Procedure</b>	Assemble equipment as above Explain procedure to patient and guardian Lubricate catheter Place patient in knee–chest or lateral position with knees and hips flexed. Restrain as needed if altered mental status/uncooperative. Introduce lubricated catheter (needle removed) into rectum until syringe is against external rectal surface. Inject medication into rectum Hold buttocks together with manual pressure for one minute. Remove and dispose of syringe and catheter.

## Cross Reference

### **Protocols:**

Pediatric – Medical Illness/Fever  
Seizures

### **Drugs:**

Acetaminophen (Tylenol)

# Spine Immobilization

## Scope of Practice

EMT, Paramedic, and Paramedic

## Indications

Any patient with a history of trauma, or found in the setting of potential trauma (including near-drowning) who meets any of the following criteria:

**Unstable Patient:** per appropriate Protocol.

**Pain:** complaining of midline neck or back pain (without language barrier).

**Tenderness:** midline neck or back tenderness.

**Altered Mental Status:**

inability to follow simple commands or inconsistency in following simple commands.

**Distracting Injury:** any injuries which appear to be distracting patient from identifying midline neck or back pain (e.g. major fractures).

**Neurologic Deficit:** any numbness, tingling or weakness not obviously explained by a co-existing extremity fracture. Eg. paresthesia, numbness, weakness, paralysis, asymmetric movements or gait, pain inhibiting neck movement. New or worsened signs or symptoms in a patient with a pre-existing deficit(s).

**NOTE:** Restricted or Painful Range of Motion: if a patient meets none of the previous criteria, then ask them to rotate their head slowly from side to side and to flex and extend their neck. If they are unable/unwilling to do so or describe pain or numbness/tingling in their arms or legs they should be immobilized.

**NOTE:** Although this procedure is primarily aimed at trauma patients who may need spinal immobilization, on rare occasions non traumatic neck or back pain with neurologic deficits (eg. pathologic fracture) may also need immobilization. See box\* below for treatment procedures for those patients with Non-Traumatic midline neck/or back pain and/or tenderness.

## Equipment

Vacuum splint, Backboard and straps, KED, rigid cervical collar, tape, head supports

## Procedure

### Ambulatory Patients:

Ambulatory patients without neurological signs or symptoms, without complaints of midline neck/back pain, and without midline neck/back tenderness to palpation should be transported in position of comfort.

Ambulatory patients with complaints of midline neck/back pain, or midline neck/back tenderness, without neurological signs or symptoms, should be transported on a gurney in position of comfort. Their neck/back can be supported as needed.

Ambulatory patients with neurological signs or symptoms after trauma, or suspected trauma, need full spinal precautions.

### Non-Ambulatory Patients:

Non-ambulatory patients without neurological signs or symptoms, without complaints of midline neck/back pain, and without midline neck/back tenderness to palpation should be transported in position of comfort.

Non-ambulatory patients with complaints of midline neck/back pain, or midline neck/back tenderness, without neurological signs or symptoms, should be transported on a gurney in a supine position. Their neck/back must be supported until placed on the gurney (e.g. manually hold C-spine, place in KED). Once on the gurney, their neck/back can be supported as needed.

Non-ambulatory patients with neurological signs or symptoms including altered mental status, after trauma, or suspected trauma, need full spinal precautions.

# Spine Immobilization

## Severe Multisystem Trauma:

Patients with severe multisystem trauma should be transported using vacuum splint, break-away flat, KED or backboard to simultaneously protect the patient and expedite transfers in severely injured patients.

The following is a chart summary regarding when spinal immobilization should be considered.

<b>Spinal Immobilization Chart - Trauma</b>				
	No midline neck pain/tenderness	Midline neck pain/tenderness	Neurological signs/symptoms	Altered mental status
Ambulatory	Position of Comfort	Gurney - Position of Comfort with/without support	Full	Position of Comfort
Non-Ambulatory	Position of Comfort	Gurney - Supine with extrication support	Full	Full
Severe Multisystem Trauma	Full	Full	Full	Full

<b>Spinal Immobilization Chart - Non-Traumatic *</b>		
	Cervical Spine Pain/Tenderness	Thoraco/Lumbar Spine Pain/Tenderness
With New Neurologic Deficits	Full	Thoraco/Lumbar Immobilization
Without New Neurologic Deficits	Position of Comfort	Position of Comfort

# Spine Immobilization

## Notes

- When Full spinal immobilization is implemented, a vacuum mattress is the ideal device.  
If a rigid backboard is necessary, special padding such as a back raft or other padding should be used – especially in prolonged transports > 30 min.
- If a patient does not meet requirements to be transported in full spinal precautions, this does **NOT** mean they are “**cleared**” from having a spinal injury. Significant injuries may be present and further evaluation is needed.
- An ALS provider (AEMT, Parkmedic, Paramedic) should consider removing spinal immobilization on any patient who does not meet the above criteria and who has been placed in spinal immobilization prior to the ALS arrival (e.g. by first responders).
- Although C-Collars are commonly used in EMS they do not constitute cervical immobilization and should be considered an adjunctive measure only and not absolutely necessary.
- Children injured in motor vehicle collisions shall be immobilized and transported in their car seats whenever possible. Appropriate padding can be used to achieve immobilization in the car seat. Small children immobilized on a rigid board will often require padding behind their torso to maintain neutral position because of their relatively large head.
- Booster seats, designed for children 40-80 pounds, are NOT adequate for spinal immobilization.
- When placing a patient in full spine precautions, splint head-to-pelvis with no lateral movement of pelvis/legs; limited bending at the hips is permissible for comfort.
- When placing a patient in T-spine precautions, splint head-to-pelvis and immobilize legs at the hips; padding the pelvis for comfort is permissible.
- When placing a patient in L-spine/pelvis precautions, also splint the T-spine, pelvis, and hips; the neck and head may be free for patient comfort.
- When any doubt or communication barrier exists, err on the side of immobilization. This is especially true in the elderly, mentally disabled, and patients with whom you have a language barrier

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Electrical and Lightning Injuries  
Major Trauma – Adult  
Near Drowning  
Pediatric – Major Trauma  
Scuba/Dive Injury  
Seizures

# Transtracheal Jet Insufflation

<b>Scope of Practice</b>	Parkmedic and Paramedic
<b>Indications</b>	Complete airway obstruction not relieved by manual procedures. Inability to insert ALS airway and inability to successfully ventilate using BVM ventilation.
<b>Equipment</b>	10ga IV catheter, 5 ml syringe, 3.0mm ET tube adapter, bag valve * see note below
<b>Complications</b>	Bleeding; misplacement causing damage to the lungs, vocal cords, and/or esophagus.
<b>Procedure</b>	<p>Locate cricothyroid membrane; it is the indentation below the thyroid cartilage (Adam's apple), between thyroid cartilage and 1<sup>st</sup> tracheal ring.</p> <p>Insert 10 gauge IV catheter through the membrane at a 45° angle, directed toward the feet. Aspirate for air return as catheter is inserted. The trachea is usually ½" - ¾" deep to skin surface. Once air return is obtained, remove needle while advancing catheter. Hold hub of catheter manually to stabilize.</p> <p>Attach 3.0mm ET tube adapter to catheter.</p> <p>Ventilate using BagValve with oxygen at 15 L/min per PROCEDURE: <i>Oxygen Administration</i>. If available, use oxygen powered breathing device.</p> <p>Check for proper placement in the following order:</p> <ul style="list-style-type: none"><li>Assess chest rise</li><li>Verify absence of gastric sounds</li><li>Check that breath sounds are present</li><li>Assess for complications; reassess ventilation rate and volume and tube placement if subcutaneous air is noted.</li></ul> <p>Reassess placement every time patient is moved. Sometimes proper placement is difficult to assess. Do not just rely on the indicators listed above. Continual clinical reassessment for adequate ventilation is essential.</p>
<b>Notes</b>	<p>Different manufacturers may have slight variations in their angiocath and ET tube adaptors. The BD 10g Angiocath &amp; Kimberly Clark 3.0 ET tube adaptor fit well together. However, any manufacturer's equipment may be used as long as they fit well and form an air-tight seal. This set of equipment should be checked and prepackaged prior to patient care.</p> <p>TTJI is a temporizing measure and will not adequately ventilate a patient if used for more than 20–30 minutes. If using pulse oximetry and capnography, expect low saturation levels and high CO<sub>2</sub>.</p> <p>Watch for chest hyperinflation, ceasing ventilation may be necessary to allow for exhalation.</p> <p>Continue attempts to obtain an advanced airway and remove any obstruction.</p> <p>Due to the small caliber of this rescue airway, a prolonged expiration phase is often encountered. Allow adequate time for exhalation.</p>

## Cross Reference

### **Procedures:**

Oxygen Administration

### **Protocols:**

Allergic Reactions

Altered Mental Status/Altered Level of Consciousness (ALOC)

Bites and Stings

Burns

Cardiac Arrest With AED (Adult Medical)

Cardiac Arrest Without AED (Adult Medical)

Electrical and Lightning Injuries

Major Trauma – Adult

Near Drowning

Pediatric – Medical Arrest With AED

Pediatric – Medical Arrest Without AED

Pediatric – Major Trauma

Respiratory Distress

Shock Without Trauma

Trauma Arrest (Adult and Pediatric)



# When To Initiate a Patient Care Report/Run Sheet (PCR)

**Scope** EMT, Parkmedic, and Paramedic

**Indications** A PCR will be completed for:  
Anyone requesting medical assessment about a present medical condition.  
Anyone who, in your judgment, requires medical attention even if medical attention is not requested (i.e. altered mental status, psychiatric condition).  
Anyone administered medication or treatment of any kind.  
An exception to this rule is Acetaminophen (Tylenol) or Ibuprofen (Motrin, Advil) dispensation for self-administration.

## Cross Reference

**Drugs:**

Acetaminophen (Tylenol)

Ibuprofen (Motrin, Advil)

# Wound Care

## Scope of Practice

EMT, Paramedic, and Paramedic

## Indications

Any significant break in the skin (e.g. open blister, abrasion, burn, puncture, laceration, open fracture, avulsion, amputation)

## Procedure

### Control bleeding in order to further assess wound:

1. Utilize direct pressure. Well-aimed direct pressure to the source of most bleeding with a gloved hand and dressing will stop most bleeding. If bleeding continues, temporarily remove dressing to ensure that direct pressure is being appropriately applied to the source of bleeding. Pack wound if needed for additional bleeding control. Bandage wound to keep dressing in place.
2. If bleeding continues, attempt the use of a pressure dressing to control bleeding.
3. If necessary a tourniquet may be required for severe or difficult to control bleeding. See below for proper use and placement of a tourniquet.
4. Once bleeding control has been achieved continue with wound care as listed below.
5. Frequently reassess to ensure bleeding hasn't returned.
6. Reassess bandages that may have become constricting and compromising distal CSM.

### Wound Care (Keep wound as clean as possible):

Gently remove any foreign material (except impaled objects), but do not delay transport if patient is unstable. Remove any constricting items (rings, watches, etc.)

### Irrigation:

For any open wounds - Irrigate with approximately 100ml per centimeter of wound-length using NS/LR, sterile water, or potable water as available. Pressure irrigation using 18 gauge IV catheter and syringe is preferred. If bleeding is or was heavy, do not disturb clots to irrigate.

Burns < 15% TBSA can be gently rinsed. Do not use high pressure lavage.

**Note:** Do not use iodine, hydrogen peroxide, alcohol, or other antiseptics for irrigation.

**Note:** Wounds that should not be irrigated include:

Actively bleeding wounds

History of arterial bleeding (see special considerations – tourniquets)

Punctures below skin surface (inside the cavity)

Burns > 15% TBSA

### Antibiotic Ointment:

Apply per DRUG: *Bacitracin* apply to abrasions and burns < 15% TBSA and if transport time > 1 hour.

DO NOT apply to large burns, deep wounds, puncture wounds or impaled objects.

## Specific wounds/situations

### Amputations:

Gently rinse the amputated part; wrap in moist, clean cloth or gauze; place into a dry, water tight plastic bag. DO NOT IMMERSE PART DIRECTLY IN WATER OR ICE. Place bag in ice water or a cool water bath and transport with patient. Do not delay transport looking for amputated tissue. Consider helicopter transport as replantation success is highly time-dependent.

### Impaled objects:

Stabilize in place unless they interfere with transport or ventilation. If shortening or removal is required for either reason, base contact/communication failure orders apply.

# Wound Care

## **Large, deep or gaping wounds:**

Should be splinted if near joints; per PROTOCOL: *Fracture/Dislocation Management*.

## **Severe wounds with expected time from injury to definitive care > 2 hours (deep, crushed, exposed tendon, heavy contamination, or open fracture):**

Administer Cefazolin (Ancef) per DRUG: *Cefazolin (Ancef)*. Do not give Cefazolin in the following circumstances:

Burns

Shallow wounds (i.e. not through all layers of the skin)

Wounds where the expected transport to definitive care is < 1 hour

Reassess distal circulation, sensory and motor function every 30 minutes during transport.

Base contact is advised for any questions/unusual circumstances

## **Sucking chest wounds:**

Place an occlusive dressing on the wound. Vent dressing or needle the chest if the signs/symptoms of a Tension Pneumothorax occur. REFERENCE PROCEDURE: *Needle Thoracostomy*.

## **Eye Injury:**

REFERENCE PROTOCOL: *Eye Trauma*. Do not apply Bacitracin to eye.

## **Tourniquets**

Tourniquets should be used if:

1. There is life threatening or uncontrollable bleeding to any extremity.
2. An MCI, Tactical, or Technical situation occurs where extremity bleeding is occurring and there are limited resources or ability to apply direct pressure for initial bleeding control.

## **Combat Application Tourniquet (CAT)**

### **Procedures**

1. Wrap band around the extremity and pass the free (running) end through the inside slit of the buckle – or – insert the wounded extremity through the loop of the self-adhering band
2. Pass band through the outside slit of the buckle  
(This utilizes the Friction Adaptor Buckle, which will lock the band in place)
3. Pull the band tight and securely fasten the band back on itself
4. Twist the windlass rod until bleeding has stopped and no distal pulse
5. Lock the rod with the clip
6. Secure the rod with the strap
7. Document time of application

### **Guidelines:**

The tourniquet should be: at least 1-1.5 inches wide, applied directly to exposed skin, unless unsafe, then place over clothing, as close to the wound as possible, not over a joint. If available, a blood pressure cuff may be used and inflated 20 mmHg above systolic blood pressure, with frequent rechecking to ensure cuff has not lost pressure. An appropriately applied tourniquet should occlude both venous and arterial blood flow and is often painful. **If a distal pulse is present, the tourniquet is not tight enough.**

**Note:** Once placed, tourniquets should be left in place and rapid transport should be initiated/arranged. Base contact should be made early if tourniquet applied (see special considerations for prolonged care/tourniquet removal).

# Wound Care



## SPECIAL CONSIDERATIONS

### **Tourniquets**

Do not attempt removal/deflation of a tourniquet if the patient is in shock.

Tourniquet should not be removed by EMS, **UNLESS:**

1. Tourniquet was placed initially in MCI, technical or tactical environments where a limited assessment was performed. Once the scene is stabilized and assessment/treatment can continue, the tourniquet may be loosened and bleeding assessed and managed as above.

2. Prolonged care (more than 2 hours) is encountered. Base contact should be attempted to discuss tourniquet removal, if Base unavailable and vital signs are stable (SBP > 90), slowly deflate/release tourniquet to assess bleeding/circulation with the goal of completely loosening the tourniquet. Do not remove tourniquet from limb, only loosen, in case reapplication is needed. When deflating/releasing a tourniquet, if life-threatening bleeding returns, immediately reapply tourniquet. If mild bleeding returns, attempt to use direct pressure and pressure dressing as described above.

Careful monitoring is necessary to ensure bleeding does not return, and swelling of limb doesn't cause compromised blood flow.

As tourniquet is being released, if no bleeding is noted, care should be taken to not create a venous tourniquet (occluding venous flow from the extremity while allowing arterial flow to resume). This may cause pressure to build up in the extremity and cause compartment syndrome or bleeding to resume.

i.e. If you can feel a distal pulse and venous return is occluded you have created a venous tourniquet.

Tourniquets left in place for more than 12 hours should be left in place until definitive care is reached.

After placing a tourniquet that successfully controls bleeding, wound irrigation can be considered, within the irrigation parameters above, if transport is prolonged.

## Cross Reference

### **Protocols:**

Bites and Stings  
Burns  
Electrical and Lightning Injuries  
Eye Trauma

### **Protocols:**

Fracture/Dislocation Management  
Major Trauma – Adult  
Minor or Isolated Extremity Trauma  
Pediatric – Major Trauma

### **Drugs:**

Bacitracin  
Cefazolin (Ancef)

# Abdominal Pain

## EMT Standing Orders

1. ABCs If signs/symptoms of shock, GO TO PROTOCOL: *Shock without Trauma*.
2. Assessment Vitals, PQRST, fever, N/V/D, pregnancy, tenderness.
3. Oxygen Per PROCEDURE: *Oxygen Administration*.
4. Transport/  
ALS Backup Consider air transport for abnormal vitals, active bleeding, syncope, ALOC, or absent distal pulses.
5. Base Contact

## Parkmedic Standing Orders

1. ABCs If signs/symptoms of shock, GO TO PROTOCOL: Shock without Trauma.
2. Assessment Vitals, PQRST, fever, N/V/D, pregnancy, tenderness.
3. Oxygen Per PROCEDURE: Oxygen Administration.
4. Transport/  
ALS Backup Consider air transport for abnormal vitals, active bleeding, syncope, ALOC, or absent distal pulses.
5. IV/IO Fluids per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous (IO) Access*.
6. Ondansetron  
Administration  
  
Adult: IV/IO: 4mg over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: 4mg, repeat in 15 min x2 prn nausea.  
IM: If no IV/IO, give 8mg IM, repeat in 15 min x1 prn nausea.  
  
3mos – 14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
  
0-3 mos: IV: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.
7. Pain  
Management Per PROCEDURE: *Pain Management*
8. Base Contact

# Abdominal Pain

## SPECIAL CONSIDERATIONS

<b>AED</b>	<b>Bring AED to patient's side if available.</b>
<b>Assessment</b>	<p>Female: Possibility of pregnancy, last menstrual period, vaginal bleeding, history of ectopic pregnancy.</p> <p>Male or Female: PQRST, trauma, previous abdominal surgery, previous episodes of similar pain, syncopal episode, vomiting (color, amount, frequency), pain or blood with urination, diarrhea, fever, palpable pulsatile abdominal mass with age &gt; 40 years.</p> <p>Abdominal pain is consistent with a broad range of potential diagnoses, some with serious outcomes--see differential diagnoses below. Careful consideration of this list of possibilities, thorough reporting to medical control, and documentation of all findings is key to good care.</p>
<b>Treatment</b>	Response to narcotic analgesics (Fentanyl/morphine) is both situation and patient specific. If prolonged patient contact is anticipated, dose adjustment within the protocol parameters may be warranted. If additional medication is indicated, contact base.
<b>Differential</b>	<p>Ectopic pregnancy, abdominal aortic aneurysm, gallstones, kidney stone, appendicitis, pneumonia, diabetic ketoacidosis.</p> <p>Remember, a heart attack or pneumonia can present as upper abdominal pain.</p>
<b>AMA/TAR</b>	<p>No TAR without base contact.</p> <p>Parks without base hospitals should follow local medical advisor approved EMS policy.</p>
<b>Documentation</b>	Relevant assessment features, reassessment, response to therapy.

## Cross References

### **Procedures:**

Intraosseous (IO) Access  
IV Access and IV Fluid  
Administration  
Oxygen Administration

### **Protocols:**

Shock Without Trauma

### **Drugs:**

Fentanyl  
Hydromorphone (Dilaudid)  
Morphine Sulfate  
Ondansetron

# Allergic Reactions

## EMT Standing Orders

1. ABCs
2. Assessment Airway edema, vital signs, mental status, wheezes/stridor, rash, history
3. Classify **Mild** reaction: local swelling and/or hives. **Skip to Step 8 (Base Contact).**  
**Severe** reaction (ANY of the following): hypotension, wheezing, respiratory distress, oral swelling, ALOC, chest tightness. **Follow Steps 4 to 8.**
4. Epinephrine Per Local Medical Advisor approved extended scope of practice, PROCEDURE:  
*Epinephrine Auto-injector* or *Epinephrine Ampule*.  
All ages: 0.3ml (0.3mg) of 1:1,000 concentration IM.
5. Oxygen High flow per PROCEDURE: *Oxygen Administration*.
6. Remove Allergen If possible (e.g., bee stinger) per PROTOCOL: *Bites and Stings*.
7. Transport/  
ALS Backup If transport immediately available perform all other therapies en route. Consider rendezvous with higher level of care and air transport.
8. Base Contact For further orders, AMA or TAR.

### EMT Base Hospital/Communication Failure Orders:

#### **Severe reactions only:**

1. Epinephrine Repeat dose every 10 minutes until severe symptoms resolve.  
Increase frequency to every 5 minutes if symptoms worsening.

# Allergic Reactions

## Parkmedic Standing Orders

1. ABCs Basic or ALS Airway if indicated, (*King Tube/ETT*).
2. Assessment Airway edema, vital signs, mental status, wheezes/stridor, rash, history.
3. Classify **Mild** reaction: local swelling and/or hives. **Skip to Step 11 (Base Contact).**  
**Severe** reaction (ANY of the following): hypotension, wheezing, respiratory distress, oral swelling, ALOC, chest tightness. **Follow Steps 4 to 11.**
4. Epinephrine > 10 yrs: 0.3ml (0.3mg) of 1:1,000 concentration IM.  
4–10 yrs: 0.2ml (0.2mg) of 1:1,000 concentration IM.  
< 4 yrs: 0.1ml (0.1mg) of 1:1,000 concentration IM.  
Repeat once in 10 minutes if not significantly improved.
5. Oxygen High-flow per PROCEDURE: *Oxygen Administration*.
6. Remove Allergen If possible (e.g., bee stinger) per PROTOCOL: *Bites and Stings*.
7. Transport If transport immediately available perform all other therapies en route. Consider rendezvous with higher level of care and air transport.
8. Albuterol If wheezing or stridor:  
Nebulizer: 1 – 14 yrs: 2.5mg in 3ml of NS/LR premixed solution.  
Use with standard acorn-type jet nebulizer.  
For all patients, start oxygen at 10 l/min. If not improved by 3–5 minutes, increase oxygen to 15 l/min.  
  
For patients who fail to respond to a single nebulized dose, repeat above dosing up to six times without allowing “acorn” to run dry.  
  
MDI: Adult: 4 puffs on consecutive breaths during mid inspiration, then 1 puff every minute for up to 10 minutes (14 puffs total) if symptoms persist.  
May repeat 10-puff dose sequence starting 10 minutes after last puff if symptoms persist.  
  
1-14 yrs: 2 puffs per minute up to six puffs then base contact.  
In communications failure repeat 10-puff dose sequence starting 10 minutes after last puff if symptoms persist.  
  
< 1 yr: 1 puff per minute up to six puffs then base contact.  
Use spacer (Aerochamber) if available to increase inhaled dose.
9. IV/IO Fluids per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*. Do not delay other therapies if difficult IV/IO access
10. Diphenhydramine (Benadryl) Adults: 50mg IV/IO every 6 hours, may utilize IM if no IV/IO access.  
≤ 10 yrs: 1mg/kg IV/IO (up to 50mg) every 6 hours, may utilize IM if no IV/IO access.
11. Base Contact For further orders and AMA/TAR.



# Allergic Reactions

## Parkmedic Base Hospital/Communication Failure Orders

### Severe reactions only:

1. Epinephrine  
Repeat IM dose every 10 minutes until severe symptoms resolve.  
Increase frequency to every 5 minutes if symptoms worsening.  
Consider IV epinephrine if worsening despite above measures.  
All ages: 1ml (0.1mg) of 1:10,000 SIVP over 20–30 seconds.  
Repeat every 1–2 minutes if symptoms worsening or no improvement.  
Flush with 20ml NS/LR after each dose.
2. Transtracheal Jet Insufflation  
Consider TTJI if complete airway obstruction not relieved by manual procedures, inability to insert ALS airway and inability to successfully ventilate using BVM ventilation, TTJI should be attempted per PROCEDURE: *Transtracheal Jet Insufflation*.  
Caution: TTJI may cause significant bleeding, worsening an already difficult airway.
3. Glucagon  
All ages: 1mg IV for refractory symptoms or patients taking beta-blockers.  
May repeat every 15 minutes x2 if symptoms not resolving.
4. Dexamethasone (Decadron)  
> 12-Adults: 8mg IV/IO (IM if no IV access), then 2mg every 6 hours.  
< 12 yrs: 4mg IV/IO (IM if no IV access), then 2mg every 6 hours.

### Mild reactions only:

1. Diphenhydramine (Benadryl)  
> 12 yrs: 50mg PO/IM  
6-12 yrs: 25mg PO/IM

# Allergic Reactions

## SPECIAL CONSIDERATIONS

### AED

**Bring to patient's side if available.**

### Assessment

- Respiratory status: airway swelling? Wheezes? Stridor?
- Rash?
- Known or suspected exposure to allergen. If unclear contact base.
- Medication use prior to arrival: epinephrine auto-injector, Benadryl?
- PMH: allergic reactions, heart disease, stroke, hypertension?
- Medications: beta-blockers (atenolol, propranolol) may block effects of epinephrine.
- Vital signs including mental status.

### Medication Issues

IV Epinephrine: When giving IV Epinephrine for allergic reactions, always use the 1:10,000 concentration (1mg in 10ml), and push dose slowly (over 20–30 seconds) to minimize risks.  
Use epinephrine with caution in the following patients:  
1. Over 70 years of age.  
2. History of heart disease, stroke or hypertension.  
3. Taking a beta-blocker, e.g., atenolol, propranolol.  
In these patients contact base when possible, but do not withhold if patient in severe distress and base contact cannot be made easily.

### Transport Priorities

Any patient with signs or symptoms of a severe reaction requires immediate evacuation. Consider air transport and/or rendezvous with higher level of care unless symptoms responding well to therapy.

### AMA/TAR

Patients may be released at scene (“TAR”) without base contact only if all of the following conditions are met and documented:

1. Mild local reaction not involving head/neck. (No systemic signs or symptoms including hives.)
2. Patient observed at least 30 minutes since onset or exposure.
3. No history of severe allergic reactions.
4. No medications administered.
5. Normal vital signs.

Parks without base hospitals should follow local medical advisor approved EMS policy.

### Documentation

History of allergies, possession of epinephrine auto-injector, rash.  
Patient should not drive for 1 hour after taking epinephrine or 6 hours after taking Diphenhydramine (Benadryl).

## Cross Reference

### Procedures:

Automatic External Defibrillator  
Base Hospital Contact Criteria  
Epinephrine Ampule  
Epinephrine Auto-injector  
Intraosseous Access  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration  
Transtracheal Jet Insufflation

### Protocols:

Bites and Stings  
Shock Without Trauma

### Drugs:

Albuterol  
Dexamethasone  
Diphenhydramine (Benadryl)  
Epinephrine  
Glucagon

# Altered Mental Status/ Altered Level of Consciousness (ALOC)

Including suspected stroke, syncope, behavioral, diabetic and hypertensive emergencies

## EMT Standing Orders

1. ABCs                      Secure airway. Assist respirations as needed, utilizing OPA/NPA if indicated. Perform spinal immobilization in setting of trauma per PROCEDURE: *Spine Immobilization*.
2. Restraints                If needed to protect patient or caregivers from injury.
3. Oxygen                    High-flow per PROCEDURE: *Oxygen Administration*.
4. Assessment              Setting, history, vitals, temperature, neurological deficits, trauma, PMH. Consider differential: "AEIOUTIPS," (See Special Considerations).  
If appropriate, **GO TO** PROTOCOL: *Altitude Illness; Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Electrical Injuries; Heat Illness; Hypothermia; Major Trauma; Near Drowning; Seizures; Shock Without Trauma*.  
Consider carbon monoxide, nerve agent/organophosphate exposure if multiple victims and/or "AB-SLUDGEM" (See Special Considerations). If appropriate, **GO TO** PROTOCOL: *"Ingestion/Poisoning."*
5. Check Glucose            Per Local Medical Advisor approved extended scope of practice Per PROCEDURE: *Blood Glucose Determination*.
6. Glucose Paste            If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).
7. Naloxone  
(Narcan)                    If still ALOC and narcotic overdose suspected:  
> 10-Adults:    2mg IN every 2 minutes prn ALOC (max 10mg).  
< 10 yrs:        0.1mg/kg up to 2mg IN every 2 minutes prn ALOC.  
Note- If using 4mg/0.1ml Preload use 4mg ampule IN, may repeat in 5 minutes x1
8. Transport/  
ALS Backup                Consider air transport if decreasing mental status, GCS <12, or airway not protected.
9. Base Contact

# ALTERED MENTAL STATUS/ ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

Including suspected stroke, syncope, behavioral, diabetic and hypertensive emergencies

## Parkmedic Standing Orders

1. ABCs                      Secure airway. Assist respirations as needed, utilizing OPA/NPA or ALS airway (*King Tube/ETT*) if indicated.  
Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtacheal Jet Insufflation*.  
Spinal immobilization in setting of trauma per PROCEDURE: *Spine Immobilization*.  
If narcotic overdose suspected, give Naloxone (Narcan) per **Step 10**. If unlikely, continue with protocol.
2. Restraints                If needed to protect patient or caregivers from injury.
3. Oxygen                    High-flow per PROCEDURE: *Oxygen Administration*.
4. Assessment              Setting, history, vitals, temperature, neurological deficits, trauma, seizure, PMH (cardiac, hypertension, diabetes)  
Consider differential: "AEIOUTIPS," (See Special Considerations).  
If appropriate, **GO TO** PROTOCOL: *Altitude Illness; Cardiac Arrest/Dysrhythmia; Electrical and Lightning Injuries; Heat Illness; Hypothermia; Major Trauma; Near Drowning; Seizures; Shock Without Trauma*  
Consider nerve agent/organophosphate exposure if multiple victims and/or "AB-SLUDGEM," (See Special Considerations). If appropriate, **GO TO** PROTOCOL: *Ingestion/Poisoning*.  
Check for signs/symptoms of stroke (See Special Considerations - *Cincinnati Prehospital Stroke Scale*).
5. IV/IO                      If unable to establish IV/IO after 2 attempts, proceed to **Steps 6-11** before reattempting IV/IO  
Fluids per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*.

**Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).

6. Check Glucose            Per PROCEDURE: *Blood Glucose Determination*.
7. Dextrose                    If glucose < 80, or ALOC and unable to determine glucose.

≥ 2 yrs:      1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
< 2 yrs:      2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml.  
(To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).

May repeat in 5 minutes if ALOC or seizure persists and glucose still < 80.  
May substitute dose on NPS Pediatric Resuscitation Tape/Broselow Tape for pediatric dose above.

# ALTERED MENTAL STATUS/ ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

8. Glucose Paste                      If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed. If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 9**.
9. Glucagon                            Adults:            1mg IM (if no IV/IO and unable to give Glucose Paste).  
0-14 yrs:         0.03mg/kg IM, max dose 1mg (if no IV/IO).  
\*May repeat once in 15 minutes if ALOC or seizure persists, and glucose remains < 80.
10. Naloxone                         If still ALOC and narcotic overdose suspected (IN route preferred):  
(Narcan)            > 10-Adults:    2mg IN/IV/IO/IM every 2 minutes prn ALOC (max 10mg).  
                      < 10 yrs:        0.1mg/kg up to 2mg IN/IV/IO/IM every 2 minutes prn ALOC.
11. Transport                         Consider air transport if decreasing mental status, GCS < 12, or airway not secure.
12. Base Contact

## Parkmedic Base Hospital/Communication Failure Orders

If patient is acting irrational, combative, or is unable to cooperate AND physical restraints are used, administer sedatives/antipsychotics and monitor patient.

1. Ketamine                            For combative patients > 10 yrs old (must be a danger to self or others).  
IV/IO/IN:        1mg/kg every 5 minutes to a maximum of 3 doses.  
IM:                2mg/kg every 10 minutes to a maximum of 3 doses.  
If patients remains combative after 3 doses of Ketamine or condition worsens with Ketamine move to Versed as below.
2. Midazolam (Versed)              For combative patients > 10 yrs old (must be a danger to self or others).  
IV/IO/IN:        2mg every 3 minutes, titrated up to 10mg.  
IM:                10mg every 15 minutes, up to 3 doses.  
Hold if SBP < 100  
**Note:** Aggressive Versed dosing may be required for combative patients. If “wild” patient and unable/unsafe to get BP. Base Contact strongly advised.  
For combative patients ≤ 10 yrs old, **Base Hospital Orders Only**.  
  
Note: The fastest way to control a combative patient is ECD application. If indicated and used, REFERENCE *Electronic Control Device* Procedure.

# ALTERED MENTAL STATUS/ ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

## SPECIAL CONSIDERATIONS

### Cardiac Monitor

Bring Cardiac Monitor/AED to patient's side if available.

### Assessment

“**AEIOUTIPS**” Mnemonic for causes of ALOC.

- A:** Alcohol, Altitude, Age.
- E:** Epilepsy, Electrolytes, Electrocutation, Eclampsia, Encephalopathy.
- I:** Insulin (hypo/hyperglycemia).
- O:** Overdose, Oxygen (hypoxemia).
- U:** Uremia (kidney failure).
- T:** Trauma, Tumor, Temperature.
- I:** Infection, Infarction (stroke, MI).
- P:** Psychosis, Poisons.
- S:** Stroke, Shock.

“**AB-SLUDGEM**” Mnemonic for organophosphate poisoning.

- A:** Altered mental status.
- B:** Bronchorrhea, Breathing difficulty or wheezing, Bradycardia.
- S:** Salivation, Sweating, Seizures.
- L:** Lacrimation (tearing).
- U:** Urination.
- D:** Defecation or Diarrhea.
- G:** GI upset (abdominal cramps).
- E:** Emesis (vomiting).
- M:** Miosis/Muscle activity (twitching).

The **Cincinnati Prehospital Stroke Scale** is a clinical scoring system used to assist in identifying the possible presence of an (ischemic) stroke in the prehospital setting with the intention of potentially expediting the delivery of thrombolytic agents upon hospital arrival. It tests three abnormal findings which may indicate that the patient is having a stroke. If *ANY* one of the three challenges exhibit abnormal findings the patient may be having a stroke and should be transported to a hospital as soon as possible.

1. *Facial Droop:* Have the person smile or bare his/her teeth. If one side of the face doesn't move as well as the other or seems to droop, this is abnormal.
  - **ABNORMAL:** Facial asymmetry at rest or with expression.
2. *Arm drift:* Have the person close his/her eyes and hold his or her arms straight out in front with palms up for about 10 seconds. If one arm does not or cannot move, or one arm seems to drift, this is abnormal.
  - **ABNORMAL:** One arm does not move or one arm drifts down compared with the other.
3. *Speech:* Have the person say, "You can't teach an old dog new tricks," or some other simple, familiar saying. If the person slurs the words, speaks some words incorrectly or is unable to speak it is abnormal.
  - **ABNORMAL:** Slurred or inappropriate words or inability to speak.

# ALTERED MENTAL STATUS/ ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

**Physical Exam**

Mental Status via GCS:

Vitals, pupils, neurologic deficits, seizures, medications, track marks, pill bottles, alcohol, drug paraphernalia, trauma setting

**Differential Diagnosis**

Stroke

History: numbness/tingling/weakness to one side of body or face. May have history of prior stroke. No trauma.  
Exam: difficulty speaking or understanding, weakness to one side of body or face. May have ALOC but usually not. See Cincinnati Stroke Scale above  
No specific treatment in field. THESE PATIENTS SHOULD NOT GET ASPIRIN. This is due to the fact that strokes can be hemorrhagic or ischemic which require a Head CT to determine. Patients whose deficit has resolved (transient ischemic attack ["TIA"]) still need hospital transport because they are at risk for stroke.

Opiate Overdose

Exam: Depressed mental status, decreased respiratory rate, pinpoint pupils (may not be present in multidrug ingestion), drug paraphernalia or pill bottles  
Treatment: IN Naloxone – **REFERENCE DRUG** *Naloxone* and **PROCEDURE** *Mucosal Atomizer Device*  
Patients who respond to reversal still need transport to hospital for observation as naloxone is shorter acting than many opiates and toxicity may recur

Syncope or Near Syncope

Causes include heart rhythm disturbances, seizures, stroke, dehydration, internal bleeding and pregnancy.  
These patients almost always require stabilization and transfer to higher level of care with cardiac monitoring

HACE/ HAPE

Typically > 8,000 feet elevation.  
May cause ALOC; **REFERENCE PROTOCOL:** *Altitude Illness*.

Heat Illness/ Hypothermia

May cause ALOC. In appropriate setting check temperature and institute cooling or warming measures per **PROTOCOL:** *Heat Illness* or *Hypothermia*.

Hypertensive Encephalopathy

This entity exists with elevated BP (usually SBP > 200 and DBP > 120), along with CNS dysfunction such as ALOC, severe headache, seizure or stroke. Patients may also have chest pain or pulmonary edema. Isolated hypertension, without symptoms, need not be treated in the field, regardless of the degree of elevation. Contact base for guidance.

Diabetic Emergencies

Hypoglycemia may cause ALOC and/or focal neurologic deficits and thereby mimic stroke or coma. Treatment is with glucose (D-50, paste) and/or glucagon.  
Hyperglycemia may occasionally cause ALOC, usually secondary to dehydration and coexisting illness. Treatment is with fluids, preferably IV. Contact base for guidance

# ALTERED MENTAL STATUS/ ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

Behavioral Emergencies	<p>Causes include drug and alcohol intoxication, psychiatric illness, developmental delay and any cause of ALOC. Any patient that may be a danger to self or others including impaired judgment must be transported. Consider legal psychiatric hold.</p> <p>If due only to psychiatric illness patients are usually alert and oriented.</p> <p>Speak to patients in a calm non-threatening manner</p>
Excited Delirium	<p>This syndrome is a potentially lethal emergency which may be seen in patients with persistently violent/bizarre/agitated behavior, restraints, and/or drug intoxication.</p> <p>The pathogenesis is not well understood, but is likely multi-factorial, including positional asphyxia, hyperthermia, drug toxicity, and/or catecholamine-induced arrhythmias.</p> <p>Treatment should focus on reduction of stress (minimize noise/light/patient stimulation), pharmacologic therapy (midazolam/Versed) and rapid monitored transport.</p> <p>If the patient has an elevated temperature or feels hot to the touch, institute cooling measures and consider administering Sodium Bicarbonate.</p>
Dystonic Reactions	<p>Dystonic Reactions include a variety of abnormal muscle movements or spasm and are associated most commonly with anti-psychotic medications. It should be noted that these symptoms are problems of motor control and while they may give the appearance of an AMS/ALOC a person experiencing a Dystonic Reaction can comprehend instructions although they may be unable to execute them because of their motor control impairment.</p> <p>See <i>PROTOCOL: Dystonic Reactions</i>.</p>

**Transport**

Consider air transport and/or rendezvous with higher level of care for patients with unmanageable airways, unstable vital signs, rapid progression of symptoms, or failure to respond to treatment.

For potential aggressive, threatening, or violent patients consider using physical AND chemical restraints to secure the patient to the gurney prior to transport.

**Restraint Issues**

Use only if necessary to protect patient or personnel from injury.

Consider restraining patient in swimmers position (one arm extended laterally beside head, one arm extended on lateral side of body) for airway protection.

Reassess mental status and vital signs every 10 minutes.

Check distal neurovascular status of restrained extremities every 30 minutes.

Consider base contact whenever restraints are used for medical purposes

**AMA/TAR**

Treat and Release (“TAR”) is not acceptable for patients who have had an alteration in mental status or focal neurologic deficit, even if they have resolved.

AMA is possible for patients that currently have a normal mental status. This is most likely to occur in diabetic patients with hypoglycemia that has been treated. It should be noted that despite treatment, hypoglycemia can recur. All patients who leave the scene against medical advice should be told to avoid any situation that would be dangerous if symptoms recurred (e.g. heights, trails, swimming, or driving).

Parks without base hospitals should follow local medical advisor approved EMS policy.



# ALTERED MENTAL STATUS/ ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

## **Documentation**

All pertinent positives and negatives under assessment.  
Frequent vital signs.  
Neurologic exam (pupils, facial droop, weakness of arms or legs).  
Blood glucose.  
Reassessments of mental status/symptoms and any change.  
Treatments rendered and response.

## **Cross Reference**

### **Procedures:**

Blood Glucose Determination  
CPAP  
Endotracheal Intubation  
Intraosseous (IO) Access  
IV Access and IV Fluid  
Administration  
King Tube  
Mucosal Atomizer Device  
Oxygen Administration  
Spine Immobilization  
Transtracheal Jet Insufflation

### **Protocols:**

Altitude Illness  
Cardiac Arrest/Dysrhythmias  
Chest Pain – Cardiac  
Dystonic Reactions  
Electrical Injuries  
Heat Illness  
Hypothermia  
Major Trauma  
Near Drowning  
Seizures  
Shock Without Trauma

### **Drugs:**

Dextrose 50% (D50)  
Glucagon  
Glucose Paste or Gel  
Ketamine  
Naloxone (Narcan)  
Midazolam (Versed)

# Altitude Illness

## Acute Mountain Sickness (AMS)

### EMT Standing Orders

1. ABCs
2. Assessment  
Vitals signs, mental status, coordination, vomiting, respiratory status.  
If patient has: ALOC, inability to walk, severe headache, or persistent vomiting, then  
**GO TO PROTOCOL: *Altitude Illness, HACE.***  
If patient has: shortness of breath at rest, increased respiratory rate, orthopnea, cough, crackles, or cyanosis, then **GO TO PROTOCOL: *Altitude Illness, HAPE.***
3. Descent  
If symptoms moderate to severe, persistent or worsening.
4. Acetaminophen (Tylenol)  
If headache, encourage Patient/Parent to take/administer their own Acetaminophen (Tylenol) if available.  
>10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.  
0-10 yrs.: 20mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.
5. Base Contact  
If severe symptoms, possible HAPE, possible HACE, or AMA/TAR.

# Altitude Illness

## Acute Mountain Sickness (AMS)

### Parkmedic Standing Orders

1. ABCs
2. Assessment  
Vitals signs, mental status, coordination, vomiting, respiratory status.  
If patient has: ALOC, inability to walk, severe headache, or persistent vomiting, then  
**GO TO PROTOCOL: *Altitude Illness, HACE.***  
If patient has: shortness of breath at rest, increased respiratory rate, orthopnea, cough, crackles, or cyanosis, then **GO TO PROTOCOL: *Altitude Illness, HAPE.***
3. Descent  
If symptoms moderate to severe, persistent or worsening.
4. Acetaminophen (Tylenol)  
If headache:  
> 10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.  
0-10 yrs.: 15mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.
5. Base Contact  
If severe symptoms, possible HAPE, possible HACE, or AMA/TAR.

### Parkmedic Base Hospital/Communication Failure Orders

1. Acetazolamide (Diamox)  
If severe symptoms:  
Adults: 250mg PO every 12 hours.  
9-12 yrs: 125mg PO every 12 hours.  
6-9 yrs: 2.5mg/kg or ½ of 125mg pill PO every 12 hours.  
< 6 yrs: 2.5mg/kg or ¼ of 125mg pill PO every 12 hours.  
-All doses may be crushed and added to liquid.  
-All doses may be stopped once patient is asymptomatic

# Altitude Illness

## High Altitude Pulmonary Edema (HAPE)

### EMT Standing Orders

1. ABCs
2. Assessment Vitals signs, respiratory distress at rest, lung sounds, sputum, mental status, rapid ascent to altitudes > 8,000 feet.
3. Oxygen Per PROCEDURE: *Oxygen Administration*.
4. Rapid Descent Assist patient with rapid descent. Consider air transport.
5. Transport/  
ALS Backup Do not delay descent/transport for ALS arrival.
6. Base Contact For all patients.

### EMT Base Hospital/Communication Failure Orders

1. Gamow Bag If descent not possible, **GO TO PROCEDURE: *Gamow Bag***.

# Altitude Illness

## High Altitude Pulmonary Edema (HAPE)

### Parkmedic Standing Orders

1. ABCs Protect airway, assist respirations, and suction as needed. OPA/NPA or ALS airway if indicated REFERENCE PROCEDURE *King Tube*.
2. Assessment Vital signs, LOC, respiratory distress or tachycardia at rest, lung sounds, sputum, mental status, rapid ascent to altitudes > 8,000 feet.
3. Oxygen Per PROCEDURE: *Oxygen Administration*.
4. Rapid Descent and Transport Eliminate or minimize exertion. Assist patient with rapid descent of at least 1000 to 2000 feet. Consider air transport.
5. IV/IO Saline lock or TKO per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous access*.
6. Ondansetron  
Adult: IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: 4mg, repeat in 15 min x2 prn nausea.  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: ½ tab (2mg) if age 4 - 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
0 – 3 mos.: IV: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.  
  
**Note:** Nausea/vomiting in HAPE may be due to mild HACE occurring simultaneously.
  1. If patient has a complaint of headache, use Dexamethasone as below (#7) before Ondansetron.
  2. If patient has no complaint of headache use Ondansetron first, then if no response to 2 doses of Ondansetron, use Dexamethasone as below (#7).
7. Dexamethasone (Decadron) ≥ 12-Adults: 8mg PO/IV/IO/IM, then 4mg every 6 hours until descent  
< 12 yrs: 4mg PO/IV/IO/IM, then 2mg every 6 hours until descent.
8. Base Contact For all patients.

# Altitude Illness

## Parkmedic Base Hospital/Communication Failure Orders

1. Nifedipine  
If severe respiratory symptoms and SBP > 100mmHg:  
Adults: -30mg SR(sustained release) tablet PO every 12 hours until symptoms resolve. .  
  
6 - 12 years: Squeeze ½ of 10mg capsule under tongue every 8 to 12 hours.  
< 6 years: Squeeze ¼ of 10mg capsule under tongue every 8 to 12 hours.  
**Note:** Pediatric dosing is not sustained release
2. Gamow Bag  
If descent not possible, **GO TO** PROCEDURE: *Gamow Bag*.
3. IV Fluids  
Consider maintenance fluids for prolonged transport per PROCEDURE: *IV Access and IV Fluid Administration*.
4. Albuterol  
See Special Considerations
5. CPAP  
See Special Considerations.

# Altitude Illness

## High Altitude Cerebral Edema (HACE)

### EMT Standing Orders

1. ABCs Assist respirations as needed
2. Assessment Vitals, severe headache, vomiting, mental status, coordination/ability to walk, rapid ascent to altitudes > 8,000 feet.  
Consider differential: carbon monoxide, hypo/hyperthermia, stroke, drugs/alcohol, hypoglycemia, trauma. Contact Base if diagnosis is unclear.
3. Oxygen Per PROCEDURE: *Oxygen Administration*.
4. Rapid Descent and Transport Assist patient with rapid descent. Consider air transport.

**Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).

5. Check Glucose Per Local Medical Advisor approved extended scope of practice. Per PROCEDURE: *Blood Glucose Determination*.
6. Glucose Paste If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).
7. ALS Backup Do not delay descent/transport for ALS arrival.
8. Base Contact For all patients.

### EMT Base Hospital/Communication Failure Orders

1. Gamow Bag If descent not possible, **GO TO** PROCEDURE: *Gamow Bag*.

# Altitude Illness

## High Altitude Cerebral Edema (HACE)

### Parkmedic Standing Orders

1. ABCs Protect airway, assist respirations, and suction as needed. OPA/NPA or ALS airway if indicated REFERENCE PROCEDURE *King Tube*.
2. Assessment Vitals, severe headache, vision changes, vomiting, mental status, coordination/ability to walk, rapid ascent to altitudes > 8,000 feet.  
Consider differential: HAPE, carbon monoxide, hypo/hyperthermia, stroke, drugs/alcohol, hypoglycemia, trauma. Contact Base if diagnosis is unclear.
3. Monitor If appropriate, Apply AED and treat rhythm.  
If indicated, **GO TO** appropriate *Cardiac Arrest/Dysrhythmias Protocol*
4. Oxygen Per PROCEDURE: *Oxygen Administration*.

**Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).

5. Check Glucose Per PROCEDURE: *Blood Glucose Determination*.
6. Dextrose If Glucose < 80, or ALOC and unable to determine glucose.  
≥ 2 yrs: 1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
< 2 yrs: 2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml.  
(To make D25, remove 25ml of D50 and draw up 25ml of NS/LR).  
May repeat in 5 minutes if ALOC or seizure persists and glucose still < 80.  
May substitute dose on Broselow Tape for pediatric dose above.
7. Glucose Paste If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 8**.
8. Glucagon Adults: 1mg IM (if no IV/IO).  
0-14 yrs: 0.03mg/kg IM, max dose 1mg (if no IV/IO).  
May repeat once in 15 minutes if ALOC or seizure persists, and glucose remains < 80.
9. Ondansetron (Zofran) For nausea or vomiting or history of vomiting with narcotic administration.  
  
Adult: IV: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: 4mg, repeat in 15 min x2 prn nausea.  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
0 – 3 mos.: IV: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.



## Altitude Illness

- |                              |                                                                                                                                          |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 10. Dexamethasone (Decadron) | ≥ 12-Adults: 8mg PO/IV/IO/IM, then 4mg every 6 hours until descent<br>< 12 yrs: 4mg PO/IV/IO/IM, then 2mg every 6 hours until descent.   |
| 11. Rapid Descent Transport  | Assist patient with rapid descent. Eliminate or minimize exertion if this does not interfere with rapid descent. Consider air transport. |
| 12. IV/IO                    | Saline lock or TKO per PROCEDURE: <i>IV Access and IV Fluid Administration and Intraosseous Access.</i>                                  |
| 13. Base Contact             | For all patients.                                                                                                                        |

### **Parkmedic Base Hospital/Communication Failure Orders**

- |                           |                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Acetazolamide (Diamox) | <u>If not actively vomiting:</u><br>Adults: 250mg PO every 12 hours.<br>9–12 yrs: 2.5mg/kg or 125mg PO every 12 hours.<br>6–9 yrs: 2.5mg/kg or ½ of 125mg pill PO every 12 hours.<br>< 6 yrs: 2.5mg/kg or ¼ of 125mg pill PO every 12 hours.<br>All doses may be crushed and added to liquid.<br>All doses may be stopped once patient is asymptomatic. |
| 2. Gamow Bag              | If <u>descent not possible</u> , <b>GO TO</b> PROCEDURE: <i>Gamow Bag.</i>                                                                                                                                                                                                                                                                              |
| 3. IV Fluids              | Consider maintenance fluids for prolonged transport per PROCEDURE: <i>IV Access and IV Fluid Administration.</i>                                                                                                                                                                                                                                        |

# Altitude Illness

## SPECIAL CONSIDERATIONS

<b>General</b>	<p>High altitude illness usually occurs above 8,000 ft. in individuals who have ascended rapidly. Exertion, underlying illness, and respiratory depressants (alcohol, sleeping pills) may play a role. Syndromes may overlap and patients may need to be simultaneously treated for Acute Mountain Sickness (AMS), High Altitude Pulmonary Edema (HAPE), and/or High Altitude Cerebral Edema(HACE).</p> <p><u>In all types of altitude illness, descent is the definitive treatment.</u> Do not wait for higher level of care if descent is possible.</p>
<b>Differential Diagnosis</b>	<p>Acute Mountain Sickness (AMS), think of this as very mild HACE: Symptoms include: headache, fatigue, nausea/vomiting, decreased appetite, and insomnia.</p> <p>High Altitude Pulmonary Edema (HAPE): Shortness of breath or tachycardia at rest. Faster breathing and heart rates than would be anticipated for altitude. Orthopnea (worsening respiratory distress when lying flat). Cough - classically with white then pink frothy sputum. Crackles in lung fields. Cyanosis, particularly of nail beds and/or lips. Altered mental status if significantly hypoxic. Differential diagnosis: CHF, pneumonia. Consider Albuterol.</p> <p>High Altitude Cerebral Edema (HACE): Severe headache. Altered level of consciousness – confusion to lethargy to coma. Ataxia/incoordination. Focal neurologic deficits such as vision changes or limb paralysis. Seizures. Differential diagnosis: Carbon monoxide poisoning (cooking without ventilation), hypo/hyperthermia, HAPE with severe hypoxia, stroke, hypoglycemia, meningitis, drug/alcohol intoxication, trauma.</p>
<b>Assessment</b>	<p>Vitals including temperature, skin signs, and mental status. Blood glucose. Neuro - mental status, focal deficits, gait/coordination. Lung exam.</p>
<b>Medication Issues</b>	<p>For patients with HAPE, the primary therapy is as listed above. However, for severely wheezing patient, consider a trial of Albuterol. Albuterol 2.5mg in 3ml of LR/NS premixed solution nebulized treatment or 2-4 MDI puffs. Use spacer (Aerochamber) if available to increase inhaled dose.</p> <p>Ondansetron: Use caution with oral medications in patients with respiratory distress, especially those requiring CPAP.</p>
<b>Treatment Issues</b>	<p>For patients with HAPE, the primary therapy is as listed above. Consider a trial of CPAP, base contact for consultation advised. REFERENCE PROTOCOL: <i>CPAP</i></p>

# Altitude Illness

- AMA/TAR** Base contact should be attempted in all cases. In the event that base contact cannot be made, patients may only be released IF:
1. They will be with a competent adult.
  2. They have a means of re-contacting help.
  3. Acute Mountain Sickness is clearly the most likely cause of their symptoms.
  4. They have normal vital signs.
  5. They do not meet any of the criteria for HAPE or HACE.
  6. They did not require any treatment other than Acetaminophen.
- Any patient released should be instructed to:
1. Descend or remain at current elevation until symptoms resolve.
  2. Drink plenty of fluids.
  3. Use over the counter analgesics as directed on the bottle.
  4. Avoid heavy exertion.
  5. Descend and call for help if symptoms worsen.
- Parks without base hospitals should follow local medical advisor approved EMS policy.

## Cross Reference

### **Procedures:**

Blood Glucose Determination  
CPAP  
King Tube  
Gamow Bag  
IV Access and IV Fluid  
Administration  
Oxygen Administration

### **Protocols:**

Altered Mental Status/ Altered  
Level of Consciousness (ALOC)  
Respiratory Distress

### **Drugs:**

Acetaminophen (Tylenol)  
Acetazolamide (Diamox)  
Albuterol  
Dexamethasone (Decadron)  
Dextrose 50%  
Glucose Paste  
Nifedipine

# Altitude Illness Prophylaxis

## Parkmedic Standing Orders

### **Acetazolamide (Diamox)**

125 mg orally every 12 hours  
Ideally dosing should begin 24 hours prior to ascent and continue for 72 hours once maximum altitude is attained, or until descent.

**Note:** Consider 62.5mg orally every 12 hours if 125mg is poorly tolerated.

**Note:** This drug is a diuretic. Additional PO fluids will be required.

**Common expected side effects:** tingling in hands/feet, frequent urination.

**Rare side effects:** nausea, taste disturbance, bone marrow suppression.

**Contraindications:** Pregnancy, allergy to sulfa drugs.

### Alternative or Adjunct Medication:

### **Dexamethasone (Decadron)**

**Note:** May be considered **only** in accordance with medical advisor approved EMS policy.

2mg PO every 6 hours.

-This drug may be used by those who cannot take Acetazolamide or for a forced rapid ascent to a very high altitude (e.g. a helicopter rescue at over 14,000 feet).

-This drug should be initiated 2-4 hours before ascent.

**Note:** Should not be used in people under 18 years old.

**Note:** Symptoms can return quickly if medication is stopped while still at altitude.

**Note:** Duration of use should not exceed 10 days

**Common expected side effects:** elevation of blood sugar.

**Rare side effects:** dyspepsia (upset stomach), bizarre dreams, dysphoria (depressed mood), euphoria, perineal (groin) itching, gastrointestinal bleeding.

