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<tr>
<td>Amputation</td>
</tr>
<tr>
<td>Burns</td>
</tr>
<tr>
<td>CNS</td>
</tr>
</tbody>
</table>
## Pediatric Neurological Emergencies
- Altered Level of Consciousness
- Seizures

## Pediatric Cardiac Emergencies
- General Management of Cardiac Arrest or Pre-Cardiac Arrest
- Cardiac Arrest
- Asystole/PEA
- Bradycardia
- Narrow Complex Tachycardia
- Ventricular Fibrillation/Pulseless VT
- Wide Complex Tachycardia (VT with pulse)
- Newborn Resuscitation

## Pediatric General Medical Emergencies
- Allergic Reaction
- Hyperthermia
- Near Drowning
- Poisoning/Overdose

## Pediatric Respiratory Emergencies
- Respiratory Distress

## Pediatric Trauma Emergencies
- General Trauma Management
- Amputation
- Burns
- CNS Injuries

## Thomas Jefferson Regional Procedures
- Accessing Central Venous Lines
- Capnography
- Cardiopulmonary Resuscitation
- Cardioversion
- CISM Activation Procedure
- Continuous Positive Airway Pressure (CPAP) Procedure
- Drug Box Contamination
- Endotracheal Tube Introducer (Bougie)
- External Jugular Cannulation
- Immobilization Decision Matrix
- Impedance Threshold Device
- Intraosseous Insertion, Bone Injector Gun
- Intraosseous Insertion, EZ-IQ
- Intraosseous Insertions, Jamshidi
- King Airway
- Manual Defibrillation
- Needle Cricothyrotomy
- Needle Decompression
- Orogastric Tube Insertion
- Pulse Oximetry
- RSI Program
- START Triage
- Subcutaneous/Intramuscular Injections
- Surgical Cricothyrotomy
- Tourniquet Procedure
- Transcutaneous Pacing
- Venous Access
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<td>Dopamine Infusion</td>
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<td>Amiodarone Infusion</td>
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<td>Pediatric Drug Dose Chart</td>
<td>152</td>
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</tbody>
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Special Thanks

This document was created for your use through the work and contribution of many people, all of whom are dedicated to providing excellent emergency medical care to the citizens of Central Virginia.

Regional Operational Medical Directors: George Lindbeck (AMC), Scott Just (AMC), Jeff Alberts (MJH), Debra Perina (UVa), Sabina Braithwaite (UVa), Bill Brady (UVa), and Scott Syverud (UVa), and Robert O’Connor (UVa).

Other contributing physicians: Nina Solenski (UVa), Alex Grunsfeld (MJH), Jeff Young (UVa), Forrest Calland (UVa).

Contributing EMS agencies: County of Orange Fire and EMS, Madison County Emergency Medical Service, Charlottesville-Albemarle Rescue Squad, Albemarle County Fire and EMS

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Cover were designed by UVA Marketing Communications: Diane Butler, Reecye Modny, Bob Larsen, and Eric Swenson

Special recognition to Wake County EMS (North Carolina) who placed their protocols on-line for public use and, in turn, heavily influenced this document.

Many, many heartfelt thanks to Tom Berry for securing the financial pieces to make distribution possible, and to the University of Virginia Center for Emergency Management for supporting this project from inception to completion.

Christy Hodge, BA, NREMT-P
UVa Prehospital Education
Use of Guidelines

These patient care guidelines have been established in close cooperation of the Regional Operational Medical Direction Committee, the Thomas Jefferson EMS Council, and the University of Virginia Prehospital Program in conjunction with many outside resources and in collaboration with the EMS providers of Central Virginia.

The intent of these guidelines is to equip providers with a rapid and readily available resource to better enable excellent patient care. This book is in no way designed to encompass every clinical encounter. Rather, it should be viewed as a resource that is outlines the most common clinical presentations and fosters sound clinical decision making. The order of treatment is not rigid and allows for the flexibility of prioritizing treatment as dictated by the patient condition. Likewise, all treatments listed on a patient care guideline may not be indicated for every patient presenting with that complaint. Therefore, some treatments listed may be deferred if justification can be made based on the patient’s presentation.