## SPECIAL CONSIDERATIONS

This protocol applies only to park personnel involved in emergency operations where rapid ascents to altitudes higher than 8,000 feet are required. Higher altitudes and faster ascents carry increased risk of altitude illness compared to lower or slower ascents. Whenever possible, supervisory rangers and incident commanders are encouraged to use personnel already acclimatized to altitude, who are healthy, and who do not have a history of serious altitude illness. Those with a history of HAPE or HACE should be excluded from rescues at altitude. Any rescuer with history of Acute Mountain Sickness should carefully weigh the pros and cons of participating in rescues at altitude.

These medications are completely optional and are not 100% effective. Personnel shall be offered such medications in the appropriate clinical circumstances but should not be forced to take them nor should participation in any incident be contingent upon their use. With LEMA approval, these medications may be dispensed by Paramedics/Parkmedics to other rescuers who are under Park Service command during a rescue. Paramedics/Parkmedics should explain the potential side effects (see above) and risk of prophylactic failure to anyone accepting medication. A single Patient Care Report (PCR) will be generated documenting the names of personnel administered medication under this policy.

Prophylaxis will ideally begin before ascent according to the guidelines above but may also be started after arrival at altitude. Once AMS symptoms develop, discontinue this protocol, start a PCR and go to PROTOCOL:  
“*Altitude Illness.*”

## Cross Reference

### **Protocols:**

Altitude Illness

### **Drugs:**

Acetazolamide (Diamox)

Dexamethasone (Decadron)

# Bites and Stings

## EMT Standing Orders

1. ABCs           Secure airway as needed.  
If signs or symptoms of allergic reaction **GO TO PROTOCOL: Allergic Reactions.**  
If signs of hemorrhage with shock **GO TO PROTOCOL: Major Trauma – Adult; Pediatric Major Trauma.**
2. Assessment    Vitals, mental status. Type, time, location and circumstances of injury. Progression of injury (draw marks on patient if appropriate). Behavior of animal prior to and after bite. Associated injuries. Distal neurovascular and tendon exam.
3. Oxygen         Per PROCEDURE: *Oxygen Administration.*
4. Classify Bite   Reassure patient and keep patient calm. Treat as specified in sections below:

### **Insect Sting/Bite:**

- |        |                                                                                                  |
|--------|--------------------------------------------------------------------------------------------------|
| Remove | Remove constricting items (e.g. rings) from area of bite/swelling.<br>Remove stinger if visible. |
| Ice    | Use ice and/or “sting ease” if available for symptomatic relief.                                 |

### **Snake Bite:**

- |            |                                                                                                                        |
|------------|------------------------------------------------------------------------------------------------------------------------|
| Remove     | Remove constricting items (e.g. rings) from area of bite/swelling.                                                     |
| Document   | Mark area of swelling and record progression over time.                                                                |
| Irrigate   | Sterile saline or potable water per PROCEDURE: <i>Wound Care.</i>                                                      |
| Immobilize | Splint injured extremity above (if possible) the level of heart per PROCEDURE: <i>Fracture/Dislocation Management.</i> |

### **Animal Bite:**

- |                  |                                                                    |
|------------------|--------------------------------------------------------------------|
| Remove           | Remove constricting items (e.g. rings) from area of bite/swelling. |
| Control Bleeding | Per PROCEDURE: <i>Wound Care.</i>                                  |
| Irrigate         | Sterile saline or potable water per PROCEDURE: <i>Wound Care.</i>  |
| Splint           | Splint injury as per PROCEDURE: <i>Fracture Management.</i>        |

### **Marine Envenomation:**

- |          |                                                                                                         |
|----------|---------------------------------------------------------------------------------------------------------|
| Remove   | Remove constricting items (eg. rings) from affected extremity                                           |
| Document | Mark area of swelling and record progression over time                                                  |
| Note     | Allergic Reactions are very common. Watch for signs of Allergy and GO TO Allergy/Anaphylaxis as needed. |

If envenomation by stingray, sea urchin, stone fish, spine fish, scorpion fish, catfish:

1. Remove the victim from the aquatic environment
2. Clean wound immediately with sea water
3. Remove any pieces of debris or stingers with tweezers or gloved hand
4. Soak the wound in non-scalding HOT water as soon as possible for 30 – 60 minutes. Hot water temperature should only be as hot as the unaffected extremity can tolerate for 1 minute.
5. Bandage loosely and Immobilize/Splint injured extremity as per PROCEDURE: Fracture Management

# Bites and Stings

If envenomation by Nematocysts/Coelenterates (jellyfish, fire coral, Portuguese man-of-war, sea wasp, stinging anemone):

1. Remove the victim from the aquatic environment
2. Rinse irritated area of skin with sea water (Do NOT use fresh water)
3. Physically lift off any tentacles that still cling to the patient with a gloved hand or tweezers
4. Wash affected area with vinegar for 15-30 minutes
5. Remove embedded nematocysts by scraping off gently.
6. Bandage loosely and Immobilize/Splint injured extremity as per PROCEDURE: Fracture Management

If source of envenomation is unknown:

1. Remove the victim from the aquatic environment
2. Rinse irritated area of skin with sea water (Do NOT use fresh water)
3. Rinse a small portion of the irritate area of skin with hot water. If the patient gets relief with this, continue with a larger area and then progressively to the entire area. If the patient complains of worsening or no relief with this, move to step 4 below.
4. Wash a small portion of the affected area with vinegar. If the patient gets relief with this, continue with a larger area and then progressively to the entire area. Continue for 15-30 minutes. If the patient complains of worsening or no relief with this, move to step 5 below.
5. Bandage loosely and Immobilize/Splint injured extremity as per PROCEDURE: Fracture Management

5. Base Contact

6. Transport/  
ALS Backup      As required for patient condition. ALS backup only if vitals unstable or long transport and high risk of infection. Transport all snake bites. See Special Considerations for AMA/TAR criteria.

## **EMT Base Hospital Only Orders, Not in Communication Failure**

- |                               |                              |                                                                                                                                  |
|-------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1. Acetaminophen<br>(Tylenol) | > 10-Adult:<br>0-10 yrs.:    | 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.<br>15mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours. |
| 2. Ibuprofen<br>(Motrin)      | > 10-Adult:<br>6 mon-10 yrs: | 600mg PO every 6 hours.<br>10mg/kg PO every 6 hours, max dose 200mg.                                                             |

# Bites and Stings

## Parkmedic Standing Orders

1. ABCs           Secure airway as needed. OPA/NPA or ALS airway if indicated (*King Tube/ETT*). Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtracheal Jet Insufflation*. If signs or symptoms of allergic reaction **GO TO** PROTOCOL: *Allergic Reactions*. If signs of hemorrhage with shock **GO TO** PROTOCOL: *Major Trauma – Adult; Pediatric Major Trauma*.
2. Assessment    Vitals, mental status. Type, time, location and circumstances of injury. Progression of injury (draw marks on patient if appropriate). Behavior of animal prior to and after bite. Associated injuries. Distal neurovascular and tendon exam.
3. Oxygen         Per PROCEDURE: *Oxygen Administration*.
4. Classify Bite   Reassure patient and keep patient calm. Treat as specified in sections below:

### **Insect Sting/Bite:**

- |        |                                                                                               |
|--------|-----------------------------------------------------------------------------------------------|
| Remove | Remove constricting items (e.g. rings) from area of bite/swelling. Remove stinger if visible. |
| Ice    | Use ice and/or “sting ease” if available for symptomatic relief.                              |

### **Snake Bite:**

- |            |                                                                                                                         |
|------------|-------------------------------------------------------------------------------------------------------------------------|
| Remove     | Remove constricting items (e.g. rings) from area of bite/swelling.                                                      |
| Document   | Mark area of swelling and record progression over time.                                                                 |
| Irrigate   | Sterile saline or potable water per PROCEDURE: <i>Wound Care</i> .                                                      |
| Immobilize | Splint injured extremity above (if possible) the level of heart per PROCEDURE: <i>Fracture/Dislocation Management</i> . |

### **Animal Bite:**

- |                  |                                                                    |
|------------------|--------------------------------------------------------------------|
| Remove           | Remove constricting items (e.g. rings) from area of bite/swelling. |
| Control Bleeding | Per PROCEDURE: <i>Wound Care</i> .                                 |
| Irrigate         | Sterile saline or potable water per PROCEDURE: <i>Wound Care</i> . |
| Splint           | Splint injury as per PROCEDURE: <i>Fracture Management</i> .       |

### **Marine Envenomation:**

- |          |                                                                                                        |
|----------|--------------------------------------------------------------------------------------------------------|
| Remove   | Remove constricting items (eg. rings) from affected extremity                                          |
| Document | Mark area of swelling and record progression over time                                                 |
| Note     | Allergic Reactions are very common. Watch for signs of Allergy and GO TO Allergy/Anaphylaxis as needed |

If envenomation by stingray, sea urchin, stone fish, spine fish, scorpion fish, catfish:

1. Remove the victim from the aquatic environment
2. Clean wound immediately with sea water
3. Remove any pieces of debris or stingers with tweezers or gloved hand
4. Soak the wound in nonscalding HOT water as soon as possible for 30 – 60 minutes. Hot water temperature should only be as hot as the unaffected extremity can tolerate for 1 minute.
5. Bandage loosely and Immobilize/Splint injured extremity as per PROCEDURE: *Fracture Management*

# Bites and Stings

If envenomation by Nematocysts/Coelenterates (jellyfish, fire coral, Portuguese man-of-war, sea wasp, stinging anemone):

1. Remove the victim from the aquatic environment
2. Rinse irritated area of skin with sea water (Do NOT use fresh water)
3. Physically lift off any tentacles that still cling to the patient with a gloved hand or tweezers
4. Wash affected area with vinegar for 15-30 minutes
5. Remove embedded nematocysts by scraping off gently.
6. Bandage loosely and Immobilize/Splint injured extremity as per PROCEDURE: Fracture Management

If source of envenomation is unknown:

1. Remove the victim from the aquatic environment
2. Rinse irritated area of skin with sea water (Do NOT use fresh water)
3. Rinse a small portion of the irritate area of skin with hot water. If the patient gets relief with this, continue with a larger area and then progressively to the entire area. If the patient complains of worsening or no relief with this, move to step 4 below.
4. Wash a small portion of the affected area with vinegar. If the patient gets relief with this, continue with a larger area and then progressively to the entire area. Continue for 15-30 minutes. If the patient complains of worsening or no relief with this, move to step 5 below.
5. Bandage loosely and Immobilize/Splint injured extremity as per PROCEDURE: Fracture Management

5. Pain Management Per PROCEDURE: *Pain Management*

6. Base Contact

7. Transport As required for patient condition. Transport all snake bites. See Special Considerations for AMA/TAR criteria.

8. IV/IO Per PROCEDURE: *IV Access and IV Fluid Administration.*

9. Ondansetron (Zofran)	Adult:	If nausea or vomiting: IV/IO: 4mg over 2–5 min, repeat in 15 min x3 prn SL: 4mg. If no IV/IO, repeat in 15 min x2 prn IM: If no IV/IO, give 8mg IM, repeat in 15 min x2 prn
	4 – 14 yrs:	IV/IO: 4mg over 2–5 min, repeat in 15 min x3 prn. SL: 4mg. If no IV/IO, repeat in 15 min x2 prn . IM: If no IV/IO, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x2 prn
	1 mo – 4 yrs:	IV/IO/SL/IM: <u>Base Hospital Order ONLY</u> , NOT in communication failure. 0.1mg/kg.



# Bites and Stings

## SPECIAL CONSIDERATIONS

<b>Assessment</b>	<p><b>Insect Sting or Bite</b></p> <p>Some insects leave their stinger in the victim. Try to remove the stinger as soon as practical. Spider bites may not be painful immediately. Ice can be helpful in treating pain.</p> <p><b>Snakebite</b></p> <p>Remember personal protection. Many snakes thought to be “dead” have bitten rescuers. Even the severed head may still be able to inflict a venomous bite. Do not engage in a search for the snake.</p> <p>Some (25-50%) of snakebites are “dry,” i.e., no venom is injected.</p> <p>If envenomated some of the following should occur in 5–30 minutes.</p> <ol style="list-style-type: none"><li>1. Severe burning pain out of proportion to the wound.</li><li>2. Edema around the bite out of proportion to the wound.</li><li>3. Small, non-blanching purple spots (petechiae), bruising, or continued oozing from site.</li><li>4. Numbness or tingling of the mouth, extremities, or bite site.</li><li>5. Metallic taste in the mouth.</li><li>6. Involuntary twitching of the mouth, extremities, or bite site.</li><li>7. Weakness</li></ol> <p>Exotic snakes (Cobra, Krait, etc.) or Coral may cause neurologic and respiratory depression prior to a local reaction. Observe for mental status change, respiratory depression, convulsions, or paralysis.</p> <p><u>Do not apply ice to snake bites. Do not incise wound or try to “suck” the venom out.</u></p> <p><b>Animal Bites</b></p> <p>Depending on the animal there can be a great deal of traumatic injury. Consider penetration of abdomen and/or thorax, fractures, etc.</p> <p>If the animal is suspected of having rabies, an attempt should be made to obtain the animal. However, the patient and rescuers take priority. Be careful not to injure other personnel in an attempt to capture the animal. If the animal is killed, try to preserve the head for necropsy.</p> <p>Most wounds should be irrigated with Normal Saline if available. Plain soap and water is also effective in decreasing infection rates. If there is a high suspicion for rabies, the wound should be scrubbed. (Scrubbing in the wound is <u>not</u> recommended for other wounds). If uncertain, address wound per PROCEDURE: <i>Wound Care</i>.</p> <p><b>Marine Envenomations</b></p> <p>Rescuers on scene need to protect themselves from injury and protect the patient from further injury. When entering the water for rescue, protective clothing with wet suits and gloves is ideal.</p> <p>If the stinger or tentacle is not able to be removed easily with gentle traction, do not compress with bandages as additional envenomation may occur</p> <p>Portuguese man-of-war, although often mistaken for a “Jellyfish”, is treated differently than most Coelenterates, <u>using hot water and not vinegar</u>.</p> <p>Stonefish envenomation can cause systemic toxicity with hypotension, tachycardia, cardiac arrhythmias, diaphoresis, dyspnea and pulmonary edema. Most cases are successfully managed with hot water immersion and symptomatic care, however some may require a specific antivenom.</p>
<b>Treatment</b>	<p>Response to narcotic analgesics (Fentanyl/Morphine) is both situation and patient specific. If prolonged patient contact is anticipated, dose adjustment within the protocol parameters may be warranted. If additional medication is indicated, contact base.</p>
<b>Transport</b>	<p>Consider air transport for serious bites to head or neck, airway difficulties, respiratory distress, major trauma, shock, or neurologic deficits.</p>

# Bites and Stings

**AMA/TAR** Minor insect bites or stings that require no treatment beyond local wound care may be released at scene after infection precautions have been given and the patient observed for 30 minutes. Tetanus immunization should be recommended if last vaccination was over 5 years ago. All animal and snakebite patients should be transported or AMA after base contact. Parks without base hospitals should follow local medical advisor approved EMS policy.

## Cross Reference

### **Procedures:**

Fracture/Dislocation Management  
IV Access and IV  
    Fluid Administration  
King Tube  
Oxygen Administration  
Pain Management  
Transtracheal Jet Insufflation  
Wound Care

### **Protocols:**

Allergic Reactions  
Major Trauma – Adult  
Pediatric – Major Trauma

### **Drugs:**

Acetaminophen (Tylenol)  
Cefazolin (Ancef)  
Fentanyl  
Ibuprofen (Motrin, Advil)  
Morphine  
Ondansetron

# Burns

## EMT Standing Orders

1. Scene Safety Beware of Hazardous Material (HazMat); protect yourself from injury.
2. Rescue Remove patient from source of injury. Stop burning process (see Special Considerations). Decontaminate patient if appropriate.
3. ABCs Protect airway and assist ventilations as needed.
4. Assessment Vitals, shock, mental status, airway burns, singed hair, stridor, lung sounds, circumferential burns to torso or extremity.  
Mechanism of burn (e.g. enclosed space, explosion, acid, oil, water, electrical, flame).  
Percentage and degree (thickness) of burn.
5. Oxygen Per PROCEDURE: *Oxygen Administration*.  
High flow for unstable vitals, ALOC, severe respiratory distress (possible inhalation injury or carbon monoxide exposure), or burns > 15% total body surface area (TBSA).
6. Prevent Hypothermia Cover patient with blanket and remove wet clothing. Move patient to warm environment.  
Consider insulating patient from ground with blanket.
7. Remove Remove constricting items (e.g. rings).
8. Dressing Small burns: (< 15% TBSA): Cover with moist sterile dressings. May apply Bacitracin if transport time > 1 hour per PROCEDURE: *Wound Care*.  
Large burns: No Bacitracin. Cover with dry sterile dressings to prevent hypothermia.
9. Transport/  
ALS Backup Consider air transport for > 15% TBSA, shock, or airway involvement.  
Transport to Regional Burn Center unless directed elsewhere by base. See Special Considerations for TAR guidelines.
10. Base Contact

## EMT Base Hospital/Communication Failure Orders

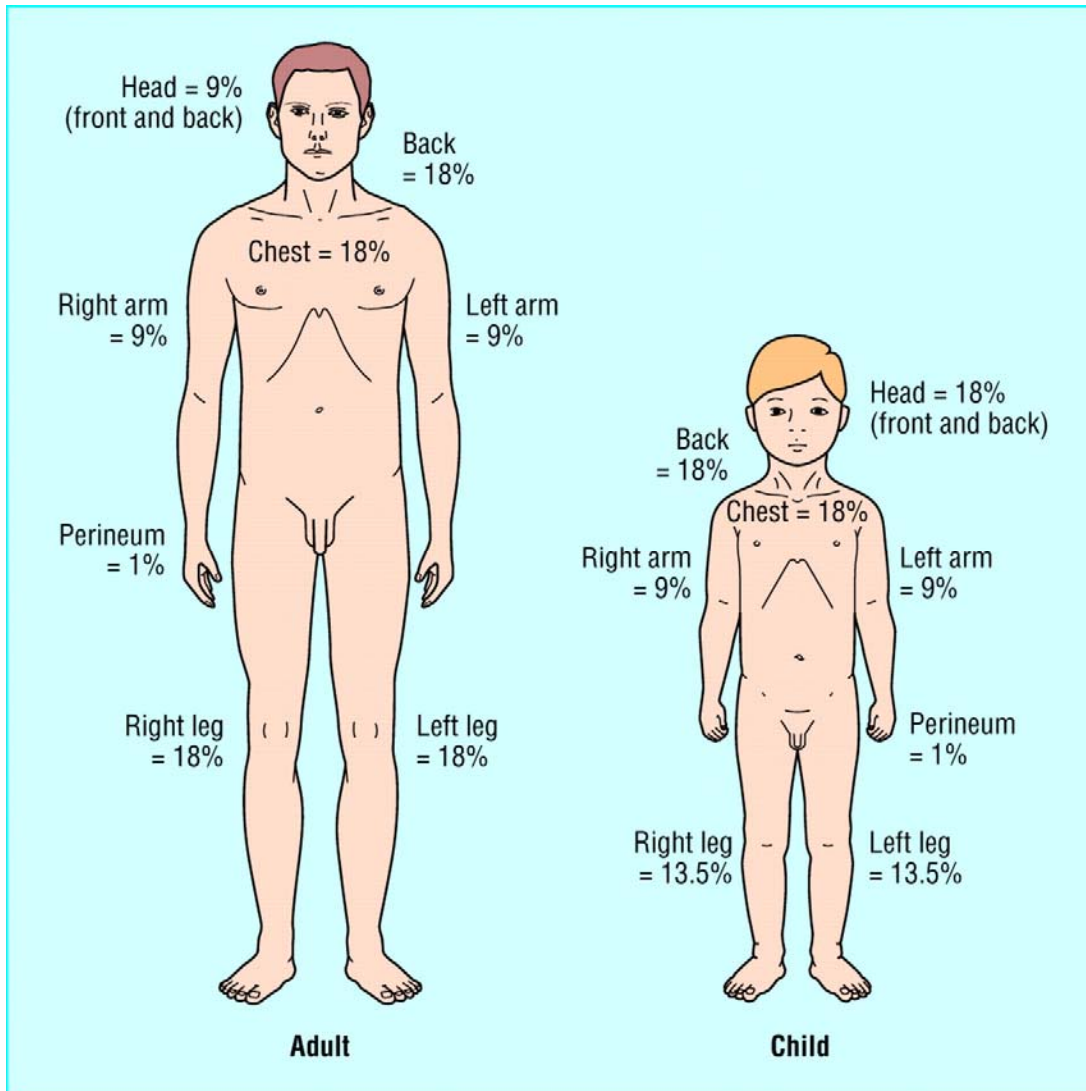
1. Acetaminophen (Tylenol) > 10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.  
0-10 yrs.: 20mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.
2. Ibuprofen (Motrin, Advil) > 10-Adult: 600mg PO every 6 hours.  
6 mon-10 yrs: 10mg/kg PO every 6 hours, max dose 200mg.

# Burns

## Parkmedic Standing Orders

1. Scene Safety      Beware of Hazardous Material (HazMat); protect yourself from injury.
2. Rescue            Remove patient from source of injury. Stop burning process (see Special Considerations). Decontaminate patient, if appropriate.
3. ABCs              Protect airway and assist ventilations as needed. OPA/NPA or ALS airway if indicated (*King Tube/ETT*). Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtacheal Jet Insufflation*.
4. Assessment      Vitals, shock, mental status, airway burns, singed hair, stridor, lung sounds, circumferential burns to torso or extremity.  
Mechanism of burn (e.g. enclosed space, explosion, acid, oil, water, electrical, flame).  
Percentage and degree (thickness) of burn.
5. Oxygen            Per PROCEDURE: *Oxygen Administration*.  
High flow for unstable vitals, ALOC, severe respiratory distress (possible inhalation injury or carbon monoxide exposure), or burns > 15% total body surface area (TBSA).
6. Prevent Hypothermia      Cover patient with blanket and remove wet clothing. Move patient to warm environment. Consider insulating patient from ground with blanket.
7. Remove            Remove constricting items (e.g. rings).
8. Dressing            Small burns:      (< 15% TBSA): Cover with moist sterile dressings. May apply Bacitracin if transport time > 1 hour per PROCEDURE: *Wound Care*.  
Large burns:      No Bacitracin. Cover with dry sterile dressings to prevent hypothermia.
9. Pain Management      Per PROCEDURE: *Pain Management*
10. IV                All transported patients: One IV with maintenance fluids (NS/LR) per PROCEDURE: *IV Access and IV Fluid Administration*.  
Shock or TBSA > 15%: Two IVs, with total IV fluid at the following rates:  
Adults:            2-L LR/NS bolus, then double the maintenance rate (240ml/hr).  
0–14 yrs.:        40 ml/kg LR/NS bolus (max bolus 2-L), then double maintenance rate (4ml/kg/hr).
11. Ondansetron (Zofran)      For nausea or vomiting or history of vomiting with narcotic administration  
Adult:            IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
                         ODT: 4mg, repeat in 15 min x2 prn nausea.  
                         IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
  
3 mos–14 yrs:    IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
                         ODT: ½ tab (2mg) if age 4- 14  
                         IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1prn nausea.  
  
0 – 3 mos.:        IV/IO: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
                         IM: Contraindicated for patient's < 3 months of age.  
  
**Note:** For severely symptomatic patient's, ODT can be administered prior to attempts for IV/IO access
12. Transport        Consider air transport for > 15% TBSA, shock, or airway involvement.  
Transport to Regional Burn Center unless directed elsewhere by base.  
See Special Considerations for TAR guidelines.
11. Base Contact

# Burns



Rule of Nines Diagram

# Burns

## SPECIAL CONSIDERATIONS

<b>Rescue</b>	<p>Thermal Burns: Protect yourself. Remove patient from source of burn to fresh air, remove burning or smoldering clothing, stop burning process. Use any water available. Consider ways of smothering the fire.</p> <p>Chemical Burns: Protect yourself. Remove all contaminated clothing. Wash patient with copious amounts of water. Do not scrub. Sterile water or saline is preferred, but any available water may be used. Record type of chemical and manner and time of exposure.</p> <p>Electrical Burns: Protect yourself. Be aware of likelihood of cardiac arrhythmias.</p> <p><b>REFERENCE PROTOCOL:</b> <i>Electrical and Lightning Injuries</i>. Treat as medical arrest, not trauma. If in cardiac arrest, <b>GO TO PROTOCOL:</b> <i>Cardiac Arrest (Adult Medical)</i> or <i>Pediatric – Medical Arrest</i>.</p>
<b>Assessment</b>	<p>Check for evidence of airway burn (singled nose or facial hair, black tinged sputum, hoarse voice, abnormal lung sounds). Consider all enclosed-space burn victims to have carbon monoxide poisoning and possible inhalation injury. Remember that inhalation injuries may have delayed presentation of life threatening lung or airway injuries.</p> <p>Check nature and extent of burn (rule of nines), mental status, smoke inhalation, duration of exposure, depth of wounds. Evaluate for associated trauma and/or drug/alcohol intoxication.</p> <p>Depth of Burn:</p> <p><u>Superficial</u> (first degree): Erythema only.</p> <p><u>Partial Thickness</u> (second degree): Blisters; sensation and capillary refill present.</p> <p><u>Full Thickness</u> (third degree): White or charred; firm to touch; lack of sensation.</p> <p>Even though small, burns that involve the eyes, hands, feet, airway, genitalia, or those that are circumferential, are more concerning.</p> <p>Burns often have greatly increased fluid requirements, especially in the first eight hours. Contact base hospital for further fluid requirements. If no other site is available, it is acceptable to place an IV/IO through burned skin.</p>
<b>Treatment</b>	<p>Response to narcotic analgesics (Fentanyl/Morphine/Dilaudid) is both situation and patient specific. If prolonged patient contact is anticipated, dose adjustment within the protocol parameters may be warranted. If additional medication is indicated, contact base.</p>
<b>Transport</b>	<p>All patients with the following should be transported to a Regional Burn Center unless directed otherwise by base: airway burns or respiratory distress; burns greater than 15% TBSA; burns with major trauma; face, hands, feet, or genitalia involvement; circumferential extremity burns; any 3<sup>rd</sup> degree burn; extremes of age.</p> <p>All other patients may go to the hospital of their choice.</p>
<b>AMA/TAR</b>	<p>Only the following may be treated and released without base contact: first-degree burns without systemic symptoms; burns less than 5% TBSA, NOT involving the face, genitals, hands, or feet.</p> <p>All patients not transported (AMA) with second- or third-degree burns should be advised to seek medical attention immediately. Base hospital contact for all others.</p> <p>Parks without base hospitals should follow local medical advisor approved EMS policy.</p>
<b>Documentation</b>	<p>Degree (thickness) and extent (TBSA) of burn using the “rule of nines” or patients palm size=1% TBSA, mechanism of burn, time of burn, associated injuries, tetanus status.</p>

## Cross Reference

<b>Procedures:</b>	<b>Protocols:</b>	<b>Drugs:</b>
IV Access and IV Fluid Administration	Cardiac Arrest With AED (Adult Medical)	Acetaminophen (Tylenol)
Intraosseous (IO) Access	Cardiac Arrest Without AED(Adult Medical)	Bacitracin
King Tube	Electrical and Lightning Injuries	Fentanyl
Oxygen Administration	Pediatric – Medical Arrest With AED	Hydromorphone (Dilaudid)
Pain Management	Pediatric – Medical Arrest Without AED	Ibuprofen (Motrin, Advil)
Transtracheal Jet Insufflation		Morphine
Wound Care		Ondansetron

# Cardiac Arrest with AED (Adult Medical)

## Resuscitation Guidelines

### **Resuscitation Management**

This protocol may be followed by a single provider. Ideally, additional provider or bystander help should be solicited. CPR and application of defibrillator devices are the priorities.

Once a second provider is available (even a well-trained bystander) direct them to perform CPR

In cardiac arrest, emphasis should be on defibrillation and quality CPR

### **CPR**

Emphasis should be on minimizing interruptions of compressions during CPR. Even when ALS providers arrive on scene, airway interventions, IV/IO access, rhythm analysis, and medication administration should be completed with minimal interruptions in chest compressions. Either single or dual rescuer CPR is conducted with a compression-to-ventilation ratio of 30:2. Compression rate is 100/minute: "Push Hard, Push Fast." Continue with 5 cycles of CPR (30:2) – approximately 2-3 minutes. **Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**

### **Cardiac Monitor External Defibrillator**

**Upon ALS arrival continue to your AED use until transition to cardiac monitor can be made.**

Note: Once AED is applied, keep it attached to the patient throughout the PROTOCOL.

### **Transport**

**Cardiac arrest < 10 minutes from health care facility, transport with CPR in route.**  
SPECIAL CASES (as noted in assessment section, step 2) < 30 minutes from health care facility, transport with CPR in route.  
All patients with ROSC, consider air transport if available.

## EMT Standing Orders

If patient is  $\leq 14$ yr or shorter than the NPS Pediatric Resuscitation Tape/Broselow Tape (5 feet), **GO TO PROTOCOL: Pediatric - Medical Arrest Without AED or Pediatric - Medical Arrest With AED.**

If patient is a newborn **GO TO PROTOCOL: Pediatric – Newborn Resuscitation.**

1. Confirm Arrest  
No response to aggressive stimulation.  
Call for ALS/ACLS backup ASAP.  
Simultaneously palpate for pulse 6 seconds (preferably carotid) while observing for breathing.  
If pulse is present patient is NOT in cardiac arrest. **GO TO PROTOCOL: Altered Mental Status/Altered Level of Consciousness (ALOC)**, or other appropriate protocol.  
If pulse is absent and AED is available, continue this PROTOCOL.  
If pulse is absent and AED is NOT available, **GO TO PROTOCOL: Cardiac Arrest Without AED (Adult Medical).**
2. Assessment  
Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated and by what means (e.g., length of downtime determines whether to start with CPR or AED). As time allows, obtain additional information including preceding events and symptoms, PMH.

# Cardiac Arrest with AED (Adult Medical)

Do not attempt resuscitation in the following cases:

Rigor mortis, lividity, obviously fatal trauma, or DNR.

Documented pulseless downtime greater than 15 minutes. In specific SPECIAL CASES (cold water drowning, hypothermia, barbiturate ingestion, electrocution or lightning strike) downtime is extended to 30 min.

**If the downtime of the patient is known to be less than 4 minutes**, then initiate resuscitation with the AED; proceed to **Step 3**.

**If the downtime of the patient is unknown, or is known to be greater than 4 minutes**, then initiate resuscitation with CPR; proceed to **Step 4**.

3. Apply AED  
Turn on AED and follow prompts per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either state “Shock Advised” or “No Shock Advised.” Allow the AED to deliver a shock if indicated.
4. Airway  
Secure airway utilizing OPA/NPA.
2. CPR/AED  
Cycle 1  
Regardless of single- or dual-rescuer CPR, compression-to-ventilation ratio is 30:2. Compression rate is 100/minute; “Push Hard, Push Fast.”  
**Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**  
Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.  
  
Outcome of shock delivery is best if rescuers minimize the time between last compression and shock delivery, so rescuers should be prepared to coordinate (brief) interruptions in chest compressions to deliver shocks, and should resume compressions immediately after shock delivery.  
  
**If AED is already attached to the patient**, perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.  
If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.  
If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 8**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 6**.  
  
**If AED is not yet attached to patient**, perform 2 minutes of CPR, then attach AED to patient per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either recommend a shock or not recommend a shock.  
If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.  
If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 8**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 6**.
6. CPR/AED  
Cycle 2  
Perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.



# Cardiac Arrest with AED (Adult Medical)

If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 7**.

If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.

If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 8**.

If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 7**.

## 7. CPR/AED Cycle 3

Perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.

If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.”

If < 30 minutes of CPR/AED have occurred, repeat this step (**Step 7**).

If > 30 minutes of CPR/AED have occurred, then consider CPR termination per **EMT Base Hospital/Communication Failure Orders**.

If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.

If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 8**.

If patient has no palpable pulse nor spontaneous respirations, and the AED has shocked the patient within the past 3 cycles, then repeat this step (**Step 7**).

If patient has no palpable pulse nor spontaneous respirations, and the AED has stated “No Shock Advised” the last 3 cycles, then consider CPR termination per **EMT Base Hospital/Communication Failure Orders**.

## 8. Transport/ALS Backup

Transport if patient has a palpable pulse or transit time to healthcare facility is <10 min. SPECIAL CASES (as noted in Assessment section): Transport if patient has a palpable pulse or transit time to healthcare facility is < 30 min.

If return of spontaneous circulation, keep AED attached to patient in “off” mode. If patient re-arrests, turn the AED back to “on” mode, return to **Step 3**, and restart CPR/AED Cycle.

If indicated but not yet performed, all patients should be assessed for airway intervention.

If patient has a palpable pulse or shows signs of life, check pulse every 3 minutes and provide appropriate ventilatory support.

## 9. Base Contact

As soon as possible without compromising patient care.

## 10. Check Glucose

If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.

## 11. Glucose Paste

If glucose < 80, or ALOC and unable to determine glucose:

Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.

If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).

### **EMT Base Hospital/Communication Failure Orders**

#### 1. CPR Termination

Follow **CPR Termination Algorithm** at end of this PROTOCOL.

Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

# Cardiac Arrest with AED (Adult Medical)

## Parkmedic Standing Orders

If patient is  $\leq 14$ yr or shorter than the NPS Pediatric Resuscitation Tape/Broselow Tape (5 feet), **GO TO PROTOCOL: Pediatric - Medical Arrest Without AED or Pediatric - Medical Arrest With AED.**

If patient is a newborn **GO TO PROTOCOL: Pediatric – Newborn Resuscitation.**

### Resuscitation Guidelines

#### **Resuscitation Management**

This protocol may be followed by a single provider. Ideally, additional provider or bystander help should be solicited. CPR and application of defibrillator devices are the priorities. These interventions should not be delayed for IV/IO placement, medication administration or ALS airways.

Once a second provider is available (even a well-trained bystander) direct them to perform CPR. The Parkmedic should attempt IV/IO placement per **Steps 5 or 13**. Once an IV/IO is placed successfully, administer appropriate medications per PROTOCOL.

In cardiac arrest, emphasis should be on defibrillation and quality CPR; however, an ALS airway will augment the effectiveness of ventilations. Early in the resuscitation, if BLS airway is inadequate or if manpower allows, consideration of ALS airway is warranted. Otherwise, after the first cycle of IV/IO medications has been delivered, the next priority is to convert the BLS airway to an ALS airway.

#### **CPR**

Emphasis should be on minimizing interruptions of compressions during CPR. Airway interventions, IV/IO access, rhythm analysis, and medication administration should be completed with minimal interruptions in chest compressions. Either single- or dual-rescuer CPR is conducted with a compression-to-ventilation ratio of 30:2. Compression rate is 100/minute: “Push Hard, Push Fast.” Continue with 5 cycles of CPR (30:2) – approximately 2-3 minutes. **Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**

#### **Medication Note**

**Unless otherwise directed by base**, the cumulative dose for Amiodarone is 450 mg IV/IO. The dose for Sodium Bicarbonate is 50 meq IV/IO. In a re-arrested patient who has already received the maximum cumulative dose during the previous arrest/resuscitation sequence, these medications should not be repeated. The exception is Epinephrine, which has no maximum cumulative dose in a coding patient.

#### **AED Analysis**

Most AEDs are programmed to analyze heart rhythm in two-minute intervals. However, once IV medications are introduced into the resuscitation, CPR must be performed for three minutes after each round of medications. Therefore, be aware that the Parkmedic may need to override the automatic cycling of the AED. In addition, once AED is applied, keep it attached to the patient throughout the PROTOCOL. However, if patient regains pulse turn AED to OFF mode.

#### **Cardiac Monitor External Defibrillator**

**If your AED already in place upon paramedic arrival continue your AED use until appropriate transition to cardiac monitor can be made.**

#### **Electrocardiogram**

Whenever return of spontaneous circulation occurs in the cardiac arrest patient, obtain 12 lead ECG.

#### **Transport**

**Cardiac arrest < 10 minutes from health care facility, transport with CPR in route. SPECIAL CASES (as noted in assessment section, step 2) < 30 minutes from health care facility, transport with CPR in route.**

All patients with ROSC, consider air transport if available.

# Cardiac Arrest with AED (Adult Medical)

1. Confirm Arrest
  - No response to aggressive stimulation.
  - Call for ALS/ACLS backup ASAP.
  - Simultaneously palpate for pulse 6 seconds (preferably carotid) while observing for breathing.
    - If pulse is present patient is NOT in cardiac arrest. **GO TO PROTOCOL:** *Altered Mental Status/Altered Level of Consciousness (ALOC)*, or other appropriate protocol.
    - If pulse is absent and AED is available, continue this PROTOCOL.
    - If pulse is absent and AED is NOT available, **GO TO PROTOCOL:** *Cardiac Arrest Without AED (Adult Medical)*.
2. Assessment
  - Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated and by what means (e.g., length of downtime determines whether to start with CPR or AED). As time allows, obtain additional information including preceding events and symptoms, PMH.
  - Do not attempt resuscitation in the following cases:
    - Rigor mortis, lividity, obviously fatal trauma, or DNR.
    - Documented pulseless downtime greater than 15 minutes. In specific SPECIAL CASES (cold water drowning, hypothermia, barbiturate ingestion, electrocution or lightning strike) downtime is extended to 30 min.
    - Refer to Initiation and Termination of Resuscitation algorithm at the end of this protocol.
  - If the downtime of the patient is known to be less than 4 minutes**, then initiate resuscitation with the AED; proceed to **Step 3**.
  - If the downtime of the patient is unknown, or is known to be greater than 4 minutes**, then initiate resuscitation with CPR; proceed to **Step 4**.
3. Apply AED
  - Turn on AED and follow prompts per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either recommend a shock or not recommend a shock. Allow the AED to deliver a shock if indicated.
4. Airway
  - Secure airway utilizing OPA/NPA or ALS airway (*King Tube/ETT*).
  - Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtacheal Jet Insufflation*.
  - Note: REFERENCE** “Resuscitation Management” section for priority of BLS versus ALS airway.
5. CPR/AED Cycle 1
  - Regardless of single- or dual-rescuer CPR, compression-to-ventilation ratio is 30:2. Compression rate is 100/minute; “Push Hard, Push Fast.”
  - Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.
  - If AED is already attached to the patient**, perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.
    - If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.
    - If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.
      - If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.
      - If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 6**.
  - If AED is not yet attached to patient**, perform 2 minutes of CPR, then attach AED to patient per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either recommend a shock or not recommend a shock.

# Cardiac Arrest with AED (Adult Medical)

If AED states "Shock Advised," follow prompts on AED to shock the patient. After shock is done, the AED will state "Shock Delivered." Do not check pulse. Proceed to **Step 6**.

If AED states "No Shock Advised," then check carotid pulse for 6 seconds.

If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.

If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 6**.

6. CPR/AED Cycle 2 Perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.  
If AED states "Shock Advised," follow prompts on AED to shock the patient. After shock is done, the AED will state "Shock Delivered." Do not check pulse. Proceed to **Step 7**.  
If AED states "No Shock Advised," then check carotid pulse for 6 seconds. If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 7**.  
After shock delivery, resume CPR, beginning with chest compressions. Minimize interruptions of chest compressions. After prolonged arrest defibrillation is more likely to be successful after a period of effective chest compressions. Ideally, chest compressions should be interrupted only for ventilations (until an advanced airway is in place), rhythm check, and shock delivery.
7. IV/IO Obtain IV/IO access (IO access preferred as initial access). Per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*. Bolus 1-L LR/NS while proceeding to **Step 8**.
8. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
9. Amiodarone Administer only if patient **WAS** shocked in **Step 6**.  
IV/IO: 300mg IVP.  
**Note:** if patient **WAS NOT** shocked in **Step 6**, hold Amiodarone. Administer Amiodarone in the first subsequent CPR/AED cycle in which the patient receives a shock. In any subsequent CPR/AED cycle in which the patient receives a second shock administer Amiodarone 150mg IV/IO. (see #11 note)
- Note:** Most AEDs are programmed to analyze heart rhythm in two-minute intervals. However, once IV medications are introduced into the resuscitation, CPR should be performed for three minutes after each round of medications. Therefore, be aware that the Parkmedic may need to override the automatic cycling of the AED.
10. CPR/AED Cycle 3 Perform CPR for three minutes while all medications from **Steps 8, 9** are administered. Do not check pulse before AED analysis.  
If AED states "Shock Advised," follow prompts on AED to shock the patient. After shock is done, the AED will state "Shock Delivered." Do not check pulse. Proceed to **Step 11**.  
If AED states "No Shock Advised," then check carotid pulse for 6 seconds. If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 11**.

# Cardiac Arrest with AED (Adult Medical)

11. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
- Note:** Administer Amiodarone IV/IO: 150mg IVP  
If the patient receives their second shock during this cycle (#3).
12. CPR/AED Cycle 4 Perform CPR for three minutes while medication from step 11 is administered.  
Do not check pulse before AED analysis.  
If AED states "Shock Advised," follow prompts on AED to shock the patient.  
After shock is done, the AED will state "Shock Delivered." Do not check pulse. Proceed to **Step 13**.  
If AED states "No Shock Advised," then check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 13**.
13. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
14. Sodium Bicarbonate IV/IO: 1 ampule (50meq) IVP.
15. CPR/AED Cycle 5 Perform CPR for three minutes while all medications from **Steps 13, 14** are administered.  
Do not check pulse before AED analysis.  
If AED states "Shock Advised," follow prompts on AED to shock the patient.  
After shock is done, the AED will state "Shock Delivered." Do not check pulse. Proceed to **Step 16**.  
If AED states "No Shock Advised," then check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 16**.
16. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
17. CPR/AED Cycle 6 Perform CPR for three minutes while medication from **Step 16** is administered. Do not check pulse before AED analysis.  
If AED states "Shock Advised," follow prompts on AED to shock the patient.  
After shock is done, the AED will state "Shock Delivered." Do not check pulse. Proceed to **Step 18**.  
If AED states "No Shock Advised," then check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has no palpable pulse nor spontaneous respirations, then proceed to **Step 18**.
18. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
19. CPR/AED Cycle 7 Perform CPR for three minutes while medication from **Step 18** is administered. Do not check pulse before AED analysis.  
If AED states "Shock Advised," follow prompts on AED to shock the patient.  
After shock is done, the AED will state "Shock Delivered." Check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has not regained pulse, nor has spontaneous respirations.  
Follow **CPR Termination Algorithm** at end of this PROTOCOL.

# Cardiac Arrest with AED (Adult Medical)

If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.  
If patient has a palpable pulse or spontaneous respirations, then proceed to **Step 20**.  
If patient has not regained pulse, nor has spontaneous respirations.  
Follow **CPR Termination Algorithm** at end of this PROTOCOL.

20. Reassess      If patient has a palpable pulse or shows signs of life, check pulse every 3 minutes and provide appropriate ventilatory support.
- If patient was not given Amiodarone during resuscitation Reference “Amiodarone” section in **Parkmedic Base Hospital/Communication Failure Orders**.
- If the rhythm remains “Non-shockable” (no shock advised) continue with cycles of CPR and epinephrine administration until:
- There is evidence of ROSC;
  - There is a change to a “Shockable” rhythm or;
  - You decide to terminate resuscitation efforts.
- Refer to Initiation and Termination of Resuscitation algorithm at the end of this protocol.
- Note:** Search for and treat reversible causes. See special considerations “Treatment.”
21. Transport      Transport if patient has a palpable pulse or transit time to healthcare facility is < 10 min. SPECIAL CASES (as noted in Assessment section): Transport if patient has a palpable pulse or transit time to healthcare facility is < 30 min.  
If return of spontaneous circulation, keep AED attached to patient in “off” mode. If patient re-arrests, turn the AED back to “on” mode, return to **Step 3**, and restart CPR/AED Cycle.  
If indicated but not yet performed, all patients should be assessed for airway intervention.
22. Base Contact      As soon as possible without compromising patient care.
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
23. Check Glucose      If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
24. Dextrose      If glucose < 80 or ALOC and unable to determine glucose:  
                            Administer 1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
                            May repeat in 5 minutes if ALOC persists and glucose still < 80.
25. Glucose Paste      If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
                            If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 26**.
26. Glucagon      1mg IM (if no IV/IO and unable to give Glucose Paste).  
                            If ALOC persists and glucose remains < 80, may repeat once in 15 minutes.

# Cardiac Arrest with AED (Adult Medical)

## Parkmedic Base Hospital/Communication Failure Orders

1. Amiodarone      Cardiac arrest responsive to shock who did not receive Amiodarone during resuscitation.  
Hold for HR < 80.  
IV/IO: 150mg in 100ml LR/NS over 10 minutes.
2. Return of Spontaneous Circulation      If return of spontaneous circulation, contact base for further management. If in communication failure consider clinical situation. If indicated, **GO TO PROTOCOL: Altered Mental Status/Altered Level of Consciousness (ALOC), Hypothermia, Respiratory Distress, Shock Without Trauma, etc.**
3. CPR Termination      Follow **CPR Termination Algorithm** at end of this PROTOCOL.  
  
Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

# Cardiac Arrest with AED (Adult Medical)

## SPECIAL CONSIDERATIONS

**Return of Spontaneous Circulation (ROSC)** If return of spontaneous circulation, contact base for further management. If in communication failure consider clinical situation. If indicated, GO TO PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC), Hypothermia, Respiratory Distress, Shock Without Trauma*, etc.

**Amiodarone** Actively coding with shockable rhythm: 300mg IVP, 2<sup>nd</sup> dose 150mg IVP.

Patients suffering cardiac arrest responsive to shock who did not receive Amiodarone during resuscitation, administer IV/IO: 150mg in 100ml NS over 10 minutes.  
Hold for HR < 80 as Amiodarone may worsen/induce bradycardia.

Base contact advised

### Initiation AND Termination of CPR Guideline

	Adult		Pediatric	
	Standard	Special Circumstance	Standard	Special Circumstance
<b>Medical Arrest</b>	15 min	30 min	30 min	60 min
	Adult		Pediatric	
	<b>Blunt</b>	<b>Penetrating</b>	<b>Blunt</b>	<b>Penetrating</b>
<b>Trauma Arrest</b>	5 min	10 min	10 min	20 min

#### Notes:

These times apply to either:

Not initiating CPR in the setting of known down time prior to EMS arrival or Cessation of CPR in an unsuccessful EMS resuscitation.

Special Circumstances include: Hypothermia, Barbiturate ingestion, Nitrate ingestion, Cold water drowning, Electrocutation, and Lightning injury.

Do not initiate if signs of prolonged lifelessness (e.g. rigor mortis, lividity) or obvious non-survivable injury (e.g. severe [100% 3<sup>rd</sup> degree] burn or decapitation).

### Assessment

Patient condition immediately prior to arrest: chest pain, shortness of breath?

Bystander resuscitation: downtime before CPR, duration of CPR, bystander experience?

Physical Exam:

Respirations: Shallow? Rate? Spontaneous?

Breath sounds: Equal? Crackles? Rhonchi?

Heart: Beating? Regular or irregular?

Pulses: Carotid? Peripheral? Regular? All pulse checks during resuscitation should be for 6 seconds. Pulse checks for termination are for 30 seconds (ideally carotid and femoral). Do not stop CPR to perform pulse checks unless specified by protocol.

Abdomen: Soft? Signs of GI bleeding?

Skin: Warm? Dry? Cyanosis? Rigor/lividity? Cold? Surgical scars/implants?

Pupils: Reactive? Size?

Evidence of trauma? Acute blood loss?

Previous medical history: medications, allergies, depression/previous attempt at self injury, drug ingestions, history of renal failure?



# Cardiac Arrest with AED (Adult Medical)

**Differential Diagnosis** Cardiac arrest is the final common pathway for every cause of death. It is important to differentiate irreversible causes of cardiac arrest from potentially reversible causes of cardiac arrest. Some examples of potentially reversible causes of cardiac arrest include: cardiogenic shock, cardiac dysrhythmia, hypovolemia, hypoglycemia, hyperkalemia, tension pneumothorax, pericardial tamponade, respiratory arrest, allergic reaction, drug/medication/toxin ingestion, hypothermia, hyperthermia, drowning, electrical injury or trauma.

**Treatment** \*\*\* In selected circumstances consider inserting any/all of the therapies below: \*\*\*

1. NS 1 liter IV/IO bolus - History of possible dehydration.
2. Sodium bicarbonate 50 meq (1 ampule) IV/IO - History of toxicologic exposure, renal failure or excessive exertion.
3. Dextrose - 1 ampule D50 IV/IO (1 ampule = 25g in 50ml) - History of diabetes medication or starvation.

**Documentation** Initial and subsequent vital signs and mental status.  
Downtime before CPR, duration of CPR, and by whom.  
Time and response to interventions administered.  
Time of death if applicable.  
If outcome unsuccessful, leave airway, IV/IO, etc. in place.  
If CPR was not initiated, the reason for not initiating CPR.

## Cross Reference

### **Procedures:**

Automated External Defibrillator  
Glucose Determination  
Intraosseous (IO) Access  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration  
Transtracheal Jet Insufflation

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest Without AED (Adult Medical)  
Hypothermia  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED  
Pediatric – Newborn Arrest  
Respiratory Distress  
Shock Without Trauma

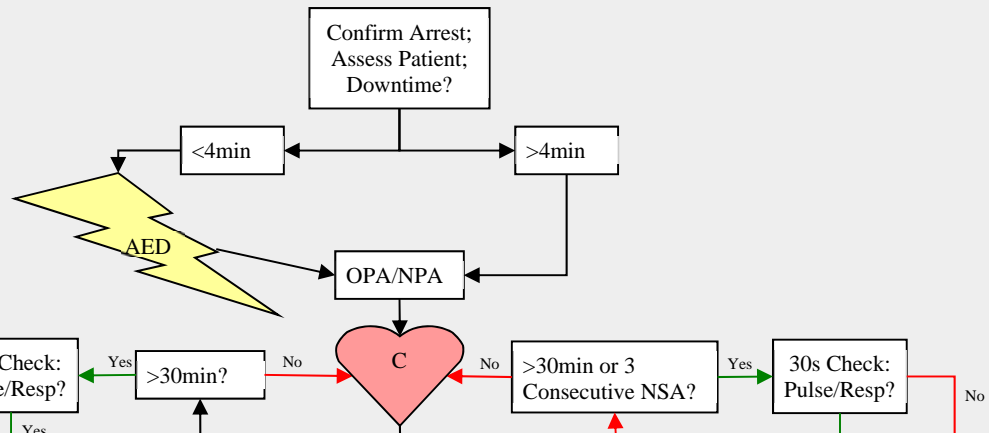
### **Drugs:**

Amiodarone  
Dextrose 50% (D50)  
Epinephrine  
Glucagon  
Glucose Paste or Gel  
Sodium Bicarbonate

# Cardiac Arrest with AED (Adult Medical)

## Non-Drug Phase

(Gray Shaded Area):  
EMT, or Parkmedic  
with no IV Access

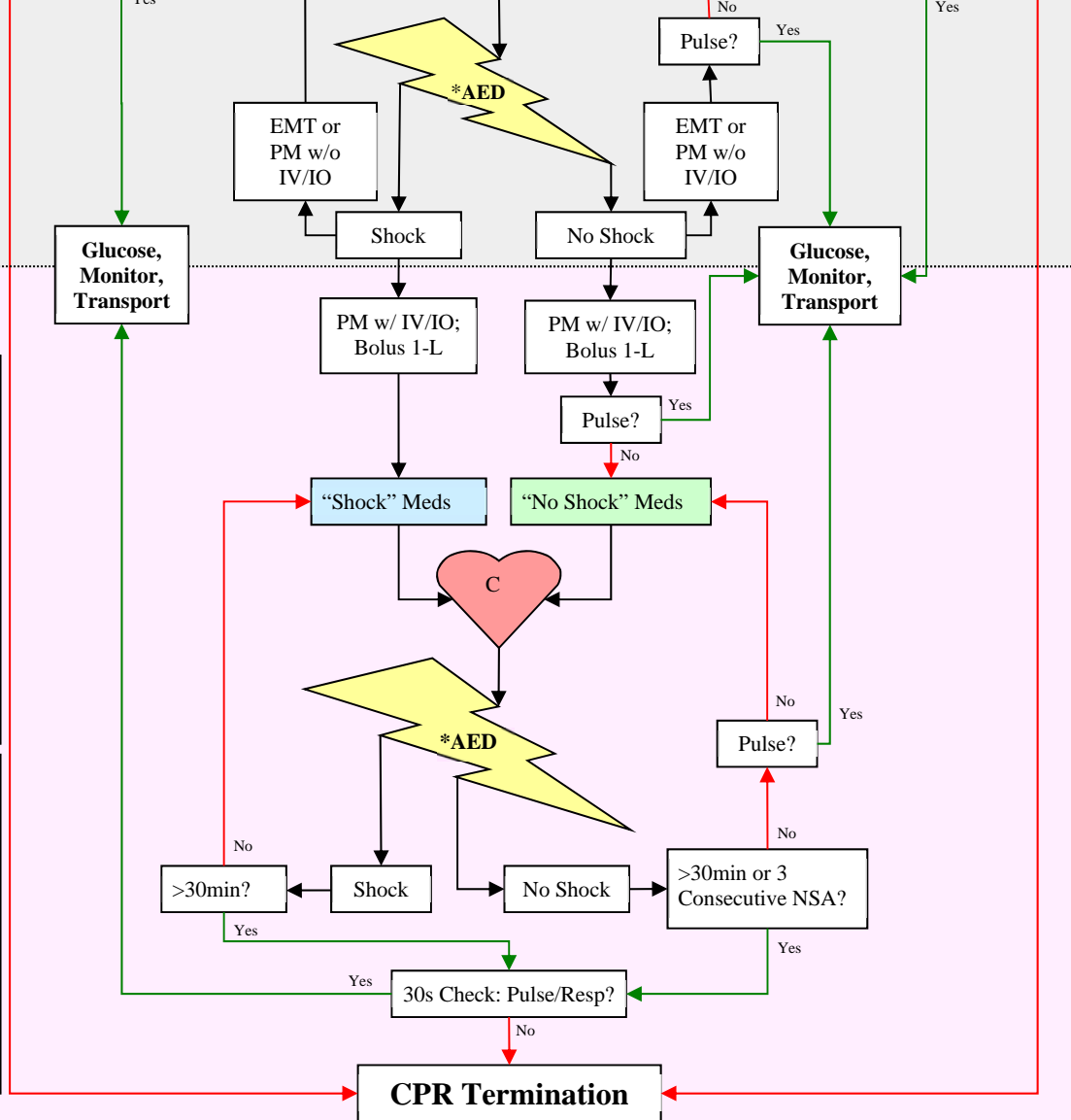


## Drug Phase

(Pink Shaded Area):  
Parkmedic with IV Access

- “Shock” Meds:**
1. Epinephrine, Amiodarone (30mg).
  2. Epinephrine.
  - \*\*Amiodarone (150mg)
  3. Epinephrine, Bicarbonate.

- “No Shock” Meds:**
1. Epinephrine,
  2. Epinephrine.
  3. Epinephrine, Bicarbonate.
  4. Epinephrine.