You will first notice that this format is color coded by level of certification. The color associated with each line of the protocol represents the minimal level of certification to consider this treatment. For example: When the line is proceeded by a blue box marked “I/P” as above, only Intermediate and Paramedic level providers are authorized to administer this treatment. However, the Intermediate and Paramedic providers are responsible for all treatments at and below their level of certification. That is, advanced level providers are expected to perform treatments that are color coded to be basic and enhanced level treatments.

Conditions that require Medical Command will be outlined in a red box. This reflects when consultation with medical command is necessary. Medical command should be utilized freely whenever the clinical situation is unclear, the patient presents as unstable, no protocol directly applies, or if you prefer consultation with a physician. If at any time, communication with medical command cannot be established within 2 minutes and the patient’s condition is critical, you may proceed with the standard treatment.

Additionally, you will note that each patient care guideline has three sections at the top. The first column is History. This outlines what medical history and history of current event that you might expect with the given complaint. This could be used to prompt further questioning and assist with documentation. The second column is Physical Exam. The physical exam outlines signs and symptoms that should be assessed for each given complaint. These should be documented as pertinent negatives or as positive assessment findings on the PPCR. Lastly, the third column is Differential Diagnoses. This column encourages providers to consider other causes of typical presentations (i.e. all chest pain is not associated with myocardial infarction). If the patient’s history and physical exam findings are not consistent with the listings on the page, it is particularly important to evaluate whether or not the treatment listed on that page is appropriate. On the bottom of the guideline pages, you will also see a section entitled Pearls. This section is intended to give you important reminders and caution against common pitfalls specific to the respective complaint or treatments.

The basic framework of all EMS calls (scene safety, patient assessment, vitals signs, etc) are not outlined on each specific page. Rather, these foundations are established in the Universal Protocol. These principles are no less important but need not be repeated on every page.

It is our sincere hope, that this document will assist you in delivering quality, comprehensive, and compassionate care to the citizens of Central Virginia. Primum non nocere (first do no harm).
<table>
<thead>
<tr>
<th>Level</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>EMT Basic</td>
</tr>
<tr>
<td>J</td>
<td>EMT-Johnson</td>
</tr>
<tr>
<td>EN</td>
<td>EMT-Enhanced</td>
</tr>
<tr>
<td>I/P</td>
<td>Intermediate or Paramedic</td>
</tr>
<tr>
<td>P</td>
<td>Paramedic Only</td>
</tr>
<tr>
<td>MC</td>
<td>Medical Command</td>
</tr>
</tbody>
</table>
# Universal Patient Care Protocol

<table>
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<tr>
<th>Scene Safety/ Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Survey</td>
</tr>
<tr>
<td>Initial interventions as needed</td>
</tr>
<tr>
<td>Supplemental O2</td>
</tr>
<tr>
<td>Obtain and document:</td>
</tr>
<tr>
<td>Vital signs</td>
</tr>
<tr>
<td>SAMPLE history</td>
</tr>
<tr>
<td>Pain assessment</td>
</tr>
<tr>
<td>OPQRST (medical)</td>
</tr>
<tr>
<td>DCAP BTLS (trauma)</td>
</tr>
<tr>
<td>Consider glucometry if indicated</td>
</tr>
<tr>
<td>Pulse oximetry if indicated</td>
</tr>
<tr>
<td>Capnography if indicated (mandatory if intubated)</td>
</tr>
<tr>
<td>Cardiac monitor</td>
</tr>
<tr>
<td>12 Lead ECG if acute coronary syndrome is suspected and the patient is hemodynamically and electrically stable</td>
</tr>
<tr>
<td>Appropriate protocol/ consider differential diagnoses</td>
</tr>
<tr>
<td>If no protocol applies or condition is unknown, consult medical command</td>
</tr>
<tr>
<td>Transport per guidelines</td>
</tr>
</tbody>
</table>