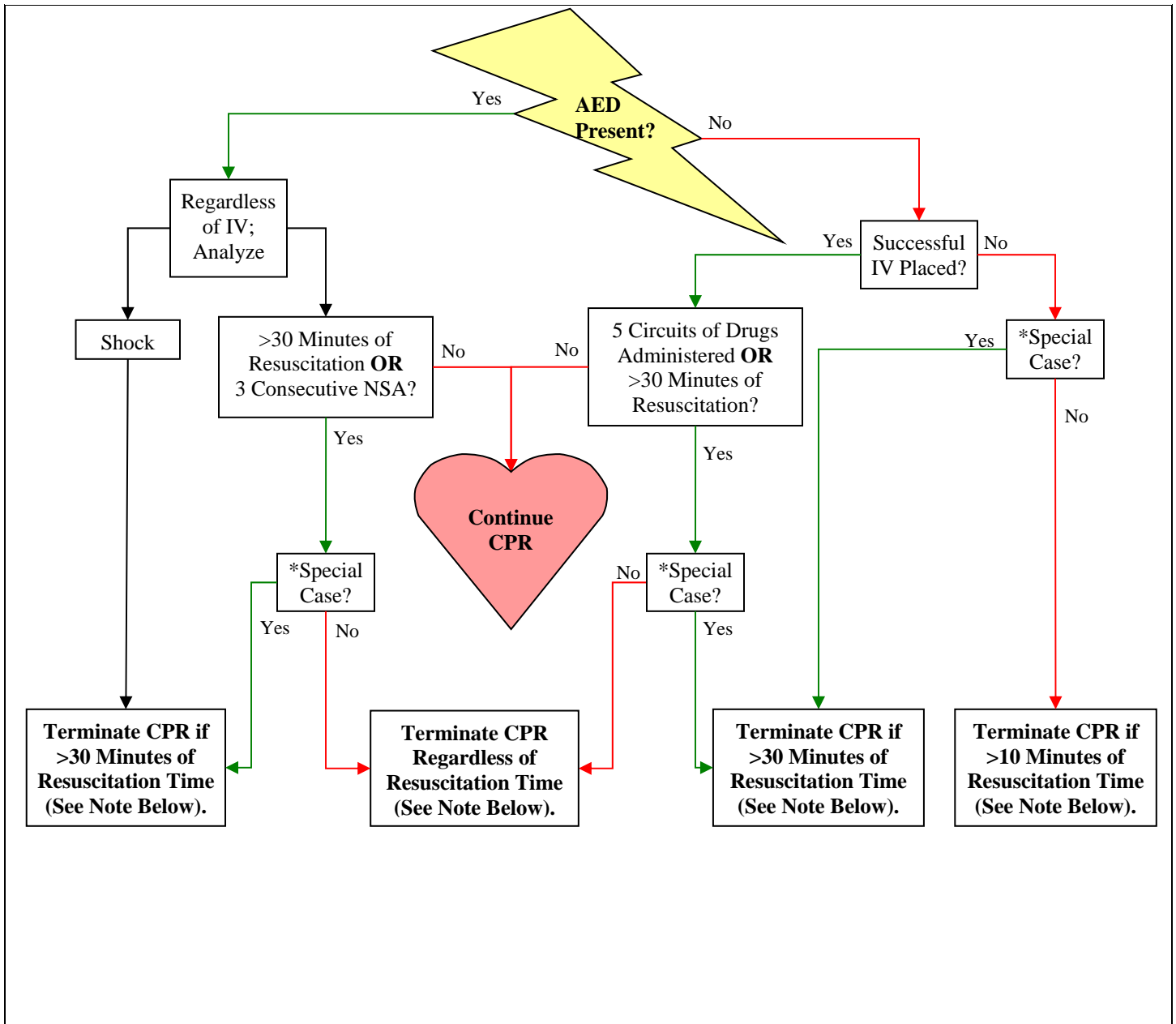
NSA: “No Shock Advised”

**Navigation:** For each circuit through the “Shock” Meds or “No Shock” Meds, drugs should be administered as indicated by the numbered sequence (1,2,3,4...). In addition, all medication preparation and administration should be done while active CPR is being performed; do not delay CPR for medication administration.

\*AED: When an AED arrives late to an ongoing adult resuscitation, enter this algorithm at either “\*AED” depending on whether medications will be administered.

\*\*Additional Amio at 150mg IVP should be administered during any cycle in which the patient receives their second shock.

# CPR Termination Algorithm



**\*Special Cases:** cold water drowning, hypothermia, barbiturate ingestion, electrocution, lightning, or pediatric patients (age <14yrs).

**NSA:** No Shock Advised.

**Note:** Before terminating CPR, palpate pulse and evaluate for spontaneous respirations for 30 seconds. Confirm with a second provider if available. If no palpable pulse nor spontaneous respirations, CPR may be terminated. If patient has a palpable pulse or spontaneous respirations, continue with *PROTOCOL: Cardiac Arrest With AED-Adult Medical*. Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

# Cardiac Arrest Without AED (Adult Medical)

## EMT Standing Orders

If patient is  $\leq 14$ yr or shorter than NPS Pediatric Resuscitation Tape/Broselow Tape (5 feet), **GO TO PROTOCOL:** *Pediatric - Medical Arrest Without AED* or *Pediatric - Medical Arrest With AED*.

If patient is a newborn **GO TO PROTOCOL:** *Pediatric – Newborn Resuscitation*.

### **AED Arrival During Resuscitation:**

If an AED arrives on scene in the middle of a resuscitation previously without an AED, **GO TO PROTOCOL:** *Cardiac Arrest With AED (Adult Medical)*, **EMT Standing Orders** and continue resuscitation. Also see Cardiac Monitor/External Defibrillator below.

### Resuscitation Guidelines

#### **Resuscitation Management**

This protocol may be followed by a single provider. Ideally, additional provider or bystander help should be solicited. CPR and application of defibrillator devices are the priorities.

Once a second provider is available (even a well-trained bystander) direct them to perform CPR

In cardiac arrest, emphasis should be on defibrillation and quality CPR

#### **CPR**

Emphasis should be on minimizing interruptions of compressions during CPR. Even when ALS providers arrive on scene, airway interventions, IV/IO access, rhythm analysis, and medication administration should be completed with minimal interruptions in chest compressions. Either single- or dual-rescuer CPR is conducted with a compression-to-ventilation ratio of 30:2. Compression rate is 100/minute: “Push Hard, Push Fast.” Continue with 5 cycles of CPR (30:2) – approximately 2-3 minutes. **Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**

#### **Cardiac Monitor External Defibrillator**

**Upon ALS/AED arrival continue your resuscitation until appropriate transition to cardiac monitor/AED can be made. GO TO PROTOCOL:** *Cardiac Arrest With AED (Adult Medical)*

#### **Transport**

**Cardiac arrest < 10 minutes from health care facility, transport with CPR in route. SPECIAL CASES (as noted in assessment section, step 2) < 30 minutes from health care facility, transport with CPR in route.**  
All patients with ROSC, consider air transport if available.

# Cardiac Arrest Without AED (Adult Medical)

1. Confirm Arrest  
No response to aggressive stimulation.  
Call for AED and ALS/ACLS backup ASAP.  
Check breathing, give 2 breaths if indicated, and check pulse 6 seconds (preferably carotid).  
If pulse is present, patient is NOT in cardiac arrest. **GO TO PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)***, or other appropriate protocol.  
If pulse is absent and AED is NOT available, continue this PROTOCOL.  
If pulse is absent and AED is available, **GO TO PROTOCOL: *Cardiac Arrest with AED (Adult Medical)***.
2. Assessment  
Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated. means (e.g., length of downtime determines whether to start with CPR or AED) As time allows, obtain additional information including: bystander CPR, preceding events and symptoms, PMH.  
  
Do not attempt resuscitation in the following cases:  
Rigor mortis, lividity, obviously fatal trauma, or DNR.  
Documented pulseless downtime greater than 15 minutes. In specific SPECIAL CASES (cold water drowning, hypothermia, barbiturate ingestion, electrocution or lightning strike) downtime is extended to 30 min.
3. Airway  
Secure airway utilizing OPA/NPA.
4. CPR  
Regardless of single- or dual-rescuer CPR, compression-to-ventilation ratio is 30:2. Compression rate is 100/minute; “Push Hard, Push Fast.”  
**Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**  
Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.
5. Transport/  
ALS Backup  
Transport if patient has a palpable pulse or transit time to healthcare facility is <10 min. SPECIAL CASES (as noted in Assessment section): Transport if patient has a palpable pulse or transit time to healthcare facility is <30 min.  
If indicated but not yet performed, all patients should be assessed for airway intervention. If patient has a palpable pulse, or shows signs of life, check pulse every 3 min and provide appropriate ventilatory support.
6. Base Contact  
As soon as possible without compromising patient care.
7. Check Glucose  
If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
8. Glucose Paste  
If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).

## **EMT Base Hospital/Communication Failure Orders**

1. CPR Termination  
Follow **CPR Termination Algorithm** at end of this PROTOCOL.  
  
Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

# Cardiac Arrest Without AED (Adult Medical)

## Parkmedic Standing Orders

If patient is  $\leq 14$ yr or shorter than the NPS Pediatric Resuscitation Tape/Broselow Tape (5 feet), **GO TO** PROTOCOL: *Pediatric - Medical Arrest Without AED* or *Pediatric - Medical Arrest With AED*.

If patient is a newborn **GO TO** PROTOCOL: *Pediatric – Newborn Resuscitation*.

### Resuscitation Guidelines

#### **Resuscitation Management**

This protocol may be followed by a single provider. Ideally, additional provider or bystander help should be solicited. CPR and application of defibrillator devices are the priorities. These interventions should not be delayed for IV/IO placement, medication administration or ALS airways.

Once a second provider is available (even a well-trained bystander) direct them to perform CPR. The Parkmedic should attempt IV/IO placement per **Steps 5 or 13**. Once an IV/IO is placed successfully, administer appropriate medications per PROTOCOL.

In cardiac arrest, emphasis should be on defibrillation and quality CPR; however, an ALS airway will augment the effectiveness of ventilations. Early in the resuscitation, if BLS airway is inadequate or if manpower allows, consideration of ALS airway is warranted. Otherwise, after the first cycle of IV/IO medications has been delivered, the next priority is to convert the BLS airway to an ALS airway.

#### **CPR**

Emphasis should be on minimizing interruptions of compressions during CPR. Airway interventions, IV/IO access, rhythm analysis, and medication administration should be completed with minimal interruptions in chest compressions. Either single- or dual-rescuer CPR is conducted with a compression-to-ventilation ratio of 30:2. Compression rate is 100/minute: “Push Hard, Push Fast.” Continue with 5 cycles of CPR (30:2) – approximately 2-3 minutes. **Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**

#### **Medication Note**

**Unless otherwise directed by base**, the cumulative dose for Amiodarone is 450 mg IV/IO. The dose for Sodium Bicarbonate is 50 meq IV/IO. In a re-arrested patient who has already received the maximum cumulative dose during the previous arrest/resuscitation sequence, these medications should not be repeated. The exception is Epinephrine, which has no maximum cumulative dose in a coding patient.

#### **Cardiac Monitor External Defibrillator**

**Upon ACLS/AED arrival continue your resuscitation until appropriate transition to cardiac monitor/AED can be made GO TO PROTOCOL: *Cardiac Arrest With AED (Adult Medical)***

#### **Electrocardiogram**

Whenever return of spontaneous circulation occurs in the cardiac arrest patient, obtain 12-lead ECG.

#### **Transport**

**Cardiac arrest < 10 minutes from health care facility, transport with CPR in route.**  
**SPECIAL CASES** (as noted in assessment section, step 2) < 30 minutes from health care facility, transport with CPR in route.  
All patients with ROSC, consider air transport if available.

# Cardiac Arrest Without AED (Adult Medical)

1. Confirm Arrest  
No response to aggressive stimulation.  
Call for AED and ACLS backup ASAP.  
Check breathing, give 2 breaths if indicated, and check pulse (preferably carotid).  
If pulse is present, patient is NOT in cardiac arrest. **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)*, or other appropriate protocol.  
If pulse is absent and AED is NOT available, continue this PROTOCOL.  
If pulse is absent and AED is available, **GO TO** PROTOCOL: *Cardiac Arrest with AED (Adult Medical)*.
2. Assessment  
Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated and by what means (e.g., length of downtime determines whether to start with CPR or AED). As time allows, obtain additional information: including bystander CPR, preceding events and symptoms, PMH.  
  
Do not attempt resuscitation in the following cases:  
Rigor mortis, lividity, obviously fatal trauma, or DNR.  
Documented pulseless downtime greater than 15 minutes. In specific SPECIAL CASES (cold water drowning, hypothermia, barbiturate ingestion, electrocution or lightning strike) downtime is extended to 30 min.  
Refer to Initiation and Termination of Resuscitation algorithm at the end of this protocol.
3. Airway  
Secure airway utilizing OPA/NPA or ALS airway (*King Tube/ETT*).  
Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtracheal Jet Insufflation*.  
**Note: REFERENCE** “Resuscitation Management” section for priority of BLS versus ALS airway.
4. CPR  
Regardless of single- or dual-rescuer CPR, compression-to-ventilation ratio is 30:2.  
Compression rate is 100/minute; “Push Hard, Push Fast.”  
**Single-rescuer resuscitation may be initiated with compression-only CPR depending upon available assistance and necessary airway equipment.**  
Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.  
Do not stop CPR to perform pulse checks unless specified by protocol.
5. IV/IO  
Obtain IV/IO access.  
Per PROCEDURE: *IV Access and IV Fluid Administration and IO Access and IV Fluid Administration*.  
Bolus 1-L LR/NS while proceeding to **Step 6**.
6. Epinephrine  
IV/IO: 10ml (1mg) of 1:10,000 IVP.
7. CPR  
Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.  
If patient has a palpable pulse, or shows signs of life, proceed to **Step 18**.  
If patient has not regained pulse, nor shows signs of life, proceed to **Step 8**.
8. Epinephrine  
IV/IO: 10ml (1mg) of 1:10,000 IVP.
9. CPR  
Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.  
If patient has a palpable pulse, or shows signs of life, proceed to **Step 18**.  
If patient has not regained pulse, nor shows signs of life, proceed to **Step 10**.
10. Amiodarone  
IV/IO: 300mg IVP.
11. Epinephrine  
IV/IO: 10ml (1mg) of 1:10,000 IVP.

## Cardiac Arrest Without AED (Adult Medical)

12. CPR Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.  
If patient has a palpable pulse, or shows signs of life, proceed to **Step 18**.  
If patient has not regained pulse, nor shows signs of life, proceed to **Step 13**.
13. Sodium Bicarbonate IV/IO: 1 ampule (50meq) IVP.
14. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
15. CPR Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.  
If patient has a palpable pulse, or shows signs of life, proceed to **Step 18**.  
If patient has not regained pulse, nor shows signs of life, proceed to **Step 16**.
16. Epinephrine IV/IO: 10ml (1mg) of 1:10,000 IVP.
17. CPR Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.  
If patient has a palpable pulse, or shows signs of life, proceed to **Step 18**.  
If patient has not regained pulse, nor shows signs of life, Refer to Initiation and Termination of Resuscitation algorithm at the end of this protocol.
18. Reassess If patient has a palpable pulse, or shows signs of life, check pulse every 3 min and provide appropriate ventilatory support.  
If patient was not given Amiodarone during resuscitation Reference “Amiodarone” section in **Parkmedic Base Hospital/Communication Failure Orders**.
19. Transport Transport if patient has a palpable pulse or transit time to healthcare facility is < 10 min.  
SPECIAL CASES (as noted in Assessment section): Transport if patient has a palpable pulse or transit time to healthcare facility is < 30 min.  
If indicated but not yet performed, all patients should be assessed for airway intervention.
20. Base Contact As soon as possible without compromising patient care.
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
21. Check Glucose If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
22. Dextrose If glucose < 80 or ALOC and unable to determine glucose:  
Administer 1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
May repeat in 5 minutes if ALOC persists and glucose still <80.
23. Glucose Paste If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 24**.
24. Glucagon 1mg IM (if no IV/IO and unable to give Glucose Paste).  
If ALOC persists and glucose remains < 80, may repeat once in 15 minutes.



# Cardiac Arrest Without AED (Adult Medical)

## Parkmedic Base Hospital/Communication Failure Orders

1. Amiodarone during resuscitation. In patients successfully resuscitated after cardiac arrest who did not receive Amiodarone during resuscitation.  
Hold for HR < 80.  
IV/IO: 150mg in 100ml LR/NS over 10 minutes.
2. Return of Spontaneous Circulation If return of spontaneous circulation, contact base for further management. If in communication failure consider clinical situation. If indicated, **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)*, *Hypothermia, Respiratory Distress, Shock Without Trauma*, etc.
3. CPR Termination Follow **CPR Termination Algorithm** at end of this PROTOCOL.  
  
Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

# Cardiac Arrest Without AED (Adult Medical)

## SPECIAL CONSIDERATIONS

**Return of Spontaneous Circulation (ROSC)** If return of spontaneous circulation, contact base for further management. If in communication failure consider clinical situation. If indicated, GO TO PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC), Hypothermia, Respiratory Distress, Shock Without Trauma, etc.*

**Amiodarone** Is indicated in actively coding patients with a shockable rhythm: 300mg IVP, 2<sup>nd</sup> dose 150mg IVP. Since this protocol is for resuscitations without an AED, the reason for Amiodarone being administered in Step 10 is the presumption that a patient may be in V-fib or pulseless V-tach and in any other rhythm successful resuscitation is extremely unlikely.

Only for patients successfully resuscitated who did not receive Amiodarone during resuscitation, administer IV/IO: 150mg in 100ml NS over 10 minutes.

Hold for HR < 80 as Amiodarone may worsen/induce bradycardia.

Base contact advised

### Initiation AND Termination of CPR Guideline

	Adult		Pediatric	
	Standard	Special Circumstance	Standard	Special Circumstance
<b>Medical Arrest</b>	15 min	30 min	30 min	60 min
	Adult		Pediatric	
	Blunt	Penetrating	Blunt	Penetrating
<b>Trauma Arrest</b>	5 min	10 min	10 min	20 min

#### Notes:

These times apply to either:

Not initiating CPR in the setting of known down time prior to EMS arrival or Cessation of CPR in an unsuccessful EMS resuscitation.

Special Circumstances include: Hypothermia, Barbiturate ingestion, Nitrate ingestion, Cold water drowning, Electrocutation, and Lightning injury.

Do not initiate if signs of prolonged lifelessness (e.g. rigor mortis, lividity) or obvious non-survivable injury (e.g. severe [100% 3<sup>rd</sup> degree] burn or decapitation).

#### Assessment

Patient condition immediately prior to arrest: chest pain, shortness of breath?

Bystander resuscitation: downtime before CPR, duration of CPR, bystander experience?

Physical Exam:

Respirations: Shallow? Rate? Spontaneous?

Breath sounds: Equal? Crackles? Rhonchi?

Heart: Beating? Regular or irregular?

Pulses: Carotid? Peripheral? Regular? All pulse checks during resuscitation should be for 6 seconds. Pulse checks for termination are for 30 seconds. Do not stop CPR to perform pulse checks unless specified by protocol.

Abdomen: Soft? Signs of GI bleeding?

Skin: Warm? Dry? Cyanosis? Rigor/lividity? Cold? Surgical scars/implants?

Pupils: Reactive? Size?

Evidence of trauma? Acute blood loss?

Previous medical history: medications, allergies, depression/previous attempt at self injury, drug ingestions, history of renal failure?

# Cardiac Arrest Without AED (Adult Medical)

<b>Differential Diagnosis</b>	Cardiac arrest is the final common pathway for every cause of death. It is important to differentiate irreversible causes of cardiac arrest from potentially reversible causes of cardiac arrest. Some examples of potentially reversible causes of cardiac arrest include: cardiogenic shock, cardiac arrhythmia, hypovolemia, tension pneumothorax, pericardial tamponade, respiratory arrest, allergic reaction, drug/medication/toxin ingestion, hypothermia, hyperthermia, drowning, electrical injury or trauma.
<b>Medication Issues</b>	Amiodarone may cause bradycardia. (see note above) Atropine is no longer indicated for bradycardic or asystolic arrests.
<b>Transport</b>	Once cardiac arrest is suspected, begin arrangements for transport and ALS rendezvous.
<b>Documentation</b>	Initial and subsequent vital signs and mental status. Downtime before CPR, duration of CPR, and by whom. Time and response to interventions administered. Time of death if applicable. If outcome unsuccessful, leave airway, IV/IO, etc. in place. If CPR was not initiated, the reason for not initiating CPR.

## Cross Reference

### **Procedures:**

Automated External Defibrillator  
Blood Glucose Determination  
Endotracheal Intubation  
Intraosseous (IO) Access  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration  
Transtracheal Jet Insufflation (TTJI)

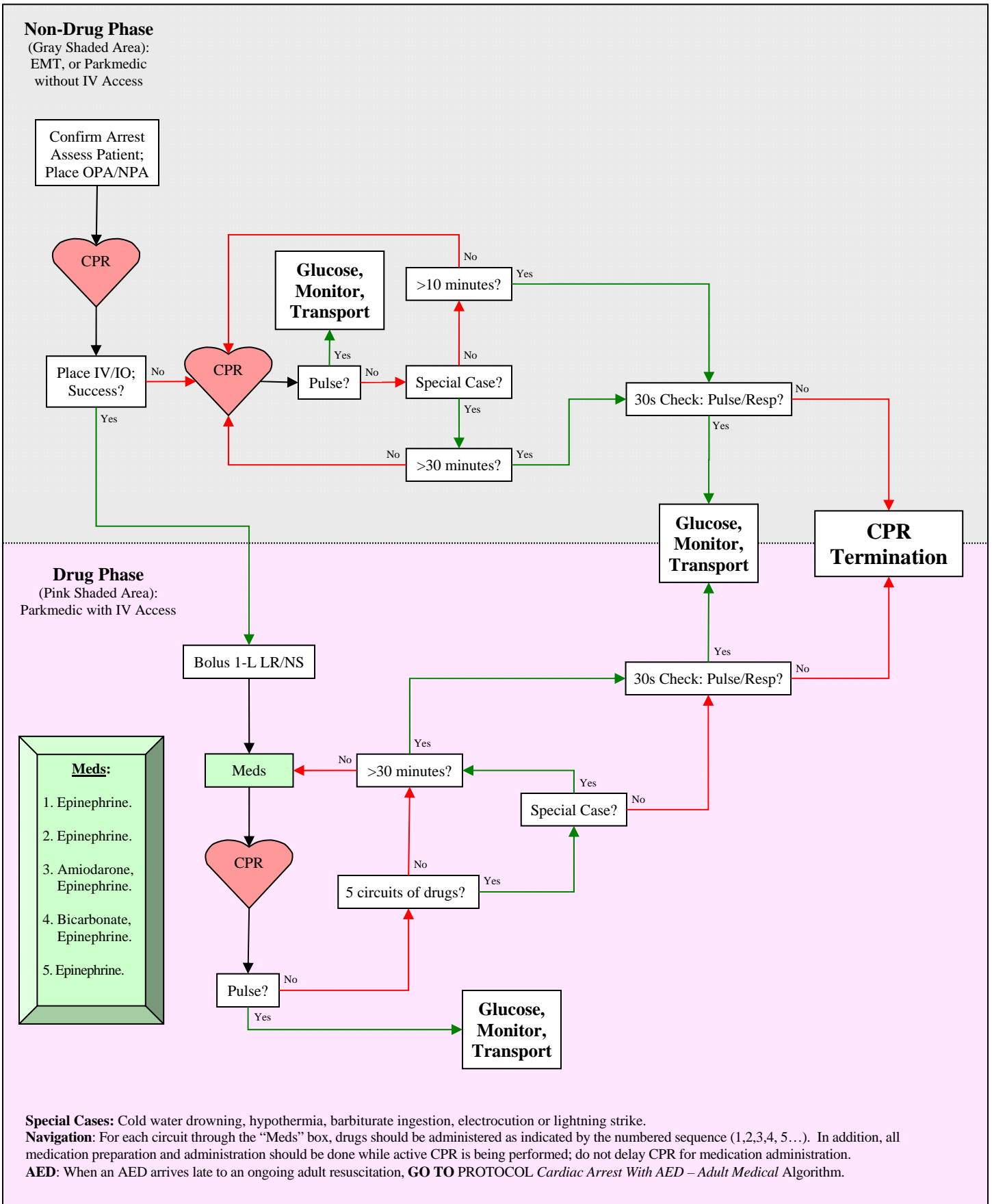
### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Hypothermia  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED  
Pediatric – Newborn Resuscitation  
Respiratory Distress  
Shock Without Trauma

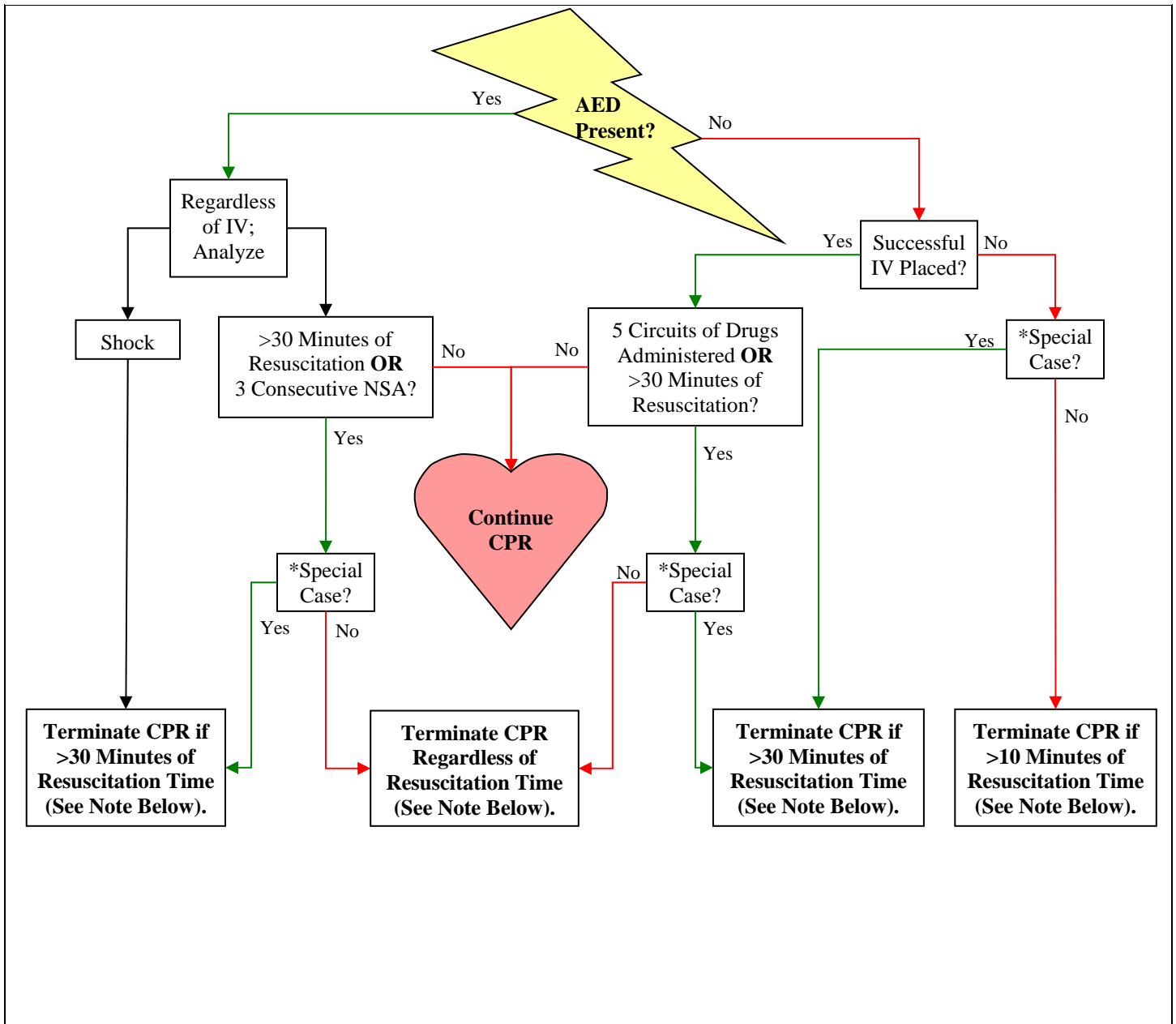
### **Drugs:**

Amiodarone  
Dextrose 50% (D50)  
Epinephrine  
Glucagon  
Glucose Paste or Gel  
Sodium Bicarbonate

# Cardiac Arrest Without AED (Adult Medical)



# CPR Termination Algorithm



**\*Special Cases:** cold water drowning, hypothermia, barbiturate ingestion, electrocution, lightning, or pediatric patients (age <14yrs).

**NSA:** No Shock Advised.

**Note:** Before terminating CPR, palpate pulse and evaluate for spontaneous respirations for 30 seconds. Confirm with a second provider if available. If no palpable pulse nor spontaneous respirations, CPR may be terminated. If patient has a palpable pulse or spontaneous respirations, continue with PROTOCOL: *Cardiac Arrest With AED-Adult Medical*. Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

# Chest Pain - Cardiac

## EMT Standing Orders

1. Assessment Evaluate ABCs. Assess pain PQRST, vital signs, lung sounds (rales), skin signs, mental status, cardiac history, medications, blood pressure in both arms.
2. Airway Protect the airway, assist respirations, and suction as needed. Consider OPA/NPA
3. Oxygen Low flow per PROCEDURE: *Oxygen Administration*. If signs of shock or respiratory distress, use high flow O<sub>2</sub>.
4. Aspirin Per EMT Base Hospital/Communication Failure Orders.
5. Reassurance Provide reassurance and prevent patient exertion.
6. STAT Transport Transport in position of comfort. Consider air transport and/or rendezvous with higher level of care for ongoing pain, abnormal vitals, shortness of breath, signs of shock, or prolonged ground transport.
7. Base Contact

## EMT Base Hospital/Communication Failure Orders

1. Aspirin If the patient has their own Aspirin, encourage the patient to take it **ONLY** if they have no allergy to Aspirin, no neurologic complaints, AND a normal mental status. Assist patient with one 325mg or four 81mg tablets, chewed and swallowed, with a little water if needed.
2. Nitroglycerin If patient has own nitroglycerin tablets or spray, EMT may assist the patient in administration if they have **ALL** of the following:
  - ongoing chest pain
  - SBP > 100
  - normal neuro exam
  - normal mental status
  - no erectile dysfunction drug use in last 24 hours

One 0.4 mg tablet under tongue or one spray in back of mouth.  
Repeat every 5 minutes if above conditions are still met, up to 8 tablets/sprays.  
Check vitals and symptoms before and 2-3 minutes after each dose.

# Chest Pain - Cardiac

## Parkmedic Standing Orders

1. Assessment Evaluate ABCs. Assess pain PQRST, vital signs, lung sounds (rales), skin signs, mental status, cardiac history, medications, blood pressure in both arms.  
For bradycardic patients see Parkmedic Base Hospital/Communication Failure Orders for atropine administration.
2. Airway Protect the airway, assist respirations, and suction as needed. Consider OPA/NPA /CPAP or ALS airway as indicated. Per PROCEDURE: *CPAP/ETT/King Tube*.
3. Oxygen Low flow per PROCEDURE: *Oxygen Administration*. If signs of shock or respiratory distress, use high flow O<sub>2</sub>.
4. AED Apply AED, REFERENCE PROCEDURE *Automated External Defibrillator* and treat rhythm if appropriate.  
If appropriate, **GO TO** appropriate *Cardiac Arrest/Dysrhythmias Protocol*
5. Aspirin Administer 325mg tablet or four 81mg tablets PO, chewed and swallowed with a little water as needed.
6. Nitroglycerin Administer 0.4 mg SL or mouth spray. **Hold for systolic BP < 100**. Repeat every minutes if chest pain continues, and systolic BP is greater than 100, to a total of 8 doses. Check BP before each dose. After fourth nitroglycerin dose, administer one dose of fentanyl 25-50mcg while continuing the above nitroglycerin regimen.  
  
Administer if patient has, and continues to have, all of the following:
  - ongoing chest pain
  - SBP >100
  - normal neuro exam
  - normal mental status
  - no erectile dysfunction drug use in last 24 hours
7. IV/IO Access Establish IV/IO Access per PROCEDURE: *IV/Access and IV Fluid Administration and Intraosseous Access*.
8. Reassurance Provide reassurance and prevent patient exertion.
9. 12-lead ECG If readily available, obtain 12-lead ECG in accordance with manufacturer's guidelines. Relay any relevant read (e.g. **\*\*\*AMI\*\*\***) to base hospital
10. STAT Transport Transport in position of comfort. Consider air transport and/or rendezvous with higher level of care for ongoing pain, abnormal vitals, shortness of breath, signs of shock STEMI, or prolonged ground transport. Check vitals 2-3 minutes after every intervention. Consider early Base contact.
11. Ondansetron For nausea or vomiting or history of vomiting with narcotic administration  
Adult:           IV/IO: 4mg IV over 2-5 min, repeat in 15 min x2 prn nausea.  
                      ODT: 4mg, repeat in 15 min x2 prn nausea.  
                      IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
  
**Note:** If ECG available and shows prolonged QTc, do not give without Base approval.

## Chest Pain - Cardiac

12. IV Fluid Administration Per PROCEDURE: *IV Access and IV Fluid Administration*. Bolus IV fluids based on SBP:

SBP > 100: LR/NS Saline Lock.  
SBP 80-100: LR/NS 250ml bolus.  
SBP < 80: LR/NS 500ml bolus.

Repeat IV fluid bolus as needed if lung sounds remain clear, following SBP directives.

13. Nitropaste If SBP > 100: Apply 1-inch to anterior chest wall.  
If SBP drops below 90: Wipe paste off chest wall.

14. Midazolam Administer 2mg IV/IO/IN if ischemic chest discomfort associated with sympathomimetic abuse (cocaine, crack, amphetamines, crank). May repeat once if needed.

15. Fentanyl If ongoing pain unresponsive to nitroglycerin, SBP > 100, and normal mental status.  
IV/IO/IN: 25-50 mcg. Repeat in 10 min x1 prn pain.  
Subsequent doses (2 max) every 20 minutes.  
i.e. Fastest possible dosing schedule would be; time 0, 10, 30, 50 min.  
IM: 50 - 100 mcg every 20 minutes. Repeat in 20 min x2 prn pain.  
i.e. Fastest possible dosing schedule would be; time 0, 20, 40 min.

**Recheck vitals and mental status before and after each dose. Administer ONLY if SBP > 100 and normal mental status.**

16. Long Acting Narcotic (Morphine **OR** Hydromorphone (Dilaudid)). Only to be used 20 minutes after fentanyl dosing schedule above is completed.

Morphine If severe pain, SBP > 100, and normal mental status.

IM: 5mg (0.5ml) every 20 min prn pain (max 20mg)  
IV/IO: 4-10mg (0.4-1ml) every 20 min prn pain (max 20mg)

**OR**

Hydromorphone (Dilaudid) If severe pain, SBP > 100, and normal mental status.

IV/IO: 0.5-1.0 mg (0.5-1ml) every 30 min prn pain (max 2mg)  
IM: 1mg (1ml) every 30 min prn pain (max 2mg).

**Recheck vitals and mental status before and after each dose. Administer ONLY if SBP > 100 and normal mental status.**

17. Base Contact

### **Parkmedic Base Hospital/Communication Failure Orders**

1. Atropine If ALL are present:

- HR < 50
- SBP < 90
- Symptoms (active chest pain **OR** shortness of breath **OR** nausea/vomiting **OR** altered mental status).

IV/IM: 0.5mg every 5 min prn HR < 50, SBP < 90, AND symptoms (max 3mg).



# Chest Pain - Cardiac

## SPECIAL CONSIDERATIONS

### **Assessment**

History of pain "PQRST":

P: Provoking/Palliating factors.

Q: Quality/Quantity of pain.

R: Region/Radiation of pain.

S: Setting/Severity (scale 1-10).

T: Time (onset/duration/variability of pain).

General appearance: ashen, cyanotic, anxious, sweating, respiratory distress.

PMH: heart attack, high blood pressure, heart disease, CHF, diabetes, high cholesterol.

Predisposing factors: age >40, smoking, high blood pressure, high cholesterol, family history of heart disease, prior heart problems or prior heart attack, diabetes.

Medications: heart/blood pressure medication (aspirin, nitroglycerine), insulin.

Allergies: Aspirin, morphine.

Social: smoking, recent drug use, sedentary lifestyle.

Mental status

Blood pressure: presence of cardiogenic shock or severe hypertension.

Heart rate (brady or tachyarrhythmias) and irregular rhythms.

Bradycardia: heart disease (blocks), pacemaker malfunction, medications.

Tachycardia: Consider shock, sympathomimetic drug use, or pain.

Unequal pulses: possibility of aortic dissection.

Lungs: wet lung sounds (rales) or wheezing suggesting heart failure and pulmonary edema.

### **Diagnosis**

Etiology of chest pain is difficult to diagnose. History is the most important guide. Assume and treat as if life-threatening condition. If unsure, contact base early. Assume cardiac until proven otherwise.

Symptoms suggesting cardiac ischemia (angina)/MI: chest pressure or tightness; chest pain, often radiating to neck, jaw, and/or arms.

Associated symptoms: shortness of breath, dizziness, syncope, diaphoresis, nausea, vomiting, abdominal pain, palpitations, anxiety and agitation. Symptoms often worsen with exertion and improve with rest.

Signs of CHF: rales, distended neck veins, shortness of breath, pedal edema.

### **Differential Diagnosis**

Cardiac ischemia (angina) and MI are frequent causes of chest pain but consider other life threatening causes and treat accordingly:

#### **Pulmonary**

Pneumothorax (young people, asthmatics, COPD, trauma): sudden onset, unilateral diminished breath sounds, tachypnea, chest pain. Some may have positional/pleuritic component.

Pulmonary embolus (pregnant women or women taking oral contraceptives, people with immobilized lower extremities or cancer, prolonged travel, smokers): tachypnea, short of breath, sudden onset of coughing blood, chest pain, tachycardia.

Pneumonia: cough, sputum, shortness of breath, fever, gradual onset.

Asthma: wheezing, history of asthma, shortness of breath.

# Chest Pain - Cardiac

## Other cardiac

Aortic aneurysm or dissection (age > 50 with atherosclerotic disease): “tearing pain” radiating to the back, hyper/hypotension, unequal upper extremity pulses and blood pressure. If suspected, transport immediately, and refer to PROTOCOL: *Shock Without Trauma*.

Pericarditis: gradual onset may have a pleuritic or positional (e.g. pain improves when leaning forward) component.

**Medication Issues** Aspirin: Contraindicated if true allergy. Not contraindicated if “allergy” due to ulcers or stomach upset. Give Aspirin regardless of whether or not the patient has had Aspirin in the past 24 hours.

Atropine: For bradycardic patients (HR < 50) where the heart rate is presumed to be the etiology of the chest pain, Atropine may be indicated with base hospital consultation.

Nitroglycerin tablets/spray/paste: Check blood pressure before and after administration. When applying Nitropaste to chest wall, avoid AED pad placement areas as Nitropaste will impede adherence of the pads. Nitropaste is a venodilator and should be placed on all patients with suspected ischemic chest pain even if pain resolves. Recurrent ischemia may be prevented with nitropaste; thus, routine use is indicated unless blood pressure is below 100 systolic.

Fentanyl: note that dosing regimen in this protocol is more aggressive and different than all other protocols using this drug. This is due to the fact that in addition to alleviating pain, this medication treats the underlying disease process.

**Transport** If suggestive of cardiac origin, do not delay on scene; begin immediate rapid evacuation. Arrange ALS rendezvous, preferably ACLS. Consider air transport if shock, ongoing pain, unstable vitals, SOB, STEMI, or extended ground transport. Continue frequent reassessment of vitals.

**AMA/TAR** NO patient with chest pain should be TAR without base contact (AMA if communication failure). Parks without base hospitals should follow local medical advisor approved EMS policy.

**Pre-Hospital ECG and Destination** Any patient with chest pain should be considered at risk for cardiac disease. These patients should have a 12-lead ECG performed and subsequently transported to a facility with interventional heart catheterization capabilities if the ECG interpretation would warrant such transport, i.e.

\*\*\* \*\* \* ACUTE MI \* \*\* \* \*\* \* (Zoll Monitor)

or

\*\*\*ACUTE MI SUSPECTED\*\*\* (Physio-Control Monitor)

## Cross Reference

### Procedures:

CPAP  
Intraosseous Access  
IV Access and IV Fluid Administration  
Oxygen Administration  
Synchronized Cardioversion

### Protocols:

Cardiac Arrest with AED (Adult Medical)  
Cardiac Arrest without AED (Adult Medical)  
Shock Without Trauma

### Drugs:

Aspirin  
Atropine  
Fentanyl  
Hydromorphone (Dilaudid)  
Midazolam (Versed)  
Morphine  
Nitroglycerin  
Ondansetron

# Childbirth

## EMT Standing Orders

1. ABCs
2. Assessment      Vitals, contractions, ruptured bag of water, urge to push, bleeding, due date, prenatal care, expected complications, prior deliveries.  
If urge to push inspect perineum.  
If crowning prepare for imminent delivery.  
If prolapsed cord or breech see Special Considerations.
3. Oxygen            Per PROCEDURE: *Oxygen Administration*. High flow if complications.
4. Transport/  
ALS Backup        Place mother on left side unless crowning/pushing.  
Begin transport unless delivery imminent (crowning/pushing). If complications consider air transport.
5. Base Contact     Consider early base contact to assist with resuscitation.
6. Delivery          Assist with delivery: If complications, see Special Considerations for procedures.  
Control head.  
Once head is delivered, suction mouth and nose with bulb syringe prior to neonate's first breath.  
Check for cord around neck.  
Deliver upper shoulder, then lower shoulder.  
After shoulders delivered, neonate will rapidly deliver.
7. Dry Neonate     Dry the neonate. Place neonate in as warm an environment as possible, replacing all wet towelings with dry. Keep neonate covered, especially the head, to minimize heat loss.
8. Clamp/  
Suction            Clamp and cut umbilical cord approximately 3" from abdominal wall of infant. Place neonate on mother's abdomen with head in neutral position. Suction mouth, pharynx, then nose with a bulb syringe.
9. Stimulate        Rub neonate's body. Flick the soles of the feet or rub the back.
10. Evaluate        Determine APGAR score at 1 min and 5 min after completion of delivery. (See APGAR chart in Special Considerations).  
If neonate in distress or APGAR <7, **GO TO PROTOCOL: Pediatric - Neonatal (Newborn) Resuscitation**.  
If healthy, place neonate to mother's breast to facilitate delivery of placenta and reduce bleeding; proceed to **Step 11**.
11. Placenta        Allow placenta to deliver on its own. Do not pull on cord. Bring placenta to hospital.
12. Massage        Massage uterine fundus. If uncontrolled heavy bleeding, see Special Considerations.

## EMT Base Hospital Only Orders

1. Acetaminophen (Tylenol)    Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.

# Childbirth

## Parkmedic Standing Orders

1. ABCs
2. Assessment                   Vitals, contractions, ruptured bag of water, urge to push, bleeding, due date, prenatal care, expected complications, prior deliveries.  
If urge to push inspect perineum.  
If crowning prepare for imminent delivery.  
If prolapsed cord or breech see Special Considerations.
3. Monitor                        Apply cardiac monitor and treat rhythm if appropriate.  
If indicated, **GO TO** appropriate *Cardiac Arrest/Dysrhythmias Protocol*.
4. Oxygen                         Per PROCEDURE: *Oxygen Administration*. High flow if complications.
5. Transport                     Place mother on left side unless crowning/pushing.  
Begin transport unless delivery imminent (crowning/pushing).  
If complications consider air transport.
6. Base Contact                 Consider early base contact to assist with resuscitation.
7. Maternal IV/IO               Per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*  
If delivery is imminent, defer IV/IO attempts until after delivery.
8. Delivery                      Assist with delivery: If complications, see Special Considerations for procedures.  
Control head.  
Once head is delivered, suction mouth and nose with bulb syringe prior to newborn's first breath.  
Check for cord around neck.  
Deliver upper shoulder, then lower shoulder.  
After shoulders delivered, newborn will rapidly deliver.
9. Dry Newborn                 Dry the newborn. Place newborn in as warm an environment as possible, replacing all wet towels with dry. Keep newborn covered, especially the head, to minimize heat loss.
10. Clamp/ Suction             Clamp and cut umbilical cord approximately 3" from abdominal wall of infant. Place newborn on mother's abdomen with head in neutral position. Suction mouth, pharynx, then nose with a bulb syringe.
11. Stimulate                    Rub newborn's body. Flick the soles of the feet or rub the back.
12. Evaluate                     Determine APGAR score at 1 min and 5 min after completion of delivery. (See APGAR chart in Special Considerations).  
If newborn in distress or APGAR < 8, **GO TO PROTOCOL: Pediatric - Newborn Resuscitation**.  
If healthy, place newborn to mother's breast to facilitate delivery of placenta and reduce bleeding; proceed to **Step 13**.
13. Oxytocin                     Once newborn is delivered, administer IV/IO if previously established, otherwise administer IM.  
IV/IO: 20 units (2ml) in 1000 ml NS/LR at 500 ml/hr.  
IM: 10 units (1ml) if no IV access.
14. Placenta                     Allow placenta to deliver on its own. Do not pull on cord. Bring placenta to hospital.
15. Massage                     Massage uterine fundus.

# Childbirth

## Parkmedic Base Hospital/Communication Failure Orders

1. Acetaminophen (Tylenol)      Adult:      1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.
2. Fentanyl      Adult:      If severe pain, SBP > 100, and normal mental status.  
IV/IO/IN:      25-50 mcg. Repeat in 15 min x1 prn pain.  
Subsequent doses (2 max) every 30 minutes.  
i.e. Fastest possible dosing schedule would be; time 0, 15, 45, 75 min.  
IM: 50 - 100 mcg every 30 minutes. Repeat in 30 min x2 prn pain.  
i.e. Fastest possible dosing schedule would be; time 0, 30, 60 min.

*Recheck vitals and mental status before and after each dose. Administer ONLY if SBP > 100 and normal mental status.*

3. Long Acting Narcotic (Morphine OR Dilaudid).      Only to be used 30 minutes after fentanyl dosing schedule above is completed.

Morphine      Adult:      If severe pain, SBP > 100, and normal mental status.  
IV/IO:      4-10mg (0.4-1ml) every 30 min prn pain (max 20mg)  
IM:      5mg (0.5ml) every 30 min prn pain (max 20mg).

Dilaudid      Adult:      If severe pain, SBP > 100, and normal mental status.  
IV/IO:      0.5-1.0 mg (0.5-1ml) every 30 min prn pain (max 2mg)  
IM:      1mg (1ml) every 30 min prn pain (max 2mg).

*Recheck vitals and mental status before and after each dose. Administer ONLY if SBP > 100 and normal mental status  
Maximum dosing refers to route of administration. Any med administration beyond 20mg of Morphine or 2mg of Dilaudid via any route requires base contact.*

# Childbirth

## SPECIAL CONSIDERATIONS

### Assessment

### APGAR CHART

	0	1	2
Appearance	Blue or Pale	Body pink, limbs blue	Completely pink
Pulse	0	< 100	> 100
Grimace	No response	Grimace	Cough, sneeze, cry
Activity	Flaccid	Some Flexion	Active Movement
Respirations	Absent	Slow, Irregular, Weak	Strongly crying

History: What is the expected birth date?  
Prenatal care? Ultrasound?  
Does patient expect any complications (e.g., twins, breech, hypertension, diabetes)?  
Number of pregnancies?  
Number of vaginal deliveries? Previous Cesarean Sections? Prior complications?  
Have the membranes ruptured (bag of water)? When?  
Urge to push?

Vital signs: High/low blood pressure?  
Contractions: frequency, duration, onset?

Examine perineum: Crowning, bleeding, cord prolapse?  
If patient has urge to push, perform external exam; do not perform digital exams.

### Childbirth Complications

*Hypertension:* SBP > 180 or DBP > 110 (preeclampsia) are particularly worrisome, especially if complications associated with headaches, blurry vision, seizures (eclampsia), chest pain, or vomiting. The most important aspect of treatment is recognition and rapid transport. Reference PROTOCOL: ***Chest Pain (Cardiac) or Seizures if appropriate.***

*Placenta Abruptio/Previa:* Vaginal bleeding in the last trimester of pregnancy not associated with labor. High flow Oxygen. Transport in left lateral decubitus position. ALS backup and air transport if available. Discourage patient from pushing if she feels the urge to push as this may significantly worsen bleeding. Two large-bore IV/IOs per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*. If patient is in shock, **GO TO PROTOCOL: Shock without Trauma.**

*Breech Presentation:* Foot or buttocks first instead of head first.

1. Allow delivery to progress naturally until the umbilicus is visualized, then apply gentle traction until the shoulders deliver. Continue encouraging mother to push.
2. If head becomes entrapped (i.e. delivery fails to progress), suffocation may occur because the newborn's umbilical cord is compressed by its head in the birth canal and its face is pressed against the vaginal wall.
3. At this point, do not attempt to pull the newborn out.
4. Insert gloved hand into vagina, palm towards newborn's face. Form a "V" with your fingers on either side of the

# Childbirth

newborn's nose and push the vaginal wall away from the newborn's face until the head is delivered.

5. Provide blow-by oxygen to newborn.
6. Begin transport immediately with mother on her left side and her hips elevated above her head, while still maintaining breathing passage with fingers.
7. Be careful not to hyperextend or hyperflex the newborn's neck during transport, as this can kink the airway.

- Shoulder Dystocia:* Shoulders are stuck, preventing delivery and potentially leading to newborn asphyxiation if not corrected rapidly. Work through the steps, stopping when shoulder is disengaged:
1. While mother is supine, bring her knees as close to her armpits as possible.
  2. Apply firm steady pressure to the lower abdomen just above the pubic bone.
  3. "Corkscrew" the shoulders: Rotate the shoulders 180° by pushing the most accessible shoulder toward the newborn's chest.
  4. Grab the lower arm of the newborn and sweep it across the neonate's chest to the chin and then pull arm out of the canal, bringing the fetal hand up to the chin.

- Prolapsed Cord:* Visible umbilical cord preceding delivery.
1. Place mother in Trendelenberg position (head lower than hips) with left lateral decubitus or manual uterine displacement.
  2. Check for pulse in cord; if pulsatile, go to **Step 4**. If no pulse in cord, place mother in knee-chest position (while still in Trendelenberg), and check for pulse in cord; if pulsatile, go to **Step 4**. If still no pulse in cord, go to **Step 3**.
  3. With gloved hand, gently push the neonate back up into the vagina to take pressure off the cord. Apply enough pressure to allow a pulse to be palpated in the cord, and then maintain the newborn in that position.
  4. Do not attempt to push the cord back into the vagina.
  5. Cover the exposed cord with a moist dressing.
  6. Air transport if available.

**EXCEPTION:** When head is crowning with a prolapsed cord, deliver immediately at the scene, as this is the most rapid means of restoring oxygen to the newborn.

- Cord Entanglement:* Umbilical cord knots may be pulled tight at delivery and may cause fetal distress. Rapid delivery and avoidance of further traction will optimize fetal outcome.
- Long umbilical cords may loop around body or neck, called a "Nuchal Cord." Reduce these nuchal cords if possible by slipping them over the head. If a loop is impeding delivery, then clamp, carefully cut the cord, and deliver the newborn as soon as possible.
- Be careful not to cut the newborn's neck.

# Childbirth

<b>Postpartum Hemorrhage</b>	Perform external exam to determine site of bleeding. If vaginal laceration seen apply direct pressure. Firmly massage fundus, and allow newborn to breast-feed. If bleeding not due to laceration <u>and</u> not controlled with fundal massage, contact base regarding Oxytocin.
<b>Transportation</b>	Many EMS helicopters cannot transport patients in active labor or at high risk of delivery due to space constraints
<b>AMA/TAR</b>	No patients may be released at scene (TAR) without base contact. Parks without base hospitals should follow local medical advisor approved EMS policy.
<b>Documentation</b>	Newborn vital signs and APGAR score at 1 and 5 minutes. Whether cord was cut by sterile or non-sterile equipment. Times: contractions began, "Water broke," delivery of newborn, delivery of placenta.

## Cross References

### **Procedures:**

Intraosseous Access  
IV Access and IV  
Fluid Administration  
Oxygen Administration

### **Protocols:**

Pediatric – Newborn Resuscitation

### **Drugs:**

Acetaminophen (Tylenol)  
Oxytocin



# Electrical and Lightning Injuries

## EMT Standing Orders

1. Scene Safety      Protect yourself and others from injury.
2. Rescue              Remove victim from unsafe environment including electrical hazard, cold, and heat.
3. Spinal Precautions    If secondary trauma suspected or cannot be ruled out, reference PROCEDURE: *Spine Immobilization*.
4. ABCs                Protect airway. Assist respirations if necessary.  
If cardiac arrest, **GO TO** PROTOCOL: *Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Pediatric – Medical Arrest With AED; or Pediatric – Medical Arrest Without AED*.
5. Oxygen              Per PROCEDURE: *Oxygen Administration*.
6. Assessment        Vitals, mental status, burns, entry/exit wounds, fractures and dislocations, blunt trauma (from falls or being thrown), hypothermia.
7. Consider Trauma    Treat for shock.  
If suspected, REFERENCE PROTOCOL: *Burns; Major Trauma – Adult; or Pediatric – Major Trauma*.  
If applicable, REFERENCE PROCEDURE: *Fracture/Dislocation Management; or Wound Care*.
8. Transport            Consider air transport if cardiac or respiratory arrest, ALOC, hypotension, or major ALS Backup trauma.
9. Base Contact        Contact early if questions about destination, mode of transport, termination of resuscitation, or other problems.

## Base Hospital/Communication Failure Orders

1. Acetaminophen (Tylenol)      > 10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.  
0-10 yrs.: 20mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.

# Electrical and Lightning Injuries

## Parkmedic Standing Orders

1. Scene Safety Protect yourself and others from injury.
2. Rescue Remove victim from unsafe environment including electrical hazard, cold, and heat.
3. ABCs Secure airway. Assist respirations, utilizing OPA/NPA or advanced airway (*King Tube/ETT*).  
Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtracheal Jet Insufflation*.  
Maintain C-spine precautions with ALL airway maneuvers.  
If patient in cardiac arrest, **GO TO** PROTOCOL: *Cardiac Arrest With AED (Adult Medical)*; *Cardiac Arrest Without AED (Adult Medical)*; *Pediatric – Medical Arrest With AED*; or *Pediatric – Medical Arrest Without AED*.
4. AED Apply AED if appropriate.  
If indicated, **GO TO** appropriate *Cardiac Arrest with AED*.
5. Spinal Precautions If secondary trauma suspected or cannot be ruled out, reference PROCEDURE: *Spine Immobilization*.
6. Oxygen Per PROCEDURE: *Oxygen Administration*.
7. Assessment Vitals, mental status, burns, entry/exit wounds, fractures and dislocations, blunt trauma (from falls or being thrown), hypothermia.
8. Pain Management Per PROCEDURE: *Pain Management*
9. IV/IO All transported patients: One IV/IO with maintenance fluids (NS/LR) per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*.  
Shock or TBSA > 15%: Two IV/IO's, with total IV fluid at the following rates:  
Adults: 2-L NS/LR bolus, then double the maintenance rate (240ml/hr).  
0–14 yrs.: 40 ml/kg NS/LR bolus (max bolus 2-L), then double maintenance rate (4ml/kg/hr).
10. Consider Trauma Treat for shock.  
If suspected, **REFERENCE** PROTOCOL: *Burns; Major Trauma – Adult*; or *Pediatric – Major Trauma*.  
If applicable, **REFERENCE** PROCEDURE: *Fracture/Dislocation Management*; or *Wound Care*.
11. Ondansetron (Zofran) For nausea or vomiting or history of vomiting with narcotic administration  
Adult: IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: 4mg, repeat in 15 min x2 prn nausea.  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
0 – 3 mos.: IV/IO: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.  
**Note:** For severely symptomatic patients, ODT can be administered prior to attempts for IV/IO access.
12. Transport Consider air transport if cardiac or respiratory arrest, ALOC, hypotension, or major trauma.
13. Base Contact Contact early if questions about destination, mode of transport, termination of resuscitation, or other problems.

# Electrical and Lightning Injuries

## SPECIAL CONSIDERATIONS

<b>Mechanism of Electrical Injury</b>	<p>If possible, determine voltage, current (AC or DC), duration of exposure, and pathway of the electricity.</p> <p>High-voltage is &gt; 1000 Volts, usually industrial, high-tension wires, lightning.</p> <p>Low-voltage is &lt; 1000 Volts, usually household voltage.</p> <p>High-voltage electrocutions create worse injuries.</p> <p>AC prevents victims from releasing, so they sustain greater internal electrical injury.</p> <p>DC often throws victims, so they sustain less electrical injury but greater trauma.</p> <p>Lightning voltage is very high but exposure is very brief, making lightning strikes much more survivable than might be expected. Lightning exposure may occur as direct strike, side flash, or ground current.</p> <p>In electrocutions, cardiac arrest is the usual cause of death.</p> <p><u>Respiratory arrest may last longer than cardiac arrest</u> so respirations may need assistance after pulse returns.</p> <p><u>With multiple patients, triage priorities are different:</u> Patients in cardiac or respiratory arrest from electrocution have a better prognosis than patients in cardiac or respiratory arrest from other causes. Therefore, in multiple patient triage situations, <u>attend to patients in cardiac or respiratory arrest first.</u></p>
<b>Common Findings</b>	<p>High-voltage/lightning injury: cardiac and/or respiratory arrest, arrhythmias, ALOC, trauma.</p> <p>High-voltage electrical: entry/exit burns; fractures/dislocations; internal burns with resultant compartment syndrome, hypovolemia and kidney failure <u>requiring vigorous hydration.</u></p> <p>Hypovolemic shock may occur from internal burns or blunt trauma. Cardiogenic shock may occur from direct electrical injury to heart.</p> <p>Lightning injuries: ruptured eardrums, transient paralysis of legs, “fern-like” or punctuate burns. Compared to major electrocutions, internal burns with relative hypovolemia and kidney failure rarely occurs, so IV hydration is much less important unless there is concomitant trauma.</p>
<b>Disposition</b>	<p>Victims of low-voltage electrical injury with mild or no symptoms may be transported to the closest facility.</p> <p>Consider transport to nearest burn/trauma center for patients with burns, significant trauma, lightning or high-voltage electrical injuries.</p>
<b>AMA/TAR:</b>	<p>No patient suffering an electrical or lightning injury may be released at scene without base contact.</p> <p>Parks without base hospitals should follow local medical advisor approved EMS policy.</p>

## Cross Reference

### **Procedures:**

Automated External Defibrillator  
Endotracheal Intubation  
Fracture/Dislocation Management  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration  
Pain Management  
Spine Immobilization  
Transtracheal Jet Insufflation  
Wound Care

### **Protocols:**

Burns  
Cardiac Arrest with AED (Adult Medical)  
Cardiac Arrest without AED (Adult Medical)  
Major Trauma – Adult  
Pediatric – Medical Arrest with AED  
Pediatric – Medical Arrest without AED

### **Drugs:**

Acetaminophen (Tylenol)  
Fentanyl  
Hydromorphone (Dilaudid)  
Morphine  
Ondansetron

# Eye Trauma

## EMT Standing Orders

1. ABCs
2. Assessment      Vision, pupil response, contact lenses, foreign body, chemical (alkali/acid), welding or sun exposure, globe rupture. If globe rupture suspected, skip to **Step 4**, (see **Special Considerations**).
3. Irrigate            If chemical exposure, immediately irrigate with LR/NS or any available potable water for 15 minutes.
4. Protect             If impaled object, foreign body, or globe rupture suspected, do not irrigate. Do not remove impaled object. Cover eye with a loose, protective dressing (eye cup), putting no pressure on the globe. Cover BOTH eyes if practical (e.g., if patient does not need to walk unassisted) to reduce eye movement.
5. Elevate             If possible, keep the patient's face upward and head of bed elevated greater than 30 degrees. This can help to minimize postural/positional increases in intraocular pressure.
6. Transport          Transport or AMA all patients unless TAR approved by base hospital.
7. Contact Base

## EMT Base Hospital/Communication Failure Orders

- |                            |                          |                                                                                                                                   |
|----------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 1. Acetaminophen (Tylenol) | >10-Adult:<br>0-10 yrs.: | 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.<br>15 mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours. |
|----------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

# Eye Trauma

## Parkmedic Standing Orders

1. ABCs
2. Assessment Vision, pupil response, contact lenses, foreign body, chemical (alkali/acid), welding or sun exposure, globe rupture. If globe rupture suspected, skip to **Step 4**, (see **Special Considerations**.)
3. Irrigate If chemical exposure, immediately irrigate with LR/NS or any available potable water for 15 minutes.
4. Protect If impaled object, foreign body, or globe rupture suspected, do NOT irrigate or apply ointment. Do NOT remove impaled object. Cover eye with a loose, protective dressing (eye cup), putting no pressure on the globe. Cover BOTH eyes if practical (e.g., if patient does not need to walk unassisted) to reduce eye movement.
5. Elevate If possible, keep the patient's face upward and head of bed elevated greater than 30 degrees. This can help to minimize postural/positional increases in intraocular pressure.
6. Pain Management Per PROCEDURE: *Pain Management*
7. IV/IO If needed for medication administration
8. Transport Transport or AMA all patients unless TAR approved by base hospital.
9. Contact Base

## Parkmedic Base Hospital/Communication Failure Orders

1. Erythromycin Ophthalmic Ointment Minor eye trauma. Do not apply if impaled objects or suspected globe penetration. Apply 1-cm ribbon to inside of lower eyelid, repeat every 2 hours while awake.
2. Cefazolin (Ancef) Consider for eye trauma if > 3 hours transport time to hospital/clinic, per PROCEDURE: *Wound Care*.  
> 12-Adult: 1g IV (IM if no IV access) every 8 hours.  
6-12 yrs.: 500mg IV (IM if no IV access) every 8 hours.  
< 6 yrs.: 250mg IV (IM if no IV access) every 8 hours.
3. Ondansetron (Zofran) For nausea or vomiting or history of vomiting with narcotic administration  
Adult: IV: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: 4mg, repeat in 15 min x2 prn nausea.  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
0 – 3 mos.: IV: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.

# Eye Trauma

4. Pain Management Per PROCEDURE: *Pain Management*

\*\* NSAIDS (Ibuprofen, Motrin, Advil) should generally NOT be administered in the setting of Ocular (Eye) Trauma as they can theoretically worsen intraocular bleeding by their anti-platelet effects.

## SPECIAL CONSIDERATIONS

### **General**

Suspect an eye injury if any significant facial trauma.  
LR/NS is the preferred solution for irrigation but potable water may be used.  
If globe rupture is suspected (high velocity mechanism, impaled object, irregular pupil, significantly decreased vision in the acute setting) eye should be protected from environment and NO irrigation or ointment should be administered.

Do not remove impaled objects. Protect them from movement with a protective dressing (eye cup) and cover BOTH eyes to reduce eye movement. Explain to patient that the injured eye moves with the other eye and movement can worsen injury.

Protect the patient from further eye injury/increases in intraocular pressure:

- Elevate the head of bed
- Keep the patient's face upward
- Consider anti-emetics with history of narcotic induced vomiting
- Avoid NSAID use
- Cover bilateral eyes

### **Documentation**

Document eye exam and assessment, focusing on vision, pupil size, and pupil shape.

## Cross Reference

### **Procedures:**

Intraosseous Access  
IV Access and IV Fluid  
Administration  
Pain Management  
Wound Care

### **Drugs:**

Acetaminophen (Tylenol)  
Cefazolin (Ancef)  
Erythromycin Ophthalmic Ointment  
Fentanyl  
Hydromorphone (Dilaudid)  
Morphine  
Ondansetron

# Frostbite

## EMT Standing Orders

1. ABCs
2. Assessment      Vitals, trauma, circulation/sensation/function/skin of all extremities, nose, ears, duration, ambient temperature, PMH, and meds.  
If appropriate, **GO TO PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)***; or *Hypothermia*.
3. Protect            Prevent further heat loss and injury. Remove tight or wet clothing and jewelry.
4. Transport/  
ALS Backup        Backup indicated if field re-warming is to be attempted.
5. Base Contact

## EMT Base Hospital/Communication Failure Orders

1. Rewarm            Rarely performed in field. Consider only if **all** of the following:  
Evacuation is not possible in less than 6–12 hours.  
Patient is not hypothermic.  
There is sufficient supply of warm water.  
There is NO risk of refreezing.  
Use 38°–42° C (100.4°–107.6° F) water only. Use thermometer.  
Immerse until skin is soft, pink, pliable and painful. Do NOT rub.  
After re-warming place gauze between toes and fingers, and dress.  
Protect from further injury and refreezing if possible.  
Patient should not walk on thawed feet.
2. Acetaminophen    >10-Adult:      1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.  
(Tylenol)        0-10 yrs.:        20mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours.
3. Ibuprofen         >10-Adult:      600mg PO every 6 hours.  
(Motrin, Advil)    6 mon-10 yrs:    5mg/kg PO every 6 hours, max dose 200mg.

# Frostbite

## Parkmedic Standing Orders

1. ABCs
2. Assessment Vitals, trauma, circulation/sensation/function/skin of all extremities, nose, ears, duration, ambient temperature, PMH, and meds.  
If appropriate, **GO TO PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC) or Hypothermia.***
3. Monitor Apply AED when indicated by patient severity.
4. Protect Prevent further heat loss and injury. Remove tight or wet clothing and jewelry.
5. Transport Backup indicated if field re-warming is to be attempted.
6. Pain Management Per PROCEDURE: *Pain Management*
7. IV/IO Saline lock if field re-warming to be attempted or analgesia required per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access.*
8. Ondansetron For nausea or vomiting or history of vomiting with narcotic administration  
Adult: IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: 4mg, repeat in 15 min x2 prn nausea.  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.  
3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
0 – 3 mos.: IV: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.  
  
Note: For severely symptomatic patients, ODT can be administered prior to attempts for IV/IO access

### 9. Base Contact

#### Parkmedic Base Hospital/Communication Failure Orders

1. Rewarm Rarely performed in field. Consider only if **all** of the following:
  - Evacuation is not possible in less than 6–12 hours.
  - Patient is not hypothermic.
  - There is sufficient supply of warm water.
  - There is NO risk of refreezing.Use 38°–40° C water only. Use thermometer.  
Provide analgesia  
Immerse until skin is soft, pink, pliable and painful. Do NOT rub.  
After re-warming place gauze between toes and fingers, and dress.  
Protect from further injury and refreezing if possible.  
Patient should not walk on thawed feet.



# Frostbite

## SPECIAL CONSIDERATIONS

<b>Assessment</b>	Other injuries Extent of frostbite (does it involve more than a digit)
<b>Treatment Issues</b>	Response to narcotic analgesics (Fentanyl/Morphine/Dilaudid) is both situation and patient specific. If prolonged patient contact is anticipated, dose adjustment within the protocol parameters may be warranted. If additional medication is indicated, contact base.
<b>Transport</b>	Consider air transport.
<b>AMA/TAR</b>	All patients not transported (AMA) should be advised to seek medical attention immediately. Base hospital contact for all others. Parks without base hospitals should follow local medical advisor approved EMS policy.
<b>Documentation</b>	Mechanism of injury Tetanus status Distal neurovascular function Care provided Instructions provided

## Cross Reference

### **Procedures:**

Intraosseous Access  
IV Access and IV Fluid  
Administration  
Pain Management

### **Protocols:**

Altered Mental Status/Altered Level  
of Consciousness (ALOC)  
Hypothermia

### **Drugs:**

Fentanyl  
Hydromorphone (Dilaudid)  
Ibuprofen (Motrin, Advil)  
Morphine  
Ondansetron

# General Medical Illness - Adult

(FEVER/NAUSEA/VOMITING/DIARRHEA/HEADACHE/DIZZINESS/WEAKNESS)

This protocol applies to adults and children age  $\geq 14$ . See *Pediatric – Medical Illness/Fever* for children  $< 14$ . This protocol is intended for the specific complaints of **fever, nausea/vomiting, diarrhea, motion sickness, weakness, dizziness, headache, extremity weakness/numbness** and non-specific complaints, e.g. **“I feel sick, ill, tired, dehydrated, or fatigued”**. At ANY time, if patient presents with another complaint then go to the appropriate protocol.

## EMT Standing Orders

- |                     |                                                                                                                                                                                                                                                                                                                                   |                                      |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| 1. ABCs             | If patient appears ill, start oxygen (PROCEDURE: <i>Oxygen Administration</i> )                                                                                                                                                                                                                                                   |                                      |
| 2. Assessment       | Vitals (temp and O2 sat if available)                                                                                                                                                                                                                                                                                             |                                      |
|                     | If altered mental status, or suspected stroke/TIA (positive Cincinnati Stroke Scale)                                                                                                                                                                                                                                              | <b>GO TO PROTOCOL: AMS/ALOC</b>      |
|                     | If shock                                                                                                                                                                                                                                                                                                                          | <b>GO TO PROTOCOL: Shock Without</b> |
|                     | If chest pain/discomfort                                                                                                                                                                                                                                                                                                          | <b>GO TO PROTOCOL: Chest Pain</b>    |
|                     | If shortness of breath                                                                                                                                                                                                                                                                                                            | <b>GO TO PROTOCOL: Respiratory</b>   |
|                     | If heat exposure and hyperthermia                                                                                                                                                                                                                                                                                                 | <b>GO TO PROTOCOL: Heat Illness</b>  |
| 3. Comfort Measures | Cool, wet towels/clothing to forehead and body if in hot environment.<br>Protect from sun and hot surfaces in hot environment.<br>Protect patient from cold environment.                                                                                                                                                          |                                      |
| 4. Check Glucose    | If diabetic or appears ill, check glucose (PROCEDURE: <i>Blood Glucose Assessment</i> )<br>If glucose $< 80$ , ALOC, or unable to determine glucose and appears sick/weak, administer 1 tube Glucose (15g) squeezed into mouth and swallowed or attempt oral fluids/foods.                                                        |                                      |
| 5. Oral Fluids/Food | If patient is thirsty or has done heavy exercise AND if normal mental status and protecting airway AND no history of trauma, abdominal pain, or chest pain:<br>Attempt frequent, small trials of oral electrolyte sports drink or any salt/sugar containing liquid or food. If unavailable, any potable water can be substituted. |                                      |
| 6. Acetaminophen    | If suspected fever or temperature greater than 38.5°C (101°F) and tolerating oral fluids;<br>Dose: 1000 mg PO every 4-6 hrs (Max 4 g/day)                                                                                                                                                                                         |                                      |
| 7. Base Contact     |                                                                                                                                                                                                                                                                                                                                   |                                      |
| 8. Transport        | If patient either presents with or develops decreased mental status, signs of shock, ill appearing, or signs of stroke/TIA.<br>Additionally, consider transport in all patients who fail to improve to their baseline.                                                                                                            |                                      |



# General Medical Illness - Adult

(FEVER/NAUSEA/VOMITING/DIARRHEA/HEADACHE/DIZZINESS/WEAKNESS)

- 7. Acetaminophen      If suspected fever or temperature greater than 38.5°C (101°F) and tolerating oral fluids;  
Dose:            1000 mg PO every 4-6 hrs (Max 4 g/day)
  
- 8. IV/IO                    If patient cannot tolerate PO, appears ill or HR >100, consider IVF bolus per protocol  
(PROCEDURE: *IV Access and IV Fluid administration and Intraosseous Access*)  
Assess vitals and listen to lung fields BEFORE & AFTER fluid bolus. Stop IV/IO fluids  
if signs of Pulmonary Edema/CHF or developing dyspnea.
  
- 9. Ondansetron            For nausea or vomiting or history of vomiting with narcotic administration  
Adult:            IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea.  
                      ODT: 4mg, repeat in 15 min x2 prn nausea.  
                      IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea.
  
- 10. Base Contact
  
- 11. Transport              If patient either presents with or develops decreased mental status, signs of shock, ill  
appearing, or signs of stroke/TIA.  
Additionally, consider transport in all patients who fail to improve to their baseline.

**Paramedic Base Contact/Communication Failure Orders**

- 1. Aspirin                    If patient > 40 years old and no complaint of headache at present or in the last 24 hours,  
Dose: 325 mg PO once.  
Consideration of this therapy is warranted for the presumed “silent MI” presenting as  
malaise/weakness
  
- 2. Ibuprofen                If temperature remains over 38.5°C (101°F) with no response to acetaminophen after 60  
minutes, administer Ibuprofen.  
Dose: 600 mg PO every 6 hrs  
Although indicated in the setting of fever (suspected infection), caution is warranted in  
the setting of hyperthermia and dehydration due to potential renal failure
  
- 3. Dextrose 50%            If glucose < 80 and unable to tolerate PO, with increasing confusion.  
Adults: D50 (25 grams/50 ml) 1amp IV  
  
If patient is a GCS < 15, **GO TO PROTOCOL: AMS/ALOC**  
Although indicated in the setting of hypoglycemia, caution is warranted in the setting of  
suspected stroke/TIA

# General Medical Illness - Adult

(FEVER/NAUSEA/VOMITING/DIARRHEA/HEADACHE/DIZZINESS/WEAKNESS)

## Special Considerations

### **Assessment**

If patient presents with or develops a specific complaint during the assessment, then go to that appropriate protocol (e.g. *Altered Mental Status, Altitude Illness, Chest Pain, Heat Illness, Abdominal pain, Ingestion/poisoning, Shortness of Breath, Shock without Trauma*). This protocol is intended for the adult (age  $\geq 14$ ) who complains of symptoms of a general medical illness (e.g. fever, nausea/vomiting, generalized weakness, headache, extremity weakness/numbness, lightheadedness/dizziness, diarrhea, dehydration) or non-specific complaints (e.g. “I feel sick”, “I feel ill”, “I have the flu”).

### **History**

Recent activities, duration of symptoms, fever (subjective or measured).  
Associated symptoms such as headache, runny nose, sore throat, cough (productive or dry); respiratory difficulties; vomiting; diarrhea (frequency, watery or bloody); neck pain; sick contacts: tolerating food/fluids; change in urine output; ability to walk normally.

### **PMH**

Age  $\geq 50$ , Comorbidities incl. Diabetes, Renal Failure, Congestive Heart Failure, Liver Failure, Coronary Artery Disease, Pacemaker/AICD, Recent surgeries.

### **Physical Exam**

Overall appearance (lethargic, dehydrated, weak, appropriate); ability to sit, stand, ambulate; vitals (including mental status, heart rate, blood pressure, resp rate and temp/O<sub>2</sub> sat if available), complete physical exam with particular attention to mucous membranes, eyes (scleral icterus), neck stiffness, lungs, heart, skin (rash, jaundice, dialysis shunts), urine output, and neurological exam (see Stroke Scale).

**Cincinnati Stroke Scale:** Unilateral facial droop, slurred/mute speech, unilateral arm drift (See PROTOCOL: *AMS/ALOC* Special Considerations for detailed description).

### **Differential Diagnosis**

Altitude Sickness, HAPE/HACE, Meningitis/Encephalitis, Dehydration, Upper Respiratory Illness, Influenza, Pneumonia, Acute Coronary syndrome (Angina, MI), CHF/Pulmonary Edema, Drug Intoxication/Withdrawal, Dysrhythmia, Renal Failure, Hepatitis/Cirrhosis, Gastroenteritis, Urinary Tract Infection, Stroke/TIA, Hypoglycemia, Hyperglycemia, Exhaustion from physical exertion.

### **Oral Rehydration Therapy**

Example of salt/sugar containing electrolyte solution:  
8 teaspoons of sugar, and 1 teaspoon of salt, dissolved in 1 quart of water

### **AMA/TAR**

AMA is possible only for age  $\geq 18$  and normal mental status.  
Treat and Release without base contact only if all conditions below are met:

1. Age  $< 60$
2. Normal mental status
3. No signs of shock (HR 50-100, SBP 100-180)
4. Respiratory rate 10-30
5. No history of syncope, chest pain or continued dyspnea
6. Patient appears well, tolerates PO fluids, and ambulates. Parks without base

hospitals should follow local medical advisor approved EMS policy.

### **Documentation**

Thorough physical exam, GCS, vitals, ability to tolerate oral fluids/food, ability to ambulate with their pack (if available).

# General Medical Illness - Adult

(FEVER/NAUSEA/VOMITING/DIARRHEA/HEADACHE/DIZZINESS/WEAKNESS)

## Cross Reference

### **Procedures:**

AED  
Blood Glucose Determination  
Intraosseous Access  
IV Access and IV Fluid  
Administration  
Oxygen Administration

### **Protocols:**

Abdominal Pain  
Altitude Illness  
AMS/ALOC  
Chest pain- Cardiac  
Heat Illness  
Pediatric – Medical Illness/Fever  
Respiratory Distress  
Shock without Trauma

### **Drugs:**

Acetaminophen (Tylenol)  
Aspirin  
Dextrose 50% (D50)  
Glucose Paste or Gel  
Ibuprofen (Motrin)  
Ondansetron (Zofran)

# Heat Illness

## EMT Standing Orders

1. ABCs Protect airway if ALOC, assist ventilations with OPA/NPA if indicated.
2. Assessment Vitals, mental status (coordination, confusion), temperature if available, skin signs (sweaty or dry), or shock.
3. Cooling Remove patient from hot environment to a cool area if possible.  
Remove constricting and warm clothing.  
If ALOC or severe symptoms, begin evaporative cooling (see special considerations).  
Don't let cooling delay transport – cool en route!
4. Oral Fluid If alert and no signs of heat stroke may give oral fluid. Frequent small amounts of water with ¼ tsp of salt, or sport drink if available.  
Adults: Give a total of 1-L  
1mon-14yrs: 10 ml/kg to a maximum of 1-L
5. Oxygen Per PROCEDURE: *Oxygen Administration*
6. Check Glucose If ALOC, per PROCEDURE: *Blood Glucose Determination*
7. Glucose Paste If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).
8. Transport/  
ALS Backup If ALOC, unable to ambulate easily, or severe symptoms.  
Consider air transport for heat stroke.
9. Base Contact Any AMA/TAR should be approved by base.

# Heat Illness

## Parkmedic Standing Orders

1. ABCs Protect airway if ALOC. Assist respirations as needed, utilizing OPA/NPA or Advanced airway (*King Tube/ETT*) if indicated.
  2. Assessment Vitals, mental status, temperature if available, skin signs (sweaty/dry), or shock.
  3. Cooling Remove patient from hot environment to a cool area if possible.  
Remove constricting and warm clothing.  
If ALOC or severe symptoms, begin evaporative cooling (see special considerations).  
Don't let cooling delay transport – cool en-route!
  4. Oral Fluid If alert and no signs of heat stroke may give oral fluid. Frequent small amounts of water with ¼ tsp of salt, or sport drink if available.  
Adults: Give a total of 1–L  
1mon-14yrs: 10 ml/kg to a maximum of 1-L
  5. IV If ALOC, unable to take oral fluids, or signs of heatstroke, place IV per PROCEDURE: *IV Access and IV Fluid Administration*.  
Adults: 1-L LR/NS bolus, then maintenance rate (120ml/hr).  
Pediatric: 20ml/kg LR/NS bolus (max 1-L), then maintenance rate (2ml/kg/hr).  
All ages: If still symptomatic after initial bolus, give second bolus.  
1mon-6yrs: if no IV access consider IO per PROCEDURE: *Intraosseous (IO) Access*.
  6. Oxygen Per PROCEDURE: *Oxygen Administration*
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
7. Check Glucose Only if ALOC per PROCEDURE: *Blood Glucose Determination*
  8. Dextrose If glucose < 80, or ALOC and unable to determine glucose:  
≥ 2 yrs: 1 amp **D50 IV** (1 amp = 25g in 50ml).  
< 2 yrs: 2 ml/kg **D25 IV** (12.5g in 50ml), up to a max of 100ml.  
(To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).  
May repeat in 5 minutes if ALOC persists and glucose still < 80.  
May substitute dose on Broselow tape/NPS Pediatric Resuscitation Tape for pediatric dose above.
  9. Glucose Paste If no IV, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 10**.
  10. Glucagon Adults: 1mg IM (if no IV and unable to give Glucose Paste).  
0-14 yrs: 0.03mg/kg IM, max dose 1mg (if no IV).  
May repeat once in 15 minutes if ALOC persists and glucose remains <80.
  11. Seizures If present, **GO TO** PROTOCOL: *Seizures*.
  12. Transport Consider air transport for heatstroke.
  13. Base Contact



# Heat Illness

## SPECIAL CONSIDERATIONS

<b>Assessment</b>	<p>Try to differentiate heat stroke from other heat illness early! There is a continuum from heat exhaustion to heat stroke, and assessment of mental status, temperature (if available), and hypotension are key.</p> <p>Many factors alter the body's ability to regulate temperature, including: age extremes, heart disease/medications (diuretics, beta blockers), antihistamines (alter sweating), alcohol, amount/type of fluid replacement, dehydration, acclimatization, humidity, altitude.</p> <p><u>Mental Status</u>: Ataxia (incoordination) and combativeness are often early signs of heat stroke. If patient has ALOC, assume heat stroke until proven otherwise and begin rapid cooling.</p> <p><u>Seizures</u>: often occur in heat stroke. Be prepared to protect the airway and treat for seizures.</p> <p><u>Temperature</u>: Take oral temperature only if normal mental status, otherwise take rectal temperature if able.</p> <p><u>Sweating</u>: If NOT present then assume heat stroke. However, a patient may still have heat stroke and sweating so don't use this alone to distinguish heat exhaustion from heat stroke.</p> <p><u>History</u>: heat exposure, exertion, age, recent alcohol use, rehydration status/fluid intake.</p> <p><u>PMH</u>: thyroid disease, psychiatric history, heart disease, seizures.</p> <p><u>Medications</u>: Haldol (other antipsychotics), blood pressure/heart medications (diuretics, beta blockers), and antihistamine (cold medicines/herbal medicine) can worsen heat illness.</p>
<b>Differential Diagnosis</b>	<p>Drug overdose (amphetamines, antihistamines, tricyclic antidepressants, aspirin)</p> <p>Alcohol withdrawal</p> <p>Sepsis, Febrile illness</p> <p>Diabetic ketoacidosis</p> <p>Meningitis, Encephalitis</p> <p>Thyroid storm (hyperthyroidism)</p> <p>Cerebral hemorrhage</p> <p>Medication reaction (antipsychotics, e.g. Haldol)</p> <p>Status Epilepticus</p>
<b>Treatment</b>	<p>Judicious fluid replacement: In elderly patients, overzealous fluid replacement may be detrimental.</p> <p><b>Cooling measures:</b></p> <p><i>Evaporative cooling</i>: The most effective. Spray or wipe skin with water and evaporate water with air using a fan, fanning or wind. Applying a moist cloth that retains moisture (cotton) is also effective.</p> <p><i>Immersion</i>: The next most effective but potentially dangerous. Use only if you can not provide evaporative cooling. Immerse the patient in cool/cold water for 10 minutes, remove patient and recheck temperature. Be cautious! Keep patient's head out of the water. It is difficult to protect an airway and manage a seizing patient in a stream! Also, it is easy to make the patient hypothermic using this method. Cool only to goal temperature of 39°C (102.5°F). Cooling will continue after you stop. If first attempt not successful then continue with 5 minute cycles, rechecking temperature 5 minutes after each immersion.</p> <p><i>Adjunctive measures</i>: Placing ice or cool towels in areas of high blood flow (neck veins, armpits, groin) works but is much less effective.</p> <p>AVOID cooling below 39° C (102.5° F) and stop if the patient starts shivering (hypothermic overshoot). Shivering increases body temperature and reflects overcooling.</p>
<b>Transport</b>	<p>Transport any patient with signs of severe heat exhaustion or heat stroke. Heat stroke warrants air transport.</p>
<b>AMA/TAR</b>	<p>Mild forms of heat illness may be treated and released after base contact if all symptoms have resolved.</p> <p>Parks without base hospitals should follow local medical advisor approved EMS policy.</p>

# Heat Illness

Types of Heat Illness				
	Who/Why	Symptoms	Treatment	Disposition
<b>Heat Edema</b>	Elderly, not acclimated to hot environment. History of rigorous activity then sitting/standing for long periods.	Redness, swelling of hands, ankles and feet.	Resolves with elevation of extremity and acclimatization.	Treat and release but make sure not CHF!
<b>Heat Rash</b> (prickly heat)	Anyone, usually in tropical/humid environment.	Blockage of sweat glands causing red painful, itchy rash in areas where clothing rubs.	None in field. Antibacterial cream, loose clothing, antihistamines.	TAR.
<b>Heat Syncope</b>	Elderly most common. Relative volume depletion. Must rule out other serious causes of syncope.	Dizziness and syncope with postural changes in hot environment.	Oral or IV fluids.	All symptoms should resolve with shade and fluid. But, you can't rule out other causes of syncope so transport all patients.
<b>Heat Tetany</b>	Anyone doing vigorous activity in a hot environment.	Hyperventilation, hand/foot spasm and tingling/numbness.	Shade and normal breathing.	All symptoms should resolve with shade, rest and cessation of hyperventilation. Base contact for disposition.
<b>Heat Cramps</b>	Unconditioned people starting vigorous activity in the heat. Fluid replacement with water and lack of adequate salt and potassium replacement.	Involuntary, spasmodic, painful cramps in calves, thighs or shoulders during or after exercise.	Rest and re-hydration with sport drink or salted water. (NOT salt pills).	All symptoms should resolve with shade, rest and adequate electrolyte replacement. Base contact for disposition.
<b>Heat Exhaustion</b>  normal mental status, body temp < 40° C (104°F)	Anyone active in hot environment without adequate fluid replacement. Caused by water and/or salt depletion.	Dizziness, weakness, fatigue, body aches, headache, nausea, sweating, vomiting, syncope, positional hypotension, tachycardia, elevated temperature but <b>NORMAL MENTAL STATUS!</b>	Rest, cooling, aggressive fluid/electrolyte replacement.	Transport. By ground OK if stable and improving. May be early heat stroke and must rule out other conditions.
<b>Heat Stroke</b>  altered mental status, temp over 104° F or 40° C A medical emergency!	Anyone active in hot environment without adequate fluid replacement. Water and/or salt depletion <u>Classic</u> : elderly in heat wave--poor ability to regulate heat because of age/meds. <u>Exertional</u> : young, healthy athletes after strenuous exercise in hot environment.	Same as heat exhaustion but no longer able to regulate heat so they develop neuro signs: un-coordination, combative, hallucinations, seizures. Severe vasodilation = hypotension, tachycardia. Dry skin = loss of sweating mechanism, i.e. temp control.	Rapid cooling, airway protection, IV fluids, seizure treatment if present.	Air transport if possible.

# Heat Illness

## Cross Reference

### **Procedures:**

Blood Glucose Determination  
Intraosseous (IO) Access  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration

### **Protocols:**

Altered Mental Status/Altered Level  
of Consciousness (ALOC)  
Seizures

### **Drugs:**

Dextrose 50% (D50)  
Glucagon  
Glucose Paste

# HYPOTHERMIA

## EMT Standing Orders

1. ABCs                      Secure airway. Assist respirations as needed, utilizing OPA/NPA if indicated.
2. Assessment              Vitals, mental status, trauma, body temperature, shivering, environment (temperature, wind, wet, duration).  
Palpate carotid and radial arteries for pulse and listen over left chest for heart sounds for two minutes before assuming cardiopulmonary arrest.  
If no pulse after two minutes, **GO TO** PROTOCOL: *Cardiac Arrest (Adult Medical)* or *Pediatric – Medical Arrest*.  
If patient has normal mental status and chief complaint is a frozen isolated extremity, nose, or ears **GO TO** PROTOCOL: *Frostbite*.
3. Stop Heat Loss           Shelter from wind and wet environment.  
Insulate from ground or snow.  
Remove wet clothes.  
Dry patient.  
Dress in dry insulated clothing or sleeping bag.  
Protect head and neck from heat loss.
4. Check Glucose            If ALOC, per PROCEDURE: *Blood Glucose Determination*.
5. Glucose Paste            If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).
6. Transport/ ALS Backup   Prepare for transport early in the rewarming effort. Avoid shaking or jostling patient.  
If ALOC, arrange ALS backup.
7. Base Contact
8. Active Rewarming            Focus rewarming efforts on head and trunk, not extremities. Place near heater or fire – monitor to prevent burns.  
Apply hot water bottles or thermal packs (insulate from skin to prevent burns) to thermal windows (head, neck, axilla, and groin).  
Warm patient with a second person in sleeping bag (if available).  
If normal mental status: Warm bath or shower.  
If patient can sit up on own and protect airway, give warm sugary drinks. Otherwise, nothing by mouth. No alcohol.

# HYPOTHERMIA

## Parkmedic Standing Orders

1. ABCs                      Secure airway. Assist respirations as needed, utilizing OPA/NPA if indicated.
2. Assessment              Vitals, mental status, trauma, body temperature, shivering, environment (temperature, wind, wet, duration).  
Palpate carotid and radial arteries for pulse and listen over left chest for heart sounds for two minutes before assuming cardiopulmonary arrest.  
If no pulse after two minutes, **GO TO PROTOCOL: Cardiac Arrest with AED or Cardiac Arrest Without AED or Pediatric – Medical Arrest with AED or Pediatric – Medical Arrest Without AED.**  
If patient has normal mental status and chief complaint is a frozen isolated extremity, nose, or ears **GO TO PROTOCOL: Frostbite.**
3. Stop Heat Loss            Shelter from wind and wet environment.  
Insulate from ground or snow.  
Remove wet clothes.  
Dry patient.  
Dress in dry insulated clothing or sleeping bag.  
Protect head and neck from heat loss.
4. IV/IO                      If ALOC, per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access.*  
Use warm IV fluids if available.  
Adults:            1-L NS/LR bolus, then maintenance rate (120ml/hr).  
0–14 yrs:        20 ml/kg NS/LR bolus (max bolus 1-L), then maintenance rate 4ml/kg/hr).
- Note:**                      Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
5. Check Glucose            If ALOC, per PROCEDURE: *Blood Glucose Determination.*
6. Dextrose                    If glucose < 80, or ALOC and unable to determine glucose:  
    ≥ 2 yrs:        1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
    < 2 yrs:        2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml.  
    (To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).  
May repeat in 5 minutes if ALOC persists and glucose still < 80.  
May substitute dose on NPS Pediatric Resuscitation Tape/Broselow Tape for pediatric dose above.
7. Glucose Paste            If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to Glucagon.
8. Glucagon                    Adults:            1mg IM (if no IV/IO and unable to give Glucose Paste).  
0-14 yrs:        0.03mg/kg IM, max dose 1mg (if no IV/IO).  
May repeat once in 15 minutes if ALOC persists and glucose remains < 80.
9. Transport                 Prepare for transport early in the rewarming effort. Avoid shaking or jostling patient.  
If transport delayed, continue with protocol.

# HYPOTHERMIA

10. Base Contact

11. Active  
Rewarming

Focus rewarming efforts on head and trunk, not extremities.  
Place near heater or fire – monitor to prevent burns.  
Apply hot water bottles or thermal packs (insulate from skin to prevent burns) to thermal windows (head, neck, axilla, and groin).  
If normal mental status: Warm bath or shower.  
If patient can sit up on own and protect airway, give warm sugary drinks. Otherwise, nothing by mouth. No alcohol.

12. Naloxone  
(Narcan)

If still ALOC and narcotic overdose suspected: (IN Route preferred)  
> 10-Adults: 2mg IN/IV/IO/IM/ every 2 minutes prn ALOC (max 10mg).  
< 10 yrs: 0.1mg/kg IN/IV/IO/IM/ every 2 minutes (max 2mg).

# HYPOTHERMIA

## SPECIAL CONSIDERATIONS

### **General**

Hypothermia usually results from patients being unable to remove themselves from a cold environment. Consider preceding trauma, alcohol/drug use or other underlying medical cause.

Degrees of hypothermia:

In *mild hypothermia*, the core temp is 32-35°C (90-95°F). The body is still able to control temperature, and signs may include tachycardia, hypertension, shivering, or normal mental status.

In *severe hypothermia*, the core temp is < 32°C (90°F). The body is unable to control temperature, and signs may include bradycardia, hypotension, loss of shivering, slowing of functions, or cardiac arrest.

The central nervous system is very sensitive to hypothermia. The patient has a progressive decline in mental ability from incoordination, to confusion, then lethargy, and finally coma.

Hypothermic patients may still be alive and have nonreactive pupils, minimal respirations, bradycardia, and hypotension. This warrants careful assessment of vitals! Palpate and listen for 2 minutes when checking vitals.

Cold irritates the heart muscle. Hypothermic patients often have a slow heart rate or arrhythmias which usually resolve with warming. They are also susceptible to ventricular fibrillation if handled roughly.

When rewarming, warm the trunk first. Warming the extremities causes dilation of peripheral blood vessels. This circulates cold blood to the core, lowering core temperature further.

### **Transport**

Arrange transport early in the rewarming effort.

Avoid shaking or jostling patient, as rough handling can precipitate arrhythmias.

Transport all hypothermic patients with ANY of the following:

ALOC, abnormal vital signs, or signs of shock.

Severe hypothermia even if successfully rewarmed, or signs of frostbite.

Other significant injury or illness.

Rewarming not possible in the field.

### **AMA/TAR**

Base contact should be made in all cases. Patients may be treated and released in communications failure only if normal mental status, mild hypothermia, all symptoms have resolved, no underlying medical problems, and has adequate protection from further hypothermia. All other patients should AMA.

The patient should demonstrate reasonable exercise tolerance prior to TAR (e.g. hiking 100 yards with pack).

Parks without base hospitals should follow local medical advisor approved EMS policy.

## Cross Reference

### **Procedures:**

Blood Glucose Determination  
Endotracheal Intubation  
Intraosseous Access  
IV Access and IV Fluid Administration  
King Tube  
Mucosal Atomizer Device

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
Frostbite  
Pediatric – Medical Arrest with AED  
Pediatric – Medical Arrest Without AED

### **Drugs:**

Dextrose 50% (D50)  
Glucose Paste or Gel  
Glucagon  
Naloxon (Narcan)

# INGESTION/POISONING

## EMT Standing Orders

1. Scene Safety  
Toxins/poisons can poison the EMS provider as well as the patient. Decontamination is paramount (see Special Considerations) because the environment may be hazardous, the patient may be hazardous, or their behavior unpredictable.
2. ABCs  
Protect airway, assist ventilation and suction as needed.  
If ALOC, seizures or shock continue on this protocol, but **REFERENCE** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC); Seizures; or Shock Without Trauma*.
3. Assessment  
Vitals, mental status, pupils, vomiting on scene, PMH, substance taken, route taken, time of ingestion, empty containers, suicide note, drug paraphernalia.  
Consider nerve agent/organophosphate exposure if multiple victims and/or AB-SLUDGEM; if suspected, **UTILIZE** PROCEDURE: *NAAK/Mark I (Nerve Agent Antidote Kit)*.  
Note: All body fluids can potentially poison the EMS provider.  
IF ALOC, proceed to **Step 4**.  
If normal mental status, proceed to **Step 7**.
4. Oxygen  
Per PROCEDURE: *Oxygen Administration*
5. Check Glucose  
If ALOC, per PROCEDURE: *Blood Glucose Determination*
6. Glucose Paste  
If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).
7. Transport/  
ALS Backup  
Arrange backup and consider air transport if abnormal vital signs, decreasing level of consciousness, or potentially toxic ingestion. Contact base for guidance.  
If a hazmat situation, decontaminate prior to transport.  
If non-accidental and self-inflicted, patient must be placed on legal hold. NO AMA/TAR.
8. Base Contact  
For all ingestions/poisonings



# INGESTION/POISONING

## Parkmedic Standing Orders

1. Scene Safety      Toxins/poisons can poison the EMS provider as well as the patient. Decontamination is paramount (see Special Considerations) because the environment may be hazardous, the patient may be hazardous, or their behavior unpredictable.
  2. ABCs              Protect airway, assist ventilation and suction as needed. OPA/NPA or ALS airway if indicated (*King Tube/ETT*). Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtacheal Jet Insufflation*.  
If ALOC, seizures or shock continue on this protocol, but **REFERENCE** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC); Seizures; or Shock Without Trauma*.  
If cardiac arrest, **GO TO** PROTOCOL: *Cardiac Arrest with AED (Adult Medical); Cardiac Arrest (Adult Medical) without AED; Pediatric – Medical Arrest without AED and Pediatric – Medical Arrest with AED*.
  3. Assessment      Vitals, mental status, pupils, vomiting on scene, PMH, substance taken, route taken, time of ingestion, empty containers, suicide note, drug paraphernalia.  
Consider nerve agent/organophosphate exposure if multiple victims and/or AB-SLUDGEM; if suspected, **UTILIZE** PROCEDURE: *NAAK/Mark I (Nerve Agent Antidote Kit)*.  
Note: All body fluids can poison the EMS provider.  
If ALOC, proceed to **Step 4**.  
If normal mental status, perform **Steps 4 and 5** then proceed to **Step 11**.
  4. Oxygen            Per PROCEDURE: *Oxygen Administration*
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
5. Check Glucose    If ALOC, per PROCEDURE: *Blood Glucose Determination*
  6. Dextrose          If glucose < 80, or ALOC and unable to determine glucose:  
    ≥ 2 yrs:      1 amp **D50** IV (1 amp = 25g in 50ml)  
    < 2 yrs:      2 ml/kg **D25** IV (12.5g in 50ml), up to a max of 100ml  
    (To make D25, remove 25ml of D50 and draw up 25ml of LR/NS)  
    May repeat in 5 minutes if ALOC persists and glucose still < 80  
    May substitute dose on NPS Pediatric Resuscitation Tape for pediatric dose above
  7. Glucose Paste    If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 8**.
  8. IV/IO              Per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*
  9. Glucagon          Adults:          1mg IM (if no IV/IO and unable to give Glucose Paste)  
0-14 yrs:      0.03mg/kg IM, max dose 1mg (if no IV/IO)  
May repeat once in 15 minutes if ALOC persists and glucose remains < 80.
  10. Naloxone        If still ALOC and narcotic overdose suspected (IN Route preferred):  
    (Narcan)            > 10-Adults: 2mg IN/IV /IO/IM every 2 minutes prn ALOC (max 10mg)  
                             < 10 yrs:      0.1mg/kg IN/IV/IO/IM every 2 minutes (max 2mg)

# INGESTION/POISONING

## 11. Transport

Arrange backup and consider air transport if abnormal vital signs, decreasing level of consciousness, or potentially toxic ingestion. Contact base for guidance.

If a hazmat situation, decontaminate prior to transport (air transport may be contraindicated). Contact Base.

If non-accidental and self-inflicted, patient must be placed on a legal hold. NO AMA/TAR.

## 12. Base Contact

For all ingestions/poisoning

If no base available, all patients require transport unless Poison Control advises otherwise.

# INGESTION/POISONING

## Parkmedic Base Hospital/Communication Failure Orders

1. Atropine  
For nerve agent/organophosphate (e.g. pesticide) exposure to control secretions.  
Adults: 2mg IV/IO/IM every 5 minutes prn secretions.  
Peds: 0.04mg/kg (0.4 ml/kg) IV/IO/IM every 5 minutes prn secretions.  
For each injection: minimum dose 0.1mg, maximum dose 2mg.
2. Glucagon  
For beta-blocker overdose.  
Adults: 2mg IV/IO/IM every 5 min prn bradycardia/hypotension causing shock.  
Peds: 0.06mg/kg IV/IO/IM (max 2mg) every 5min prn bradycardia/hypotension causing shock.  
Maximum cumulative dose is based on patient symptoms.
3. Sodium Bicarbonate  
For known tricyclic antidepressant or salicylate (aspirin) overdose,  
Any patient with seizures, hypotension or any wide complex tachycardia on monitor or ECG.  
Adults: 1amp IVP.  
Peds: 1meq/kg IVP (max 50meq=1 amp).  
Contact Base Hospital for repeat doses.
4. Midazolam (Versed)  
For actively seizing patients.  
Adults: IV/IO: 2mg every 3 min prn seizure (max 10mg).  
IN: 2mg every 3 min prn seizure (max 10mg).  
IM: 5mg every 10 min prn seizure (max 15mg).  
< 10 yrs: IV/IO: 0.1mg/kg (max 2mg) every 3 min prn seizure (max 5 doses).  
IN: 0.1mg/kg (max 2mg) every 3 min prn seizure (max 5 doses).  
IM: 0.15mg/kg (max 5mg) every 10 min prn seizure (max 3 doses).
5. Albuterol  
For wheezing or stridor associated with chemical exposure.  
Nebulizer: All ages: 5mg in 3ml of LR/NS premixed solution.  
Use with standard acorn-type jet nebulizer.  
For all patients, start oxygen at 10 l/min. If not improved by 3–5 minutes, increase oxygen to 15 l/min.  
MDI: Adult: 4 puffs on consecutive breaths during mid inspiration, then 1 puff every minute for up to 10 minutes (14 puffs total) if symptoms persist.  
May repeat 10-puff dose starting 10 minutes after last puff if symptoms persist.  
1-14 yrs: 2 puffs per minute up to six puffs then base contact.  
In communications failure repeat 6-puff sequence starting 10 minutes after last puff if symptoms persist.  
< 1 yr: 1 puff per minute up to six puffs then base contact.
6. Charcoal  
Indicated for some life threatening oral ingestions within 1 hour. (see Special Considerations.)  
If patient able to sit up and drink:  
Adult: 50g PO.  
1–14 yrs: 1g/kg PO (max dose 50g).  
< 1 yr: Base contact only, not in communications failure.
7. Nasogastric/Orogastric Tube Insertion  
For administration of charcoal per PROCEDURE: *Nasogastric/Orogastric Tube Insertion* per local medical advisor approved EMS policy.

# INGESTION/POISONING

## SPECIAL CONSIDERATIONS

### **Assessment**

Physical Exam should pay special attention to airway, lung sounds, mental status, bowel sounds, skin signs, pupils, oral burns, gag reflex, odors, track marks, pill containers, drug paraphernalia, or kitchen/workshop containers (children). If possible, verify the route of exposure: ingestion, inhalation, absorption, or injection.

History is very valuable in guiding therapy, but do not delay transport of potentially unstable patient for prolonged medication container search or prolonged questioning.

Beware of possible co-ingestions. For example, it is not uncommon for an overdose victim to mix drugs and alcohol. Consider base contact for direction when ingestion includes drugs/substances that have both indication and contraindication for charcoal, e.g., beta blocker and a caustic agent.

Particularly toxic/hazardous ingestions that may cause the patient to rapidly decline include:  
Beta blockers (most commonly present with bradycardia and hypotension, especially in young pediatrics).

Calcium channel blockers (especially in young pediatrics).

Tricyclic antidepressants.

Organophosphates.

Digoxin/Lanoxin.

Caustic agents (agents with a high/basic pH).

Some parents may have Ipecac. If given prior to arrival, patient may be vomiting due to the Ipecac. Advise parents to not give Ipecac.

Information specific to organophosphate/nerve agent exposure: AB-SLUDGEM:

A: Altered mental status.

B: Bronchorrhea, Breathing difficulty or wheezing, Bradycardia.

S: Salivation, Sweating, Seizures.

L: Lacrimation (tearing).

U: Urination.

D: Defecation or Diarrhea.

G: GI upset (abdominal cramps).

E: Emesis (vomiting).

M: Miosis/Muscle activity (twitching).

A single symptom of AB-SLUDGEM will almost certainly not be due to a poisoning.

Organophosphates occur in liquid or powder form, may or may not smell like insecticide, can be absorbed through the skin, and are often found in farms or gardens.

Attend to scene safety. Do not enter any area where nerve agent or significant quantity of organophosphate is suspected without proper personal protection.

If your team is exposed AND symptomatic, evacuate the team from the area.

Prevent continued exposure by removing all clothing from any symptomatic person, flushing the patient with water, and moving the patient from the scene.

# INGESTION/POISONING

**Medication Issues** Activated Charcoal should only be used for an oral ingestion. Do NOT use if:  
Patient cannot sit and sip water without choking or gagging.  
Active seizures or postictal status.  
Hydrocarbon ingestion (i.e. gasoline, kerosene, turpentine).  
Caustic ingestion (i.e. agents with a high/basic pH like lye or oven cleaner).  
Acids.  
Medications likely to cause rapid mental status decline (i.e. antidepressants, cardiac meds).  
Time of ingestion is known to be more than 2 hours prior to EMS contact.  
Charcoal is likely to be beneficial only with life threatening medications within 1 hour (e.g. beta blockers, calcium channel blockers, digoxin, oral hypoglycemics, etc) . After 2 hours it may be beneficial only in selected circumstances (e.g. long acting drugs, drugs that slow GI motility).

**Documentation** Time of ingestion  
Circumstances of ingestion  
Substances available  
Substances ingested (type and amount?)  
Any vomiting that occurred, whether pill fragments or other ingested substances were seen.  
Pill containers found, expiration date?

## Cross Reference

### **Procedures:**

Blood Glucose Determination  
Endotracheal Intubation  
Intraosseous Access  
IV Access and IV Fluid Administration  
King Tube  
NAAK/Mark I (Nerve Agent Antidote Kit)  
Nasogastric/Orogastric Tube Insertion  
Oxygen Administration Transtracheal  
Jet Insufflation (TTJI)

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC) Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
Pediatric – Medical Arrest With AED.  
Pediatric – Medical Arrest Without AED  
Seizures  
Shock Without Trauma

### **Drugs:**

Activated Charcoal  
Albuterol Atropine  
Dextrose 50% (D50)  
Glucagon  
Glucose Paste or Gel  
Midazolam (Versed)  
Naloxone (Narcan)  
Pralidoxime Chloride (2 PAM)  
Sodium Bicarbonate

# Major Trauma - Adult

## EMT Standing Orders

If patient is  $\leq 14$  yrs or shorter than 5 feet tall, **GO TO PROTOCOL: Pediatric – Major Trauma.**

1. ABCs Perform all ABC's with consideration of spine immobilization per PROCEDURE: *Spine Immobilization*.  
Secure airway.  
Assist respirations, utilizing OPA/NPA and suction as needed.  
Maintain C-spine precautions with ALL airway maneuvers.  
If patient in cardiac arrest, **GO TO PROTOCOL: Trauma Arrest (Adult and Pediatric)**.  
Control bleeding.  
Direct pressure and tourniquet per PROCEDURE *Wound Care*.  
Four-sided dressing to any open chest or neck wounds.  
Bandage non life/limb threatening injuries en route.
2. Primary Assessment Perform primary survey.  
Vitals – categorize:  
**Stable** if ALL present: SBP > 100; HR < 100; 10 < RR < 24; GCS=15.  
**Unstable** if ANY present: SBP < 100; HR > 100; RR < 10 or RR > 24; GCS < 15;  
unstable airway; neurovascular deficit; GSW to head, neck or torso;  
amputations other than digits (except thumb).  
Check the back for penetrating thoracic/abdominal injury. Check perineum.
3. Transport/ALS Backup On-scene time < 10 MINUTES when transport available.  
Consider air transport, especially if ALOC or abnormal vital signs.
4. Oxygen Per PROCEDURE: *Oxygen Administration*  
**Stable:** Low flow  
**Unstable:** Hi flow or BVM as indicated
5. Prevent Hypothermia Remove wet clothing and apply blankets.
6. Pelvic Stabilization Per PROCEDURE: *Pelvic Stabilization*
7. Secondary Assessment Repeat vital signs and mental status  
Perform secondary survey  
Determine PMH, medications, allergies  
Calculate trauma score per local medical advisor approved EMS policy
8. Check Glucose Only if ALOC, per PROCEDURE: *Blood Glucose Determination*.  
If no ALOC, proceed to **Step 11**.  
Note: ALOC secondary to hypoglycemia may have preceded the event.
9. Glucose Paste If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).
10. Base Contact
11. Splint/Bandage Injuries Immobilize and splint fractures en route per PROCEDURE: *Fracture/Dislocation Management and Wound Care*.  
Reduce any fracture/dislocation with deformity affecting ability to splint/transport, or any fracture/dislocation with decreased distal pulses.

# Major Trauma - Adult

## Parkmedic Standing Orders

If patient is  $\leq$  14 yrs or shorter than 5 feet tall, **GO TO PROTOCOL: Pediatric – Major Trauma.**

1. ABCs  
Perform all ABC's with consideration of spine immobilization per PROCEDURE: *Spine Immobilization*.  
Secure airway.  
Assist respirations, utilizing OPA/NPA or ALS airway (*King Tube/ETT*).  
Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtracheal Jet Insufflation*.  
Maintain C-spine precautions with ALL airway maneuvers.  
If patient in cardiac arrest, **GO TO PROTOCOL: Trauma Arrest (Adult and Pediatric)**.  
Control Bleeding.  
Direct pressure and tourniquet per PROCEDURE *Wound Care*.  
Four-sided dressing to any open chest or neck wounds.  
Bandage non life/limb threatening injuries en route.  
If signs/symptoms of tension pneumothorax develop, contact your base hospital; or, if in communication failure, refer to Step 1, Needle Thoracostomy, under Base Hospital Communication Failure.
2. Primary Assessment  
Perform primary assessment.  
Vitals – categorize:  
**Stable** if ALL present: SBP > 100; HR < 100; 10 < RR < 24; GCS=15.  
**Unstable** if ANY present: SBP < 100; HR > 100; RR < 10 or RR > 24; GCS < 15; unstable airway; neurovascular deficit; GSW to head, neck or torso; amputations other than digits (except thumb).  
Check the back for penetrating thoracic/abdominal injury. Check perineum.
3. Monitor/AED  
Apply cardiac monitor/AED when indicated  
If not placed during ABC's above, timing of monitor application is dependent on patient severity.
4. Transport  
On-scene time < 10 MINUTES when transport available.  
Consider air transport, especially if ALOC or abnormal vital signs.
5. Oxygen  
Per PROCEDURE: *Oxygen Administration*  
**Stable:** Low flow  
**Unstable:** Hi flow or BVM as indicated
6. Prevent Hypothermia  
Remove wet clothing and apply blankets
7. Pelvic Stabilization  
Per PROCEDURE: *Pelvic Stabilization*
8. Secondary Assessment  
Repeat vital signs and mental status.  
Perform secondary survey.  
Determine PMH, medications, allergies.  
Calculate trauma score per local medical advisor approved EMS policy.
9. Pain Management  
Per PROCEDURE: *Pain Management*

# Major Trauma - Adult

10. IV/IO                      Per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*  
                                         **Stable:**        One 14-16 gauge IV/IO  
                                         **Unstable:**    Two 14-16 gauge IV/IOs  
                                         If SBP > 100 AND HR < 100, then administer LR/NS at maintenance (120ml/hr).  
                                         If SBP 80-100 OR HR > 100, then bolus LR/NS 500ml.  
                                         If SBP < 80, then bolus LR/NS 1-L under pressure.  
                                         Recheck vitals after boluses, and run IV fluids as above. Continue IVF; after 2-L, contact base.
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
11. Check Glucose            Only if ALOC, per PROCEDURE: *Blood Glucose Determination*  
                                         If no ALOC, proceed to **Step 16**  
                                         Note: ALOC secondary to hypoglycemia may have preceded the event
12. Dextrose                    If glucose < 80 or ALOC and unable to determine glucose:  
                                         Administer 1 amp **D50** IV/IO (1 amp = 25g in 50ml)  
                                         May repeat in 5 minutes if ALOC persists and glucose still < 80
13. Glucose Paste            If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
                                         If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
                                         If no response to Glucose Paste in 5 minutes, then proceed to **Step 15**.
14. Glucagon                    1mg IM (if no IV/IO and unable to give Glucose Paste)  
                                         May repeat once in 15 minutes if ALOC persists and glucose remains < 80
15. Ondansetron              For nausea or vomiting or history of vomiting with narcotic administration  
    (Zofran)                      Adult:        IV/IO:    4mg IV/IO/ over 2–5 min, repeat in 15 min x2 prn nausea  
                                                            ODT:     4mg, repeat in 15 min x2 prn nausea  
                                                            IM:        If no IV/IO or ODT, give 8mg, repeat in 15 min x1 prn nausea
16. Base Contact
17. Splint/Bandage            Immobilize and splint fractures en route per PROCEDURE: *Fracture/Dislocation*  
    Injuries                      *Management and Wound Care.*  
                                         Reduce any fracture/dislocation with deformity affecting ability to splint/transport, or any fracture/dislocation with decreased distal pulses.