**Pearls:**
- Complete vital signs should be taken every 5 min for critical and 15 min for non-critical patients.
- Complete vitals include a minimum of HR, RR, and BP.
- In most cases, on scene times should be limited to 10 minutes.
- Do not delay oxygen therapy to obtain pulse oximetry reading.
Emergency Physicians
### Abdominal Pain

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age</td>
<td>• Pain</td>
<td>• Trauma</td>
</tr>
<tr>
<td>• Past medical/surgical history</td>
<td>• Tenderness</td>
<td>• Pregnancy</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Nausea/vomiting</td>
<td>• Pneumonia</td>
</tr>
<tr>
<td>• Onset</td>
<td>• Dysuria/hematuria</td>
<td>• Pulmonary embolism</td>
</tr>
<tr>
<td>• Provocation/palliation</td>
<td>• Vaginal bleeding/discharge</td>
<td>• Liver (hepatitis, CHF)</td>
</tr>
<tr>
<td>• Quality</td>
<td>• Pregnancy</td>
<td>• Peptic ulcer disease</td>
</tr>
<tr>
<td>• Radiation</td>
<td>• Fever</td>
<td>• Gastritis</td>
</tr>
<tr>
<td>• Severity</td>
<td>• Headache</td>
<td>• Gallbladder</td>
</tr>
<tr>
<td>• Time</td>
<td>• Malaise</td>
<td>• Myocardial Infarction</td>
</tr>
<tr>
<td>• Fever</td>
<td></td>
<td>• Pancreatitis</td>
</tr>
<tr>
<td>• Last oral intake</td>
<td></td>
<td>• Kidney stone</td>
</tr>
<tr>
<td>• Last bowel movement/ emesis</td>
<td></td>
<td>• Abdominal aneurysm</td>
</tr>
<tr>
<td>• Menstrual history</td>
<td></td>
<td>• Appendicitis</td>
</tr>
<tr>
<td>• Diarrhea</td>
<td></td>
<td>• Bladder/prostate</td>
</tr>
<tr>
<td>• Constipation</td>
<td></td>
<td>• Pelvic inflammatory</td>
</tr>
</tbody>
</table>

Pearls:
Acute, undiagnosed abdominal pain should not receive analgesics in the field without medical command.
<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>EN</td>
<td>For persistent nausea and vomiting, consider ondansetron 4 mg IV, may repeat in 10 minutes</td>
<td>EN</td>
</tr>
</tbody>
</table>
### Acute Psychological Agitation

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Situational crisis  
• Psychiatric illness/medications  
• Injury to self  
• Threat others  
• Medic alert  
• Substance abuse/overdose  
• Diabetes  
• Disease process | • Anxiety, agitation, confusion  
• Change in affect  
• Hallucinations  
• Delusional thoughts  
• Bizarre behavior  
• Combative/violent  
• Expression of suicidal or homicidal thoughts | • Hypoxia  
• Alcohol intoxication  
• Medication or illicit drug effect  
• Withdrawal syndromes  
• Depression  
• Bipolar disorder  
• Schizophrenia  
• Anxiety disorders  
• Brain cancer |

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/P</td>
<td>Haloperidol 5 mg IM for adults to control acute agitation when pt is risk to themselves or others.</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>For patients who remain agitated, repeat haloperidol 5 mg IM and midazolam 2 mg IM.</td>
<td>I/P</td>
</tr>
<tr>
<td>MC</td>
<td>If patient refuses transport, consider Emergency Custody Order.</td>
<td>MC</td>
</tr>
</tbody>
</table>

**Pearls:**
- Substance-induced disorders, diabetic emergencies, and hypoxia must be ruled out.
- Suicidal patients are not permitted to sign a refusal.
- Consultation with law enforcement, mental health professionals, and medical command should guide patient disposition.
- Watch for extrapyramidal symptoms and treat with diphenhydramine if needed.
## Alcohol Related Emergencies