# Major Trauma - Adult

## Parkmedic Base Hospital/Communication Failure Orders

1. Needle Thoracostomy  
Per PROCEDURE: *Needle Thoracostomy*  
For suspected tension pneumothorax **not** in traumatic arrest:  
Clinical situation/criteria for needle thoracostomy:  
Penetrating Chest Trauma or;  
Suspected pneumothorax from blunt trauma or;  
Patient signs and symptoms: **ALL** of the following must be present  
Severe respiratory distress ( RR < 10 or > 24)  
Hemodynamic compromise (SBP < 80)  
Decreased or absent breath sounds on one side  
  
**Note:** Tension pneumothorax is a rare, but life threatening condition and is often difficult to assess clinically. Early base contact is advised if tension pneumothorax is suspected and patient does not meet all of the above criteria.
2. IV/IO Fluid  
After administering 2-L of IVF, follow base orders for additional fluid management; if in communication failure, give 500mL boluses x 2 for SBP < 70 mmHg, up to 3-L maximum total IV fluids.
3. Oral Fluids  
Base Order ONLY, NOT in communication failure.  
If no IV access is obtainable, oral rehydration may be considered in conjunction with a base hospital physician.  
Suggested criteria are as follows:  
Normal mental status  
Stable and protected airway  
Unstable SBP or unstable HR as defined in Step 10, IV/IO above  
Greater than 4 hours between injury and anticipated arrival at hospital  
Fluids may be administered as frequent small sips of water or non-carbonated electrolyte replenishment drink.
4. Cefazolin (Ancef)  
Consider for serious wounds if > 2 hours between injury and arrival at hospital/clinic, per PROCEDURE: *Wound Care*.  
1g IV/IO (IM if no IV/IO access) every 8 hours.

# Major Trauma - Adult

## SPECIAL CONSIDERATIONS

### General

On-scene time SHOULD BE < 10 MINUTES unless multiple patients, prolonged extrication, or transport unavailable. All delays on scene must be documented. On-scene treatment should be limited to airway management, pressure control of major bleeding, covering an open chest wound and spine immobilization. Begin organizing transport immediately. Contact base as soon as transport underway, or immediately if transport delayed. Reassess ABCs & vital signs frequently once en route, and after any treatment.

### Assessment

#### Primary assessment:

- A: Airway with cervical spine control
- B: Breathing\*\*
- C: Circulation/uncontrolled bleeding
- D: Disability/neuro status
- E: Exposure (undress) with Environmental control (temperature)

\*\*Tension Pneumothorax can develop at any time.

Signs and symptoms of tension pneumothorax:

If not in arrest, **ALL** of the following must be present:

Severe respiratory distress (RR < 10 or RR > 24)

Hemodynamic compromise (SBP < 80)

Decreased or absent breath sounds on one side

Either distended neck veins **or** tracheal deviation AWAY from side with tension.

If patient is intubated, increasing difficulty ventilating the patient along with all of the above should prompt a search for development of tension pneumothorax.

Per PROCEDURE: *Needle Thoracostomy*

Secondary assessment: (head-to-toe) Identify immediate life threats: head injury, neck vein distention, tracheal shift, chest trauma/flail chest, unequal lung sounds, abdominal trauma, pelvic/femur fractures, back trauma, shock, major hemorrhage, survey of injuries. If ALOC, document pupil size/reactivity, and continuously monitor neuro status.

History: Mechanism of injury: Penetrating or blunt trauma? Speed of vehicles? Angle of impact, rollover, secondary impacts, exterior damage, airbags deployed? Seatbelt? Damage to steering wheel or windshield? Patient ejected? What did patient actually hit? Loss of consciousness? Fatality on scene? Extrication time > 20 minutes? Height of fall? Helmet? Possible cause of incident: medical problem, drug overdose, alcohol, MI, seizure? AMPLE history.

Vitals: Repeat frequently during transport, including mental status. Tachycardia is an early sign of shock. A palpable radial pulse corresponds to SBP  $\geq$  80, and a palpable carotid pulse corresponds to SBP  $\geq$  60.

Shock: In trauma, hypotension is usually from internal blood loss, NOT from isolated head injury.

Head Trauma: Repeated neuro exams (GCS, pupils, respiratory pattern, posturing) are essential. Deteriorating mental/neuro status is an emergency and air transport should be utilized if available. Agitation may suggest head trauma or hidden medical cause. If patient's respiratory rate is < 10, assist respirations with BVM at a rate of 20/min.

# Major Trauma - Adult

Amputations: Per PROCEDURE: *Wound Care*. Wrap extremity in dry sterile gauze, place in plastic bag and keep cool (put on ice if possible). Amputated part should NOT be wet or placed directly in water/ice.

Open Fractures: Per PROCEDURE: *Wound Care*. Irrigate with potable water, apply sterile dressing and splint per PROCEDURE: *Fracture/Dislocation Management*. Apply moist sterile dressing to exposed bone or tendon.

Pelvic Stabilization: Per PROCEDURE: *Pelvic Stabilization*.

Penetrating Trauma: Secure impaled objects and transport. Modify object or patient position for transport as needed. Do not remove object unless necessary for transport or CPR.

## Transport

If unstable trauma patient, initiate immediate transport with ALS treatment en route and ultimately air transport to trauma center if available.

## AMA/TAR

No patient may be Treated and Released without base contact in the setting of multisystem trauma. A patient over age 18 with normal mental status may AMA after base contact or in communication failure.

Parents or legal guardian must be on scene to sign a pediatric patient AMA after base contact.

Parks without base hospitals should follow local medical advisor approved EMS policy.

## Documentation

MOI (mechanism of incident and mechanism of injury).

Loss of consciousness and duration.

Initial and repeat vital signs.

Pertinent exam findings (breath sounds, pelvic stability, fractures and bleeding).

If on scene > 10 minutes, document reason.

## Cross Reference

### Procedures:

Blood Glucose Determination  
Fracture/Dislocation Management  
Intraosseous Access  
IV Access and IV Fluid Administration  
King Tube  
Needle Thoracostomy  
Oxygen Administration  
Pain Management  
Pelvic Stabilization  
Spine Immobilization  
Transtracheal Jet Insufflation  
Wound Care

### Protocols:

Pediatric-Major Trauma  
Trauma Arrest (Adult and Pediatric)

### Drugs:

Cefazolin (Ancef)  
Dextrose 50% (D50)  
Fentanyl  
Glucagon  
Glucose Paste or Gel  
Hydromorphone (Dilaudid)  
Morphine  
Ondansetron

# Minor or Isolated Extremity Trauma

## EMT Standing Orders

1. ABCs **GO TO PROTOCOL:** *Major Trauma – Adult, Pediatric – Major Trauma, or Altered Mental Status/Altered Level of Consciousness (ALOC)* if any of the following are present:  
SBP<100; HR>100; RR<10 or RR>24; GCS<15; unstable airway;  
neurovascular deficit; GSW to head, neck or torso; amputations other than digits (except thumb); femur fracture with significant mechanism.
2. Assessment Vital signs, other injuries, bones and joints above and below injury, open wounds, deformity, distal circulation, sensation and motor function.
3. Control Bleeding Direct pressure. Elevate if possible.
4. Wound Care Per PROCEDURE: *Wound Care*. Irrigate thoroughly unless bleeding is/was heavy, and apply dressing.  
If fracture/dislocation, proceed to **Step 5**; final dressing should be applied after reduction. Apply Bacitracin to shallow wounds and burns if <15% TBSA and transport time >1 hour.
5. Reduce Fracture Per PROCEDURE: *Fracture/Dislocation Management*, reduce any suspected fractured limb with decreased distal pulses or with a deformity affecting ability to adequately splint and/or transport.
6. Immobilize Splint any extremity that has been reduced, has a suspected fracture, a gaping wound, wounds with excessive bleeding, large wounds over joints, or for patient comfort.
7. Reassess Bleeding, comfort, distal circulation, sensation and motor function.
8. Transport/  
ALS Back-Up See Special Considerations for Treat and Release criteria.
9. Base Contact For abnormal vitals, orders, or any AMA.

## EMT Base Hospital/Communication Failure Orders

1. Reduce Dislocation If ETA to hospital/clinic >2 hours AND per Local Medical Advisor approved extended scope of practice, reduce shoulder, patella, or finger dislocations per PROCEDURE: *Fracture/Dislocation Management*.

Note: for shoulder reduction, wait for ALS back-up to provide analgesia unless ALS arrival is >1 hour.

1. Acetaminophen (Tylenol) >10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours  
0-10 yrs: 20mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours
2. Ibuprofen (Motrin, Advil) >10-Adult: 600mg PO every 6 hours  
6 mon-10 yrs: 5mg/kg PO every 6 hours, max dose 200mg

# Minor or Isolated Extremity Trauma

## Parkmedic Standing Orders

1. ABCs **GO TO PROTOCOL: Major Trauma – Adult, Pediatric – Major Trauma, or Altered Mental Status/Altered Level of Consciousness (ALOC)** if any of the following are present:  
SBP < 100; HR > 100; RR < 10 or RR > 24; GCS < 15; unstable airway; neurovascular deficit; GSW to head, neck or torso; amputations other than digits (except thumb); femur fracture with significant mechanism.
2. Assessment Vital signs, other injuries, bones and joints above and below injury, open wounds, deformity, distal circulation, sensation and motor function.
3. Control Bleeding Direct pressure.
4. Wound Care Per PROCEDURE: *Wound Care*. Irrigate thoroughly unless bleeding is/was heavy, and apply dressing.  
If fracture/dislocation, proceed to **Step 5**; final dressing should be applied after reduction. Apply Bacitracin to shallow wounds and burns if < 15% TBSA and transport time > 1 hour.
5. Reduce Fracture Per PROCEDURE: *Fracture/Dislocation Management*, reduce any suspected fractured limb with decreased distal pulses or with a deformity affecting ability to adequately splint and/or transport.
6. Immobilize Splint any extremity that has been reduced, has a suspected fracture, a gaping wound, wounds with excessive bleeding, large wounds over joints, or for patient comfort.
7. Reassess Bleeding, comfort, distal circulation, sensation and motor function.
8. Pain Management Per PROCEDURE: *Pain Management*
9. IV/IO Place IV and administer IV fluids per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*, if abnormal vitals or administration of medications anticipated.  
  
Note: Do not place in injured extremity if possible.
10. Ondansetron (Zofran) For nausea or vomiting or history of vomiting with narcotic administration  
  
Adult: IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea  
ODT: 4mg, repeat in 15 min x2 prn nausea  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea  
3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea  
0 – 3 mos.: IV/IO: Base Hospital Order ONLY. 0.1mg/kg SIVP  
IM: Contraindicated for patients < 3 months of age
11. Transport See Special Considerations for Treat and Release criteria
12. Base Contact For abnormal vitals, orders, or any AMA

# Minor or Isolated Extremity Trauma

## SPECIAL CONSIDERATIONS

### Assessment

Other injuries.  
Distal circulation, sensation, and motor function before and after reduction or splinting.  
Tenderness, deformity, crepitus, range of motion (ROM).  
Open wounds and degree of contamination.  
Joint above and below fracture. Bones above and below joint injury.  
If isolated joint injury without obvious fracture (i.e., no deformity, crepitus, or extreme pain) test pain-free range of motion.  
If isolated lower extremity injury and no obvious fracture (i.e., no deformity, crepitus, or extreme pain) test ability to bear weight.  
Wounds potentially needing suture repair include cosmetic areas (i.e. hands, face, neck), gaping lacerations, or if fat/muscle/tendon is visible.  
Assess risk for rabies in animals (species: skunk, fox, bat) appearing ill or displaying unusual behavior, e.g., unprovoked attacks.  
Suspect a fracture if there is an appropriate mechanism of injury with associated focal pain and tenderness, deformity, significant swelling, and/or loss of function (e.g., unable to walk on leg or grab with hand).  
Suspect a joint injury (sprain with or without associated fracture) when there is an appropriate mechanism of injury with pain, swelling, and loss of function or range of motion. Joint injuries may not have significant tenderness.  
Suspect a joint dislocation when any of the findings for joint injury are associated with deformity.

### Treatment Issues

A splint should be applied whenever a fracture or joint injury is suspected with loss of function. Exceptions: An isolated knee or ankle injury which does not limit function (i.e. patient states and demonstrates that they can still walk) may be supported without splinting to allow self-evacuation from the backcountry. Support without splinting may include heavy hiking boots for an ankle or improvised knee immobilizer.

Response to narcotic analgesics (Fentanyl/Morphine/Dilaudid) is both situation and patient specific. If prolonged patient contact is anticipated, dose adjustment within the protocol parameters may be warranted. If additional medication is indicated, contact base.

### Transport

Consider helicopter evacuation for any of the following:  
Any fracture or dislocation with neurovascular compromise;  
Ground transport time > 6 hours with: corrected neurovascular compromise; an open fracture; unreduced dislocations; femur, humerus or tibia/fibula fractures; or qualifying wound but no Cefazolin (Ancef).

### AMA/TAR

**May treat and release if NONE OF THE FOLLOWING ARE PRESENT:**

Signs of shock or ALS performed  
Abnormal neurovascular function distal to the injury  
Medications administered  
Tourniquets used (including those applied by patient)  
Gross wound contamination, signs of infection, or suspected retained foreign bodies  
Wound depth > 1cm, or bite wounds breaking skin  
Vital structures damaged (tendons, muscle, vessels)  
Crush or contaminated wounds to hands or feet  
Open fractures  
Head, neck, or torso involvement  
Splint or reduction required  
PMH: diabetes, age > 65, current steroid use, or immunocompromised state

# Minor or Isolated Extremity Trauma

Advise any patient released to:

Keep wound clean, dry, and bandaged.

Seek medical attention ASAP to evaluate wound for possible suturing and tetanus immunization.

See a doctor ASAP for: any redness, swelling, warmth, pain, pus, or fever; limitation of function or mobility; any other concerns.

Base contact should be attempted for all patients not meeting above criteria.

Parks without base hospitals should follow local medical advisor approved EMS policy.

## Documentation

Mechanism of injury

Distal neurovascular function

Location, depth, length, and width of wound

Tendon, muscle, or vessel exposure

Contamination

Active or pulsatile bleeding

Tetanus status

Care provided: bleeding control, irrigation, foreign material removal, bandaging, splinting, reduction, pre- and post-procedure exam

Instructions provided

## Cross Reference

### Procedures:

Fracture/Dislocation Management

Intraosseous (IO) Access

IV Access and IV Fluid

Administration

Pain Management

Wound Care

### Protocols:

Altered Mental Status/Altered Level of Consciousness (ALOC)

Major Trauma – Adult

Pediatric – Major Trauma

### Drugs:

Acetaminophen (Tylenol)

Bacitracin

Cefazolin (Ancef)

Fentanyl

Hydromorphone (Dilaudid)

Ibuprofen (Motrin, Advil)

Morphine

Ondansetron (Zofran)





12. Splint/Bandage Injuries

Immobilize and splint fractures en route per PROCEDURE: *Fracture/Dislocation Management and Wound Care*.

Reduce any fracture/dislocation with deformity affecting ability to splint/transport, or any fracture/dislocation with decreased distal pulses.

**EMT Base Hospital/Communication Failure Orders**

1. Oral Fluids

Base Hospital Order ONLY, NOT in communication failure.

Oral fluid rehydration may be attempted in a patient if ALL of the following conditions are met:

Normal mental status.

Stable and protected airway.

Unstable SBP or unstable HR as defined in PROTOCOL: *Pediatric Parameters*.

Greater than 4 hours between injury and anticipated arrival at hospital.

If ALL of these conditions are met, the patient may be given frequent small sips of water or non-carbonated electrolyte replenishment drink.

2. Glucose Paste

If glucose < 80, or ALOC and unable to determine glucose:

Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.

If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).



10. IV/IO Place IV/IO per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*.  
 If no signs of shock, administer 10ml/kg LR/NS bolus, then maintenance IV/IO fluids.  
 If signs of shock, administer 20ml/kg LR/NS bolus, then recheck vitals.  
 Bolus may be repeated x2 before base contact if vital signs not improved.  
 Give bolus via syringe IV/IO push. Establish second IV/IO when able.  
 Continue to administer maintenance fluids regardless of shock status unless ordered to stop by base.
11. Check Glucose If ALOC, per PROCEDURE: *Blood Glucose Determination*.  
 Note: ALOC secondary to hypoglycemia may have preceded the event.
12. Dextrose If glucose < 80 or ALOC and unable to determine glucose:  
 ≥ 2 yrs: 1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
 < 2 yrs: 2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml.  
 (To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).  
 May repeat in 5 minutes if ALOC persists and glucose still < 80.  
 May substitute dose on NPS Pediatric Resuscitation Tape / Broselow Tape for pediatric dose above.  
 If hypoglycemia/ALOC persists reference **Parkmedic Base Hospital/Communication Failure Orders** for Glucose Paste and Glucagon.
13. Pain Management Per PROCEDURE: *Pain Management*
14. Ondansetron For nausea or vomiting or history of vomiting with narcotic administration:  
 (Zofran) 3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea.  
 ODT: ½ tab (2mg) if age 4- 14  
 IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea.  
 0 – 3 mos.: IVIO: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
 IM: Contraindicated for patients < 3 months of age.  
**Note:** For severely symptomatic patients, ODT can be administered prior to attempts for IV/IO access
15. Base Contact
16. Splint/Bandage Immobilize and splint fractures en route per PROCEDURE: *Fracture/Dislocation Injuries Management and Wound Care*.  
 Reduce any fracture/dislocation with deformity affecting ability to splint/transport, or any fracture/dislocation with decreased distal pulses.

**Parkmedic Base Hospital/Communication Failure Orders**

1. Needle Per PROCEDURE: *Needle Thoracostomy*.  
 Thoracostomy If not in arrest, **ALL** of the following must be present:  
 Severe respiratory distress (RR<10 or RR>24).  
 Hemodynamic compromise (**0-8yrs**: SBP < 50).  
 Decreased or absent breath sounds on one side.  
**Note:** Tension pneumothorax is a rare, but life threatening condition and is often difficult to assess clinically. Early base contact is advised if tension pneumothorax is suspected and patient does not meet all of the above criteria.

2. Oral Fluids  
Base Hospital Order ONLY, NOT in communication failure.  
Oral fluid rehydration may be attempted in a patient if ALL of the following conditions are met:
  - Normal mental status.
  - Stable and protected airway.
  - Unstable SBP or unstable HR as defined in PROTOCOL: *Pediatric Parameters*.
  - Greater than 4 hours between injury and anticipated arrival at hospital.If ALL of these conditions are met, the patient may be given frequent small sips of water or non-carbonated electrolyte replenishment drink.
  
3. Glucose Paste  
If no IV, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, proceed to glucagon administration.
  
4. Glucagon  
0.03mg/kg IM, max dose 1mg (if no IV/IO).  
May repeat once in 15 minutes if ALOC persists and glucose remains <80.
  
5. Pain Management  
Per PROCEDURE: *Pain Management*
  
6. Cefazolin (Ancef)  
Consider for serious wounds if > 2 hours between injury and arrival at hospital/clinic, per PROCEDURE: *Wound Care*.
  - 12-14 yrs.: 1g IV (IM if no IV access) every 8 hours.
  - 6-12 yrs.: 500mg IV (IM if no IV access) every 8 hours.
  - < 6 yrs.: 250mg IV (IM if no IV access) every 8 hours

SPECIAL CONSIDERATIONS**General**

On-scene time SHOULD BE <10 MINUTES unless multiple patients, prolonged extrication, or transport unavailable. All delays on scene must be documented. On-scene treatment should be limited to airway management, pressure control of major bleeding, covering an open chest wound and spine immobilization. Begin organizing transport immediately. Contact base as soon as transport underway, or immediately if transport delayed. Reassess vital signs frequently once en route, and after any treatment.

**Pediatric General**

Airway management: most children can be easily ventilated by BVM if proper head position is maintained. Use a King Tube/ETT per PROCEDURES: *King Tube; ETT*. Use chest rise/fall to indicate adequate ventilation. NPS Pediatric Resuscitation Tape/Broselow tape uses length to estimate weight and has pre-calculated drug doses and appropriate equipment sizes (BVM, oral airways, IVs, cervical collars, BP cuffs, suction). Booster seats, designed for children 40-80 pounds, are NOT adequate for spinal immobilization. IV/IO Access: All IV medications and IV fluids can be given IO. Reference PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous (IO) Access*. Assessment of children is difficult. You must rely on repeated observation, especially for mental status.

**Assessment**Primary assessment:

- A: Airway with cervical spine control
- B: Breathing\*\*
- C: Circulation/uncontrolled bleeding
- D: Disability/neuro status
- E: Exposure (undress) with Environmental control (temperature)

\*\*Tension Pneumothorax can develop at any time.

If not in arrest, **ALL** of the following must be present for the diagnosis of Tension Pneumothorax. Per PROCEDURE: *Needle Thoracostomy*.

Severe respiratory distress (Abnormal RR) defined per PROTOCOL: Pediatric Parameters).

Hemodynamic compromise (Low SBP) defined per PROTOCOL: Pediatric Parameters.

Decreased or absent breath sounds on one side.

Either distended neck veins **or** tracheal deviation AWAY from side with tension.

IF patient is intubated, increasing difficulty ventilating the patient along with all of the above should prompt a search for development of tension pneumothorax.

Per PROCEDURE: *Needle Thoracostomy*.

Secondary assessment: (head-to-toe) Identify immediate life threats: head injury, neck vein distention, tracheal shift, chest trauma/flail chest, unequal lung sounds, abdominal trauma, pelvic/femur fractures, back trauma, shock, major hemorrhage, survey of injuries. If ALOC, document pupil size/reactivity, and continuously monitor neuro status.

History: Mechanism of injury: Penetrating or blunt trauma? Speed of vehicles? Angle of impact, rollover, secondary impacts, exterior damage, airbags deployed? Seatbelt? Damage to steering wheel or windshield? Patient ejected? What did patient actually hit? Loss of consciousness? Fatality on scene? Extrication time >20 minutes? Height of fall? Helmet? Possible cause of incident: medical problem, drug overdose, alcohol, seizure? AMPLE history.

Vitals: Repeat frequently, including mental status. **REFERENCE PROTOCOL:** *Pediatric Parameters* or NPS Pediatric Resuscitation Tape/Broselow Tape for age-appropriate vital signs. Remember that a pediatric patient’s SBP will remain normal even in moderate acute blood loss.

Shock: Children have a large capacity to compensate for shock. Tachycardia or ALOC are the best signs and **hypotension is a very late sign**. Children often have masked internal injuries. In trauma, hypotension is usually from internal blood loss, NOT from isolated head injury. **REFERENCE PROTOCOL:** *Pediatric Parameters* or NPS Pediatric Resuscitation Tape/Broselow Tape for age-appropriate vital signs. A fluid bolus of 20ml/kg represents 25% blood volume. A positive response is indicated by decreased heart rate, increased blood pressure, improved perfusion or improved mental status.

Mental status: Consider what would be normal behavior for a child that age. Crying is probably appropriate. A lethargic, non-crying child is often a sign of head injury or shock. If parents are available, ask if the child responds appropriately to them. If ALOC, document pupil size and reactivity, and continuously monitor neuro status. **REFERENCE PROTOCOL:** *Pediatric Parameters* for pediatric GCS calculation.

Head Trauma: Repeated neuro exams (GCS, pupils, respiratory pattern, posturing) are essential. Agitation and/or lethargy suggest head trauma, shock, or other hidden medical cause. Deteriorating mental/neuro status is an emergency and air transport should be utilized if available.

Amputations: Per PROCEDURE: *Wound Care*. Gently rinse the amputated part; wrap in moist, clean cloth or gauze; place into a dry, water tight plastic bag. **DO NOT IMMERSER PART DIRECTLY IN WATER OR ICE**. Place bag in ice water or a cool water bath and transport with patient. Do not delay transport looking for amputated tissue. Consider helicopter transport as replantation success is highly time-dependent.

Fractures: Children will often have no external signs of trauma over a fracture. Failure to move an extremity is often a sign of fracture and failure to move legs could indicate a pelvic fracture. Irrigate with potable water, apply sterile dressing and splint per PROCEDURE: *Fracture/Dislocation Management*. Apply moist sterile dressing to exposed bone or tendon per PROCEDURE: *Wound Care*.

Pelvic Stabilization: Per PROCEDURE: *Pelvic Stabilization*.

Penetrating Trauma: Secure impaled objects and transport. Modify object or patient position for transport as needed. Do not remove object unless necessary for transport or CPR.

**Transport** If unstable trauma patient, initiate immediate transport with ALS treatment en route and ultimately air transport to trauma center if available.

**AMA/TAR** No patient may be Treated and Released without base contact in the setting of multisystem trauma.  
Parents or legal guardian must be on scene to sign a pediatric patient AMA after base contact. Parks without base hospitals should follow local medical advisor approved EMS policy.

**Documentation** MOI (mechanism of incident and mechanism of injury).  
Loss of consciousness and duration.  
Initial and repeat vital signs.  
Pertinent exam findings (breath sounds, pelvic stability, fractures and bleeding).  
If on scene >10 minutes, document reason.

## Cross Reference

### **Procedures:**

Blood Glucose Determination  
Fracture/Dislocation Management  
Intraosseous (IO) Access  
IV Access and IV Fluid  
Administration  
King Tube  
Needle Thoracostomy  
Oxygen Administration  
Pain Management  
Pelvic Stabilization  
Spine Immobilization  
Transtracheal Jet Insufflation  
Wound Care

### **Protocols:**

Major Trauma – Adult  
Pediatric Parameters  
Trauma Arrest (Adult and  
Pediatric)

### **Drugs:**

Cefazolin (Ancef)  
Dextrose 50% (D50)  
Fentanyl  
Glucagon  
Glucose Paste or Gel  
Morphine  
Ondansetron

**EMT Standing Orders**

If patient is >14yrs or taller than NPS Pediatric Resuscitation Tape/Broselow tape (5 feet), **GO TO** PROTOCOL: *Cardiac Arrest Without AED (Adult Medical)*; or *Cardiac Arrest With AED (Adult Medical)*.

If patient is a newborn (<1 day old) **GO TO** *Pediatric – Newborn Resuscitation*.

If patient is a neonate (1–28 days old) **GO TO** *Pediatric – Medical Arrest without AED*. AEDs cannot be used on patients <28 days old.

**Note:** Once AED is applied, keep it attached to the patient throughout the Protocol.

1. Confirm Arrest
  - No response to aggressive stimulation.
  - Call for ALS/ACLS backup ASAP.
  - Check breathing, give 2 breaths if indicated, and check pulse (preferably carotid).
  - If pulse is present, patient is NOT in cardiac arrest. **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)*, or other appropriate protocol.
  - If pulse is absent and AED is available, continue this PROTOCOL.
  - If pulse is absent and AED is **NOT** available, **GO TO** PROTOCOL: *Pediatric – Medical Arrest Without AED*.
  
2. Assessment
  - Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated and by what means (e.g., length of downtime determines whether to start with CPR or AED). As time allows, obtain additional information including preceding events and symptoms, and PMH.
  
  - Do not attempt resuscitation in the following cases:
    - Rigor mortis, lividity, obviously fatal trauma, or DNR.
    - Documented pulseless downtime greater than 30 minutes.
  
  - If the downtime of the patient is known to be less than 4 minutes**, then initiate resuscitation with the AED; proceed to **Step 3**.
  - If the downtime of the patient is unknown, or is known to be greater than 4 minutes**, then initiate resuscitation with CPR; proceed to **Step 4**.
  
3. Apply AED
  - Turn on AED and follow prompts per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either state “Shock Advised” or “No Shock Advised.” Allow the AED to deliver a shock if indicated.
  - Note:** use age-appropriate pads if available.
  
4. Airway
  - Secure airway utilizing OPA/NPA.
  
5. CPR/AED  
Cycle 1
  - Begin with a compression-to-ventilation ratio of 15:2. Compression rate is 100/minute. Compress  $\geq \frac{1}{3}$  anterior-posterior diameter of chest. Allow complete recoil between compressions. “Push Hard, Push Fast.” Continue with 5 cycles of CPR (15:2) – approximately 2-3 minutes.
  
  - Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.
  - REFERENCE** PROTOCOL: *Pediatric Parameters* for other pediatric CPR details.
  
  - If AED is already attached to the patient**, perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.



If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.

If AED states “No Shock Advised,” then check carotid pulse for 6 seconds. If patient has a palpable pulse or signs of life, then proceed to **Step 8**. If patient has no palpable pulse nor signs of life, then proceed to **Step 6**.

**If AED is not yet attached to patient**, perform 2 minutes of CPR, then attach AED to patient per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either recommend shock or not recommend shock.

If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.

If AED states “No Shock Advised,” then check carotid pulse for 6 seconds. If patient has a palpable pulse or signs of life, then proceed to **Step 8**. If patient has no palpable pulse nor signs of life, then proceed to **Step 6**.

- 6. CPR/AED Cycle 2      Perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.
  - If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 7**.
  - If AED states “No Shock Advised,” then check carotid pulse for 6 seconds. If patient has a palpable pulse or signs of life, then proceed to **Step 8**. If patient has no palpable pulse nor signs of life, then proceed to **Step 7**.
  
- 7. CPR/AED Cycle 3      Perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.
  - If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.”
  - If <30 minutes of CPR/AED have occurred, repeat this step (**Step 7**).
  - If >30 minutes of CPR/AED have occurred, then consider CPR termination per **EMT Base Hospital/Communication Failure Orders**.
  - If AED states “No Shock Advised,” then check carotid pulse for 6 seconds. If patient has a palpable pulse or signs of life, then proceed to **Step 8**. If <30 minutes of CPR/AED have occurred, repeat this step (**Step 7**).
  - If >30 minutes of CPR/AED have occurred, then consider CPR termination per **EMT Base Hospital/Communication Failure Orders**.
  
- 8. Transport/ALS Backup      Transport if patient has a palpable pulse or transit time to healthcare facility is <30 min. If return of spontaneous circulation, keep AED attached to patient in “off” mode. If patient re-arrests, turn the AED back to “on” mode, return to **Step 3**, and restart CPR/AED Cycle.
  
- 9. Base Contact      If indicated but not yet performed, all patients should be assessed for airway intervention. As soon as possible without compromising patient care.
  
- 10. Check Glucose      If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
  
- 11. Glucose Paste      If glucose < 80, or ALOC and unable to determine glucose:
  - Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.
  - If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. (Maintain spinal precautions if indicated).

## EMT Base Hospital/Communication Failure Orders

1. CPR Termination      By definition, all pediatric arrests are “special cases.” As such, continue all resuscitative efforts for 30 minutes. Before terminating CPR, palpate pulse and evaluate for spontaneous respirations for 30 seconds. Confirm with a second provider if available. If no palpable pulse nor spontaneous respirations, CPR may be terminated.

Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.

Refer to Initiation and Termination of Resuscitation Guideline at the end of this protocol.

**Parkmedic Standing Orders**

If patient is >14yrs or taller than NPS Pediatric Resuscitation Tape/ Broselow tape (5 feet), **GO TO** PROTOCOL: *Cardiac Arrest Without AED (Adult Medical); or Cardiac Arrest With AED (Adult Medical).*

If patient is a newborn (<1 day old) **GO TO** *Pediatric – Newborn Resuscitation.*

If patient is a neonate (1–28 days old) **GO TO** *Pediatric – Medical Arrest without AED.* AEDs cannot be used on patients <28 days old.

**Resuscitation Guidelines**

**Resuscitation Management**

This protocol is written to be followed as circumstances permit by a single provider. CPR and AED (if available) and adequate ventilations are the priorities. These interventions should not be delayed for IV/IO placement, medication administration or ALS airways. Many pediatric arrests are precipitated by an airway emergency and care should be taken to ensure adequate chest rise during ventilation. This may be achieved by airway manipulation with jaw-thrust and chin lift or may require placement of an OA/NA.

Once there is a second provider (even a well-trained bystander) who can perform CPR, then the Parkmedic is to attempt IV/IO placement per **Step 5** while instructing the second provider to proceed with CPR. Once an IV/IO is placed successfully, administer medications per PROTOCOL.

In cardiac arrest, emphasis should be on AED and good CPR; Specific to pediatrics, the vast majority of cardiac arrests are of RESPIRATORY etiology. Therefore, good CPR in pediatrics has to emphasize good respiratory support while maintaining compressions. However, at some point an advanced ALS airway will augment the effectiveness of ventilations. Early in the resuscitation, if BLS airway is inadequate or if manpower allows, consideration of ALS airway is warranted. Otherwise, after the first cycle of IV medications has been delivered, the next priority is to convert the BLS airway to an ALS airway.

**Medication Note**

In a coding patient, the maximum cumulative dose for Amiodarone is 5mg/kg (maximum 300mg). When to administer Amiodarone is determined on a cycle-by-cycle basis, dependent upon whether the AED delivers a shock to the patient during that cycle. In a re-arresting patient Amiodarone should not be repeated. Epinephrine, has no maximum cumulative dose in a coding patient or a re-arrested patient.

**AED Analysis Schedule**

Most AEDs are programmed to analyze heart rhythm in two-minute intervals. However, once IV medications are introduced into the resuscitation, CPR must be performed for three minutes after each round of medications. Therefore, be aware that the Parkmedic may need to override the automatic cycling of the AED. In addition, once AED is applied, keep it attached to the patient throughout the PROTOCOL.

1. Confirm Arrest

No response to aggressive stimulation.  
Call for ACLS backup ASAP.

Check breathing, give 2 breaths if indicated, and check pulse (preferably carotid).

If pulse is present, patient is NOT in cardiac arrest. **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)*, or other appropriate protocol.

If pulse is absent and AED is available, continue this PROTOCOL.

If pulse is absent and AED is **NOT** available, **GO TO** PROTOCOL: *Pediatric – Medical Arrest Without AED.*

2. Assessment
- Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated and by what means (e.g., length of downtime determines whether to start with CPR or AED). As time allows, obtain additional information including preceding events and symptoms, PMH.
- Do not attempt resuscitation in the following cases:
- Documented pulseless downtime greater than 30 minutes.
  - Rigor mortis, lividity, obviously fatal trauma, or DNR.
- If the downtime of the patient is known to be less than 4 minutes**, then initiate resuscitation with the AED; proceed to **Step 3**.
- If the downtime of the patient is unknown, or is known to be greater than 4 minutes**, then initiate resuscitation with CPR; proceed to **Step 4**.
3. Apply AED
- Turn on AED and follow prompts per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either state “Shock Advised” or “No Shock Advised.” Allow the AED to deliver a shock if indicated.
- Note:** use age-appropriate pads if available.
4. Airway
- Secure airway utilizing OPA/NPA or ALS airway (*King Tube/ETT*).
- REFERENCE PROCEDURE:** *King Tube, Endotracheal Intubation* for appropriate ALS tube size for patient age/size.
- Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtacheal Jet Insufflation*.
- Note: REFERENCE** “Resuscitation Management” section for priority of BLS versus ALS airway.
5. CPR/AED  
Cycle 1
- Begin with a compression-to-ventilation ratio of 15:2. Compression rate is 100/minute. Compress  $\geq \frac{1}{3}$  anterior-posterior diameter of chest. Allow complete recoil between compressions. “Push Hard, Push Fast.” Continue with 5 cycles of CPR (15:2) – approximately 2-3 minutes.
- Compression rate is 100/minute; “Push Hard, Push Fast.”
- Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.
- REFERENCE PROTOCOL:** *Pediatric Parameters* for other pediatric CPR details.
- Do not stop CPR to perform pulse checks unless specified by protocol.
- If AED is already attached to the patient**, perform CPR until the AED prompts for the next analysis (approximately 2 minutes). Do not check pulse before AED analysis.
- If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.
  - If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.
    - If patient has a palpable pulse or signs of life, then proceed to **Step 22**.
    - If patient has no palpable pulse nor signs of life, then proceed to **Step 6**.
- If AED is not yet attached to patient**, perform 2 minutes of CPR, then attach AED to patient per PROCEDURE: *Automated External Defibrillator (AED)*. After initial rhythm analysis, the AED will either recommend shock or not recommend shock.
- If AED states “Shock Advised,” follow prompts on AED to shock the patient. After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 6**.
  - If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.
    - If patient has a palpable pulse or signs of life, then proceed to **Step 22**.
    - If patient has no palpable pulse nor signs of life, then proceed to **Step 6**.



15. Epinephrine IV/IO: 0.01 mg/kg (0.1 ml/kg) of 1:10,000 IVP (max dose 1mg).
16. CPR/AED Cycle 6 Perform CPR for three minutes while medication from **Step 15** is administered. Do not check pulse before AED analysis.  
 If AED states “Shock Advised,” follow prompts on AED to shock the patient.  
 After shock is done, the AED will state “Shock Delivered.” Do not check pulse. Proceed to **Step 17**.  
 If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.  
 If patient has a palpable pulse or signs of life, then proceed to **Step 19**.  
 If patient has no palpable pulse nor signs of life, then proceed to **Step 17**.
17. Epinephrine IV/IO: 0.01 mg/kg (0.1 ml/kg) of 1:10,000 IVP (max dose 1mg).
18. CPR/AED Cycle 7 Perform CPR for three minutes while medication from **Step 17** is administered. Do not check pulse before AED analysis.  
 If AED states “Shock Advised,” follow prompts on AED to shock the patient.  
 After shock is done, the AED will state “Shock Delivered.” Check carotid pulse for 6 seconds.  
 If patient has a palpable pulse or signs of life, then proceed to **Step 19**.  
 If patient has not regained pulse nor shows signs of life, reference **Parkmedic Base Hospital/Communication Failure Orders**.  
 If AED states “No Shock Advised,” then check carotid pulse for 6 seconds.  
 If patient has a palpable pulse or signs of life, then proceed to **Step 19**.  
 If patient has not regained pulse, nor shows signs of life, reference **Parkmedic Base Hospital/Communication Failure Orders**.
19. Reassess If patient has a palpable pulse, or shows signs of life, check pulse every 3 minutes and  
 If patient was not given Amiodarone during resuscitation Reference “Amiodarone” section in **Parkmedic Base Hospital/Communication Failure Orders**.
20. Transport Transport if patient has a palpable pulse or transit time to healthcare facility is <30 min.  
 If return of spontaneous circulation, keep AED attached to patient in “off” mode. If patient re-arrests, turn the AED back to “on” mode, return to **Step 3**, and restart CPR/AED Cycle.  
 If indicated but not yet performed, all patients should be assessed for airway intervention.
21. Base Contact As soon as possible without compromising patient care.
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
22. Check Glucose If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
23. Dextrose If glucose < 80 or ALOC and unable to determine glucose:  
 ≥ 2 yrs: 1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
 < 2 yrs: 2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml.  
 (To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).  
 May repeat in 5 minutes if ALOC persists and glucose still <80.  
 May substitute dose on Broselow Tape for pediatric dose above.

24. Glucose Paste      If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
                                 If patient is unable to swallow, paste may be placed outside the teeth, between  
                                 the gum and cheek, while patient is positioned on side. (Maintain spinal  
                                 precautions if indicated).  
                                 If no response to Glucose Paste in 5 minutes, then proceed to **Step 25**.
25. Glucagon            0.03mg/kg IM, max dose 1mg (if no IV/IO).  
                                 If ALOC persists and glucose remains <80, may repeat once in 15 minutes.

### Parkmedic Base Hospital/Communication Failure Orders

1. Amiodarone      Cardiac arrest responsive to shock who did not receive Amiodarone during resuscitation.  
                                 Hold for HR <80.  
                                 IV/IO: 5mg/kg (max dose 150mg) in 100ml over 20 min.
2. Return of  
    Spontaneous  
    Circulation      If return of spontaneous circulation, contact base for further management. If in  
                                 communication failure consider clinical situation. If indicated, **GO TO**  
                                 **PROTOCOL: Altered Mental Status/Altered Level of Consciousness (ALOC),**  
                                 *Hypothermia, Respiratory Distress, Shock Without Trauma, etc.*
3. CPR Termination      By definition, all pediatric arrests are “special cases.” As such, continue all resuscitative  
                                 efforts for 30 minutes. Before terminating CPR, palpate pulse and evaluate for  
                                 spontaneous respirations for 30 seconds. Confirm with a second provider if available. If  
                                 no palpable pulse nor spontaneous respirations, CPR may be terminated.  
  
                                 Any return of spontaneous circulation restarts the clock (time for CPR termination)  
                                 should the patient subsequently re-arrest.  
                                 Refer to Initiation and Termination of Resuscitation Guideline at the end of this protocol.

**SPECIAL CONSIDERATIONS**

**General**

Cardiac arrest in children is usually secondary to respiratory arrest or shock. Often supporting ventilations and oxygenation will improve cardiac status.  
 USE BROSELOW TAPE or NPS Pediatric Resuscitation Tape if available for easy determination of weight, drug and fluid doses, and equipment size.  
 If the patient is longer than the Blue/Orange junction on the Broselow tape, the patient is over 4 feet tall, and the small King Tube may be attempted.  
 For children ≤ 6yrs in cardiac arrest, place IO; only attempt IV after 2 unsuccessful IO attempts.

**Initiation AND Termination of CPR Guideline**

	Adult		Pediatric	
	Standard	Special Circumstance	Standard	Special Circumstance
<b>Medical Arrest</b>	15 min	30 min	30 min	60 min
	Adult		Pediatric	
	Blunt	Penetrating	Blunt	Penetrating
<b>Trauma Arrest</b>	5 min	10 min	10 min	20 min

**Notes:**

These times apply to either:  
 Not initiating CPR in the setting of known down time prior to EMS arrival or Cessation of CPR in an unsuccessful EMS resuscitation.  
 Special Circumstances include: Hypothermia, Barbiturate ingestion, Nitrate ingestion, Cold water drowning, Electrocutation, and Lightning injury.  
 Do not initiate if signs of prolonged lifelessness (e.g. rigor mortis, lividity) or obvious non-survivable injury (e.g. severe [100% 3<sup>rd</sup> degree] burn or decapitation).

**Assessment**

Patient condition immediately prior to arrest: chest pain, shortness of breath?  
 Bystander resuscitation: downtime before CPR, duration of CPR, bystander experience?  
 Physical Exam:  
 Respirations: Shallow? Rate? Spontaneous?  
 Breath sounds: Equal? Crackles? Rhonchi?  
 Heart: Beating? Regular or irregular?  
 Pulses: Carotid? Peripheral? Regular? All pulse checks during resuscitation should be for 6 seconds. Pulse checks for termination are for 30 seconds. Do not stop CPR to perform pulse checks unless specified by protocol.  
 Abdomen: Soft? Signs of GI bleeding?  
 Skin: Warm? Dry? Cyanosis? Rigor/lividity? Cold? Surgical scars/implants?  
 Pupils: Reactive? Size?  
 Evidence of trauma? Acute blood loss?  
 Previous medical history: genetic heart abnormality (corrected surgically?), medications, allergies, depression/previous attempt at self injury, drug ingestions, renal failure?

**Differential Diagnosis**

Cardiac arrest is the final common pathway for every cause of death. It is important to differentiate irreversible causes of cardiac arrest from potentially reversible causes of cardiac arrest. Some examples of potentially reversible causes of cardiac arrest include: cardiogenic shock, cardiac arrhythmia, hypovolemia, tension pneumothorax, pericardial tamponade, respiratory arrest, allergic reaction, drug/medication/toxin ingestion, hypothermia, hyperthermia, drowning, electrical injury or trauma.



# Pediatric

# Medical Arrest With AED

<b>Medication Issues</b>	Amiodarone may cause bradycardia. Atropine is no longer indicated in bradycardic or asystolic arrests
<b>Transport</b>	Once cardiac arrest is suspected, begin arrangements for transport and ALS rendezvous.
<b>Documentation</b>	Initial and subsequent vital signs and mental status. Downtime before CPR, duration of CPR, and by whom. Time and response to interventions administered. Time of death if applicable. If outcome unsuccessful, leave airway, IV, etc. in place. If CPR was not initiated, the reason for not initiating CPR.

### Cross Reference

**Procedures:**

Automatic External Defibrillator  
Blood Glucose Determination  
Endotracheal Intubation  
Intraosseous (IO) Access  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration  
Transtracheal Jet Insufflation

**Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED(Adult Medical)  
Hypothermia  
Pediatric – Medical Arrest Without AED  
Pediatric – Newborn Arrest  
Pediatric Parameters  
Respiratory Distress  
Shock Without Trauma

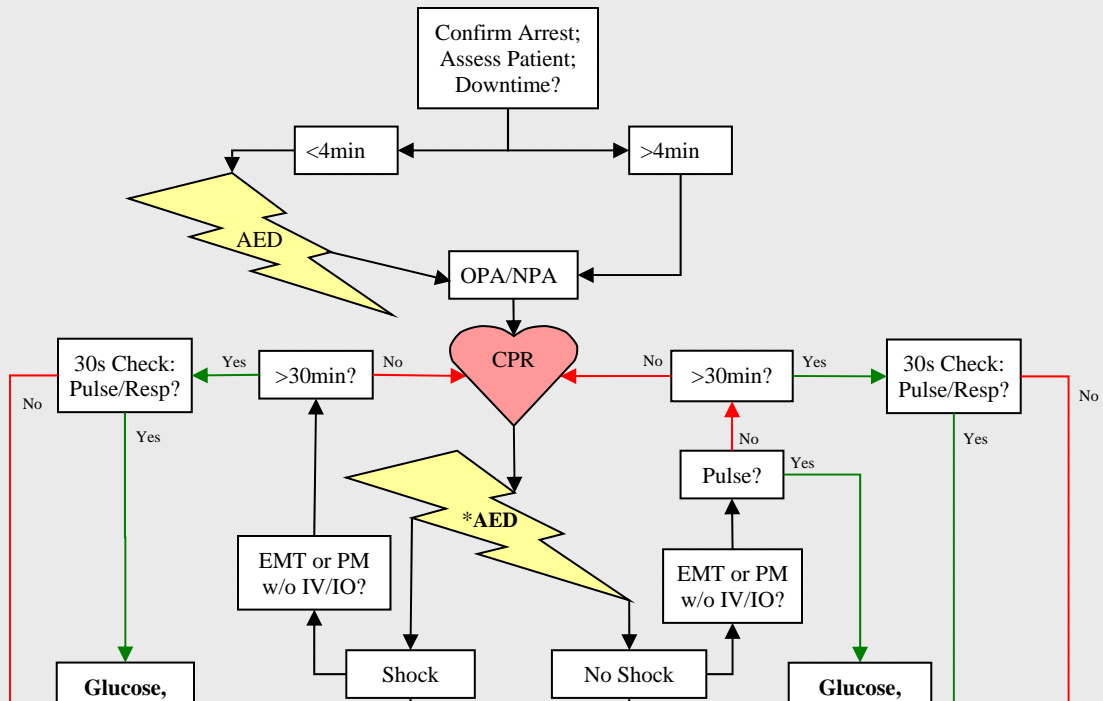
**Drugs:**

Amiodarone  
Dextrose 50% (D50)  
Epinephrine  
Glucagon  
Glucose Paste or Gel

# Pediatric

# Medical Arrest With AED

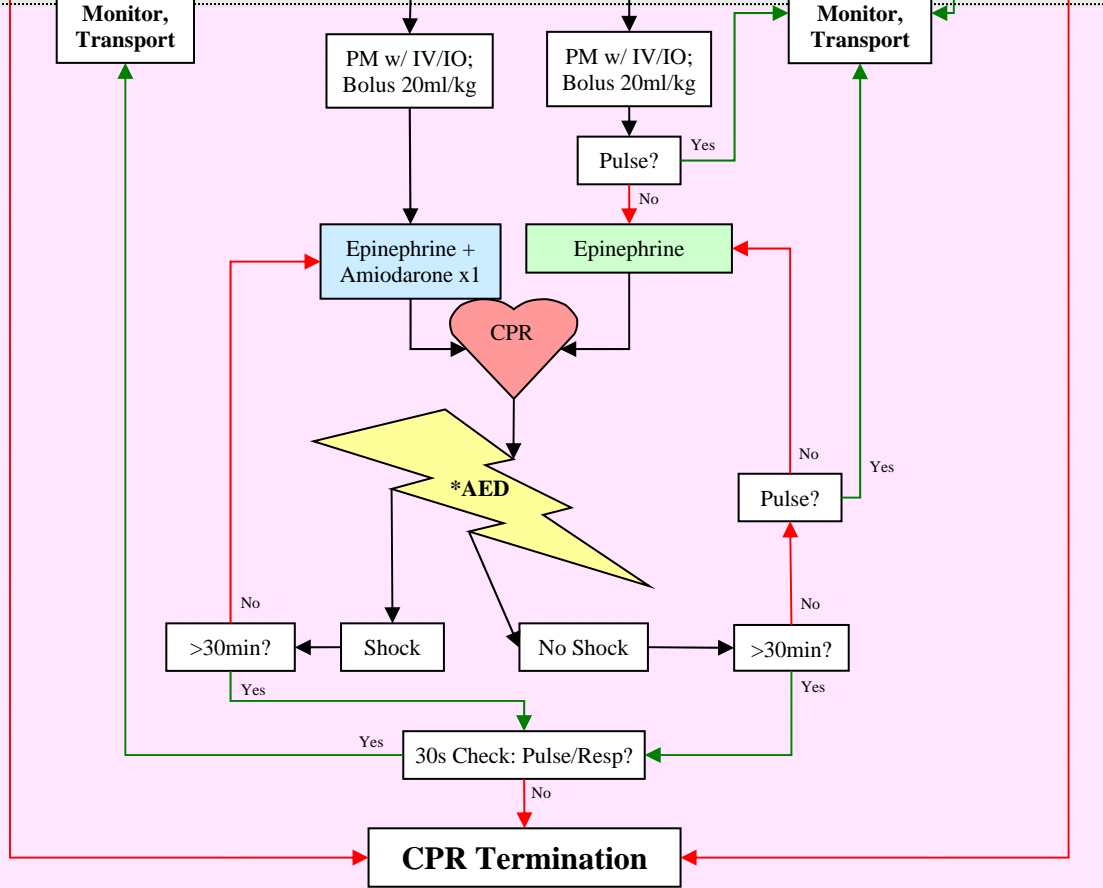
**Non-Drug Phase**  
(Gray Shaded Area):  
EMT, or Parkmedic  
without IV Access



**Drug Phase**  
(Pink Shaded Area):  
Parkmedic with IV Access

**“Shock” Meds:**  
If a shock is indicated and delivered at any time in the resuscitation, give Amiodarone 300mg IV once time only

**“No Shock” Meds:**  
1. Epinephrine.  
2. Epinephrine.  
3. Epinephrine.  
4. Epinephrine.



NSA: “No Shock Advised”

**Navigation:** For each circuit through the “Shock” Meds or “No Shock” Meds, drugs should be administered as indicated by the numbered sequence (1,2,3,4...). In addition, all medication preparation and administration should be done while active CPR is being performed; do not delay CPR for medication administration.

\*AED: When an AED arrives late to an ongoing pediatric resuscitation, enter this algorithm at either “\*AED” depending on whether medications will be administered.

**EMT Standing Orders**

If patient is >14yrs or taller than NPS Pediatric Resuscitation tape/ Broselow tape (5 feet), **GO TO** PROTOCOL: *Cardiac Arrest Without AED (Adult Medical)*; or *Cardiac Arrest With AED (Adult Medical)*.

If patient is a newborn (<1 day old) **GO TO** *Pediatric – Newborn Resuscitation*.

**AED Arrival During Resuscitation:** if an AED arrives on scene in the middle of a resuscitation previously without an AED, **GO TO** PROTOCOL: *Pediatric – Medical Arrest With AED*, **EMT Standing Orders** and continue resuscitation.

1. Confirm Arrest
  - No response to aggressive stimulation.
  - Call for AED and ALS/ACLS backup ASAP.
  - Check breathing, give 2 breaths if indicated, and check pulse.
    - If pulse is present, patient is NOT in cardiac arrest. **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)*, or other appropriate protocol.
    - If pulse is absent and AED is **NOT** available, continue this PROTOCOL.
    - If pulse is absent and AED is available, **GO TO** PROTOCOL: *Pediatric – Medical Arrest with AED*.
  
2. Assessment
  - Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated. As time allows, obtain additional information including: bystander CPR, preceding events and symptoms, PMH.
  
  - Do not attempt resuscitation in the following cases:
    - Rigor mortis, lividity, obviously fatal trauma, or DNR.
    - Documented pulseless downtime greater than 30 minutes.
  
3. Airway
  - Secure airway utilizing OPA/NPA.
  
4. CPR
  - Either single- or dual-rescuer CPR is conducted with a compression-to-ventilation ratio of 15:2. Compression rate is 100/minute: “Push Hard, Push Fast.” Continue with 5 cycles of CPR (15:2) – approximately 2-3 minutes.
  - Active ventilation with 15-L Oxygen per PROCEDURE: *Oxygen Administration*.
  - REFERENCE** PROTOCOL: *Pediatric Parameters* for other pediatric CPR details.
  - Do not stop CPR to perform pulse checks unless specified by protocol.
  
5. Transport/  
ALS Backup
  - Transport if patient has a palpable pulse or transit time to healthcare facility is <30 min.
  
6. Base Contact
  - As soon as possible without compromising patient care.
  
7. Check Glucose
  - If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
  
8. Glucose Paste
  - If glucose < 80, or ALOC and unable to determine glucose:
    - Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.
    - If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side.

## EMT Base Hospital/Communication Failure Orders

1. CPR Termination      By definition, all pediatric arrests are “special cases.” As such, continue all resuscitative efforts for 30 minutes. Before terminating CPR, palpate pulse and evaluate for spontaneous respirations for 30 seconds. Confirm with a second provider if available. If no palpable pulse nor spontaneous respirations, CPR may be terminated.

Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.  
Refer to Initiation and Termination of Resuscitation Guideline at the end of this protocol.

**Parkmedic Standing Orders**

If patient is >14yrs or taller than NPS Pediatric Resuscitation Tape/Broselow tape (5 feet), **GO TO** PROTOCOL: *Cardiac Arrest Without AED (Adult Medical)*; or *Cardiac Arrest With AED (Adult Medical)*.

If patient is a newborn (<1 day old) **GO TO** *Pediatric – Newborn Resuscitation*.

**Resuscitation Guidelines**

**Resuscitation Management**

This protocol is written to be followed as circumstances permit by a single provider. CPR and AED (if available) and adequate ventilations are the priorities. These interventions should not be delayed for IV/IO placement, medication administration or ALS airways. Many pediatric arrests are precipitated by an airway emergency and care should be taken to ensure adequate chest rise during ventilation. This may be achieved by airway manipulation with jaw-thrust and chin lift or may require placement of an OA/NA.

Once there is a second provider (even a well-trained bystander) who can perform CPR, then the Parkmedic is to attempt IV/IO placement per **Step 5** while instructing the second provider to proceed with CPR. Once an IV/IO is placed successfully, administer medications per PROTOCOL.

In cardiac arrest, emphasis should be on AED and good CPR; Specific to pediatrics, the vast majority of cardiac arrests are of RESPIRATORY etiology. Therefore, good CPR in pediatrics has to emphasize good respiratory support while maintaining compressions. However, at some point an advanced ALS airway will augment the effectiveness of ventilations. Early in the resuscitation, if BLS airway is inadequate or if manpower allows, consideration of ALS airway is warranted. Otherwise, after the first cycle of IV medications has been delivered, the next priority is to convert the BLS airway to an ALS airway.

**AED Arrival During Resuscitation:**

If an AED arrives on scene in the middle of a resuscitation previously without an AED, **GO TO PROTOCOL: *Pediatric – Medical Arrest With AED*, Parkmedic Standing Orders** and continue resuscitation.

**Medication Note**

In a coding patient, the maximum cumulative dose for Amiodarone is 5mg/kg (maximum 300mg). Amiodarone should not be repeated in a re-arrest situation. Epinephrine has no maximum cumulative dose in a coding patient or a re-arrested patient.

**Neonates**

Neonatal Patients (age 1–28 days) in cardiac arrest should be coded as pediatric patients. The exception is that neonates should not be administered Atropine or Amiodarone; Epinephrine should be administered per this PROTOCOL.

1. Confirm Arrest

No response to aggressive stimulation.  
 Call for AED and ACLS backup ASAP.  
 Check breathing, give 2 breaths if indicated, and check pulse.  
 If pulse is present, patient is NOT in cardiac arrest. **GO TO PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC)***, or other appropriate protocol.  
 If pulse is absent and AED is **NOT** available, continue this PROTOCOL.  
 If pulse is absent and AED is available, **GO TO PROTOCOL: *Pediatric – Medical Arrest with AED***.

- |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.  | <p>Assessment</p> <p>Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated. As time allows, obtain additional information including: bystander CPR, preceding events and symptoms, PMH.</p> <p><u>Do not attempt resuscitation in the following cases:</u><br/>                 Documented pulseless downtime greater than 30 minutes.<br/>                 Rigor mortis, lividity, obviously fatal trauma, or DNR.</p>                                                                                                                                                             |
| 3.  | <p>Airway</p> <p>Secure airway utilizing OPA/NPA or ALS airway (<i>King Tube/ETT</i>).<br/> <b>REFERENCE PROCEDURE:</b> <i>King Tube</i> for appropriate ALS tube size for patient age/size. Consider TTJI if ALS airway unsuccessful per PROCEDURE: <i>Transtacheal Jet Insufflation</i>.<br/> <b>Note: REFERENCE</b> “Resuscitation Management” section for priority of BLS versus ALS airway.</p>                                                                                                                                                                                                                                           |
| 4.  | <p>CPR</p> <p>Either single- or dual-rescuer CPR is conducted with a compression-to-ventilation ratio of 15:2. Compression rate is 100/minute: “Push Hard, Push Fast.” Continue with 5 cycles of CPR (15:2) – approximately 2-3 minutes.<br/>                 Active ventilation with 15-L Oxygen per PROCEDURE: <i>Oxygen Administration</i>.<br/> <b>REFERENCE PROTOCOL:</b> <i>Pediatric Parameters</i> for other pediatric CPR details.<br/>                 Do not stop CPR to perform pulse checks unless specified by protocol.</p> <p><b>Note:</b> In pediatric arrest IO access as initial attempt is preferred over IV attempts.</p> |
| 5.  | <p>IV/IO</p> <p>Place IV/IO per PROCEDURE: <i>IV Access and IV Fluid Administration and Intraosseous Access</i>.<br/>                 20ml/kg LR/NS bolus while proceeding to <b>Step 6</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6.  | <p>Epinephrine</p> <p>IV/IO: 0.1ml/kg (0.01mg/kg) of 1:10,000 IVP (max dose 1mg).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7.  | <p>CPR</p> <p>Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.<br/>                 If patient has a palpable pulse or shows signs of life, proceed to <b>Step 15</b>.<br/>                 If patient has not regained pulse nor shows signs of life, proceed to <b>Step 8</b>.</p>                                                                                                                                                                                                                                                                                                                                      |
| 8.  | <p>Epinephrine</p> <p>IV/IO: 0.1ml/kg (0.01mg/kg) of 1:10,000 IVP (max dose 1mg).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 9.  | <p>CPR</p> <p>Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.<br/>                 If patient has a palpable pulse or shows signs of life, proceed to <b>Step 15</b>.<br/>                 If patient has not regained pulse nor shows signs of life, proceed to <b>Step 10</b>.</p>                                                                                                                                                                                                                                                                                                                                     |
| 10. | <p>Amiodarone</p> <p>IV/IO: 5mg/kg IVP (max dose 300mg).<br/> <b>DO NOT</b> administer if age &lt; 28 days.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 11. | <p>Epinephrine</p> <p>IV/IO: 0.1ml/kg (0.01mg/kg) of 1:10,000 IVP (max dose 1mg).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 12. | <p>CPR</p> <p>Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.<br/>                 If patient has a palpable pulse or shows signs of life, proceed to <b>Step 15</b>.<br/>                 If patient has not regained pulse nor shows signs of life, proceed to <b>Step 13</b>.</p>                                                                                                                                                                                                                                                                                                                                     |
| 13. | <p>Epinephrine</p> <p>IV/IO: 0.1ml/kg (0.01mg/kg) of 1:10,000 IVP (max dose 1mg).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 14. | <p>CPR</p> <p>Continue CPR for 3 minutes, then recheck carotid pulse for 6 seconds.<br/>                 If patient has a palpable pulse, or shows signs of life, proceed to <b>Step 15</b>.<br/>                 If patient has not regained pulse nor shows signs of life, reference <b>Parkmedic Base Hospital/Communication Failure Orders</b>.</p>                                                                                                                                                                                                                                                                                        |

# Pediatric

# Medical Arrest Without AED

- 15. Reassess  
If patient has a palpable pulse, or shows signs of life, check pulse every 3 min and provide appropriate ventilatory support.  
If patient was not given Amiodarone during resuscitation Reference “Amiodarone” section in **Parkmedic Base Hospital/Communication Failure Orders**.
  - 16. Transport  
Transport if patient has a palpable pulse or transit time to healthcare facility is < 30 min.  
If indicated but not yet performed, all patients should be assessed for airway intervention.
  - 17. Base Contact  
As soon as possible without compromising patient care.
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
- 18. Check Glucose  
If return of spontaneous circulation, per PROCEDURE: *Blood Glucose Determination*.
  - 19. Dextrose  
If glucose < 80 or ALOC and unable to determine glucose:  
    ≥ 2 yrs: 1 amp **D50** IV/IO (1 amp = 25g in 50ml).  
    < 2 yrs: 2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml.  
    (To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).  
    May repeat in 5 minutes if ALOC persists and glucose still < 80.  
    May substitute dose on Broselow Tape for pediatric dose above.
  - 20. Glucose Paste  
If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side.  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 21**.
  - 21. Glucagon  
0.03mg/kg IM, max dose 1mg (if no IV/IO).  
If ALOC persists and glucose remains < 80, may repeat once in 15 minutes.

### **Parkmedic Base Hospital/Communication Failure Orders**

- 1. Amiodarone  
Patients (> 28 days) in cardiac arrest who did not receive Amiodarone during resuscitation.  
Hold for HR < 80.  
IV/IO: 5mg/kg (max dose 150mg) in 100ml over 20min.
- 2. Return of Spontaneous Circulation  
If return of spontaneous circulation, contact base for further management. If in communication failure consider clinical situation. If indicated, **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC), Hypothermia, Respiratory Distress, Shock Without Trauma, etc.*
- 3. CPR Termination  
By definition, all pediatric arrests are “special cases.” As such, continue all resuscitative efforts for 30 minutes. Before terminating CPR, palpate pulse and evaluate for spontaneous respirations for 30 seconds. Confirm with a second provider if available. If no palpable pulse nor spontaneous respirations, CPR may be terminated.  
  
Any return of spontaneous circulation restarts the clock (time for CPR termination) should the patient subsequently re-arrest.  
  
Reference Initiation and Termination of Resuscitation Guideline at the end of this protocol

**SPECIAL CONSIDERATIONS**

**General**

Cardiac arrest in children is usually secondary to respiratory arrest or shock. Often supporting ventilations and oxygenation will improve cardiac status.  
 USE BROSELOW TAPE if available for easy determination of weight, drug and fluid doses, and equipment size.  
 If the patient is longer than the Blue/Orange junction on the Broselow tape, the patient is over 4 feet tall, and the small King Tube may be attempted.  
 For children ≤ 6yrs in cardiac arrest, place IO; do not attempt IV.

**Initiation AND Termination of CPR Guideline**

	Adult		Pediatric	
	Standard	Special Circumstance	Standard	Special Circumstance
<b>Medical Arrest</b>	15 min	30 min	30 min	60 min
	Adult		Pediatric	
	Blunt	Penetrating	Blunt	Penetrating
<b>Trauma Arrest</b>	5 min	10 min	10 min	20 min

**Notes:**

These times apply to either:  
 Not initiating CPR in the setting of known down time prior to EMS arrival or Cessation of CPR in an unsuccessful EMS resuscitation.  
 Special Circumstances include: Hypothermia, Barbiturate ingestion, Nitrate ingestion, Cold water drowning, Electrocutation, and Lightning injury.  
 Do not initiate if signs of prolonged lifelessness (e.g. rigor mortis, lividity) or obvious non-survivable injury (e.g. severe [100% 3<sup>rd</sup> degree] burn or decapitation).

**Assessment**

Patient condition immediately prior to arrest: chest pain, shortness of breath?  
 Bystander resuscitation: downtime before CPR, duration of CPR, bystander experience?  
 Physical Exam:  
 Respirations: Shallow? Rate? Spontaneous?  
 Breath sounds: Equal? Crackles? Rhonchi?  
 Heart: Beating? Regular or irregular?  
 Pulses: Carotid? Peripheral? Regular? All pulse checks during resuscitation should be for 6 seconds. Pulse checks for termination are for 30 seconds. Do not stop CPR to perform pulse checks unless specified by protocol.  
 Abdomen: Soft? Signs of GI bleeding?  
 Skin: Warm? Dry? Cyanosis? Rigor/lividity? Cold? Surgical scars/implants?  
 Pupils: Reactive? Size?  
 Evidence of trauma? Acute blood loss?  
 Previous medical history: genetic heart abnormality (corrected surgically?), medications, allergies, depression/previous attempt at self injury, drug ingestions, history of renal failure?

**Differential Diagnosis**

Cardiac arrest is the final common pathway for every cause of death. It is important to differentiate irreversible causes of cardiac arrest from potentially reversible causes of cardiac arrest. Some examples of potentially reversible causes of cardiac arrest include: cardiogenic shock, cardiac arrhythmia, hypovolemia, tension pneumothorax, pericardial tamponade, respiratory arrest, allergic reaction, drug/medication/toxin ingestion, hypothermia, hyperthermia, drowning, electrical injury or trauma.



<b>Medication Issues</b>	Amiodarone may cause bradycardia. Atropine is no longer indicated in bradycardic or asystolic arrests.
<b>Transport</b>	Once cardiac arrest is suspected, begin arrangements for transport and ALS rendezvous.
<b>Documentation</b>	Initial and subsequent vital signs and mental status. Downtime before CPR, duration of CPR, and by whom. Time and response to interventions administered. Time of death if applicable. If outcome unsuccessful, leave airway, IV, etc. in place. If CPR was not initiated, the reason for not initiating CPR.

### Cross Reference

**Procedures:**

Automatic External Defibrillator  
Blood Glucose Determination  
Intraosseous (IO) Access  
IV Access and IV Fluid  
Administration  
King Tube  
Oxygen Administration  
Transtracheal Jet Insufflation

**Protocols:**

Altered Mental Status/Altered Level of  
Consciousness (ALOC)  
Cardiac Arrest With AED (Adult  
Medical)  
Cardiac Arrest Without AED(Adult  
Medical)  
Hypothermia  
Pediatric – Medical Arrest With AED  
Pediatric – Newborn Arrest  
Pediatric Parameters  
Respiratory Distress  
Shock Without Trauma

**Drugs:**

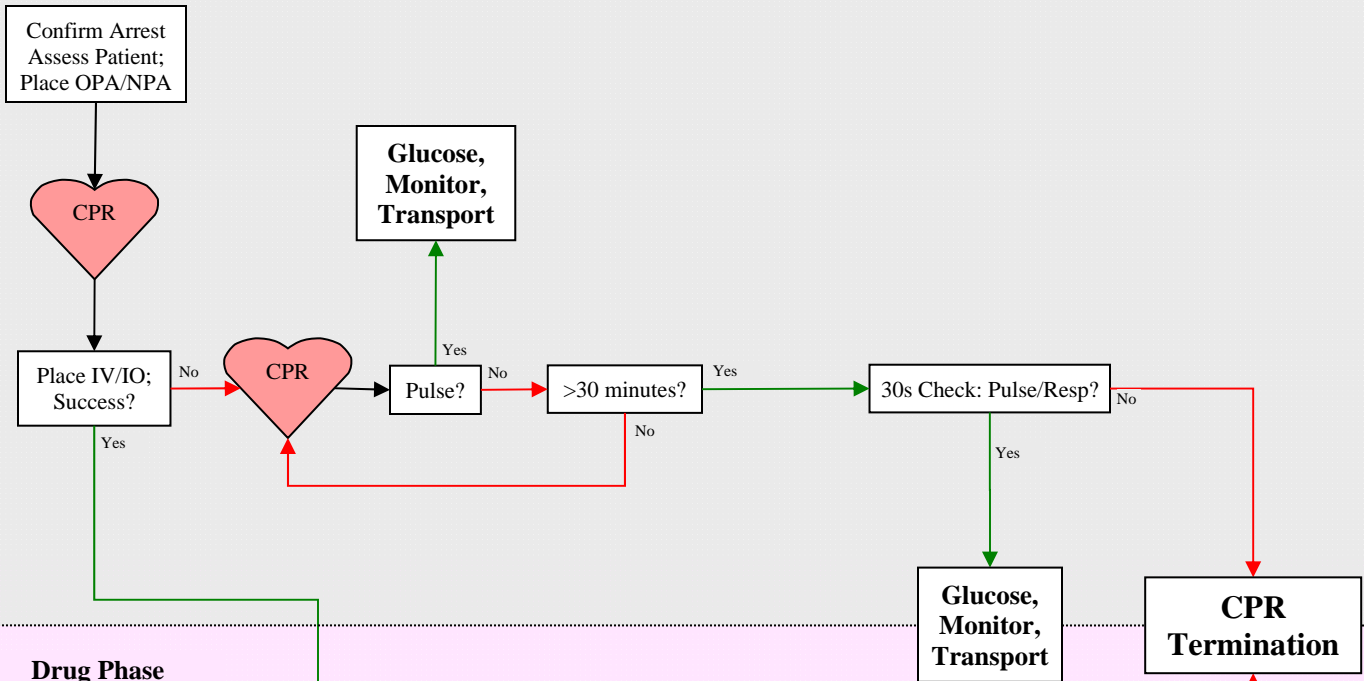
Amiodarone  
Dextrose 50% (D50)  
Epinephrine  
Glucagon  
Glucose Paste or Gel

# Pediatric

# Medical Arrest Without AED

## Non-Drug Phase

(Gray Shaded Area):  
EMT, or Parkmedic  
without IV Access

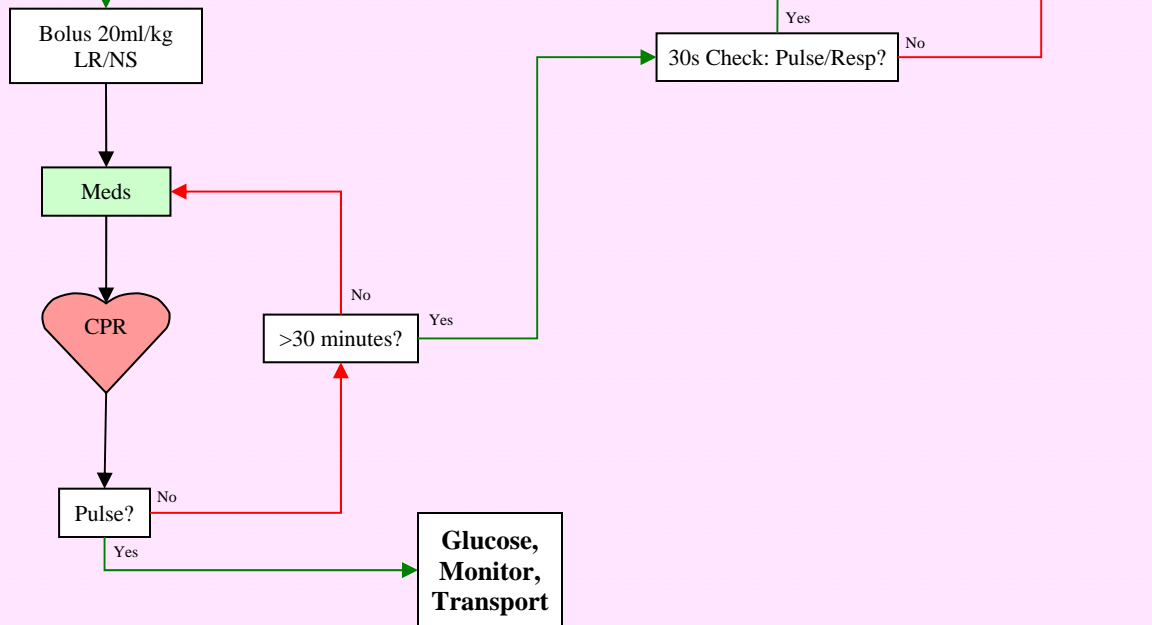


## Drug Phase

(Pink Shaded Area):  
Parkmedic with IV Access

- Meds:**

  1. Epinephrine.
  2. Epinephrine.
  3. \*Amiodarone, Epinephrine.
  4. Epinephrine.



**Neonates:** Neonates (age 1-28 days) are not to be given \*Amiodarone. The only resuscitation med given to neonates is Epinephrine.

**Navigation:** For each circuit through the “Meds” box, drugs should be administered as indicated by the numbered sequence (1,2,3,4...). In addition, all medication preparation and administration should be done while active CPR is being performed; do not delay CPR for medication administration.

**AED:** When an AED arrives late to an ongoing pediatric resuscitation, **GO TO PROTOCOL Pediatric - Medical Arrest With AED** Algorithm.

**EMT Standing Orders**

If patient is taller than Broselow tape/ NPS Pediatric Resuscitation Tape (5 feet) or >14 yrs, **GO TO PROTOCOL:** *Abdominal Pain, Nausea and Vomiting*, or other appropriate protocol.

1. ABC's
2. Assessment                      Vitals including temperature and mental status.  
History of present illness including seizures, rash, vomiting, or diarrhea.  
If altered mental status or shock **GO TO PROTOCOL:** *Altered Mental Status/Altered Level of Consciousness (ALOC) or Shock Without Trauma.*
3. Oral Fluids                      If normal mental status and protecting airway, attempt oral trial of electrolyte drink or any salt-containing liquid (10-15 ml at a time, small sips if vomiting).
4. Acetaminophen (Tylenol)      If temperature greater than 38.5° C (101°F) and tolerating oral fluid.  
Acetaminophen 15mg/kg (max 1,000mg) PO.
5. Base Contact
6. Transport/  
ALS Backup                      Any child with abnormal vitals or decreased mental status (unless elevated temperature is the only abnormal vital sign).  
NO AMA/TAR without attempted base contact.

**Parkmedic Standing Orders**

If patient is taller than Broselow tape/NPS Pediatric Resuscitation Tape (5 feet) or >14 yrs, **GO TO PROTOCOL:** *General Medical Illness-Adult* or other appropriate protocol.

1. ABC's
2. Assessment                      Vitals including temperature and mental status.  
History of present illness including seizures, rash, vomiting, or diarrhea.  
If altered mental status **GO TO PROTOCOL:** *Altered Mental Status/Altered Level of Consciousness (ALOC)s*  
If shock **GO TO PROTOCOL:** *Shock Without Trauma*  
If Respiratory Distress **GO TO PROTOCOL:** *Respiratory Distress*
3. Oral Fluids                      If normal mental status and protecting airway, attempt oral trial of electrolyte drink or any salt-containing liquid (10-15 ml at a time, small sips if vomiting).
4. Acetaminophen (Tylenol)      If temperature greater than 38.5° C (101°F) and tolerating oral fluid.  
Acetaminophen 15mg/kg (max 1,000mg) PO.
5. Base Contact
6. IV/IO                              If patient fails oral fluid trial, consider IV/IO placement per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access.*  
IV fluid bolus: LR/NS 20ml/kg. Reassess vitals after fluid bolus.

7. Ondansetron For nausea or vomiting
- 3 mos–14 yrs: IV/IO: 0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2  
prn nausea.  
ODT: ½ tab (2mg) if age 4- 14  
IM: If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min  
x1 prn nausea.
- 0 – 3 mos.: IV/IO: Base Hospital Order ONLY. 0.1mg/kg SIVP.  
IM: Contraindicated for patients < 3 months of age.

**Note:** For severely symptomatic patients, ODT can be administered prior to attempts for IV/IO access

8. Transport Any child with decreased mental status or abnormal vitals (unless elevated temperature is the only abnormal vital sign).
9. AMA/TAR NO AMA/TAR without attempted base contact.

**Paramedic Base Contact/Communication Failure Orders**

1. Ibuprofen (Motrin, Advil) If temperature over 38.5°C (101°F), no response to acetaminophen after 60 minutes, and tolerating oral fluid, administer Ibuprofen.  
10-14 yrs: 600mg PO every 6 hours.  
6 mon-10 yrs: 10mg/kg PO every 6 hours, max dose 200mg.
2. Acetaminophen If unable to administer Acetaminophen PO give 15mg/kg (max 1,000mg) PR per PROCEDURE: *Rectal Drug Administration*.
- Repeat Doses > 10 yrs: 1,000mg PO/PR every 4-6 hours, not to exceed 4,000mg in 24 hours.  
0-10 yrs: 15mg/kg PO/PR every 4-6 hours, not to exceed 4,000mg in 24 hours.

**SPECIAL CONSIDERATIONS**

**Assessment** If patient presents with a specific complaint (e.g. shortness of breath, altered mental status), then GO TO the appropriate protocol. This protocol is intended for pediatric fever or general illness (“I feel sick”).

**History:** duration of symptoms, fever (subjective or measured orally, tympanic, rectally). Associated symptoms such as runny nose; cough (productive or dry); respiratory difficulties; vomiting; diarrhea (frequency, soft or watery, bloody); sore throat; headache; neck pain; sick contacts; tolerating fluids or not; change in urine output (number of wet diapers); jaundice; irritability.

**PMH:** immunization status (up to date?); recent or past hospitalizations (if any); operations; birth and perinatal history; congenital problems.

**Physical Exam:** Overall appearance of child (e.g. lethargic, active, playful); eye contact; attentiveness for age; consolable or not; ability to sit, stand, ambulate; vitals; full physical exam with particular attention to capillary refill, fontanelle, mucous membranes (moist or dry), skin turgor, color, rash.

**Differential Diagnosis** Common illnesses: upper respiratory illness including croup, epiglottitis, common cold, ear infection; pneumonia, meningitis, measles, chicken pox, acute gastritis or gastroenteritis.

**AMA/TAR** Parks without base hospitals should follow local medical advisor approved EMS policy.

**Documentation** Overall appearance of child, vitals, ability to tolerate oral fluid.

**Cross Reference**

**Procedures:**  
Intraosseous Access  
IV Access and IV Fluid Administration  
Rectal Drug Administration

**Protocols:**  
Abdominal Pain  
Altered Mental Status/Altered Level of Consciousness (ALOC)  
General Medical Illness- Adult  
Shock Without Trauma

**Drugs:**  
Acetaminophen (Tylenol)  
Ibuprofen (Motrin, Advil)  
Ondansetron

## EMT Standing Orders

1. Dry Newborn      Dry the newborn. Place newborn in as warm an environment as possible, replacing all wet towelings with dry. Keep newborn covered, especially the head, to minimize heat loss.  
NOTE: Newborns less than 500 grams do not survive and resuscitation should NOT be attempted. (500 grams is approximately the size of a 12-ounce soda can).
  
2. Position/  
Suction              Place on back with head in neutral position. A towel may be placed under the neck to maintain position. Suction mouth, pharynx, then nose with a bulb syringe.
  
3. Stimulate              Rub newborn's body. Flick the soles of the feet or rub the back.
  
4. Respirations        30-60 breaths/minute is normal.
  
5. Base Contact        Consider early base contact to assist with resuscitation.
  
6. Oxygen              If RR > 30 with pink body and face and no respiratory distress, proceed to Step 7.  
If RR < 30, central cyanosis\*\* of the body or face, or respiratory distress\*,  
administer O2 at 15L via blow-by.  
If newborn improves to a normal RR with no cyanosis or gasping, continue blow-by and proceed to **Step 7**.  
If no improvement in 30 seconds, assist ventilation with BVM with 15-L O2 at a rate of 40-60 breaths/min, and proceed to **Step 8**.  
If RR < 15 or apneic, proceed directly to BVM with 15-L O2 at a rate of 40-60 breaths/minute and proceed to Step 8.  
Note: when assisting respirations with BVM, watch chest rise and fall to ensure adequate ventilation.
  
7. Heart Rate        Palpate heart rate (HR) at the umbilical cord base or brachial artery, or listen to heart.  
If HR < 60, begin PPV with BVM and start chest compressions, proceed to **Step 8**.  
If HR 60-100, begin PPV with BVM for 3 minutes, then reassess HR and proceed to **Step 8**.  
If HR > 100 with any RR, assist respirations as needed with 15-L O2 via blow-by and proceed to **Step 10**.
  
8. CPR                If HR < 60, continue PPV (BVM) and begin chest compressions. Proceed to **Step 9**.  
Compressions should be delivered on the lower third of the sternum, to a depth of 1/3 the anterior/posterior diameter of the chest.  
Cycle rate: 3:1 ratio of compressions: ventilations per minute  
If HR 60-100 continue PPV (BVM) but do not begin chest compressions. Proceed to **Step 9**.  
If HR > 100 proceed to **Step 9**.  
Note: during CPR, the rate of assisted ventilations decreases from 40-60/min to 30/min
  
9. Reassess            Reassess HR, respirations and color of newborn every 60 seconds for a period of 6 seconds.  
Note: once both coordinated compressions and ventilations are in progress, assessment intervals increase from every 30 seconds to every 60 seconds.  
Coordinated compressions and ventilations should continue until spontaneous HR ≥ 60.  
Ventilations assisted with BVM should continue until HR ≥ 100, newborn demonstrates no respiratory distress, **and** color is pink throughout.
  
10. Transport/  
ALS Backup            All newborns should be transported unless instructed otherwise by base, or newborn falls under declaration of death criteria listed in special considerations.

# Pediatric

# Newborn Resuscitation

## 11. APGAR

APGAR should be assessed and recorded at 1 and 5 minutes after birth.

**APGAR Chart**

	0	1	2
Appearance	Blue or Pale	Body pink, limbs blue	Completely pink
Pulse	0	<100	>100
Grimace	No response	Grimace	Cough, sneeze, cry
Activity	Flaccid	Some Flexion	Active Movement
Respirations	Absent	Slow, Irregular, Weak	Strongly crying

### **EMT Base Hospital/Communication Failure Orders**

#### 1. Declaration of Death

Code may be terminated if ordered by base or in communication failure if there are no signs of life (apneic and pulseless) after 30 minutes of continuous and adequate resuscitative efforts.

**Parkmedic Standing Orders**

1. Dry Newborn      Dry the newborn. Place newborn in as warm an environment as possible, replacing all wet toweling with dry. Keep newborn covered, especially the head, to minimize heat loss.  
**NOTE:** Newborns less than 500 grams do not survive and resuscitation should NOT be attempted. (500 grams is approximately the size of a 12-ounce soda can).
2. Position/  
Suction              Place on back with head in neutral position. A towel may be placed under the neck to maintain position. Suction mouth, pharynx, then nose with a bulb syringe.
3. Stimulate              Rub newborn's body. Flick the soles of the feet or rub the back.
4. Respirations              30-60 breaths/minute is normal.
5. Base Contact              Consider early base contact to assist with resuscitation.
6. Oxygen              If RR 30-60 with pink body and face and no respiratory distress, proceed to **Step 7**.  
**If RR < 30, central cyanosis\*\* of the body or face, or respiratory distress\*,**  
                                 administer O2 at 15L via blow-by.  
                                 If newborn improves to a normal RR with no cyanosis or gasping, continue blow-by and proceed to **Step 7**.  
                                 If no improvement in 30 seconds, assist ventilation with BVM with 15-L O2 at a rate of 40-60 breaths/min, and proceed to **Step 8**.  
If apneic, proceed directly to BVM with 15-L O2 at a rate of 40-60 breaths/minute and proceed to **Step 8**.  
Note: when assisting respirations with BVM, watch chest rise and fall to ensure adequate ventilation.
7. Heart Rate              Palpate heart rate (HR) at the umbilical cord base or brachial artery, or listen to heart.  
                                 **If HR < 60,** begin PPV with BVM and start chest compressions, proceed to **Step 8**.  
                                 **If HR 60-100,** begin PPV with BVM for 3 minutes, then reassess HR and proceed to **Step 8**.  
                                 **If HR > 100 with any RR,** assist respirations as needed with 15-L O2 via blow-by and proceed to **Step 12**.
8. CPR                      **If HR < 60,** continue PPV (BVM) and begin chest compressions. Proceed to **Step 9**.  
                                 Compressions should be delivered on the lower third of the sternum, to a depth of 1/3 the anterior/posterior diameter of the chest.  
                                 Cycle rate: 3:1 ratio of compressions: ventilations per minute  
**If HR 60-100** continue PPV (BVM) but do not begin chest compressions. Proceed to **Step 9**.  
**If HR > 100** proceed to **Step 12**.  
Note: during CPR, the rate of assisted ventilations decreases from 40-60/min to 30/min
9. Place IV/IO              Place IV in umbilical cord while keeping distal cord clamped or place IO per  
                                 PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access* .
10. Dextrose              If HR < 100, and newborn has experienced any resuscitation including assisted respirations or compressions, then administer dextrose:  
                                 **D12.5 IV/IO 4ml/kg**  
                                 (Assuming a 3kg newborn, give 12mL of D12.5)  
                                 **Note:** To make D12.5, mix NS and D50 in a 3:1 ratio. For example, with a 12mL syringe, mix 3mL D50 and 9mL NS



11. Epinephrine/  
IV Fluids                      If spontaneous HR < 60 despite 3 minutes of coordinated compressions and PPV with BVM, administer:  
                                          **Epinephrine: 0.03 mg/kg (0.3 ml/kg)** of 1:10,000 IV, may repeat every 3-5 min.  
                                          (Assuming 3kg newborn, give 0.9 mL of 1:10,000 epinephrine)  
                                          **IVF: 10ml/kg of LR/NS bolus**, may repeat once after first bolus finished.  
                                          (Assuming 3kg newborn, give 30mL LR or NS via IV/IO)

12. Reassess                      Reassess HR, respirations and color of newborn every 60 seconds for a period of 6 seconds.  
 Note: once both coordinated compressions and ventilations are in progress, assessment intervals increase from every 30 seconds to every 60 seconds.  
                                          Coordinated compressions and ventilations should continue until spontaneous HR ≥ 60.  
                                          Ventilations assisted with BVM should continue until HR ≥100, newborn demonstrates no respiratory distress, **and** color is pink throughout.

13. Transport                      All newborns should be transported unless instructed otherwise by base, or newborn falls under declaration of death criteria listed in special considerations.

14. APGAR                          APGAR should be assessed and recorded at 1 and 5 minutes after birth.

**APGAR Chart**

	0	1	2
Appearance	Blue or Pale	Body pink, limbs blue	Completely pink
Pulse	0	<100	>100
Grimace	No response	Grimace	Cough, sneeze, cry
Activity	Flaccid	Some Flexion	Active Movement
Respirations	Absent	Slow, Irregular, Weak	Strongly crying

\*Respiratory distress – increased respiratory rate and/or effort seen as nasal flaring, chest retractions, abnormal breath sounds, belly breathing, head bobbing, etc.

\*\* Central cyanosis – blue appearance of lips, gums

**Parkmedic Base Hospital/Communication Failure Orders**

1. Declaration of Death                      Code may be terminated if ordered by base or in communication failure if there are no signs of life (apneic and pulseless) after 30 minutes of continuous and adequate resuscitative efforts.

## SPECIAL CONSIDERATIONS

<b>General</b>	<p>Asphyxiation/respiratory difficulty is the most common cause of newborn arrest. Prompt warming, suctioning, and oxygen is the key to a successful resuscitation</p> <p>If the newborn does not respond immediately to ventilation, successful resuscitation is unlikely.</p> <p>NOTIFY BASE as soon as possible to help utilize all available resources.</p> <p>Begin transport early.</p> <p>Make sure BVM fits the face well; maintain a good seal. Pressure on the newborn's eyes can induce bradycardia.</p> <p>Warmth is critical and all measures to minimize heat loss should be taken.</p> <p>Newborns less than 500 grams do not survive and resuscitation should NOT be attempted. (500 grams is approximately the size of a 12-ounce soda can).</p> <p>Use the umbilical cord vessels like a regular vein to start an IV. Remember the drug has to get into the body, so keep the distal cord clamped, start your IV close to the baby, and flush with NS to ensure drugs get into the circulation.</p>
<b>Assessment</b>	<p>Vitals: Newborn normal HR = 160 (120-190). Normal respiratory rate = 30-50/min. Determine APGAR 1 and 5 minutes after delivery.</p> <p>Color: Distinction should be made between peripheral cyanosis (i.e. of the extremities) and central cyanosis (i.e. of the trunk or face). It is normal for a newborn newborn to have peripheral cyanosis in the first few minutes after delivery; central cyanosis is never normal. In addition to RR and HR indicators, resuscitation should be triggered by central cyanosis as detailed in the protocol, but not by peripheral cyanosis. However, once BVM has been initiated, it should be continued until the newborn is entirely pink with HR&gt;100 and good respiratory effort. Although respiratory support via BVM/blow-by oxygen is key to newborn resuscitation, use caution with BVM as excessive pressure may induce barotrauma (damage to lungs).</p> <p>History: Number of weeks pregnant? Expected birth date? Prenatal care? Maternal medications/drug use? Problems with pregnancy?</p>
<b>Transport</b>	<p>In all resuscitations, begin arrangements for transport and/or ALS rendezvous early.</p> <p>If no spontaneous pulse, transport should NOT commence until patient either has return of spontaneous pulse or as designated in protocol.</p>
<b>AMA/TAR</b>	<p>All newborns should be transported unless instructed otherwise by base, or newborn falls under declaration of death criteria.</p> <p>Parks without base hospitals should follow local medical advisor approved EMS policy.</p>
<b>Documentation</b>	<p>Detailed maternal history, including drug, tobacco and alcohol use, hypertension, maternal medications, history of previous pregnancies, complications with past and current pregnancies.</p> <p>Continuous monitoring of heart rate, respiratory rate, color and responsiveness.</p> <p>Detailed account of resuscitation drugs utilized and response.</p>

## Cross Reference

### **Procedures:**

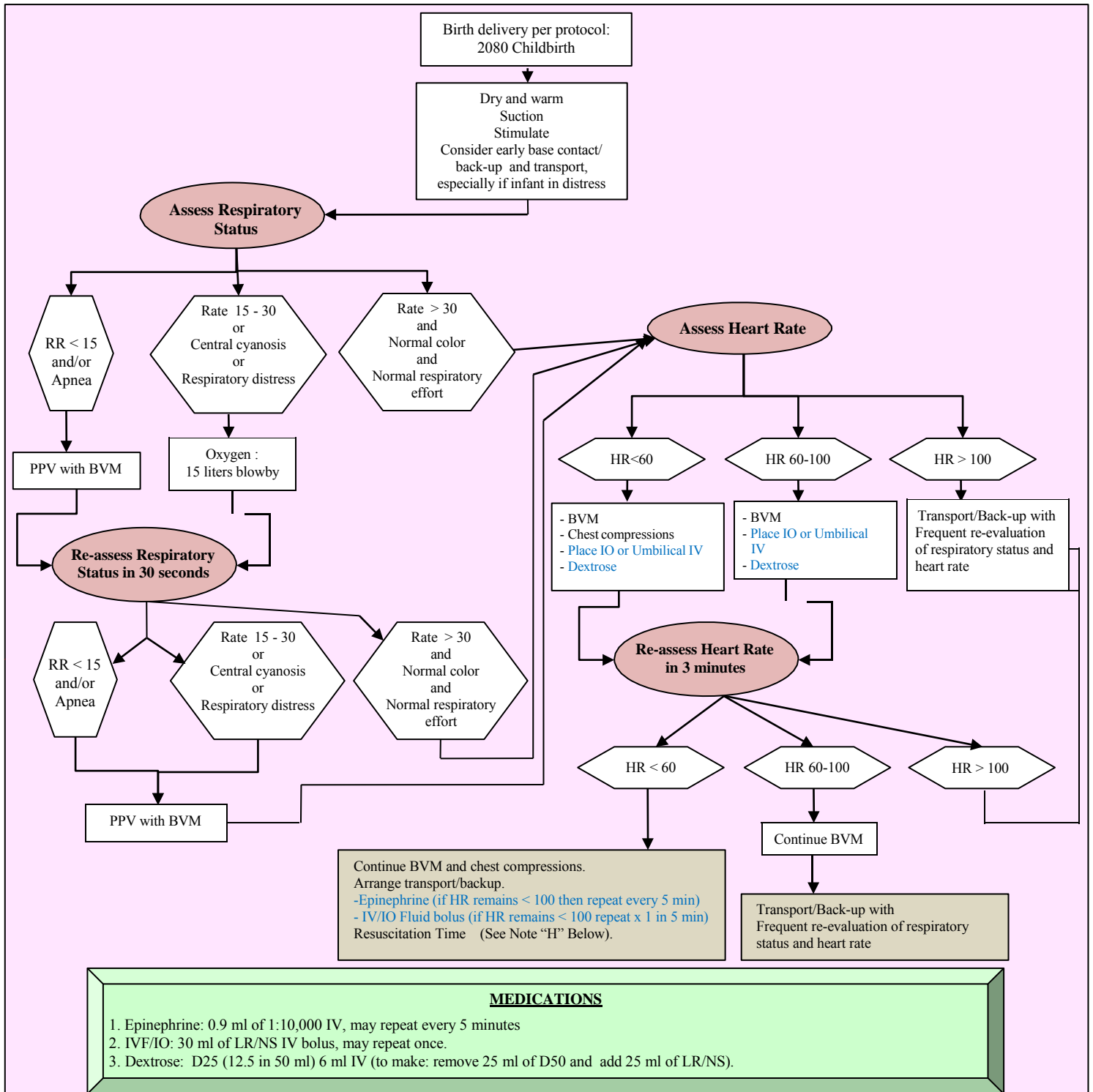
IV Access and IV Fluid Administration  
Intraosseous Access  
Oxygen Administration

### **Drugs:**

Dextrose 50% (D50)  
Epinephrine

# Pediatric

# Newborn Resuscitation



**MEDICATIONS**

1. Epinephrine: 0.9 ml of 1:10,000 IV, may repeat every 5 minutes
2. IVF/IO: 30 ml of LR/NS IV bolus, may repeat once.
3. Dextrose: D25 (12.5 in 50 ml) 6 ml IV (to make: remove 25 ml of D50 and add 25 ml of LR/NS).

- A. Blue text is used to denote actions in the Parkmedic scope of practice, all other actions apply to providers at all levels.
- B. CPR Cycle rate: 3:1 ratio of 90 compressions to 30 ventilations per minute
- C. Drug doses are given for an average 3 kg neonate (may be adjusted for extremely large neonate).
- D. APGAR score should ideally be calculated at 1 and 5 minutes, but must not delay or interfere with resuscitative activities.
- E. Once chest compressions are initiated, it should be continued until HR > 100.
- F. Once BVM is initiated, it should be continued until HR > 100 for three minutes without the benefit of chest compressions.  
If HR > 100 after three minutes of NO chest compressions, a trial of blow-by O<sub>2</sub> may be attempted.
- G. Once initiated, oxygen blow-by therapy should be continued, unless directed otherwise by base hospital.
- H. CPR may be terminated after 30 minutes of continuous resuscitation without return of any palpable pulse or spontaneous respirations (30-second evaluation).  
Confirm with a second provider if available. Any return of spontaneous circulation restarts the 30-minute clock (time for CPR termination)

# Pediatric Parameters

Normal Ranges for Pediatric Vital Signs				
Age	Estimated Weight (kg)	Heart Rate	Systolic Blood Pressure	Respiratory Rate
PREEMIES	2 kg	120-170	55-75	40-70
FULL TERM	3-4 kg	100-150	65-85	35-55
0-3 months	3-6 kg	100-150	65-85	35-55
3-6 months	6-7 kg	90-120	70-90	30-45
6-12 months	7-10 kg	80-120	80-100	25-40
1-3 years	10-16 kg	70-110	90-105	20-30
3-6 years	16-22 kg	65-110	95-110	20-25
6-12 years	22-35 kg	60-95	100-120	14-22
> 12 years	> 35 kg	55-85	110-135	12-18

## NPS Pediatric Resuscitation Tape/Broselow Tape

This is your best source for pediatric weights and drug dosages.

**\*\*Broselow tape is 4 feet at the blue/orange junction, and 5 feet overall. If the child is longer than the tape (> 5 feet), treat them as an adult.\*\***

## Pediatric Formulas

Weight: < 1yr:  $4 + \frac{1}{2} \times (\text{age in months}) = \text{Weight (kg)}$ .

> 1yr:  $10 + 2 \times (\text{age in years}) = \text{Weight (kg)}$ .

SBP: Normal:  $80 + 2 \times (\text{age in years}) = \text{Point estimate for Normal SBP}$ .

Lower Limit:  $70 + 2 \times (\text{age in years}) = \text{Lower SBP Limit}$ .

Ratio of Heart Rate : Respiratory rate = 4:1.

Child/Infant CPR Reference						
Age	Position	Hands	Depth	Compression Rate	Compression: Ventilation	
					1 Rescuer	2 Rescuers
Newborn	Lower third of sternum	2 fingers/ 2 thumbs	$\frac{1}{3}$ depth of chest	90/min	3 : 1	3 : 1
0-1 Infant	Mid-sternum	2 fingers/ 2 thumbs	$\frac{1}{3} - \frac{1}{2}$ chest	100/min	15 : 2	15 : 2
1-8 Child	Mid-sternum	Heel of one hand	$\frac{1}{3} - \frac{1}{2}$ chest	100/min	15 : 2	15 : 2

Systemic Responses to Blood Loss in the Pediatric Patient			
Blood Volume Loss	Mild (< 30%)	Moderate (30-45%)	Severe (> 45%)
Cardiovascular	Tachycardia Normal BP Weak/thready peripheral pulses	Marked tachycardia Low/normal BP Absent peripheral pulses	Tachycardia/Bradycardia Hypotension
CNS	Anxious Irritable Confused	Lethargic Dulled response to pain	Comatose
Skin	Cool Mottled Prolonged capillary refill	Cyanotic Markedly prolonged capillary refill	Pale Cold
Urinary Output	Decreased	Minimal	None

# Pediatric Parameters

<b>Estimation of Dehydration in Pediatric Patients</b>			
<b>Clinical Signs</b>	<b>Degree of Dehydration</b>		
	<b>Mild</b>	<b>Moderate</b>	<b>Severe</b>
Weight Loss (%)	5	10	15
Behavior	Normal	Irritable	Irritable to Lethargic
Thirst	Slight	Moderate	Intense
Mucous Membrane	May be normal	Dry	Parched
Tears	Present	Decreased	Absent
Anterior Fontanel	Flat	Flat to Sunken	Sunken
Skin Turgor	Normal	Mildly Increased	Increased

<b>Pediatric Glasgow Coma Score (GCS)</b>			
<b>Points</b>	<b>Eye Opening Response</b>	<b>Best Verbal Response</b>	<b>Best Motor Response</b>
6	-----	-----	Normal spontaneous movement
5	-----	Cries appropriately, coos, babbles	Withdraws to touch
4	Open spontaneously	Irritable cry, but consolable	Withdraws to pain
3	To speech or shout	Inappropriate crying/screaming	Flexion withdrawal (Decorticate)
2	To painful stimuli	Grunts	Extension (Decerebrate)
1	No response	No response	No response

<b>Trauma Score</b>					
<b>Points</b>	<b>Respiratory Rate (per minute)</b>	<b>Respiratory Effort</b>	<b>Systolic Blood Pressure (mmHg)</b>	<b>Capillary Return</b>	<b>Glasgow Coma Score</b>
<b>5</b>	-----	-----	-----	-----	14-15
<b>4</b>	10-24	-----	≥ 90	-----	11-13
<b>3</b>	25-35	-----	70-89	-----	8-10
<b>2</b>	≥ 36	-----	50-69	Normal	5-7
<b>1</b>	1-9	Normal	1-49	Delayed	3-4
<b>0</b>	Absent	Shallow/Retractions	Absent	None	-----

The best possible Trauma Score is 16:

4 (RR of 10-24) + 1 (normal respiratory effort) + 4 (SBP ≥ 90) + 2 (normal capillary refill) + 5 (GCS 14-15).

# Respiratory Distress

## EMT and Parkmedic Standing Orders

1. ABCs                      Protect airway and assist ventilation if needed.
2. Oxygen                    Per PROCEDURE: *Oxygen Administration*. High flow if moderate to severe distress, or ALOC.
3. Assessment              Vitals including temperature if possible, mental status, lung sounds, pulse ox if available. Obtain history of present illness, meds, PMH.  
Consider nerve agent/organophosphate exposure if multiple victims and/or AB-SLUDGEM, (see Special Considerations).  
If appropriate, **GO TO** PROTOCOL: *Ingestions/Poisoning*.
4. AED                        Apply AED and treat if appropriate.  
If indicated, **GO TO** appropriate PROTOCOL *Cardiac Arrest with AED (Adult Medical)*.
5. Classify                    Based on assessment, make a provisional diagnosis and go to appropriate section.  
Consider early base contact if diagnosis unclear.

**Note: This table gives you the most common findings to help you differentiate the cause of respiratory distress. Each case is unique and may not exactly fit one category.**

PROVISIONAL DIAGNOSIS	HISTORY	SPUTUM	PHYSICAL EXAM
<b><u>UPPER AIRWAY OBSTRUCTION (MECHANICAL)</u></b> Foreign Body Obstruction (food/toy)	Onset during meal/play	None	Grabbing neck, unable to speak, drooling.
<b><u>UPPER AIRWAY OBSTRUCTION (NON-MECHANICAL)</u></b> Croup/Epiglottitis	Fever, drooling, sore throat	None	<b>Inspiratory stridor</b> , anxious, leaning forward to breathe, drooling.
Anaphylaxis	Known allergy + exposure	None	Airway edema (swelling), chest tightness, low BP.
<b><u>BRONCHOSPASM</u></b> Asthma and/or COPD	PMH: asthma, emphysema, bronchitis, heavy smoking. Meds: albuterol, atrovent, prednisone, home oxygen.	Thick, white or yellow/green	<b>Prolonged expiration with wheezes</b> , poor air movement, very little to no pitting edema, pursed lip breathing in emphysema.
<b><u>CARDIOGENIC PULMONARY EDEMA-CHF</u></b> Congestive Heart Failure (CHF)	PMH: CHF, MI, Angina, Paroxysmal Nocturnal Dyspnea, Orthopnea. Meds: Digoxin, BP Meds (diuretics, ACE inhibitors, Lasix), Nitroglycerin.	May be watery/foamy white or pink/blood-tinged.	<b>Inspiratory crackles</b> , pitting edema in legs, distended neck veins. Typically have very elevated BP.
<b><u>HAPE</u></b> High Altitude Pulmonary Edema	Rapid ascent to altitudes > 8,000 feet with worsening SOB.	May be watery/foamy white or pink/blood tinged.	<b>Inspiratory crackles</b> , usually no lower extremity pitting edema.
<b><u>PNEUMONIA</u></b>	Any age. Progressive SOB with cough, fever, chills, sputum. May be on antibiotics.	Thick, any color	<b>Asymmetric or localized crackles</b> , may have mild wheezing, no peripheral edema.

Note: If patients do not respond to initial treatment it may be due to the severity of the disease, e.g., patients needs more nitrates for severe congestive heart failure or, you have chosen the wrong provisional diagnosis, e.g. patients does not need more nitrates, but rather needs albuterol for their COPD.

Therefore, if patient worsens or fails to respond to appropriate initial treatment aimed at your provisional diagnosis, reassess, reconsider, and contact base for assistance.

# Respiratory Distress

## Upper Airway Obstruction (Mechanical)

### EMT and Paramedic Standing Orders

1. ABCs
 

If **Incomplete Obstruction** suspected (patient is awake, coughing, or gagging), protect airway with position. Allow patient to assume position of comfort.  
Assist respirations and suction as needed, but minimize stimulation to airway.  
If **Complete Obstruction** (patient collapses or loses consciousness) and foreign body suspected, follow table below:

<b>COMPLETE AIRWAY OBSTRUCTION – FOREIGN BODY</b>			
	<b>Adult ( &gt; 8 yrs old)</b>	<b>Child (1-8 yrs old)</b>	<b>Infant (birth – 1 yr)</b>
<b>Ventilations</b>	10-12 per min	20 per min	20 per min
<i>If unable to ventilate, reposition head and reattempt ventilation. If still unsuccessful:</i>			
<b>Tongue/Jaw Lift</b>	Yes	Yes	Yes
<b>Finger Sweep</b>	Only if object is seen	Only if object is seen	Only if object is seen
<b>Abdominal Thrusts</b>	Sets of 5	Sets of 5	<b>Not Used</b>
<b>Chest Thrusts</b>	Pregnant, obese, or after abdominal thrusts fail	Sets of 5. After abdominal thrusts fail	Sets of 5 back blows followed by 5 chest thrusts
<b>Back Blows</b>	<b>Not Used</b>	Sets of 5 after abdominal and chest thrusts fail.	

NOTE: Guidelines for foreign body obstruction vary and are based on limited evidence. However, rotating sequences of abdominal/chest thrusts and back blows as in the table above, fits most recommendations.

2. Oxygen
 

Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC or moderate to severe respiratory distress.
3. Assessment
 

Age, vitals, history of event (onset during meal/play), ability to speak, drooling, stridor, lung sounds, mental status
4. Transport
 

Rapid transport is indicated in foreign body airway obstruction. Use caution when transporting airway obstructed patients via air medevac since airway interventions mid-flight are often very difficult due to limited space in the patient compartment of a helicopter or fixed-wing aircraft.
5. Base Contact
 

No TAR without base contact.

# Respiratory Distress

## Upper Airway Obstruction (Non-Mechanical)

### EMT and Parkmedic Standing Orders

1. ABCs  
Protect airway with position. Allow patient to assume position of comfort.  
Assist respirations and suction as needed, but minimize stimulations to airway.  
If anaphylaxis suspected, GO TO PROTOCOL: *Allergic Reactions*.  
If unable to manage airway with BLS maneuvers. Establish airway (King Tube/ETT).  
If unable to establish ALS airway perform TTJI. REFERENCE PROCEDURE:  
*Transtacheal Jet Insufflation*.
2. Oxygen  
Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC or moderate to severe respiratory distress.
3. Assessment  
Age, vitals, history, ability to speak, drooling, sore throat, stridor, sputum, lung sounds, fever, temperature (if possible), mental status
4. Epinephrine  
**EMT:** Per PROCEDURE: *Epinephrine Auto-Injector* or *Epinephrine Ampule* (per Local Medical Advisor approved extended scope of practice)  
  
All ages: 0.3ml (0.3mg) of 1:1,000 concentration IM  
Repeat dose every 10 minutes until severe symptoms resolve.  
Increase frequency to every 5 minutes if symptoms worsening.  
  
**Parkmedic:** Per PROCEDURE: *Epinephrine Auto-Injector* or *Epinephrine Ampule*  
  
> 10 yrs: 0.3ml (0.3mg) of 1:1,000 concentration IM  
4–10 yrs: 0.2ml (0.2mg) of 1:1,000 concentration IM  
< 4 yrs: 0.1ml (0.1mg) of 1:1,000 concentration IM  
Repeat dose every 10 minutes until severe symptoms resolve.  
Increase frequency to every 5 minutes if symptoms worsening.
5. IV/IO  
**Parkmedic:** Fluids per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*
6. Dexamethasone (Decadron)  
**Parkmedic:** ≥ 12-Adults: 8mg PO/IV/IO/IM, then 4mg every 6 hours  
< 12 yrs: 4mg PO/IV/IO/IM, then 2mg every 6 hours
7. Transport  
Consider air transport if febrile child, severe distress, or unstable vitals.
8. Base Contact  
No TAR without base contact.



# Respiratory Distress

## Bronchospasm (COPD/Asthma)

### EMT Standing Orders

1. ABCs Protect airway with position, OPA/NPA, or suctioning.  
Assist respirations as needed. Allow patient to choose position of comfort.
2. Oxygen Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC or moderate to severe respiratory distress.
3. Assessment Vitals including temperature if possible, mental status, lung sounds
4. Epinephrine Under Local Medical Advisor approved extended scope of practice, per PROCEDURE:  
*Epinephrine Auto-Injector* or *Epinephrine Ampule*.  
  
Patients with the following symptoms; severe distress (unable to speak, cyanotic, severe retractions, accessory muscle use), AND history of asthma or COPD.  
  
All ages: 0.3ml (0.3mg) of 1:1,000 concentration IM  
Note: Do not give if patient has history of angina or MI.
5. Transport/  
ALS Backup Consider air transport for patients in severe distress or unstable vitals.
6. Base Contact No TAR without base contact.

### EMT Base Hospital/Communication Failure Orders

1. Epinephrine Repeat dose every 10 minutes until severe symptoms resolve.  
Increase frequency to every 5 minutes if symptoms worsening.
2. Albuterol If patient has an albuterol or other short acting beta agonist inhaler (e.g., Ventolin, Proventil, Bronkosol, Alupent): give 4 puffs on consecutive breaths during mid inspiration, then 1 puff every minute for up to 10 minutes (14 puffs total) if symptoms persist.  
May repeat 10-puff dose sequence starting 10 minutes after last puff if symptoms persist.

# Respiratory Distress

## Bronchospasm (COPD/Asthma)

### Parkmedic Standing Orders

1. ABCs Protect airway, assist respirations, and suction as needed.  
OPA/NPA or ALS airway if indicated REFERENCE PROCEDURE *King Tube/ETT*
2. Oxygen Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC or moderate to severe respiratory distress.
3. Assessment Vitals including temperature if possible, mental status, lung sounds, pulse ox if available.
4. Albuterol If wheezing or stridor:  
Nebulizer: All ages: 2.5mg in 3ml of LR/NS premixed solution  
Use with standard acorn-type jet nebulizer  
For all patients, start oxygen at 10 l/min. If not improved by 3–5 minutes, increase oxygen to 15 l/min.  
For patients who fail to respond to a single nebulized dose, repeat above dosing up to six times without allowing “acorn” to run dry.  
  
MDI: All ages: 4 puffs on consecutive breaths during mid inspiration, then start 10-puff dose sequence (1 puff every minute for up to 10 minutes) if symptoms persist.  
May repeat 10-puff dose sequence starting 10 minutes after last puff if symptoms persist. Use spacer (Aerochamber) if available to increase inhaled dose.
5. Ipratropium If giving Albuterol nebulizer treatment, add the Ipratropium nebulizer treatment simultaneously. If the patient has their own Ipratropium MDI, or if using MDI instead of nebulizer, use MDI dosing below. If using MDI treatment, complete first dose of Albuterol before giving Ipratropium.  
In general, nebulized treatments are preferred.  
Nebulizer: All ages: 500mcg (one vial) via standard acorn-type jet nebulizer with 15-L Oxygen. If still symptomatic, repeat dose every 4 hours.  
  