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Last alcoholic drink  
• Daily amount of alcohol intake | • Tremors  
• Anxiety  
• Unsteady gait  
• Spider angiomas  
• Distended abdomen | • Hypoglycemia  
• Traumatic injury  
• Drug intoxication  
• Sepsis in elderly |

### Universal Care Protocol

| B | Monitor for respiratory depression | B |
| B | If seizures occur, refer to the Neurological/Seizure Protocol | B |
| EN | IV Procedure | EN |
| B | Treat suspected hypoglycemia | B |
| I/P | For agitation, tachycardia, or hallucinations secondary to alcohol withdrawals, consider diazepam (Valium) 5 mg IV or midazolam (Versed) 5 mg IM. May repeat either in 10 minutes | I/P |
## Allergic Reaction

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Onset and location  
• Insect bite or sting  
• Food allergy/exposure  
• New clothing, soap, detergent  
• Past history of reactions  
• Past medical history  
• Medication history | • Itching or hives  
• Coughing or wheezing  
• Chest or throat constriction  
• Difficulty swallowing  
• Hypotension or shock  
• Edema  
• Vomiting | • Rash only  
• Anaphylaxis  
• Shock  
• Angioedema  
• Aspiration/airway obstruction  
• Vasovagal event  
• Asthma or COPD  
• CHF |

**Pearls:**
Ipratropium is not indicated for allergic reaction.
# Universal Care Protocol

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Remove from source of exposure.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>Assist with prescribed auto injector for severe hives, respiratory distress, and/or shock if &gt;8 years or &gt;30 kg.</td>
<td>B</td>
</tr>
</tbody>
</table>

### J

1. Epinephrine (1;1000) 0.3 mg SQ or IM. May repeat in 10 minutes.

2. Albuterol 2.5 mg nebulized for wheezing/bronchospasm.

2. Diphenhydramine 50 mg IM.

### EN

1. Epinephrine (1;1000) 0.3 mg SQ or IM. May repeat in 10 minutes.

2. Albuterol 2.5 mg nebulized for wheezing/bronchospasm.

3. Diphenhydramine 25 mg IM or IV for mild to moderate reactions, 50 mg IM or IV for severe reactions. May repeat once in 10 minutes to a max of 50 mg.

4. Methylprednisolone 125 mg IV over 1 minutes for severe hives or difficulty breathing.

### IV Procedure

#### EN

- IV Epinephrine per Medical Command Only

- Epinephrine 2-10 mcg/min to maintain BP >90 mmHg
# Envenomation

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Type of sting/bite                                                   • Rash, skin break, wound                                              • Animal bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Description of animal involved                                      • Pain, soft tissue swelling, redness                                    • Human bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Time, location, size of bite/sting                                   • Blood oozing from wound                                               • Snake bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Previous reaction                                                   • Evidence of infection                                                 • Spider bite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Domestic vs. wild                                                    • Shortness of breath, wheezing                                           • Insect sting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tetanus and rabies risk                                              • Allergic reaction                                                     • Anaphylaxis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Infection risk                                                       • Hypotension</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Universal Care Protocol

- Refer to allergic reaction protocol if needed.
- Minimize activity, remove tight clothing or jewelry, immobilize extremity at level of heart.
- For exotic animals, contact Poison Control. Do not delay transport.

### IV Procedure

- Consider morphine 2-4 mg IV, up to a total of 10 mg for pain.
- Dopamine 2 to 20 mcg/kg/min IV infusion for hypotension unresponsive to fluid therapy.

**Pearls:**
- Signs of pit viper envenomation are swelling that begins at the bite mark and spreads proximally within minutes, ecchymosis, hemorrhagic blisters, and severe pain.
- Avoid using constricting bands or tourniquets, cold application, incision, suction, and extractor devices in pit viper envenomations.
- Black widow spider envenomations may present with painful muscle spasms.