MDI: All ages: 2 puffs during mid inspiration, may be repeated in 4 hours if symptoms persist.  
**Note:** Ipratropium (Atrovent) does not have an immediate effect.
6. Epinephrine Severe distress (unable to speak, cyanotic, severe retractions, accessory muscle use), AND history of asthma or COPD.  
Contact base before administration if patient is known to be on beta-blockers, or has a history of angina or MI.  
    > 10 yrs: 0.3ml (0.3mg) of 1:1,000 concentration IM  
    4–10 yrs: 0.2ml (0.2mg) of 1:1,000 concentration IM  
    < 4 yrs: 0.1ml (0.1mg) of 1:1,000 concentration IM  
    May repeat once in ten minutes if not significantly improved.
7. CPAP For most patients treated under this protocol, the medications above take precedence over CPAP. Administer CPAP; REFERENCE PROCEDURE: *CPAP*. Continue inline nebulized therapy.



# Respiratory Distress

## Cardiogenic Pulmonary Edema (CHF)

### EMT Standing Orders

1. ABCs Protect airway, assist respirations, and suction as needed.
2. Oxygen Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC or moderate to severe respiratory distress.
3. Assessment Vitals, mental status, lung sounds, sputum, peripheral edema
4. Sit Patient Up Legs lower than heart if possible
5. HAPE If suspected, **GO TO PROTOCOL: *Altitude Illness***
6. Transport/  
ALS Backup
7. Base Contact

### EMT Base Hospital/Communication Failure Orders

1. Nitroglycerin If patient has own nitroglycerin tablets or spray, EMT may assist in administration as follows:  
SBP 100-120: 0.4mg (1 tab/spray) sublingual  
SBP 120-200: 0.8mg (2 tabs/sprays) sublingual  
SBP >200: 1.2mg (3 tabs/sprays) sublingual and call base  
Repeat single dose 0.4mg (1 tab/spray) sublingual every 5 minutes if patient still symptomatic and SBP >100, to a total of 8 tablets/sprays.
2. Aspirin If patient has own aspirin, EMT may assist in administration of 325mg PO.

# Respiratory Distress

## Cardiogenic Pulmonary Edema/Congestive Heart Failure (CHF)

### Parkmedic Standing Orders

1. ABCs Protect airway, assist respirations, and suction as needed. OPA/NPA or ALS airway if indicated REFERENCE PROCEDURE /*King Tube/ETT*.
2. Oxygen Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC or moderate to severe respiratory distress.
3. Assessment Vitals, mental status, lung sounds, sputum, peripheral edema  
If SBP < 90 base contact advised, see Special Considerations, Assessment.
4. Sit Patient Up Legs lower than heart if possible.
5. HAPE If suspected, **GO TO PROTOCOL: *Altitude Illness***
6. Nitroglycerin SBP 100-120: 0.4mg (1 tab/spray) sublingual  
SBP 120-200: 0.8mg (2 tabs/sprays) sublingual  
SBP > 200: 1.2mg (3 tabs/sprays) sublingual and call base  
Repeat single dose 0.4mg (1 tab/spray) sublingual every 5 minutes if patient still symptomatic and SBP >100, to a total of 8 tablets/sprays.
7. Aspirin 325mg PO x 1
8. CPAP For patients treated under this protocol, the medications above take precedence over CPAP. Administer CPAP; REFERENCE PROCEDURE: *CPAP*. Continue nitroglycerin dosing.
9. Ondansetron If nausea develops administer:  
IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea  
  
If vomiting, discontinue CPAP, then administer:  
IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea  
Contact base if considering resumption of CPAP.
10. Nitropaste If SBP still above 100: Apply 1 inch of Nitropaste to chest wall  
If SBP drops below 90: Wipe paste off chest wall
11. Transport Consider air transport if patient condition is worsening.
12. Base Contact
13. IV/IO Saline lock

### Parkmedic Base Hospital/Communication Failure Orders

1. Nitroglycerin Repeat dose 0.4mg (1 tab/spray) sublingual every 5 minutes if patient still symptomatic and SBP >100, 8 additional doses to a grand total of 16 tablets/sprays.
2. Nitropaste Apply a second 1-inch dose if still in distress after above treatments and SBP > 100.

# Respiratory Distress

## Pneumonia

### EMT Standing Orders

1. ABCs Protect airway, assist respirations and suction as needed.  
If patient is in shock, **GO TO PROTOCOL: Shock Without Trauma.**
2. Oxygen Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC, moderate to severe respiratory distress, or unstable vitals.
3. Assessment Vitals including temperature (if possible), mental status, lung sounds
4. Transport/  
ALS Backup
5. Base Contact
6. Acetaminophen (Tylenol) If temperature  $>38.5^{\circ}\text{C}$  ( $>101.3^{\circ}\text{F}$ ), encourage patient/parent to take/administer their own Acetaminophen (Tylenol) if available.  
>10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours  
0-10 yrs: 15mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours

# Respiratory Distress

## Pneumonia

### Parkmedic Standing Orders

1. ABCs Protect airway, assist respirations and suction as needed.  
OPA/NPA or ALS airway if indicated (*/King Tube/ETT*).  
If patient is in shock, **GO TO PROTOCOL: Shock Without Trauma.**
2. Oxygen Per PROCEDURE: *Oxygen Administration*  
High flow if ALOC, moderate to severe respiratory distress, or unstable vitals.
3. Assessment Vitals including temperature and pulse ox mental status, lung sounds
4. Transport
5. IV/IO Adults: 500ml LR/NS bolus  
0-14 yrs: 20ml/kg LR/NS bolus to a max of 500ml  
Additional IV Fluids per IV Access and IV Fluid Administration
6. Base Contact
7. Acetaminophen (Tylenol) If temperature > 38.5°C (> 101.3°F) administer:  
> 10-Adult: 1,000mg PO every 4-6 hours, not to exceed 4,000mg in 24 hours  
0-10 yrs: 15mg/kg PO every 4-6 hours, not to exceed 4,000mg in 24 hours
8. Ondansetron IV/IO: 4mg IV over 2–5 min, repeat in 15 min x2 prn nausea  
ODT: 4mg, repeat in 15 min x2 prn nausea  
IM: If no IV, give 8mg IM, repeat in 15 min x1 prn nausea

### Parkmedic Base Hospital/Communication Failure Orders

1. Albuterol If patient is wheezing or has prolonged expirations, give one nebulizer treatment and reassess.  
If wheezing/prolonged expirations are partially improved, repeat treatment up to 3 times.  
If wheezing/prolonged expirations resolve, hold any further treatments.  
  
Use spacer (Aerochamber) if available to increase inhaled dose.
2. CPAP For patients treated under this protocol, the therapies above take precedence over CPAP.  
Administer CPAP; REFERENCE PROCEDURE: *CPAP*.  
  
If vomiting develops, administer Ondansetron as above.  
Contact base if considering resumption of CPAP.

# Respiratory Distress

## SPECIAL CONSIDERATIONS (for entire Respiratory Distress section)

<b>Assessment</b>	<p>Mental status, vital signs, breath sounds, peripheral edema, cyanosis, inspiratory/expiratory ratio, accessory muscle use, retractions, neck vein distention, tracheal position, increased AP diameter of chest, diaphoresis, chest pain.</p> <p>Be prepared to assist ventilations.</p> <p>Patients with SBP &lt; 90 and severe CHF are in cardiogenic shock. Base contact is strongly advised as these patients are critically ill requiring advanced therapies that are only available in the hospital setting. In the pre-hospital setting a combination of a dopamine drip and CPAP may be of some benefit but is best managed with base consultation.</p> <p>Patients with severe COPD may retain CO<sub>2</sub> as they recover from hypoxemia. All patients on high flow oxygen must be watched carefully for decreasing mental status and decreased respiratory effort. Respirations may need to be assisted.</p> <p>“<b>AB-SLUDGEM</b>” Mnemonic for organophosphate poisoning</p> <ul style="list-style-type: none"><li><b>A:</b> Altered mental status</li><li><b>B:</b> Bronchorrhea, Breathing difficulty or wheezing, Bradycardia</li><li><b>S:</b> Salivation, Sweating, Seizures</li><li><b>L:</b> Lacrimation (tearing)</li><li><b>U:</b> Urination</li><li><b>D:</b> Defecation or Diarrhea</li><li><b>G:</b> GI upset (abdominal cramps)</li><li><b>E:</b> Emesis (vomiting)</li><li><b>M:</b> Miosis/Muscle Activity (twitching)</li></ul>
<b>Differential Diagnosis</b>	<p>Other causes of respiratory distress may include hyperthyroidism, aspirin overdose, diabetic ketoacidosis, amphetamine or cocaine abuse, anxiety attack, hyperventilation, pulmonary embolism, anemia, early shock, traumatic or spontaneous pneumothorax, or MI.</p>
<b>AMA/TAR</b>	<p>All patients are either transported or signed out AMA unless specified otherwise by base. Exception: TAR only after base contact, and only for mild asthma/COPD attacks completely resolved with treatment (3-4 puffs of MDI or one nebulized Albuterol) and ambulates without respiratory distress.</p> <p>Parks without base hospitals should follow local medical advisor approved EMS policy.</p>
<b>Documentation</b>	<p>Document repeated lung exams, vitals and response to treatments.</p>
<b>Medication Issues</b>	<p>Albuterol: Relatively contraindicated in active heart disease; No maximum for a young asthmatic.</p> <p>Epinephrine: Relatively contraindicated in active heart disease unless patient is in cardiac arrest. Only EMTs certified in Epinephrine Auto-Injectors/Epi Ampule Draw-up may use it. Parkmedics and epinephrine-certified EMTs may use the patient’s Epinephrine Auto-Injector if available. Use caution with COPD patients, as they are less likely to benefit from Epinephrine as compared to asthmatics.</p> <p>Nitropaste: When applying Nitropaste to chest wall, avoid AED pad placement areas as Nitropaste will impede adherence of the pads.</p> <p>Ondansetron: Use caution with oral medications in patients with respiratory distress, especially those requiring CPAP.</p>



# Respiratory Distress

## Cross Reference

### **Procedures:**

CPAP  
Endotracheal Intubation  
Epinephrine Auto-Injector  
Intraosseous Access  
IV Access and IV Fluid  
Administration  
King Tube  
Oxygen Administration  
Transtracheal Jet Insufflation

### **Protocols:**

Allergic Reactions  
Altitude Illness  
Ingestions/Poisoning  
Shock Without Trauma

### **Drugs:**

Acetaminophen (Tylenol)  
Albuterol  
Aspirin  
Atrovent  
Dexamethasone (Decadron)  
Epinephrine  
Nitroglycerin  
Ondansetron

# SCUBA/Dive Injury

## EMT Standing Orders

NOTE: There are multiple medical and trauma circumstances that may occur simultaneously and complicate a dive injury. Ideally both the dive injury and any other underlying issues (e.g. bite, sting, anaphylaxis, trauma, airway obstruction, hypothermia) may need to be addressed simultaneously.

**For example, a patient with a sting inducing anaphylaxis and subsequent rapid ascent may need epinephrine, oxygen and rapid transport to a dive chamber.** If there is an obvious medical or trauma complaint e.g., an extremity fracture, and a scuba/dive injury follow the dive injury and the minor and isolated extremity trauma simultaneously.

Exceptions: If pulseless or in cardiac arrest; **GO TO PROTOCOL:** *Cardiac Arrest/Dysrhythmia* or *Pediatric – Arrest/Dysrhythmia*.

1. ABCs  
If cardiac arrest, **GO TO PROTOCOL:** *Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Pediatric – Medical Arrest With AED; or Pediatric – Medical Arrest Without AED.*  
Protect airway if ALOC. Assist respirations and suction as needed, utilizing OPA/NPA if indicated.  
Consider C-spine protection if indicated.  
If ALOC, **REFERENCE PROTOCOL:** *Altered Mental Status/Altered Level of Consciousness (ALOC).*
2. Spinal Immobilization  
If indicated per PROCEDURE: *Spine Immobilization*
3. Assessment  
Vital signs, temperature, mental status, frequent respiratory examinations, trauma exam, PMH
4. Oxygen  
10–15 L/min by non-rebreather mask. **DO NOT** discontinue even if symptoms improve. Keep patient on oxygen throughout transport unless instructed to discontinue by base hospital or Diver’s Alert Network (see Special Considerations).
5. Position  
If conscious, position patient horizontally on left side with no obstruction to blood flow (no crossed arms/legs). Protect from excess heat, cold, wet, and noxious fumes.
6. Consider Hypothermia  
Remove wet clothing and apply dry blankets per PROTOCOL: *Hypothermia*
7. Base Contact
8. Transport  
Consider air transport (see Special Considerations).

# SCUBA/Dive Injury

## Parkmedic Standing Orders

NOTE: There are multiple medical and trauma circumstances that may occur simultaneously and complicate a dive injury. Ideally both the dive injury and any other underlying issues (e.g. bite, sting, anaphylaxis, trauma, airway obstruction, hypothermia) may need to be addressed simultaneously.

**For example, a patient with a sting inducing anaphylaxis and subsequent rapid ascent may need epinephrine, oxygen and rapid transport to a dive chamber.** If there is an obvious medical or trauma complaint e.g., an extremity fracture, and a scuba/dive injury follow the dive injury and the minor and isolated extremity trauma simultaneously.

Exceptions: If pulseless or in cardiac arrest; **GO TO PROTOCOL:** *Cardiac Arrest/Dysrhythmia* or *Pediatric Arrest/Dysrhythmia*.

1. ABCs  
Protect airway, assist respirations, and suction as needed. OPA/NPA or ALS airway if indicated (*King Tube*).  
Apply AED if pulseless or in cardiac arrest.  
If indicated, **GO TO** appropriate *Cardiac Arrest/Dysrhythmias Protocol*  
Consider C-spine protection if indicated by mechanism of injury, signs of trauma, presence of fast currents. See PROCEDURE: *Spine Immobilization*.
2. Oxygen  
10-15L/min by non-rebreather mask. See PROCEDURE: *Oxygen Administration*. **DO NOT** discontinue even if symptoms improve. Keep patient on oxygen throughout transport unless instructed to discontinue by base hospital or Diver's Alert Network (see Special Considerations).
3. Environment  
Protect from excess heat, cold, wet, and noxious fumes. Consider hypo/hyperthermia.
4. Position  
If conscious, position patient horizontally on left side with no obstruction to blood flow (no crossed arms/legs). Patients in spinal precautions can have a towel roll placed under the right side of the spine board.
5. Assessment  
Vitals signs including temperature, respiratory distress or tachycardia, lung sounds, sputum, LOC/mental status; trauma exam; frequent lung examinations.
  - 5a. The following symptoms suggest Arterial Gas Embolism (AGE) and urgent transport to a recompression chamber. STAT 100% oxygen at 10-15LPM is critical. Lay patient flat, elevate extremities. Return to ABCs above and see Special Considerations:

- unconsciousness	- personality changes
- disorientation	- bloody froth from airway
- paralysis or weakness	- apnea
- convulsions	- chest pain
- visual blurring	
  - 5b. Delayed presentation (up to 24 hrs after a dive) of the following symptoms suggest Decompression Sickness (DCS) and will require transport to a recompression chamber:

- Joint, muscle, extremity, or torso pain	- Excessive fatigue
- Numbness or tingling	- Paralysis or weakness
- Dizziness, instability	- Collapse or unconsciousness
- Coughing spasms	- Shortness of breath
	- Skin itch or rash

# SCUBA/DIVE INJURY

6. Pain Management Per PROCEDURE: *Pain Management*
7. IV/IO Saline lock or TKO per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access.*
8. Base Contact For all patients, especially those who may require air transport or whose symptoms up to 24 hrs after a dive suggest AGE or DCS, Consider contacting Divers Alert Network (DAN) at 919-684-911.  
*DAN should be considered a first line alternative in case of failed Base Contact.*

# SCUBA/DIVE INJURY

## SPECIAL CONSIDERATIONS

### **General**

Base hospital may use DIVER'S ALERT NETWORK (DAN) at 919-684-9111 for consultation. Field providers should use base hospital as primary source of advice, but may use DAN if unable to contact base hospital.

Choose the closest ER if stabilization of life threatening injuries is required, before considering transport to hyperbaric chamber.

### **Assessment**

History of Dive: (dive computer, maximum depth, type of air)

If possible, obtain details leading up to event from the victim as well as from witnesses (dive buddy).

Careful neurologic exam is key to identifying subtle findings caused by Decompression Illness. Repeat every 60 minutes and include:

-Pain (O-P-Q-R-S-T questions)

-Nausea/Vomiting

-Ability to urinate

-Mental function by GCS and orientation

-Cranial nerves (vision & ocular motion, facial nerves & muscles, hearing)

-Motor function (strength of major joints)

-Sensory (light touch & pin prick intact everywhere?)

-Coordination & Balance

### **Transport**

If evacuation is by air, fly as low as safety allows (generally 1,000ft) to minimize barometric pressure changes.

Send all equipment, trip dive log, and medical history with diver if possible.

### **In-Water Recompression**

Is defined as re-entering the water to treat Decompression Illness.

Should never be performed by those without training.

Is not a substitute for transport to a recompression chamber and should never delay transport.

May be performed by certified National Park Service employees with LEMA approval.

## Cross Reference

### **Procedures:**

Foreign Body Airway Obstruction

Intraosseous Access

IV Access and IV Fluid

Administration

King Tube

Oxygen Administration

Pain Management

Spine Immobilization

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)

Cardiac Arrest With AED (Adult Medical)

Cardiac Arrest Without AED (Adult Medical)

Heat Illness

Hypothermia

Pediatric – Medical Arrest With AED

Pediatric – Medical Arrest Without

AED

### **Drugs:**

Fentanyl

Hydromorephone (Dilaudid)

Morphine

# Seizures

## EMT Standing Orders

1. ABCs                      Protect C-spine if there is evidence of trauma per PROCEDURE: *Spine Immobilization*, and protect patient from additional injury. If there is no evidence of trauma, and actively seizing patient, place patient in lateral decubitus position. Secure airway, assist respirations, and suction as needed, utilizing OPA/NPA if indicated. Do not place objects in the mouth while seizing.
2. Assessment              Vitals including temperature and mental status; signs of trauma or drug use; pregnancy; altitude > 8,000ft; history of seizures, diabetes, recent illness, or exercise with water intake but little food.
3. Oxygen                    If ALOC, per PROCEDURE: *Oxygen Administration*
4. Determine Cause of Seizure      If cause of seizure likely due to altitude, heatstroke, trauma, or fever, then **GO TO** PROTOCOL: *Altitude Illness; Heat Illness; Major Trauma – Adult; or Pediatric – Medical Illness/Fever*.
5. Check Glucose            If seizures persist, Per PROCEDURE: *Blood Glucose Determination*
6. Glucose Paste            If glucose < 80, or ALOC and unable to determine glucose:  
                                         Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
                                         If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).
7. Transport/  
ALS Backup                  Consider air transport if ALOC or seizures persist.
8. Base Contact

# Seizures

## Parkmedic Standing Orders

1. ABCs Protect C-spine if there is evidence of trauma per PROCEDURE: *Spine Immobilization*, and protect patient from additional injury. If there is no evidence of trauma, and actively seizing patient, place patient in lateral decubitus position.  
Secure airway, assist respirations, and suction as needed, utilizing OPA/NPA if indicated.  
Do not place objects in the mouth while seizing.
  2. Assessment Vitals including temperature and mental status; signs of trauma or drug use; pregnancy; altitude > 8,000ft; history of seizures, diabetes, recent illness, or exercise with water intake but little food.
  3. Oxygen If ALOC, per PROCEDURE: *Oxygen Administration*
  4. Determine Cause of Seizure If cause of seizure likely due to altitude, heatstroke, trauma, or fever, then **GO TO** PROTOCOL: *Altitude Illness; Heat Illness; Major Trauma – Adult; or Pediatric – Medical Illness/Fever*.
  5. Midazolam (Versed) For actively seizing patients, administer:  
Adults: IN: 2mg via MAD every 3 min prn seizure (max 10mg)  
< 10 yrs: IN: 0.1mg/kg (max 2mg) via MAD every 3 min prn seizure (max 5 doses)
  6. IV/IO Place IV and administer IV fluids per PROCEDURE: *IV Access and IV Fluid Administration*.  
If unsuccessful after 3 attempts, proceed with protocol utilizing IN, IM route for interventions as listed below.
  7. Midazolam (Versed) For continued or recurrent seizures, administer:  
Adults: IV/IO: 2mg slow IVP every 3 min prn seizure (max 10mg)  
IN: 2mg via MAD every 3 min prn seizure (max 10mg)  
IM: 5mg every 10 min prn seizure (max 15mg)  
< 10 yrs: IV/IO: 0.1mg/kg (max 2mg) every 3 min prn seizure (max 5 doses)  
IN: 0.1mg/kg (max 2mg) via MAD every 3 min prn seizure (max 5 doses)  
IM: 0.15mg/kg (max 5mg) every 10 min prn seizure (max 3 doses)
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
8. Check Glucose If seizures persist, per PROCEDURE: *Blood Glucose Determination*
  9. Dextrose If glucose < 80, or ALOC and unable to determine glucose:  
≥ 2 yrs: 1 amp **D50 IV** (1 amp = 25g in 50ml)  
< 2 yrs: 2 ml/kg **D25 IV** (12.5g in 50ml), up to a max of 100ml  
(To make D25, remove 25ml of D50 and draw up 25ml of LR/NS)  
May repeat in 5 minutes if ALOC persists and glucose still < 80.  
May substitute dose on NPS Pediatric Resuscitation Tape/Broselow Tape for pediatric dose above.





# Seizures

## SPECIAL CONSIDERATIONS

<b>AED</b>	<b>Bring AED to patients side, if available.</b>
<b>Assessment</b>	History: <u>FACTS</u> F: focus A: activity (tonic, clonic) C: color during and after seizure T: time (onset, duration) S: supplemental history: seizures, meds/compliance, drugs, trauma, preceding headache, numbness/weakness, recent illness/fever, heavy exercise with water intake but little food  Exam: Mental status, vitals, focal neurologic deficits (pupils, facial symmetry, strength/sensation all extremities), trauma.
<b>Differential</b>	High Altitude Cerebral Edema (HACE), heatstroke, fever, hypoglycemia, meningitis, stroke, drugs/overdose, eclampsia, hyponatremia. Remember, patients with a known seizure disorder may have another cause for their seizures. Always consider trauma.  There are multiple causes for seizures, so ideally both the seizure and the underlying cause are addressed simultaneously. When following this protocol, primary focus should be controlling the seizure and protecting the patient from complications (e.g. aspiration, trauma). However, if a known/suggested cause exists, this should also be addressed (e.g. High Altitude Cerebral Edema [HACE], dehydration, or hyperthermia). Contact base hospital for guidelines as this is one of the rare circumstances where two protocols may need to be followed simultaneously. For example, a seizing patient with High Altitude Cerebral Edema (HACE) may need Dexamethasone, Midazolam, and rapid descent to lower altitudes; a hyperthermic and seizing patient may need Acetaminophen, Midazolam, and active cooling measures.
<b>Transport</b>	Consider air transport for patients with unmanageable airways, unstable vital signs, declining mental status or mental status failing to improve, uncontrolled seizures, hyperthermia, or High Altitude Cerebral Edema (HACE).
<b>AMA/TAR</b>	TAR is not acceptable for patients who have seized. AMA is possible for a patient who has seized but now has a completely normal mental status. This is most likely to occur in a patient with a known seizure disorder who has a typical seizure. All seizure patients should be told to avoid situations that would be dangerous were they to have another seizure, including driving. Parks without base hospitals should follow local medical advisor approved EMS policy.
<b>Documentation</b>	Reassessment of mental status; treatment rendered and response to therapy; blood glucose.

## Cross Reference

<b>Procedures:</b>	<b>Protocols:</b>	<b>Drugs:</b>
Blood Glucose Determination	Altered Mental Status/Altered Level of Consciousness (ALOC)	Acetaminophen (Tylenol)
Intraosseous Access	Altitude Illness	Dextrose 50% (D50)
IV Access and IV Fluid Administration	Heat Illness	Glucagon
King Tube	Major Trauma – Adult	Glucose Paste or Gel
Mucosal Atomizer Device	Pediatrics – Medical Illness/Fever	Magnesium Sulfate 50%
Oxygen Administration		Midazolam (Versed)
Rectal Drug Administration		
Spine Immobilization		



# SHOCK WITHOUT TRAUMA

## Parkmedic Standing Orders

1. ABCs Protect airway and assist ventilations as needed. OPA/NPA or ALS airway if indicated (*King Tube/ETT*).
  2. Oxygen Per PROCEDURE: *Oxygen Administration*
  3. Assessment Vitals, mental status, history, JVD, heart sounds, lung sounds, edema, fever, pain, bleeding, pregnancy, PMH, medications, capillary refill.  
Classify type of shock – see Special Considerations.  
If anaphylaxis, **GO TO** PROTOCOL: *Allergic Reactions*, and start with: “Epinephrine;” otherwise, continue this protocol.
  4. Monitor Apply AED and treat rhythm if appropriate  
If indicated, **GO TO** appropriate *Cardiac Arrest with AED (Adult Medical)*
  5. IV/IO Per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous (IO) Access*  
  
Adult: Two 14-16 gauge IV/IOs  
If SBP 80-100 OR HR > 100, then bolus LR/NS 500ml  
If SBP < 80, then bolus LR/NS 1-L under pressure  
Recheck vitals after boluses, and run IV fluids as above. Continue IVF to 3-L max.  
Once SBP > 100 AND HR < 100, then administer LR/NS at maintenance (120ml/hr).  
  
0-14yrs: Administer 20ml/kg LR/NS bolus, then recheck vitals. Bolus may be repeated x2 before base contact if vital signs not improved.  
Give bolus via syringe IV/IO push. Establish second IV/IO when able.  
Continue to administer maintenance fluids regardless of shock status unless ordered to stop by base.
  6. Transport Consider air transport for all patients
  7. Base Contact
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
8. Check Glucose Per PROCEDURE: *Blood Glucose Determination*
  9. Dextrose If glucose < 80 or ALOC and unable to determine glucose:  
≥ 2 yrs: 1 amp **D50** IV/IO (1 amp = 25g in 50ml)  
< 2 yrs: 2 ml/kg **D25** IV/IO (12.5g in 50ml), up to a max of 100ml  
(To make D25, remove 25ml of D50 and draw up 25ml of LR/NS)  
May repeat in 5 minutes if ALOC persists and glucose still < 80.
  10. Glucose Paste If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 11**.
  11. Glucagon Adults: 1mg IM (if no IV/IO and unable to give Glucose Paste)  
0-14 yrs: 0.03mg/kg IM, max dose 1mg  
May repeat once in 15 minutes if ALOC persists and glucose remains < 80.

# SHOCK WITHOUT TRAUMA

## SPECIAL CONSIDERATIONS

**Classify Type of Shock: (Usual signs/symptoms listed below)**

<b>Type of Shock</b>	<b>History</b>	<b>Physical Exam</b>	<b>Patient Medications</b>	<b>Treatment Considerations</b>
<b>Cardiogenic</b>	Heart disease; Chest pain; Orthopnea; SOB; PMH: MI, angina, CHF, dialysis.	Pulmonary edema (wet lung sounds); cool; diaphoretic; peripheral edema.	Lasix; Nitroglycerine; Digoxin; Beta-blocker; Calcium channel blocker; ACE inhibitors, Aspirin.	Difficult to treat in the field.
<b>Pericardial Tamponade</b>	MI in last 2 wks; Chest trauma; Recent heart/chest surgery; Cancer	Normal lung sounds; +/- Muffled heart sounds; JVD.	Similar to cardiogenic meds.	Fluids
<b>Pulmonary Embolism</b>	Postpartum; Blood clot in leg; Long car/plane ride; Immobilized (cast).	Normal lung sounds; JVD; +/- Swollen leg; +/- Normal exam; +/- Smoker.	Birth control pills; Coumadin.	Fluids
<b>Tension Pneumothorax</b>	Chest pain; SOB; Recent procedure or prior pneumothorax; Lung disease (COPD); HIV.	Absent breath sounds on one side with hyperresonance; Deviated trachea; JVD.	Inhalers; Isoniazid.	Needle thoracostomy; Consider fluids.
<b>Hypovolemic</b>	Vomiting; diarrhea; fever; GI/Vaginal bleeding; Decreased PO; Abdominal pain.	Normal lung sounds; Flat neck veins; Signs of bleeding; Fever.	Anti-diarrheal; Anti-emetic; Proton pump inhibitor.	Multiple fluid boluses may be necessary.
<b>Neurogenic</b>	PMH: spinal cord injury; Lower extremity weakness.	Normal lung sounds; Flat neck veins; Warm skin; Lower extremity weakness; Bradycardia.		IV fluid boluses.
<b>Septic</b>	Recent fever or infection,	Normal/Wet lung sounds; Flat neck veins; Warm skin; Lethargic.	Antibiotics	Multiple fluid boluses may be necessary.
<b>Anaphylactic</b>	Onset after food/drug/sting exposure; Prior reactions.	Normal lung sounds or wheezing/stridor; Flat neck veins; Rash; Red skin; Airway edema; +/- Med Alert Tag.	Epinephrine auto-injector; Benadryl.	Consider Epinephrine, Benadryl, Albuterol and fluids.
<b>Heat Stroke</b>	Hot weather and exertion; Dehydration.	Normal lung sounds; Flat neck veins; High temperature.	None	IV fluid bolus; Cooling measures.
<b>Drugs (toxin, street drugs, carbon monoxide, organophosphate, cyanide)</b>	IV drug abuse; Closed environment with chemicals or fire; Farm worker.	Highly variable vitals, skin, lung, eye and mental status findings.	None	Give Naloxone before ALS airway if suspect narcotics; Fluids.

# SHOCK WITHOUT TRAUMA

## General

Signs of Shock: Any person who is cool and tachycardic is considered to be in shock until proven otherwise.

- Adults: Skin signs may vary from cool/moist to hot/flushed  
Altered mental status  
Tachycardia (HR > 100)  
Hypotensive (SBP < 100; later sign)
- Pediatric: Skin signs may vary from cool/moist to hot/flushed  
Altered mental status or lethargy  
Tachycardia (**REFERENCE PROTOCOL: Pediatric Parameters**):  
School age: HR > 120  
Preschool: HR > 140  
Infant: HR > 160  
Hypotensive: Children compensate for shock better than adults.  
Tachycardia is an early sign. Decreased blood pressure is a sign of critical shock.

## Types of Shock:

Cardiogenic: Inability of heart to pump blood secondary to pump failure (CHF). May be due to MI without chest pain, consider aspirin.

Obstructive shock: Inability of the heart to properly fill, thereby reducing cardiac output (e.g. tamponade, pulmonary embolism, tension pneumothorax).

Hypovolemic: Low blood volume secondary to:  
Hemorrhagic shock: external or internal bleeding.  
Dehydration: fluid loss (internal or external) or poor fluid intake.

Distributive: Inability to properly distribute fluid in the body due to peripheral vasodilation. Examples are:

- Neurogenic: CNS damage/cord injury
- Septic shock: overwhelming infection
- Anaphylaxis
- Drug ingestion

## Transport

Consider air transport for all patients in shock.

## AMA/TAR

All patients should be transported or AMA after attempted base contact. Parks without base hospitals should follow local medical advisor approved EMS policy.

## Cross Reference

### Procedures:

AED  
Blood Glucose Determination  
Endotracheal Intubation  
Intraosseous (IO) Access  
IV Access and IV Fluid Administration  
King Tube  
Oxygen Administration

### Protocols:

Allergic Reactions  
Pediatric Parameters

### Drugs:

Dextrose 50% (D50)  
Glucagon  
Glucose Paste or Gel

# SUBMERSION/NEAR DROWNING

## EMT Standing Orders

1. Scene Safety
2. Rescue                      Handle patient as gently as possible. Maintain spinal precautions.
3. ABCs                        If cardiac arrest, **GO TO** PROTOCOL: *Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Pediatric – Medical Arrest With AED; or Pediatric – Medical Arrest Without AED.*  
Protect airway if ALOC. Assist respirations and suction as needed, utilizing OPA/NPA if indicated.
4. Spine  
Immobilization              If suspicion of neck injury (e.g. secondary to diving) per PROCEDURE: *Spine Immobilization*
5. Oxygen                     Per PROCEDURE: *Oxygen Administration*
6. Assessment                Vitals, mental status, temperature, trauma, coughing, lung sounds, preceding events (medical, trauma, intoxication), down/submersion time, loss of consciousness, water temperature/type (saltwater, freshwater, brackish, contaminated).
7. Treat Hypothermia        Remove wet clothing and apply dry blankets, per PROTOCOL: *Hypothermia*
8. Check Glucose            If ALOC, per PROCEDURE: *Blood Glucose Determination*
9. Glucose Paste             If glucose < 80, or ALOC and unable to determine glucose:  
Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).
10. Transport/  
ALS Backup                    Consider air transport for ALOC or respiratory distress. If appropriate, **GO TO** PROTOCOL: *Altered Mental Status/Altered Level of Consciousness (ALOC) or Respiratory Distress.*
11. Base Contact

# SUBMERSION/NEAR DROWNING

## Parkmedic Standing Orders

1. Scene Safety
  2. Rescue                    Handle patient as gently as possible. Maintain spinal precautions.
  3. ABCs                    If cardiac arrest, **GO TO PROTOCOL: Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Pediatric – Medical Arrest With AED; or Pediatric – Medical Arrest Without AED.**  
Protect airway if ALOC. Assist respirations and suction as needed, utilizing OPA/NPA or ALS airway (*King Tube/ETT*) if indicated.  
Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtracheal Jet Insufflation*.
  4. Spine Immobilization            If suspicion of neck injury (e.g. secondary to diving), per PROCEDURE: *Spine Immobilization*
  5. Oxygen                    Per PROCEDURE: *Oxygen Administration*
  6. CPAP                    For patients treated under this protocol, only utilize if patient has shortness of breath or pulse ox < 90%. Administer CPAP; REFERENCE PROCEDURE: *CPAP*.
  7. Assessment            Vitals, mental status, temperature, pulse oximetry (if available), trauma, coughing, lung sounds, preceding events (medical, trauma, intoxication), down/submersion time, loss of consciousness, water temperature/type (saltwater, freshwater, brackish, contaminated).
  8. Treat Hypothermia      Remove wet clothing and apply dry blankets per PROTOCOL: *Hypothermia*
  9. IV/IO                    If abnormal vitals or ALOC, place IV/IO and administer IV fluids, per PROCEDURE: *IV Access and IV Fluid Administration: Intraosseous (IO) Access*
- Note:** Perform glucose intervention steps below (dextrose, glucose paste, glucagon) sequentially to address potential or actual low glucose. Allow five minutes for patient response after each intervention. If patient responds, subsequent sugar interventions may be omitted. However, other treatment steps should proceed while awaiting response to glucose intervention(s).
10. Check Glucose            Only if ALOC per PROCEDURE: *Blood Glucose Determination*
  11. Dextrose                If glucose < 80, or ALOC and unable to determine glucose:  
                                  ≥ 2 yrs:        1 amp **D50 IV** (1 amp = 25g in 50ml)  
                                  < 2 yrs:        2 ml/kg **D25 IV** (12.5g in 50ml), up to a max of 100ml  
(To make D25, remove 25ml of D50 and draw up 25ml of LR/NS).  
May repeat in 5 minutes if ALOC persists and glucose still <80.  
May substitute dose on Broselow Tape for pediatric dose above.
  12. Glucose Paste            If no IV/IO, administer 1 tube of Glucose (15g) squeezed into mouth and swallowed.  
                                  If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side (maintain spinal precautions if indicated).  
If no response to Glucose Paste in 5 minutes, then proceed to **Step 13**.
  13. Glucagon                Adults:        1mg IM (if no IV/IO and unable to give Glucose Paste)  
                                  0-14 yrs:     0.03mg/kg IM, max dose 1mg (if no IV/IO)  
                                  May repeat once in 15 minutes if ALOC persists and glucose remains <80.





# TRAUMA ARREST

## (Adult and Pediatric)

### EMT Standing Orders

- 1. Confirm Arrest**

No response to aggressive stimulation.  
Call for ALS/ACLS backup ASAP.  
Check breathing, give 2 breaths if indicated, and check pulse (preferably carotid).  
If pulse is present, patient is NOT in cardiac arrest. **GO TO PROTOCOL:**  
*Major Trauma – Adult; Pediatric – Major Trauma*, or other appropriate protocol.  
If patient is victim of electrocution or lightning strike, run arrest as medical arrest;  
**GO TO PROTOCOL:** *Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Pediatric – Medical Arrest With AED; or Pediatric – Medical Arrest Without AED.*
- 2. Assessment**

Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated. As time allows, obtain additional information including: mechanism (penetrating vs blunt), bystander CPR, preceding events and symptoms, PMH.

Do not attempt resuscitation in the following cases:  
Rigor mortis, lividity, or obviously fatal trauma.  
Documented pulseless downtime greater than 15 minutes. In specific SPECIAL CASES (cold water drowning, hypothermia, barbiturate ingestion, pediatric patients, electrocution or lightning strike) downtime is extended to 30 minutes.
- 3. Airway**

Secure airway utilizing OPA/NPA
- 4. Oxygen**

Active ventilation with 15-L per PROCEDURE: *Oxygen Administration*
- 5. CPR**

Adult:  
Regardless of single or dual rescuer CPR, compression-to-ventilation ratio is 30:2.  
Compression rate is 100/minute; “Push Hard, Push Fast.”  
Continue CPR for **5 minutes** (blunt) or **10 minutes** (penetrating), or until patient has palpable pulse or shows signs of life.

0-14yrs:  
Compression-to ventilation ratio differs based on patient age and number of providers:  
Single Rescuer 1day – 14yrs Compression:Ventilation ratio is 30:2.  
Dual Rescuer 1day – 8yrs Compression:Ventilation ratio is 15:2.  
Dual Rescuer 8–14yrs Compression:Ventilation ratio is 30:2.  
Compression rate is 100/minute; “Push Hard, Push Fast.”  
**REFERENCE PROTOCOL:** *Pediatric Parameters* for other pediatric CPR details.  
Continue CPR for **10 minutes** (blunt), or **20 minutes** (penetrating), or until patient has palpable pulse or shows signs of life.
- 6. Transport/  
ALS Backup**

Transport if patient regains pulse or is within 5 minutes of health care facility (15 minutes for pediatric patients).
- 7. CPR  
Termination**

CPR may be terminated after 5 minutes (15 minutes for pediatric patients), if the following conditions are met:  
Patient does not respond to aggressive stimulation;  
Patient has no palpable pulse for 15 seconds AND  
Patient has no spontaneous respirations for 15 seconds.
- 8. Base Contact**

# TRAUMA ARREST

## (Adult and Pediatric)

### Parkmedic Standing Orders

1. Confirm Arrest  
No response to aggressive stimulation.  
Call for ACLS backup ASAP.  
Check breathing, give 2 breaths if indicated, and check pulse (preferably carotid).  
If pulse is present, patient is NOT in cardiac arrest. **GO TO PROTOCOL:**  
*Major Trauma – Adult; Pediatric – Major Trauma*, or other appropriate protocol.  
If patient is victim of electrocution or lightning strike, run arrest as medical arrest;  
**GO TO PROTOCOL:** *Cardiac Arrest With AED (Adult Medical); Cardiac Arrest Without AED (Adult Medical); Pediatric – Medical Arrest With AED; or Pediatric – Medical Arrest Without AED.*
2. Assessment  
Quickly obtain information (15-30 seconds) from witnesses to determine whether resuscitation should be initiated. As time allows, obtain additional information including: mechanism (penetrating vs blunt), bystander CPR, preceding events and symptoms, PMH.  
  
Do not attempt resuscitation in the following cases:  
Rigor mortis, lividity, or obviously fatal trauma.  
Documented pulseless downtime greater than 15 minutes. In specific SPECIAL CASES (cold water drowning, hypothermia, barbiturate ingestion, pediatric patients, electrocution or lightning strike) downtime is extended to 30 minutes.
3. Airway  
Secure airway utilizing OPA/NPA or ALS airway (PROCEDURE: *King Tube/Endotracheal Intubation*).  
If patient is < 4ft tall, ALS airway *King Tube* is not indicated.  
Consider TTJI if ALS airway unsuccessful per PROCEDURE: *Transtracheal Jet Insufflation*.
4. Oxygen  
Active ventilation with 15-L per PROCEDURE: *Oxygen Administration*
5. CPR  
Adult:  
Regardless of single or dual rescuer CPR, compression-to-ventilation ratio is 30:2. Compression rate is 100/minute; “Push Hard, Push Fast.”  
Continue CPR for **5 minutes**(blunt) or **10 minutes** (penetrating), or until patient has palpable pulse or shows signs of life.  
  
0-14yrs:  
Compression-to ventilation ratio differs based on patient age and number of providers:  
Single Rescuer 1day – 14yrs Compression: Ventilation ratio is 30:2.  
Dual Rescuer 1day – 8yrs Compression: Ventilation ratio is 15:2.  
Dual Rescuer 8–14yrs Compression: Ventilation ratio is 30:2.  
Compression rate is 100/minute; “Push Hard, Push Fast.”  
**REFERENCE PROTOCOL:** *Pediatric Parameters* for other pediatric CPR details.  
Continue CPR for **10 minutes** (blunt), or **20 minutes** (penetrating), or until patient has palpable pulse or shows signs of life.
6. Needle Thoracostomy  
Perform bilateral needle thoracostomies per PROCEDURE: *Needle Thoracostomy*.
7. IV/IO  
Per PROCEDURE: *Intraosseous (IO) Access and/or IV Access and IV Fluid Administration*.  
If ≤ 6 yrs, place IO per PROCEDURE: *Intraosseous (IO) Access*. Do not attempt IV access.  
Adult: If successful, bolus (ideally under pressure) 1-L LR/NS  
0-14yrs: If successful, bolus (ideally under pressure) 20ml/kg LR/NS

# TRAUMA ARREST

## (Adult and Pediatric)

8. Transport/  
ACLS Backup      Transport if patient regains pulse or is within 5 minutes of health care facility (15 minutes for pediatric patients).
9. CPR  
Termination      CPR may be terminated after 5 minutes (15 minutes for pediatric patients), if the following conditions are met:
  - Patient does not respond to aggressive stimulation;
  - Patient has no palpable pulse for 15 seconds, AND
  - Patient has no spontaneous respirations for 15 seconds.
10. Base Contact

### SPECIAL CONSIDERATIONS

**AED**      **Bring AED to patient's side, if available.**

**General**      With termination of CPR, consider early base contact as these situations are highly emotional and the base may assist in difficult decision-making.

Regardless of age, victims of traumatic arrest never survive unless they are within minutes of a hospital. Even in that setting, survival without neurological impairment is rare. Providing futile care will distract you from caring for potentially viable patients, keep personnel unavailable for other emergencies, and puts personnel at risk of injury from rescue, transportation, and body fluid exposures (i.e. needle stick).

In the field, it may be difficult to know that the heart has arrested, or is no longer viable, because of the trauma. While following this protocol, consider if events of the incident suggest contributing factors that may be addressed with the AED. Examples include:

- Isolated blunt chest trauma (especially in children), e.g. a baseball to the chest.
- An electrocution victim with traumatic injuries from falling or being thrown.
- A Myocardial Infarction (MI) leading to a Motor Vehicle Collision (MVC).

**Assessment**      Fixed and dilated pupils are not always reliable as a sign of death (e.g. sympathomimetic overdose).  
Hypothermic patients have a higher likelihood of survival, and may be viable while appearing to be dead.

### Cross Reference

**Procedures:**

- Automated External Defibrillator
- Endotracheal Intubation (ETT)
- Intraosseous (IO) Access
- IV Access and IV Fluid Administration
- King Tube
- Needle Thoracostomy
- Oxygen Administration
- Transtracheal Jet Insufflation

**Protocols:**

- Altered Mental Status/Altered Level of Consciousness (ALOC)
- Cardiac Arrest With AED (Adult Medical)
- Cardiac Arrest Without AED (Adult Medical)
- Hypothermia
- Major Trauma – Adult
- Pediatric – Major Trauma
- Pediatric – Medical Arrest With AED
- Pediatric – Medical Arrest Without AED
- Pediatric Parameters

# VAGINAL BLEEDING

## EMT Standing Orders

1. ABCs                      Secure airway. Assist respirations as needed, utilizing OPA/NPA if indicated.
2. Assessment              Vitals, mental status, dizziness/syncope, amount of bleeding, pregnancy, date of last menstrual period, abdominal pain, blood pressure (high or low) if pregnant, trauma, PMH.  
Consider pregnancy in any female who has ever had a menstrual period.  
If patient is found to be in labor, **GO TO PROTOCOL: *Childbirth***.
3. Oxygen                    Per PROCEDURE: *Oxygen Administration*  
                                    Stable:        Low flow  
                                    Unstable:    Hi flow or BVM as indicated
4. Treat Shock              If present, lay patient in Trendelenberg or left lateral decubitus (especially if pregnant) position and arrange immediate ALS backup.
5. Transport                Transport all patients unless released by base contact.  
If signs of shock, transport immediately, and consider air transport.  
If patient is > 5 months pregnant, place on left lateral decubitus side during transport.
6. Base Contact              All patients with vaginal bleeding should have base contact.

# VAGINAL BLEEDING

## Parkmedic Standing Orders

1. ABCs                      Secure airway. Assist respirations as needed, utilizing OPA/NPA if indicated.
2. Assessment              Vitals, mental status, dizziness/syncope, amount of bleeding, pregnancy, date of last menstrual period, abdominal pain, blood pressure (high or low) if pregnant, trauma, PMH.  
Consider pregnancy in any female who has ever had a menstrual period or between the ages of 10-50 years.  
If patient is found to be in labor, **GO TO PROTOCOL: *Childbirth***.
3. Oxygen                    Per PROCEDURE: *Oxygen Administration*  
                                    Stable:            Low flow  
                                    Unstable:        Hi flow or BVM as indicated
4. Pain Management        Per PROCEDURE: *Pain Management*
5. IV/IO                      Per PROCEDURE: *IV Access and IV Fluid Administration and Intraosseous Access*
6. Ondansetron (Zofran)    For nausea or vomiting or history of vomiting with narcotic administration  
  
Adult:                      IV:            4mg IV over 2–5 min, repeat in 15 min x2 prn nausea  
                                    ODT:        4mg, repeat in 15 min x2 prn nausea  
                                    IM:        If no IV, give 8mg IM, repeat in 15 min x1 prn nausea  
3 mos–14 yrs:            IV/IO:      0.1mg/kg (max 4mg) SIVP over 2–5 min, repeat in 15 min x2 prn nausea  
                                    ODT:        ½ tab (2mg) if age 4- 14  
                                    IM:        If no IV, give 0.2mg/kg (max 8mg) IM, repeat in 15 min x1 prn nausea
7. Treat Shock              If present, lay patient in Trendelenberg or left lateral decubitus (especially if pregnant) position and arrange immediate transport.
8. Transport                Transport all patients unless released by base contact.  
If signs of shock, transport immediately, and consider air transport.  
If patient is > 5 months pregnant, place in left lateral decubitus position during transport.
9. Base Contact              All patients with vaginal bleeding should have base contact.

# VAGINAL BLEEDING

## SPECIAL CONSIDERATIONS

**Assessment** Vitals/mental status: tachycardia, hypotension, skin signs, dizziness, syncope. If tachycardic, hypotensive or dizzy, treat as hypovolemic shock.  
Bleeding: duration and amount (soaked pads per hour), passing tissue, recent trauma.  
Menstrual history: date of last menstrual period (LMP), was it a typical period (i.e. normal and on time?).  
Pregnancy: If known pregnancy, how many weeks? Any problems with pregnancy (e.g. high blood pressure/eclampsia?), assess for signs of labor (visible/palpable abdominal contractions, urge to push).  
Abdominal pain: location (suprapubic, back, isolated R or L lower quadrant), cramping, similarity to prior labor pain or menstrual cramps?  
PMH: prior pregnancy number and/or problems including ectopic (tubal pregnancy), pelvic infections, or STDs.

**Differential Diagnosis** First and Second Trimester bleeding (up to 20 wks):  
Ectopic pregnancy: a ruptured ectopic pregnancy is a life threatening emergency. There may be little to no vaginal bleeding but internal hemorrhage may be present. Patients typically complain primarily of abdominal pain as opposed to vaginal bleeding. Watch for shock.  
Threatened abortion (bleeding during pregnancy): many women will not know or be in denial about being pregnant. Always ask LMP (last menstrual period) and if > 1 month ago, assume pregnancy if in child bearing years (10-50 years old).  
Spontaneous abortion (miscarriage): if patient is passing tissue, save it and bring it to the hospital. It can be important to determine if all products of conception have passed.  
Delivery: be prepared for possible premature delivery if late term pregnancy;  
**REFERENCE PROTOCOL**: *Childbirth*.

Third Trimester bleeding (> 20 wks):  
Abruptio placentae (placenta separates from uterus): can occur after blunt trauma. High risk of fetal death.  
Eclampsia/Pre-Eclampsia: if patient > 5 months pregnant or has delivered in past 2 weeks, AND is hypertensive or with a headache, ask about prior history of eclampsia or current symptoms (edema of face and hands, seizures). Usually no vaginal bleeding. **REFERENCE PROTOCOL**: *Seizures*.  
Regular menses: common cause.  
Trauma: consider pelvic fracture, or placental bleeding if in third trimester.  
Foreign body (IUD, rape): consider uterine perforation/rupture (rare).  
Hormonal imbalance: irregular menses (very common).  
Tumors: cervical and uterine, typically painless.  
Non-Vaginal sources: rectal or urethral.

**Transport** Immediate transport if suspect pregnancy and/or abnormal vital signs.

**AMA/TAR** All patients should be transported or AMA after attempted base contact.  
Parks without base hospitals should follow local medical advisor approved EMS policy.

**Documentation** Frequent vital signs and symptoms of shock (dizziness, syncope, pallor); menstrual history (as above); bleeding amount and duration; presence of passed tissue; abdominal pain.

## Cross Reference

**Procedures:**  
Intraosseous Access  
IV Access and IV Fluid Administration  
Oxygen Administration  
Pain Management

**Protocols:**  
Childbirth  
Seizures

**Drugs:**  
Acetaminophen (Tylenol)  
Fentanyl  
Hydromorphone (Dilaudid)  
Morphine  
Ondansetron

# Acetaminophen (Tylenol)

<b>Scope</b>	EMT (with base contact/communication failure), Parkmedic, Paramedic
<b>Class</b>	Antipyretic, analgesic
<b>Action</b>	Elevates pain threshold and readjusts hypothalamic temperature-regulatory center.
<b>Onset</b>	PO/PR: 20 minutes
<b>Duration</b>	4 hours
<b>Indications</b>	Altitude illness Febrile seizure Fever Mild pain
<b>Contraindications</b>	Known hypersensitivity (rare)
<b>Form</b>	325 or 500 mg tablets 160 mg/5 ml liquid
<b>Dosage</b>	> 10-Adult: 1,000 (975)_mg PO every 4-6 hours. Do not exceed 4,000 mg in 24 hours.  0-10 yrs.: 15mg/kg PO every 4-6 hours, max dose 1,000mg. Do not exceed 4,000 mg in 24 hours.
<b>Notes</b>	Small quantities of Acetaminophen may be supplied to any person if requested for self administration. The person should be offered an evaluation. A PCR does not need to be filled out if the person declines the evaluation and appears well. <b>REFERENCE PROCEDURE: <i>When to Initiate a PCR (Patient Care Report/Run Sheet)</i></b> . If the person appears acutely ill in your judgment, do your best to convince the person of the need for evaluation. A PCR shall be completed in this instance, even if the evaluation is declined. In general, Acetaminophen and Ibuprofen are interchangeable. The decision should be based on patient preference and contraindications.

## Cross Reference

### **Procedures:**

When to Initiate a PCR (Patient Care Report/Run Sheet)

### **Protocols:**

Altitude Illness  
Bites and Stings  
Burns  
Childbirth  
Electrical and Lightning Injuries  
Eye Trauma  
Frostbite  
General Medical Illness - Adult  
Minor or Isolated Extremity Trauma  
Pediatric – Medical Illness/Fever  
Respiratory Distress  
Seizures  
Vaginal Bleeding

### **Drugs:**

Ibuprofen (Motrin, Advil)

# Acetazolamide (Diamox)

<b>Scope</b>	Parkmedic, Paramedic
<b>Class</b>	Sulfonamide Carbonic anhydrase inhibitor
<b>Action</b>	Increases urination (diuretic) Stimulates respiration
<b>Onset</b>	PO: 1 hour
<b>Duration</b>	12 hours
<b>Indications</b>	Treatment of Acute Mountain Sickness (AMS) and High Altitude Cerebral Edema (HACE). Prevention of Altitude Illness in emergency personnel ascending rapidly to altitudes > 8,000 ft.
<b>Contraindications</b>	Sulfa allergies (examples: Bactrim or Septra) Severe kidney or liver disease
<b>Side Effects</b>	Tingling in hands and feet (very common) Increased urination (nearly universal) Tinnitus (ringing in ears) Nausea/vomiting/diarrhea/taste disturbances
<b>Form</b>	125mg or 250mg tablets
<b>Dosage</b>	<u>Prophylaxis:</u> 125 mg orally every 12 hours Ideally dosing should begin 24 hours prior to ascent and continue for 72 hours once maximum altitude is attained, or until descent.  <u>For severe symptoms of Acute Mountain Sickness:</u>  Adults: 250mg PO every 12 hours. 9–12 yrs: 125mg PO every 12 hours. 6–9 yrs: 2.5mg/kg or ½ of 125mg pill PO every 12 hours. < 6 yrs: 2.5mg/kg or ¼ of 125mg pill PO every 12 hours.  -All doses may be crushed and added to liquid. -All doses may be stopped once patient is asymptomatic or descended from altitude
<b>Notes</b>	Hydration is very important in the treatment and prevention of AMS. As this medication promotes urination, particular attention must be paid to maintaining fluid intake.

## Cross Reference

### **Protocols:**

Altitude Illness

Altitude Illness Prophylaxis



# Activated Charcoal

<b>Scope</b>	Parkmedic, Paramedic.
<b>Class</b>	Chemical adsorbent.
<b>Action</b>	Binds certain toxic substances, thereby reducing gastrointestinal absorption.
<b>Onset</b>	PO: Immediate
<b>Duration</b>	12-24 hours
<b>Indications</b>	For some life threatening oral ingestions within 1 hour.
<b>Contraindications</b>	Patient cannot follow commands or sit and sip water. Active seizures or post-ictal state. No gag reflex. Hydrocarbon ingestion (gasoline, kerosene, turpentine, etc). Acidic/caustic ingestion (acids, lye, oven cleaner, etc).
<b>Relative Contraindications</b>	An ingestion likely to cause a rapid decrease in mental status (psychiatric drugs).
<b>Side Effects</b>	Vomiting, constipation, black stools
<b>Form</b>	Premixed bottle: 50g in 240ml of water or sorbitol.
<b>Dosage</b>	Adult: 50g PO 1-14 yrs: 1 g/kg PO, (max dose 50g). < 1 yr: Base contact only, NOT in communications failure.
<b>Notes</b>	Base contact only, not in communications failure. Shake vigorously prior to administration. Activated Charcoal does not adsorb cyanide, ethanol, methanol, caustic alkali, potassium, lithium, iron or petroleum products, and should NOT be used if known to be an isolated ingestion of these agents.

## Cross Reference

### **Procedures:**

Nasogastric/Orogastric Tube Insertion

### **Protocols:**

Ingestion/Poisoning

# Albuterol and Metaproterenol Sulfate (Proventil HFA, Ventolin HFA, ProAir HFA)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Sympathomimetic B2 agonist
<b>Actions</b>	Relaxes bronchial smooth muscle, causing bronchodilation.
<b>Onset</b>	Immediate
<b>Duration</b>	2-4 hours
<b>Indications</b>	Respiratory distress with bronchospasm (allergic reaction, asthma, COPD). HAPE ( <b>REFERENCE PROTOCOL:</b> <i>Respiratory Distress</i> in Special Considerations).
<b>Contraindications</b>	Relatively contraindicated in active heart disease, severe hypertension or within 6 weeks of a known MI.
<b>Side Effects</b>	Palpitations, tremor, and anxiety (uncommon when taken in recommended doses).
<b>Forms</b>	Metered Dose Inhaler (MDI): Approximately 90mcg per actuation. Hand-held Nebulizer (HHN): Vial, 2.5mg in 3ml LR/NS.
<b>Dosage</b>	<u>Nebulizer:</u> All ages: 2.5mg in 3ml of LR/NS premixed solution. Use with standard acorn-type jet nebulizer. For all patients, start oxygen at 10 l/min. If not improved by 3–5 minutes, increase oxygen to 15 l/min For patients who fail to respond to a single nebulized dose, repeat above dosing up to six times without allowing “acorn” to run dry.  <u>MDI:</u> All ages: 4 puffs on consecutive breaths during mid inspiration, then start 10-puff dose sequence (1 puff every minute for up to 10 minutes) if symptoms persist. Use spacer (Aerochamber) if available to increase inhaled dose.
<b>Notes</b>	Assess respiratory effort, distress level, breath sounds, and vitals before and after administration. Use nebulizer if age or respiratory distress precludes use of MDI. Albuterol and ipratropium solutions can be mixed in a single nebulized treatment. Albuterol and Metaproterenol are virtually identical medications and can be used interchangeably. No maximum dose for a young asthmatic.

## Cross Reference

### **Protocols:**

Allergic Reactions  
Altitude Illness  
Respiratory Distress

### **Drugs:**

Ipratropium (Atrovent)

# Amiodarone (Cordarone)

<b>Scope</b>	Parkmedic and Paramedic		
	<b>Note:</b> Indications for this medication differ slightly in the Parkmedic protocols; this is because Parkmedics generally do not have cardiac monitors.		
<b>Class</b>	Anti-arrhythmic		
<b>Action</b>	Stabilizes cardiac conduction system. Has multiple sites of action but in IV form is predominately an AV nodal blocker.		
<b>Onset</b>	Immediate		
<b>Duration</b>	10-20 minutes		
<b>Indications</b>	Cardiac arrest due to Vfib or Vtach Patient has been shocked by AICD Patient has ROSC after AED shock Ventricular Dysrhythmias (VFib, VTach)		
<b>Contraindications</b>	HR < 80 in patients with a pulse (i.e. ROSC) 2 <sup>nd</sup> and 3 <sup>rd</sup> degree heart block		
<b>Side Effects</b>	Hypotension, rhythm disturbances, bradycardia, CHF, cardiac arrest, shock, respiratory depression, rash, anaphylaxis, vomiting.		
<b>Form</b>	150mg, 3mL vial (50mg/ml)		
<b>Dosage</b>	<u>Adults:</u>	<u>Actively Coding:</u>	IV/IO: 300mg (50mg/ml) IVP. Repeat 150 mg IVP x 1
		<u>ROSC:</u>	IV/IO: 150mg in 100ml NS over 10 minutes
		<u>Re-arrest:</u>	IV/IO: 150mg IVP
		<u>ROSC:</u>	IV/IO: 150mg in 100ml NS over 10 minutes
		<u>Wide Complex Tachydysrhythmia:</u>	IV/IO: 150mg in 100ml NS over 10 minutes
	Hold for HR < 80 as Amiodarone may worsen/induce bradycardia.		
	<u>1 mo-14 yrs:</u>	<u>Actively Coding:</u>	IV/IO: 5mg/kg IVP (max dose 300mg), repeat 2.5 mg/kg x 1
		<u>Re-arrest:</u>	IV/IO: 2.5mg/kg (max dose 150mg) IVP
	<u>&lt; 1 month:</u>	<u>Not Used</u>	

Hold for HR < 80 as Amiodarone may worsen/induce bradycardia.

### Cross Reference

#### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED

#### **Procedures:**

Intraosseous Access  
IV Access and IV Fluid Administration

# Aspirin (Acetylsalicylic acid)

<b>Scope</b>	EMT, Paramedic, and Paramedic
<b>Class</b>	Analgesic Anti-platelet (“Blood thinner”) Non-Steroidal Anti-Inflammatory Drug (NSAID)
<b>Action</b>	Analgesia Inhibits prostaglandin synthesis for anti-inflammatory and anti-pyretic (fever) effect. Inhibits platelet aggregation and reduces chances of complete coronary artery blockage in an AMI, therefore reducing the death of heart muscle.
<b>Onset</b>	PO: 5-30 minutes
<b>Duration</b>	Anti-inflammatory: 1-4 hours      Anti-platelet activity: slowly decreases over 10 days
<b>Indications</b>	Chest pain suggestive of acute myocardial infarction
<b>Contraindications</b>	Allergy to Aspirin or other non-steroidal anti-inflammatory (Motrin, Ibuprofen) Active, uncontrolled bleeding Pregnancy <b>Note:</b> Many people are told not to take aspirin because it upsets their stomach or they have a history of GI bleeding (e.g., ulcers). In the setting of cardiac chest pain this is NOT a contraindication – give them Aspirin.
<b>Side Effects</b>	Stomach irritation and/or nausea Tinnitus (ringing in the ears) in an overdose situation Bleeding with chronic use
<b>Form</b>	81mg and 325mg tablets in various packaging
<b>Dosage</b>	Adults: 325mg or 81 mg x 4 PO single dose; instruct the patient to chew the aspirin, then swallow.
<b>Notes</b>	Aspirin is the <b>MOST</b> important drug to give during an acute myocardial infarction (MI). The sooner Aspirin is given to a patient having an acute MI, the less potential for damage to the patient’s heart. Give Aspirin regardless of whether or not the patient has had Aspirin in the past 24 hours. If patient has a history of a bleeding disorder or is on anticoagulants (i.e. Coumadin, Warfarin, Lovenox, Pradaxa, Eliquis, Xarelto), contact base before administering Aspirin. If in communication failure, give Aspirin. An acute Aspirin overdose is potentially lethal. Signs and symptoms may include tinnitus, vomiting, rapid respirations, high fever, seizure, hypoglycemia, or altered mental status. For fever reduction use Acetaminophen (Tylenol) or Ibuprofen, <b>NOT</b> Aspirin.

## Cross Reference

### **Protocols:**

Chest Pain - Cardiac  
Respiratory Distress

# Atropine Sulfate

<b>Scope</b>	EMT per PROCEDURE: <i>NAAK/Mark I (Nerve Agent Antidote Kit)</i> Parkmedic, and Paramedic  <b>Note:</b> Indications for this medication differ slightly in the Parkmedic protocols, this is because Parkmedics generally do not have cardiac monitors.
<b>Class</b>	Anticholinergic
<b>Action</b>	Blocks the receptors of the parasympathetic nervous system (vagal) resulting in: Increased heart rate causing increased cardiac output. Decreased smooth muscle activity in stomach, intestine, and bladder causing decreased sweating, salivation, tears, and mucus secretions.
<b>Onset</b>	IV/IO/IM: Immediate
<b>Duration</b>	4 hours
<b>Indications</b>	<u>Symptomatic</u> bradycardia (HR < 50 AND SBP < 90 plus, symptoms). Symptoms = active chest pain OR shortness of breath OR nausea/vomiting OR altered mental status. Organophosphate poisoning.
<b>Contraindications</b>	None for emergency use
<b>Side Effects</b>	Tachycardia, palpitations, hypertension, dry mouth, increased thirst, headache, nervousness, weakness, dilated pupils, and blurred vision.
<b>Form</b>	Preload (10ml syringe): 1mg in 10ml (0.1 mg/ml). Vial: 8mg in 20ml (0.4 mg/ml). Auto Injector: 2mg dose.
<b>Dosage</b>	<u>Chest pain with symptomatic bradycardia</u> (ALL present): HR < 50, SBP < 90, AND symptoms (active chest pain, shortness of breath, nausea/vomiting, OR altered mental status). Adults: IV/IO: 0.5mg every 5 min prn HR < 50, SBP < 90, AND symptoms (max 3mg). 0-14 yrs: Not indicated.  <u>Organophosphate Poisoning:</u> (BASE CONTACT) Adults: IV/IO/IM: 2mg every 5 minutes prn secretions, no max total dose. 0-14 yrs: IV/IO/IM: 0.04mg/kg (0.4ml/kg preload) (minimum dose 0.1mg, max dose 2mg) every 5 minutes prn secretions, no max total dose.
<b>Notes</b>	May increase myocardial oxygen demand, thus precipitating angina or worsen acute MI. Low dose Atropine (< 0.1mg pediatric) can cause paradoxical bradycardia. Enhanced anticholinergic effects may occur with antihistamines, haldol, meperidine, procainamide, quinidine, and tricyclic antidepressants. Organophosphate poisoning requires large amounts of Atropine; there is no maximum dose. Call backup for more medication early. Titrate until bronchial secretions are controlled. <b>REFERENCE PROCEDURE:</b> <i>NAAK/Mark I (Nerve Agent Antidote)</i> for auto-injector dose.
<b>Procedures:</b> NAAK/Mark I (Nerve Agent Antidote Kit)	<b><u>Cross Reference</u></b> <b>Protocols:</b> Chest Pain (Cardiac) Ingestion/Poisoning

# Bacitracin Ointment

<b>Scope</b>	EMT, Parkmedic, and Paramedic
<b>Class</b>	Topical (skin) antibiotic
<b>Action</b>	Inhibits bacterial growth, thereby helping to prevent infection
<b>Indications</b>	Minor cuts, scrapes and partial-thickness burns (< 15% total body surface area)
<b>Contraindications</b>	Known hypersensitivity Large deep wounds (any wound that you think may require stitches) Any full-thickness burn, partial-thickness burns > 15%, puncture wounds, animal bites
<b>Side Effects</b>	Local allergy – rash Systemic allergy – wheeze, diffuse rash, anaphylaxis
<b>Forms</b>	Multi-use tube
<b>Dosage</b>	After cleansing the area, apply thinly over affected part, and cover with bandage. Apply only once.
<b>Notes</b>	Application of Bacitracin Ointment may provide some pain relief.

## Cross Reference

**Procedures:**  
Wound Care

**Protocols:**  
Burns  
Minor or Isolated Extremity Trauma

# Cefazolin Sodium (Ancef)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Cephalosporin antibiotic
<b>Action</b>	Prevents and treats infection
<b>Onset</b>	IV: Immediate
<b>Duration</b>	8 hours
<b>Indications</b>	Severe wounds (deep, crushed, or exposed tendon; open fracture; heavy contamination, globe rupture) with > 2 hours between injury and arrival at hospital/clinic.
<b>Contraindications</b>	Allergy to cephalosporin antibiotics. Prior anaphylactic reaction to penicillin (simple rash/itching is <u>not</u> a contraindication).
<b>Side Effects</b>	Rare
<b>Form</b>	Vial: 1g powder, reconstituted with 2ml sterile water when needed
<b>Dosage</b>	> 12-Adult: 1g IV/IO (IM if no IV/IO access) every 8 hours 6-12 yrs.: 500mg IV/IO (IM if no IV/IO access) every 8 hours < 6 yrs.: 250mg IV/IO (IM if no IV/IO access) every 8 hours
<b>Notes</b>	To reconstitute dose, add 2 ml of <u>sterile water</u> to vial and shake well to mix. IM: Inject into shoulder (deltoid) or thigh muscle (no more than 2 ml per injection). IV: Dilute the reconstituted dose in additional 10 ml of <u>normal saline</u> (from IV bag) and administer over 5 minutes.

## Cross Reference

### **Procedures:**

Intraosseous Access  
IV Access and IV Fluid Administration  
Wound Care

### **Protocols:**

Bites and Stings  
Eye Trauma  
Minor or Isolated Extremity Trauma

# Dexamethasone (Decadron)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Steroid
<b>Action</b>	Anti-inflammatory Decreases cerebral edema
<b>Onset</b>	IV/IO/IM: 15-30 minutes
<b>Duration</b>	6 hours
<b>Indications</b>	High Altitude Cerebral Edema (HACE). Prophylaxis against acute mountain sickness during rapid ascents to elevations above 8,000 feet in individuals with history of severe AMS or allergy to acetazolamide. Severe asthma exacerbation or allergic reaction with prolonged transport time. Non-mechanical upper airway obstruction. HAPE
<b>Contraindications</b>	None in the emergency setting
<b>Side Effects</b>	Potential gastrointestinal bleeding, elevation of blood sugar
<b>Form</b>	Vial: 10mg in 1ml; 4mg in 1ml
<b>Dosage</b>	<u>Treatment of High Altitude Cerebral Edema (HACE), Asthma Exacerbation, Anaphylaxis, or Non-Mechanical Airway Obstruction:</u>  ≥ 12-Adults: 8mg PO/IV/IO/IM, then 4mg every 6 hours < 12 yrs: 4mg PO/IV/IO/IM, then 2mg every 6 hours  <u>Prophylaxis against Acute Mountain Sickness:</u> Adult Emergency Personnel only: 4mg PO every 12 hours. Do not stop taking until back to base elevation or a maximum of 10 days.
<b>Notes</b>	Protect medication from heat and light IV/IO/IM liquid can be given PO

## Cross Reference

### **Protocols:**

Allergic Reactions  
Altitude Illness  
Altitude Illness Prophylaxis  
Respiratory Distress

### **Drugs:**

Acetazolamide (Diamox)



# Dextrose 50% (D50)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Carbohydrate (sugar)
<b>Action</b>	Provides sugar which is the principal form of carbohydrate utilized by the body for energy. Elevates blood glucose rapidly.
<b>Onset</b>	IV/IO: 1 minute
<b>Duration</b>	Variable
<b>Indications</b>	When directed by specific PROTOCOL, and blood glucose < 80
<b>Contraindications</b>	None in the acute setting
<b>Side Effects</b>	Tissue damage at IV/IO site (verify IV/IO is working; dilute drug as instructed below for pediatric patients). Hyperglycemia (not clinically significant) Osmotic diuresis (not clinically significant)
<b>Form</b>	25g/50ml Preload (ampule) of D50
<b>Dosage</b>	$\geq 2$ yrs: 1 amp <b>D50</b> IV/IO (1 amp = 25g in 50ml)  < 2 yrs: 2 ml/kg <b>D25</b> IV/IO (12.5g in 50ml), up to a max of 100ml (To make D25, remove 25ml of D50 and draw up 25ml of LR/NS)  May repeat in 5 minutes if altered mental status/seizure persists and glucose still < 80
<b>Notes</b>	Utilize as large a vein as possible. Do NOT give IM. Effects may be delayed in elderly patients or those with poor circulation. IV/IO Dextrose is preferred (first-line) for patients with altered mental status or seizure; second-line is PO Glucose Paste, and third-line is IM Glucagon. If unable to determine blood glucose, give only to patients whose altered mental status is more severe than disorientation to time or date. May substitute dose on Broselow Tape/ NPS Pediatric Resuscitation Tape for pediatric dose above.

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered  
Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult  
Medical)  
General Medical Illness  
Heat Illness  
Hypothermia  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED  
Pediatric – Newborn Resuscitation  
Seizures  
Shock Without Trauma

### **Drugs:**

Glucagon  
Glucose Paste or Gel

# Diphenhydramine (Benadryl, Benacine)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Antihistamine
<b>Action</b>	Blocks action of histamine, thereby suppressing allergic reactions. Has mild anti-nausea, sedative, and anticholinergic effects.
<b>Onset</b>	IV/IO/IM/PO: Variable
<b>Duration</b>	4-6 hours
<b>Indications</b>	Allergic reactions or anaphylaxis Motion sickness and nausea (Base Hospital approval) Dystonic reactions
<b>Contraindications</b>	Patient taking MAO inhibitors (Nardil, phenelzine, Parnate, tranylcypromine): these medications can increase the anticholinergic effects. Concurrent use of alcohol may worsen drowsiness.
<b>Side Effects</b>	Tachycardia, thickening of bronchial secretions, sedation, dry mouth, and a paradoxical agitation (as opposed to the normal side effect of sedation)
<b>Form</b>	Preload: 50mg in 1ml Tablet/Capsule: 25mg and 50mg
<b>Dosage</b>	<u>Adults</u> : IV/IO/IM/PO: 50mg (over 1 minute if IV), may repeat every 6 hours <u>0-14 yrs</u> : IV/IO/IM/PO: 1 mg/kg (over 1 minute if IV), max single dose 50mg, may repeat every 6 hours
<b>Notes</b>	Use half regular dose if elderly or intoxicated. Contact base prior to administration if patient is hyperthermic or in a hot environment. Dystonic reactions can occur up to 48 hours after a patient has taken certain medications (commonly antipsychotic or antiemetic). The reaction often involves twisting of facial or neck muscles.

## Cross Reference

### **Protocols:**

Allergic Reactions  
Dystonic Reactions

# Epinephrine

<b>Scope</b>	EMT (per Local Medical Advisor approved extended scope of practice), Parkmedic and Paramedic	
<b>Class</b>	Catecholamine, Sympathomimetic	
<b>Action</b>	Cardiovascular: Increases strength of heart muscle contraction, increases heart rate, increases systolic blood pressure. Respiratory: Bronchodilation.	
<b>Onset</b>	IV/IO: Immediate	IM: 3-5 minutes
<b>Duration</b>	IV/IO: 5-60 minutes	IM: 1-4 hours
<b>Indications</b>	Anaphylaxis/Allergic reaction Asthma exacerbation Medical cardiac arrest	
<b>Contraindications</b>	There are no contraindications to Epinephrine if a patient is hypoxic secondary to anaphylaxis or asthma, or in cardiac arrest.	
<b>Relative Contraindications</b>	Severe hypertension Coronary artery disease Cocaine use	
<b>Side Effects</b>	Tachycardia, palpitations, hypertension, headache, anxiety	
<b>Forms</b>	Auto-injector: 0.3mg or 0.15mg in a single metered dose (1:1000) Ampule: 1mg in 1ml (1:1000) Preload: 1mg in 1ml (1:1000) Preload: 1mg in 10ml (1:10,000) <b>Note:</b> IM: 1:1000 = 1mg/ml concentration IV/IO: 1:10,000 = 1mg/10ml concentration	
<b>Dosage</b>	<u>EMT:</u> Allergic reactions/Asthma (severe) All ages: 0.3 ml (0.3 mg) of 1:1000 IM Repeat dose every 5–10 minutes per protocol  <u>Parkmedic/Paramedic:</u> Respiratory distress (infectious upper airway obstruction, allergic reactions, asthma): > 10 years: 0.3 ml (0.3 mg) of 1:1000 IM 4–10 years: 0.2 ml (0.2 mg) of 1:1000 IM < 4 years: 0.1 ml (0.1 mg) of 1:1000 IM All ages: Repeat dose every 5–10 minutes per protocol  Severe Respiratory Distress/Severe Anaphylaxis/Shock: All ages: 1ml (0.1mg) of 1:10,000 IV/IO every 1-2 min until relief Flush with 20 ml LR/NS after each dose  Adult Cardiac Arrest: 10ml (1mg) of 1:10,000 IV/IO  Pediatric Medical Arrest: 0.1ml/kg (0.01mg/kg) of 1:10,000 IV/IO  Newborn Resuscitation: 0.3ml/kg (0.03mg/kg) of 1:10,000 IV/IO	

# Epinephrine

## Notes

IV epinephrine should be limited to near-death situations because of higher risk from cardiac side effects.

Do not administer Epinephrine concurrently with alkaline solution (e.g. Sodium Bicarbonate).

Check type of solution, concentration (IM=1:1000 vs. IV/IO=1:10,000), and route.

## Cross Reference

### Procedures:

Epinephrine Auto-Injector  
IV Access and IV Fluid Administration

### Protocols:

Allergic Reactions  
Cardiac Arrest with AED (Adult Medical)  
Cardiac Arrest without AED (Adult Medical)  
Pediatric – Medical Arrest with AED  
Pediatric – Medical Arrest without AED  
Pediatric – Newborn Resuscitation  
Respiratory Distress  
Shock Without Trauma

# Erythromycin Ophthalmic Ointment (Eye)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Topical antibiotic (eye)
<b>Action</b>	Inhibits bacterial growth
<b>Indications</b>	Minor eye trauma (corneal abrasions)
<b>Contraindications</b>	Globe penetration, impaled objects, known hypersensitivity
<b>Side Effects</b>	Local allergy: irritation Systemic allergy: wheeze, anaphylaxis (rare)
<b>Form</b>	Multi-dose tube (single patient)
<b>Dosage</b>	1-cm ribbon to inside lower eyelid

## Cross Reference

**Protocols:**  
Eye Trauma

# Fentanyl (Sublimaze)

<b>Scope</b>	Parkmedic, Paramedic	
<b>Class</b>	Narcotic analgesic/synthetic opioid agonist	
<b>Action</b>	Analgesic with short duration of action. Minimal histamine release with minimal hemodynamic compromise and minimal nausea/vomiting.	
<b>Onset</b>	IV/IO: Immediate IM: 7-8 minutes IN: 1-2 minutes	Duration: 0.5 – 1 hour (all routes) Peak Effect: IV/IO/IN: 5 min IM: 10-12 min

**Indications** Severe pain in hemodynamically STABLE patients. See individual protocols. Analgesia after ALS airway (see ETT / King Tube procedures).

**Contraindications** Altered mental status  
Shock/hypotension  
Allergy to Fentanyl

**Side Effects** Respiratory depression, bradycardia, hypotension, nausea and vomiting. Hypertension and rigid chest syndrome are rare.

**Form** Ampule: 250 mcg in 5ml

**Dosage – all protocols except Cardiac Chest Pain:**

**Adult:** If moderate to severe pain, SBP > 100, and normal mental status.

IV/IO/IN: 50 mcg. Repeat in 15 min x1 prn pain.

Subsequent doses (2 max) every 30 minutes, i.e. fastest possible dosing schedule would be; time 0, 15, 45, 75 min.

IM: 100 mcg. Repeat in 15 min x1 prn pain,

Subsequent doses (2 max) every 30 minutes, i.e. fastest possible dosing schedule would be; time 0, 15, 45, 75 min

**Pediatric:** IV/IO/IN: 1 mcg/kg (max 50 mcg). Repeat in 15 min x1 prn pain.

Subsequent doses (2 max) every 30 minutes, i.e. fastest possible dosing schedule would be; time 0, 15, 45, 75 min.

IM: 2 mcg/kg (max 100 mcg). Repeat in 30 min x2 prn pain.

Fastest possible dosing schedule would be; time 0, 30, 60 min.

**Cardiac Chest Pain:** If ongoing pain, SBP > 100, and normal mental status.

IV/IO/IN: 25-50 mcg. Repeat in 10 min x1 prn pain.

Subsequent doses (2 max) every 20 minutes, i.e. fastest possible dosing schedule would be; time 0, 10, 30, 50 min.

IM: 50 - 100 mcg every 20 minutes. Repeat in 20 min x2 prn pain, i.e. Fastest possible dosing schedule would be; time 0, 20, 40 min.

# Fentanyl (Sublimaze)

## Notes

Some indications require prior base contact (see specific protocols).  
Should be given prior to a joint reduction if possible and if patient meets indications.  
Monitor blood pressure, respirations, and mental status carefully.  
Be prepared for respiratory depression. Have equipment to assist respirations, and Naloxone (Narcan) prepared for drug reversal if necessary.  
Hypotension after Fentanyl should be treated with fluids.  
Use with caution:  
    Multi-system trauma  
    Patients in whom respiratory depression should be avoided (asthma/COPD)  
    Patients in whom CNS (mental status) depression should be avoided (head injury)  
    At altitudes > 8,000 ft, respiratory depression may be exacerbated  
Elderly patients generally require smaller doses and are more susceptible to hypotension.  
Side effects are increased by alcohol or drugs that are CNS depressants and other narcotics.

## Cross Reference

### Protocols:

Abdominal Pain  
Bites and Stings  
Burns  
Chest Pain – Cardiac  
Eye Trauma  
Fracture/Dislocation Management  
Frostbite  
Major Trauma  
Minor or Isolated Extremity Trauma  
Mucosal Atomizer Device  
Pediatric – Major Trauma  
Vaginal Bleeding

### Procedures:

Endotracheal Intubation  
King Tube  
Pain Management

### Drugs:

Naloxone (Narcan)

# Glucagon

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Pancreatic islet hormone Hyperglycemic agent
<b>Action</b>	Increases blood glucose levels through release of glycogen stores from the liver Counteracts the action of insulin
<b>Onset</b>	5-20 minutes
<b>Duration</b>	Variable
<b>Indications</b>	When directed by specific PROTOCOL, and blood glucose < 80 Beta blocker overdose
<b>Contraindications</b>	None
<b>Side Effects</b>	Nausea/vomiting Hyperglycemia (not clinically significant)
<b>Form</b>	Two-vial kit: (a) 1 mg powder, and (b) 1 ml special diluent Add diluent to powder (1 mg in 1 ml)
<b>Dosage</b>	<u>Hypoglycemia:</u> Adults: 1mg IM 0-14 yrs: 0.03mg/kg IM, max dose 1mg May repeat once in 15 minutes if ALOC persists and glucose remains < 80. <b>Note:</b> May be given IV/IO. However, only if no D50 available and PO Glucose Paste contraindicated.  <u>Beta-Blocker Overdose:</u> Adults: 2mg IV/IO/IM every 5 min prn bradycardia/hypotension (shock) 0-14yrs: 0.06mg/kg IV/IO/IM (max 2mg) every 5 min prn bradycardia/hypotension (shock) Maximum cumulative dose is based on patient symptoms.
<b>Notes</b>	Use only diluent supplied by manufacturer in glucagon kit. IV/IO Dextrose is preferred (first-line) for patients with altered mental status or seizure; second-line is PO Glucose Paste, and third-line is IM Glucagon.

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
Heat Illness  
Hypothermia  
Major Trauma (Adult)  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED  
Pediatric – Newborn Resuscitation  
Seizures  
Shock Without Trauma  
Trauma Arrest (Adult and Pediatric)



# Glucose Paste or Gel (Glucose)

<b>Scope</b>	EMT, Parkmedic, Paramedic
<b>Class</b>	Carbohydrate (sugar)
<b>Action</b>	Elevates blood glucose rapidly
<b>Onset</b>	PO: Within one minute
<b>Duration</b>	Variable
<b>Indications</b>	When directed by specific PROTOCOL, If glucose < 80, or ALOC and unable to determine glucose.
<b>Contraindications</b>	None
<b>Side Effects</b>	May be aspirated if patient is unable to protect airway (i.e. is unable to swallow) Hyperglycemia (not clinically significant)
<b>Form</b>	15g per tube
<b>Dosage</b>	Administer 1 tube of Glucose (15g) squeezed into mouth and swallowed. If patient is unable to swallow, paste may be placed outside the teeth, between the gum and cheek, while patient is positioned on side. May repeat in 10 minutes if altered mental status/seizure persists and glucose still < 80.
<b>Notes</b>	Oral glucose is preferred for patients able to protect their airway (i.e. able to swallow). Do not overfill mouth because it will increase the potential for aspiration. IV/IO Dextrose is preferred (first-line) for patients with altered mental status or seizure; second-line is PO Glucose Paste, and third-line is IM Glucagon.

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
General Medical Illness - Adult  
Heat Illness  
Hypothermia  
Major Trauma (Adult)  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED  
Pediatric – Newborn Resuscitation  
Seizures  
Shock Without Trauma

# Hydromorphone (Dilaudid)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Narcotic analgesic/synthetic opioid agonist
<b>Action</b>	Analgesic with long duration of action. Minimal histamine release with minimal hemodynamic compromise and minimal nausea/vomiting.
<b>Onset</b>	IV/IO: 5 minutes                      Duration: 4-5 hours (all routes) IM:    variable                      Peak Effect: IV/IO 10-20 minutes    IM: variable
<b>Indications</b>	Severe pain in STABLE patients with extended transport times (i.e., greater than 2hours). See individual protocols. Analgesia after ALS airway (see ETT / King Tube procedures)
<b>Contraindications</b>	Altered mental status Shock/hypotension, or concern for falling blood pressure Allergy to Dilaudid
<b>Side Effects</b>	Respiratory depression, bradycardia, hypotension, nausea and vomiting. Hypertension is rare.
<b>Form</b>	1mg/1ml
<b>Dosage</b>	Adult:                      If severe pain, SBP > 100, and normal mental status. IV/IO: 0.5-1.0 mg (0.5-1ml) every 30 min prn pain (max 2mg) IM: 1mg (1ml) every 30 min prn pain (max 2mg) 5 – 14 yrs <u>Base Hospital Order ONLY</u> , NOT in communication failure. IV/IO: 0.015mg/kg. Max 1mg IM: 0.015mg/kg . Max 1mg < 5 yrs                      Not used
<b>Notes</b>	Volume of Diladid (mls) may vary based on concentration of drug in vial, e.g. Diladid may come as 1mg/ml or 2mg/ml. Some indications require prior base contact (see specific protocols). Should be given prior to a joint reduction if possible and if patient meets indications. Monitor blood pressure, respirations, and mental status carefully. Be prepared for respiratory depression. Have equipment to assist respirations, and Naloxone (Narcan) prepared for drug reversal if necessary. Hypotension after Dilaudid should be treated with fluids. Use with caution: Multi-system trauma Patients in whom respiratory depression should be avoided (asthma/COPD) Patients in whom CNS (mental status) depression should be avoided (head injury) At altitudes > 8,000 ft, respiratory depression may be exacerbated Elderly patients generally require smaller doses and are more susceptible to hypotension. Side effects are increased by alcohol or drugs that are CNS depressants and other narcotics.

## Cross Reference

### **Protocols:**

Abdominal Pain  
Bites and Stings  
Burns  
Chest Pain – Cardiac  
Eye Trauma  
Frostbite  
Major Trauma  
Minor or Isolated Extremity Trauma  
Pediatric – Major Trauma  
Vaginal Bleeding

### **Procedures:**

Endotracheal Intubation  
King Tube  
Pain Management

### **Drugs:**

Naloxone (Narcan)

# Ibuprofen (Motrin, Advil)

<b>Scope</b>	EMT (with base contact/communication failure), Parkmedic, and Paramedic
<b>Class</b>	Antipyretic Analgesic Non-Steroidal Anti-Inflammatory Drug (NSAID)
<b>Action</b>	Prostaglandin synthetase inhibition
<b>Onset</b>	PO: 20 minutes
<b>Duration</b>	6–8 hours
<b>Indications</b>	Fever Pain
<b>Contraindications</b>	Known hypersensitivity Pregnancy Known ulcer or GI bleeding Trauma other than isolated extremity Known renal disease
<b>Side Effects</b>	GI upset
<b>Form</b>	200mg tablet 100mg/5ml liquid
<b>Dosage</b>	<u>Adult:</u> 600 mg PO every 6 hours <u>10-14 yrs:</u> 200mg tablet PO every 6 hours <u>6mo-10yrs:</u> 10 mg/kg (max dose 200mg) liquid PO every 6 hours
<b>Notes</b>	<p>Small quantities of Ibuprofen may be supplied to any person if requested for self-administration. The person should be offered an evaluation. A PCR does not need to be filled out if the person declines the evaluation and appears well. <b>REFERENCE PROCEDURE:</b> <i>When to Initiate a PCR (Patient Care Report/Run Sheet)</i>.</p> <p>If the person appears acutely ill in your judgment, do your best to convince the person of the need for evaluation. A PCR shall be completed in this instance, even if the evaluation is declined.</p> <p>In general, Ibuprofen and Acetaminophen are interchangeable. The decision should be based on patient preference and contraindications.</p>

## Cross Reference

### **Procedures:**

When to Initiate a PCR (Patient Care Report/Run Sheet)

### **Protocols:**

Bites and Stings  
Burns  
Electrical and Lightning Injuries  
Frostbite  
General Medical Illness – Adult  
Minor or Isolated Extremity Trauma  
Pediatric Medical Illness/Fever

### **Drugs:**

Acetaminophen (Tylenol)

# Ipratropium (Atrovent)

<b>Scope</b>	EMT (with base contact/communication failure), Parkmedic and Paramedic
<b>Class</b>	Anticholinergic Parasympatholytic
<b>Action</b>	Inhalation aerosol bronchodilator
<b>Onset</b>	15 minutes
<b>Duration</b>	3-6 hours    Peak Effect: 1-2 hours
<b>Indications</b>	Respiratory distress secondary to bronchospasm (COPD/Asthma)
<b>Contraindications</b>	Known hypersensitivity Peanut, soy or lecithin allergy
<b>Side Effects</b>	CNS: nervousness, dizziness, headache, delirium, psychosis, paresthesias, tremor. Palpitations, GI distress, blurred vision, dry mouth, cough/exacerbation of symptoms.
<b>Forms</b>	Metered Dose Inhaler (MDI): Approximately 18mcg per actuation. Each unit contains sufficient quantity to deliver 200 inhalations. Hand-Held Nebulizer (HHN): 500mcg in 2.5ml NS per unit-dose vial.
<b>Dosage</b>	<u>MDI:</u> 2 puffs (approx. 36mcg) at mid-inspiration (use spacer if available) If still symptomatic, repeat dose every 4 hours  <u>HHN:</u> 500mcg (one vial) via standard acorn-type jet nebulizer with 10-15-L Oxygen If still symptomatic, repeat dose every 4 hours
<b>Notes</b>	In 2-6% of cases, Ipratropium may cause cough or worsening of respiratory distress. However, the more likely cause is simply the COPD/asthma getting worse. If patient gets significantly worse within 60 seconds of starting Ipratropium or starts coughing (and was not previously coughing) then stop Ipratropium. Albuterol, however, should be continued. Ipratropium is to be given only every 4 hours, as opposed to albuterol, which may be used continuously. Ipratropium and albuterol solutions can be mixed in a single nebulized treatment.

## Cross Reference

**Protocols:**  
Respiratory Distress

**Drugs:**  
Albuterol

# Ketamine Hydrochloride (Ketalar)

<b>kinkoScope</b>	Parkmedic and Paramedic
<b>Class</b>	Anesthetic; analgesic
<b>Action</b>	Blocks impulses of pain perception; suppresses spinal cord activity; affects CNS transmitter systems; anesthesia with profound analgesia, minimal respiratory depression; and minimal skeletal muscle relaxation.
<b>Onset</b>	IV/IO: 30 seconds      IN/IM: 3-4 minutes
<b>Duration</b>	IV/IO: 5-10 minutes      IN/IM: 12-25 minutes
<b>Indications</b>	Analgesia (Severe Pain); Excited Delirium/Behavioral Emergencies; Severe Anxiety
<b>Contraindications</b>	Hypersensitivity to Ketamine
<b>Relative Contraindications</b>	Pregnancy; hyperthyroidism; cardiovascular disease; gastroesophageal reflux; hepatidysfunction; history of alcohol abuse.
<b>Side Effects</b>	Hallucinations; hypertension; increased cardiac output; tachycardia; hypotension; bradycardia; nausea and vomiting. <b>Note:</b> with high doses or rapid administration, respiratory depression may occur.
<b>Form</b>	Vial: 10 mg/ml, 50 mg/ml
<b>Dosage</b>	Adults/Peds:      For combative patients > 10 yrs old (must be a danger to self or others). IV/IO/IN:      1mg/kg every 5 minutes to a maximum of 3 doses IM:      2mg/kg every 10 minutes to a maximum of 3 doses  If patients remains combative after 3 doses of Ketamine or condition worsens with Ketamine move to Midazolam (Versed) as in Protocol 2020 Altered Mental Status/Altered Level of Consciousness (ALOC)  Adult/Peds:      If moderate to severe pain, SBP > 100, and normal mental status.  IV/IO/IN: .5mg/kg. Repeat in 15 min x1 prn pain. IM: 1mg/kg. Repeat in 15 min x1 prn pain,
<b>Notes</b>	Use with barbiturates or opioid analgesics may result in prolonged recovery time. Concurrent administration with midazolam may decrease incidence of unpleasant dreams. Assess level of consciousness frequently – patient will experience a dissociative state and may emerge from this agitated anxious and/or hallucinating.

## Cross Reference

**Protocols:**  
Behavioral Emergencies  
Major Trauma  
Minor Trauma

**Procedures:**  
Mucosal Atomizer Device  
Pain Management

## Lidocaine 2% (Xylocaine)

<b>Scope</b>	Paramedic and Parkmedic
<b>Class</b>	Local anesthetic
<b>Action</b>	Produces local anesthesia by reducing sodium permeability of sensory nerves, which blocks impulse generation and conduction.
<b>Onset</b>	45-90 seconds
<b>Duration</b>	10-30 minutes
<b>Indications</b>	Intraosseous access needle use only, for pain control at injection site.
<b>Contraindications</b>	Hypersensitivity to amide-type anesthetics (lidocaine, bupivacaine, mepivacaine) and those with history of arrhythmia.
<b>Side Effects</b>	Side effects are rare but can include: Slurred speech, drowsiness, confusion, nausea, vertigo, ataxia, tinnitus, paresthesias, muscle twitching, psychosis, seizures, respiratory depression, allergic reaction, anaphylaxis, dysrhythmia, palpitations, hypotension.
<b>Dosage</b>	<u>Adults:</u> 40 mg (2ml) of 2% Lidocaine (20 mg/ml), slow IO push, once, if conscious or significant pain <u>Children:</u> 0.5 mg/kg, slow IO push once, if conscious or significant pain
<b>Patient monitoring</b>	Watch for adverse reactions, particularly anaphylaxis, seizures, dysrhythmia

### Cross Reference

**Protocols:**  
Intraosseous Access

# Magnesium Sulfate 50%

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Anticonvulsant Electrolyte replacement
<b>Action</b>	CNS depressant. Raises the blood level of magnesium, thereby decreasing CNS, cardiac and muscle irritability. Shortens the QT interval. Increases the seizure threshold. Anticonvulsant properties produced by decreasing the amount of acetylcholine liberated from motor nerve terminals, leading to peripheral neuromuscular blockade. Excessive dosages cause vasodilation by ganglionic blockade and direct action on blood vessels by relaxing the smooth muscle. Excessive dosages cause respiratory depression by neuromuscular blockade.
<b>Onset</b>	IV: Immediate
<b>Duration</b>	3–4 hours
<b>Indications</b>	Eclampsia: In third trimester patients with hypertension and active seizures, administer Midazolam (Versed) to stop the seizure prior to administering Magnesium. Pre-Eclampsia: Base hospital may order Magnesium for pre-eclampsia (severe hypertension/headache) as a prophylactic therapy, or for patients who have suffered a seizure secondary to eclampsia.
<b>Contraindications</b>	Hypersensitivity, heart block, severe renal disease
<b>Side Effects</b>	CV: <u>Hypotension</u> , circulatory collapse, reduced heart rate CNS: <u>Depression</u> , <u>flushing</u> , <u>drowsiness</u> , hypothermia RESP: <u>Depression</u> , failure INTEG: Feeling of warmth, <u>sweating</u>
<b>Form</b>	Preload: 5g in 10ml
<b>Dosage</b>	<u>Pre-eclampsia/Eclampsia (adult)</u> : 5g in 250ml LR/NS IV infusion over 20 minutes. <u>0–14 yrs</u> : Not indicated. <b>Note:</b> If a pediatric patient is pregnant or has recently given birth (< 4 weeks postpartum), treat as an adult, regardless of age.
<b>Notes</b>	CNS depressant effects may be increased when used with barbiturates, narcotics or hypnotics. Observe closely for symptoms indicative of Magnesium overdose: hypotension, heart block (bradycardia), and respiratory paralysis. Do not leave patient unsupervised - monitor respirations (rate and depth), pulse, BP, and EKG (if available).

## Cross Reference

**Protocols:**  
Seizures

**Drugs:**  
Midazolam (Versed)





# Morphine Sulfate

<b>Scope</b>	Parkmedic and Paramedic	
<b>Class</b>	Narcotic analgesic	
<b>Action</b>	Acts on specific receptors in the brain to relieve pain, depress mental status, and depress respiratory drive. Peripheral vasodilation causing decreased venous return to the heart, decreased systemic vascular resistance, and hypotension. All decrease oxygen demand of the heart.	
<b>Onset</b>	IV: Immediate IM: 10-30 minutes	Duration: 3-4 hrs (all routes) Peak effect: IV: 20 min, IM: 40-60 min
<b>Indications</b>	Chest pain unrelieved by nitroglycerin and Fentanyl Severe pain in hemodynamically STABLE patients Analgesia after ALS airway (see ETT / King Tube procedures)	
<b>Contraindications</b>	Patients in whom respiratory depression or histamine release should be avoided (asthma/COPD). Patients in whom CNS (mental status) depression should be avoided (head injury). Shock/hypotension. Allergy to morphine. Altitude Illness – HAPE.	
<b>Side Effects</b>	Respiratory depression, bradycardia, hypotension, nausea and vomiting, flushing sedation, dizziness.	
<b>Form</b>	Preload: 10mg in 1ml	
<b>Dosage</b>	Adults: If severe pain, SBP > 100, and normal mental status: IV/IO: 4–10mg (0.4-1ml) every 30 min prn pain (max 20mg) IM: 5mg (0.5ml) every 30 min prn pain (max 20mg)  Pediatric: <u>Base Hospital Order ONLY</u> , NOT in communication failure. IV/IO: 0.1mg/kg (0.01ml/kg - max 10mg) repeat in 30 min x1 prn. IM: 0.2mg/kg (0.02ml/kg -max 10mg) repeat in 30 min x1 prn.	
<b>Notes</b>	Some indications require prior base contact (see specific protocols). Should be given prior to a joint reduction if possible and if patient meets indications. Monitor blood pressure, respirations, and mental status carefully. Be prepared for respiratory depression. Have equipment to assist respirations, and Naloxone (Narcan) prepared for drug reversal if necessary. Hypotension after Morphine should be treated with fluids. Use with caution: Multi-system trauma Patients in whom respiratory depression should be avoided (asthma/COPD) Patients in whom CNS (mental status) depression should be avoided (head injury) At altitudes > 8,000 ft, respiratory depression may be exacerbated Elderly patients generally require smaller doses and are more susceptible to hypotension. Side effects are increased by alcohol or drugs that are CNS depressants and other narcotics.	

# Morphine Sulfate

## Cross Reference

### **Protocols:**

Abdominal Pain  
Bites and Stings  
Burns  
Chest Pain – Cardiac  
Childbirth  
Eye Trauma  
Frostbite  
Major Trauma  
Minor or Isolated Extremity Trauma  
Pediatric – Major Trauma  
Respiratory Distress  
Vaginal Bleeding

### **Procedures:**

Endotracheal Intubation  
King Tube

### **Drugs:**

Naloxone (Narcan)

# Naloxone (Narcan)

<b>Scope</b>	EMR, EMT, Parkmedic and Paramedic																		
<b>Class</b>	Narcotic Antagonist																		
<b>Action</b>	Competes with narcotics for opiate receptor sites in the brain that affect pain and breathing, thereby reversing the respiratory depressant effects of narcotic drugs.																		
<b>Onset</b>	IV/IO: 2 minutes IN/IM: 5 minutes																		
<b>Duration</b>	1- 4 hours																		
<b>Indications</b>	Suspected narcotic intoxication with altered mental status AND apnea or slow shallow breathing.																		
<b>Contraindications</b>	None																		
<b>Side Effects</b>	Acute withdrawal syndrome in patients addicted to opiates (pain, nausea, vomiting, diarrhea, hypertension, tachycardia, tremors).																		
<b>Form</b>	Ampule: Various sizes: 1mg, 2mg, 10mg Preload: 2mg in 2ml 4mg/0.1ml																		
<b>Dosage</b>	IN Route preferred > 10-Adults: IN/IM: 2mg every 5 minutes prn ALOC (max 10mg) IV/IO: 2mg every 2 minutes prn ALOC (max 10mg) Note- If using 4mg/0.1ml preload use 4mg ampule, may repeat in 5 minutes x1  < 10 yrs: IN/IM: 0.1mg/kg (max 2mg per dose) every 5 minutes (max 10 mg) IV/IO: 0.1mg/kg (max 2mg per dose) every 2 minutes (max 10 mg) Note- If using 4mg/0.1ml preload use 4mg ampule, may repeat in 5 minutes x1																		
<b>Notes</b>	Pinpoint pupils are the classic sign of narcotic use/overdose, but with multi-drug intoxications, pupil findings may be variable. Naloxone has no side effects in the absence of narcotics. It is remarkably safe, so do not hesitate to use if indicated. Naloxone has a shorter duration of action than many narcotics, so observe closely for re-sedation. Repeat doses may be necessary. Some agents (e.g. Darvon, Fentanyl) may require higher than usual doses for reversal. Examples of narcotic preparations (natural and synthetic):  <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Butorphanol (Stadol)</td> <td style="width: 50%;">Loperamide (Immodium)</td> </tr> <tr> <td>Codeine (Tylenol #2,3,4)</td> <td>Meperidine (Demerol)</td> </tr> <tr> <td>Dezocine (Dalgan)</td> <td>Methadone (Dolophine)</td> </tr> <tr> <td>Diphenoxylate (Lomotil)</td> <td>Morphine (MS Contin, Oramorph, Roxanol)</td> </tr> <tr> <td>Fentanyl (Duragesic Patch)</td> <td>Nalbuphine (Nubain)</td> </tr> <tr> <td>Heroin</td> <td>Oxycodone (Percodan, Roxicodone, Tylox, Percocet, Roxicet)</td> </tr> <tr> <td>Hydrocodone (Anexsia, Lorcet, Lortab, Vicodin, Vicoprofen)</td> <td>Pentazocine (Talwin, Talacen)</td> </tr> <tr> <td>Hydromorphone (Dilaudid)</td> <td>Propoxyphene (Darvon, Darvocet)</td> </tr> <tr> <td>Levorphanol (Levo-Dromoran)</td> <td></td> </tr> </table>	Butorphanol (Stadol)	Loperamide (Immodium)	Codeine (Tylenol #2,3,4)	Meperidine (Demerol)	Dezocine (Dalgan)	Methadone (Dolophine)	Diphenoxylate (Lomotil)	Morphine (MS Contin, Oramorph, Roxanol)	Fentanyl (Duragesic Patch)	Nalbuphine (Nubain)	Heroin	Oxycodone (Percodan, Roxicodone, Tylox, Percocet, Roxicet)	Hydrocodone (Anexsia, Lorcet, Lortab, Vicodin, Vicoprofen)	Pentazocine (Talwin, Talacen)	Hydromorphone (Dilaudid)	Propoxyphene (Darvon, Darvocet)	Levorphanol (Levo-Dromoran)	
Butorphanol (Stadol)	Loperamide (Immodium)																		
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Hydromorphone (Dilaudid)	Propoxyphene (Darvon, Darvocet)																		
Levorphanol (Levo-Dromoran)																			

# Naloxone (Narcan)

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)

Hypothermia

Ingestions/poisoning

Submersion/Near Drowning

# Nifedipine (Adalat, Procardia)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Calcium channel blocker
<b>Action</b>	Vasodilation – systemic and pulmonary (decreases blood flow to lungs) Decreases cardiac contractility
<b>Onset</b>	PO: 5-20 minutes
<b>Duration</b>	6-8 hours
<b>Indications</b>	Severe High Altitude Pulmonary Edema (HAPE)
<b>Contraindications</b>	SBP < 100
<b>Side Effects</b>	Hypotension Nausea/vomiting/diarrhea Dizziness Flushing Increased heart rate/palpitations
<b>Form</b>	30mg SR (sustained release) tablet and 10mg capsule  Adults: 30mg SR every 12 hours  6 – 10 yrs: ½ of 10 mg capsule squeezed under tongue < 6 yrs: ¼ of 10 mg capsule squeezed under tongue  Repeat age-appropriate doses every 20 minutes (up to 3 doses), or until SBP drops by 20mmHG, SBP < 100, or symptoms resolve.

## Cross Reference

**Protocols:**  
Altitude Illness

# Nitroglycerin

<b>Scope</b>	EMT (assist patients to take their own), Parkmedic, and Paramedic	
<b>Class</b>	Vasodilator	
<b>Action</b>	Increases cardiac output primarily by decreasing preload, but also decreases afterload and dilates coronary arteries.	
<b>Onset</b>	Tablet/Spray: Immediate to 2 minutes	Paste: 10 minutes
<b>Duration</b>	Tablet/Spray: 10-30 minutes	Paste: 24 hours
<b>Indications</b>	Cardiac chest pain (angina or acute myocardial infarction) Pulmonary edema from CHF (NOT HAPE or non-cardiogenic)	
<b>Contraindications</b>	Hypotension (SBP < 100) Cerebral edema or increased intracranial pressure Erectile dysfunction drug use in past 24 hours	
<b>Side Effects</b>	Headache, dizziness, hypotension, tachycardia, flushing, diaphoresis, rash.	
<b>Form</b>	Tablet/Spray: 0.4 mg per tablet/spray	Paste: Multi-dose or single dose tube
<b>Dose</b>	<u>Chest Pain:</u> <u>Tablet/Spray:</u> 0.4mg tablet SL or one spray PO every 5 minutes (max 8 tablets/sprays) prn chest pain. Check vitals/symptoms before and 2-3 min after each dose. Repeat doses may only be given if patient has ongoing chest pain, SBP > 100, AND normal neuro exam/mental status.  <u>Paste:</u> One inch on special paper and applied to anterior chest wall. Only apply if SBP > 100. If SPB goes below 90, wipe paste off.  <u>CHF:</u> <u>Tablet/Spray:</u> If SBP 100-120: 0.4mg (1 tab/spray) SL. If SBP 120-200: 0.8mg (2 tabs/sprays) SL. If SBP > 200: 1.2mg (3 tabs/sprays) SL and call base. Dose may be repeated per PROTOCOL: <i>Respiratory Distress</i> .  <u>Paste:</u> One inch on special paper and applied to anterior chest wall. Only apply if SBP > 100. If SPB goes below 90, wipe paste off.	
<b>Notes</b>	Nitroglycerin is not indicated for children. Patient should not chew or swallow tablets. They are designed to dissolve under the tongue. Recheck blood pressure, vitals, mental status and symptoms 2-3 minutes after each dose. Date bottle after opening. It is good for 2 months once opened. Protect it from heat and light. Patients taking nitrates chronically may develop a tolerance to them and require higher doses. Nitropaste is absorbed through the skin. Always wear gloves when handling Nitropaste as it can cause your blood pressure and you to drop. Place Nitropaste away from potential AED pad sites.	

## Cross Reference

### **Protocols:**

Chest Pain – Cardiac  
Respiratory Distress



# Oxytocin (Pitocin®)

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Synthetic posterior pituitary hormone
<b>Action</b>	Stimulates uterine contractions
<b>Onset</b>	IV/IO: Immediate IM: 3-5 minutes
<b>Duration</b>	IV/IO: Less than one hour IM: 2-3 hours
<b>Indications</b>	Postpartum uterine bleeding
<b>Contraindications</b>	Hypersensitivity Incomplete delivery (twins and/or placenta)
<b>Side Effects</b>	Anaphylaxis Nausea, vomiting, abdominal pain Uterine hypertonicity Cardiac arrhythmias Entrapment of twin or placenta by uterine contraction
<b>Form</b>	Ampule: 10units in 1ml
<b>Dosage</b>	<u>IV/IO</u> : 20units (2ml) in 1000ml of LR/NS to run at 500ml/hr after delivery of placenta <u>IM</u> : 10units (1ml) if no IV access
<b>Notes</b>	It is essential to ensure that the placenta has been delivered and there are not twins prior to administration. Attempt uterine fundal massage and allow the baby to breast feed first. Monitor vitals every 15 minutes; watch for hypertension and irregular heart beat. Oxytocin is incompatible with other drugs through the same IV tubing. Before giving any other medications through the IV tubing, the Oxytocin infusion must be stopped, and the line flushed with LR/NS.

## Cross Reference

**Protocols:**  
Childbirth



# Pralidoxime Chloride (2 PAM)

<b>Scope</b>	EMT, Parkmedic, and Paramedic (for all levels as part of NAAK/Mark I procedure)
<b>Class</b>	Cholinesterase reactivator (acts via dephosphorylation)
<b>Action</b>	Reverses organophosphate poisoning by regenerating cholinesterase Detoxifies remaining organophosphate molecules
<b>Onset</b>	IM: 10–40 minutes
<b>Duration</b>	IM: 6 hours
<b>Indications</b>	Organophosphate poisoning/Nerve gas exposures with multiple AB-SLUDGEM symptoms
<b>Contraindications</b>	None for emergency use
<b>Side Effects</b>	Dizziness, headache, nausea, tachycardia, weakness, hypertension, blurred vision
<b>Form</b>	Auto-Injector: 600mg
<b>Dosage</b>	IM: 600mg auto-injection <b>REFERENCE PROCEDURE:</b> <i>NAAK/Mark I (Nerve Agent Antidote Kit)</i> for repeat dosing
<b>Notes</b>	Acts synergistically with atropine to treat cholinergic excess Repeat doses may be needed in severe poisonings Not to be used for prophylaxis  “ <b>AB-SLUDGEM</b> ” Mnemonic for organophosphate poisoning. <b>A:</b> Altered mental status <b>B:</b> Bronchorrhea, Breathing difficulty or wheezing, Bradycardia <b>S:</b> Salivation, Sweating, Seizures <b>L:</b> Lacrimation (tearing) <b>U:</b> Urination <b>D:</b> Defecation or Diarrhea <b>G:</b> GI upset (abdominal cramps) <b>E:</b> Emesis (vomiting) <b>M:</b> Miosis/Muscle Activity (twitching)

## Cross Reference

### **Procedures:**

NAAK/Mark I (Nerve Agent Antidote Kit)

### **Protocols:**

Ingestion/Poisoning

# Sodium Bicarbonate

<b>Scope</b>	Parkmedic and Paramedic
<b>Class</b>	Alkalinizing Agent
<b>Action</b>	Buffers the acids present in the body during and after severe hypoxia or ischemia. Counteracts cardiac effects of Tricyclic Antidepressants (TCAs). Alkalinizes urine to enhance elimination of some drugs (TCAs, Aspirin). Lowers serum potassium.
<b>Onset</b>	IV: Immediate
<b>Duration</b>	IV: 30 minutes
<b>Indications</b>	Cardiac arrest/dysrhythmias Suspected hyperkalemia Suspected tricyclic antidepressant or aspirin ingestion with abnormal vital signs (Base order only) Consider in excited delirium
<b>Contraindications</b>	None
<b>Side Effects</b>	Hypoventilation, volume overload, muscle cramps, pain, tetany
<b>Form</b>	Preload: 50mEq in 50ml (1 amp)
<b>Dosage</b>	Adult: 1 amp IV/IO 0-14 yrs.: 1 meq/kg, maximum 50 meq, IO/IV Contact Base Hospital for repeat doses.
<b>Notes</b>	When Sodium Bicarbonate is administered, patient must be adequately ventilating and oxygenating, either on their own or with assistance. Monitor ABCs during administration. May worsen CHF. <u>Flush IV line before and after administration of any other drugs.</u> Severe tissue necrosis may result if Sodium Bicarbonate extravasates. Although no longer recommended in routine cardiac arrest, sodium bicarbonate may be indicated with a history of toxicologic exposure, renal failure or excessive exertion.

## Cross Reference

### **Protocols:**

Altered Mental Status/Altered Level of Consciousness (ALOC)  
Cardiac Arrest With AED (Adult Medical)  
Cardiac Arrest Without AED (Adult Medical)  
Ingestion/Poisoning  
Pediatric – Medical Arrest With AED  
Pediatric – Medical Arrest Without AED



### **Emergency Medical Services Protocols and Procedures**

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