Blue Ridge Poison Center 434-924-5543
# Hyperthermia

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Age
• Exposure to increased temperature or humidity
• Past medical history/medications
• Extreme exertion
• Time and length of exposure
• Poor PO intake
• Fatigue
• Muscle cramping | • Altered mental status
• Hot, dry or sweaty
• Hypotension
• Seizures
• Nausea | • Fever
• Dehydration
• Medications
• Hyperthyroidism
• Delirium tremens
• Heat cramps
• Heat exhaustion
• Heat stroke
• CNS lesions or tumors |

**Pearls:**
- Tricyclic antidepressants, phenothiazines, anticholinergics, and alcohol predispose patients to hyperthermia.
- Cocaine, amphetamines, and salicylates may elevate body temperature.
- The major difference between heat exhaustion and heat stroke is CNS impairment.
- Avoid dramatic decreases in temperature which can cause shivering and increase temperature.
- Dehydration and volume depletion may not occur in classic stroke. Vigorous fluid administration may result in pulmonary edema, particularly in the elderly.
### Hyperthermia

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Move to cooler environment, remove excess clothing, protect from further heat gains.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>For heat exhaustion, PO water if patient can tolerate. Cool with wet towels or fans.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>For heat stroke, use aggressive evaporation (fine mist water spray, ice packs to groin and axillae).</td>
<td>B</td>
</tr>
</tbody>
</table>

| EN | IV Procedure | EN |
# Hypotension (Symptomatic)

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blood loss</td>
<td>• Restlessness, confusion</td>
<td>• Shock</td>
</tr>
<tr>
<td>• Fluid loss</td>
<td>• Weakness, dizziness</td>
<td>Hypovolemic</td>
</tr>
<tr>
<td>• Infection</td>
<td>• Weak, rapid pulse</td>
<td>Cardiogenic</td>
</tr>
<tr>
<td>• Cardiac ischemia</td>
<td>• Pale, cool, clammy skin</td>
<td>Septic</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Delayed capillary refill</td>
<td>Neurogenic</td>
</tr>
<tr>
<td>• Allergic reaction</td>
<td>• Coffee-ground emesis</td>
<td>Anaphylactic</td>
</tr>
<tr>
<td>• Pregnancy</td>
<td>• Tarry stools</td>
<td>• Ectopic pregnancy</td>
</tr>
<tr>
<td>• History of poor oral intake</td>
<td></td>
<td>• Dysrhythmias</td>
</tr>
</tbody>
</table>

## Physical Findings
- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Coffee-ground emesis
- Tarry stools

## Differential Diagnoses
- Shock
- Hypovolemic
- Cardiogenic
- Septic
- Neurogenic
- Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolism
- Tension pneumothorax
- Medication effect
- Vasovagal
- Physiological (pregnancy)

<table>
<thead>
<tr>
<th>B</th>
<th>EN</th>
<th>If anaphylaxis, refer to Severe Allergic Reaction protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>EN</td>
<td>IV Procedure</td>
</tr>
<tr>
<td>I/P</td>
<td></td>
<td>Dopamine 5-20 mcg/kg/min to maintain BP &gt;90 mmHg if no response to IV therapy or if CHF is present.</td>
</tr>
</tbody>
</table>

**Pearls:**
- Hypovolemia must be corrected prior to dopamine infusion.
- Identify and manage underlying cause.
- Consider drug side effects or overdose.
## Hypothermia

### History
- Past medical history
- Medications
- Exposure to environment, even in normal temperatures
- Exposure to extreme cold
- Extremes of age
- Drug use
- Infections/sepsis
- Length of exposure/wetness

### Physical
- Cold, clammy
- Shivering
- Altered mental status
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension

### Differential Diagnoses
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
- Stroke
- Head injury
- Spinal cord injury

### Pearls:
- If patient is centrally cold to touch, consider severely hypothermic.
- Avoid rough handling.
- Warm fluids as close to 109° as possible by placing on heater or hot packs.
- Do not microwave.
- Avoid intubation if possible in the severely hypothermic patient.
- Consider “urban hypothermia” with high association of poverty or drug/alcohol abuse.
## Hypothermia

<table>
<thead>
<tr>
<th></th>
<th>Universal Care Protocol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refer to Special Arrest: Hypothermic Arrest Protocol if needed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remove wet garments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protect from further heat loss. Increase ambient temperature.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apply heat packs if patient is responsive.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If moderate to severely hypothermic, wrap head and core with blankets.</td>
<td></td>
</tr>
</tbody>
</table>

### EN

- Airway management
- IV Procedure
### Near Drowning

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submersion in water</td>
<td>Unresponsive</td>
<td>Trauma</td>
</tr>
<tr>
<td>Associated trauma</td>
<td>Altered mental status</td>
<td>Pre-existing medical problem</td>
</tr>
<tr>
<td>Duration of immersion</td>
<td>Decreased vital signs</td>
<td>Pressure injury barotrauma</td>
</tr>
<tr>
<td>Temperature of water</td>
<td>Vomiting</td>
<td>decompression sickness</td>
</tr>
<tr>
<td>Fresh vs. salt water</td>
<td>Cough</td>
<td></td>
</tr>
<tr>
<td>Contamination of water</td>
<td>Aspiration</td>
<td></td>
</tr>
</tbody>
</table>

#### B
- Remove from water if trained and safe to do so.
- Spinal immobilization if indicated.
- Prevent heat loss, refer to “Hypothermia” protocol if indicated.

#### EN
- IV Procedure

#### I/P
- Refer to specific cardiac arrhythmias protocol as needed.

**Pearls:**
Most near drowning victims will be hypothermic to some extent. Assess type of incident (surface impacted, object strike, propeller trauma). Assess water conditions (depth of submersion, length of time). Monitor airway status closely.
Poisoning/ Overdose

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion of toxic substance</td>
<td>Altered mental status</td>
<td>Tricyclic antidepressants</td>
</tr>
<tr>
<td>Route and quantity of ingestion</td>
<td>Hypotension</td>
<td>Acetaminophen</td>
</tr>
<tr>
<td>Time of ingestion</td>
<td>Decrease respiratory rate</td>
<td>Depressants</td>
</tr>
<tr>
<td>Reason (suicide, accident)</td>
<td>Tachycardia</td>
<td>Stimulants</td>
</tr>
<tr>
<td>Available medications near patient</td>
<td>Dysrhythmias</td>
<td>Anticholinergics</td>
</tr>
<tr>
<td>Past medical history</td>
<td>Seizures</td>
<td>Cardiac medications</td>
</tr>
<tr>
<td>Medications</td>
<td></td>
<td>Solvents, cleaning agents</td>
</tr>
<tr>
<td>Illicit drug abuse</td>
<td></td>
<td>Insecticides/organophosphates</td>
</tr>
</tbody>
</table>

Pearls:
- Intubated patients should not receive naloxone unless hemodynamically unstable.
- Tachycardia is not a contraindication to atropine administration.
- Poison control should be consulted on all complex toxicology at 434-924-5543 or 1-800-451-1428.
- Aeromedical resources will not transport contaminated patients.
# Poisoning/ Overdose

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Identify substance and assure decontamination.</td>
</tr>
<tr>
<td>B</td>
<td>Flush skin/membranes with water unless contraindicated.</td>
</tr>
</tbody>
</table>

## IV Procedure

| EN | Naloxone 0.8 mg IV or IM for suspected narcotic overdose with respiratory depression. |
| EN | Diphenhydramine 1 mg/kg slow IVP for dystonic reaction (max dose of 50 mg). |

## I/P

| For Symptomatic Tricyclic Antidepressant: |
| (if QRS >0.12 secs, hypotension, or dysrhythmia) |
| • Sodium bicarbonate 1mEq/kg slow IVP over 2 minutes |

| For Symptomatic Organophosphate Poisoning: |
| (secretions, bronchospasm, seizures, bradycardia) |
| • Atropine 0.05 mg/kg IV doubled every 5-10 minutes until decreased secretions. |

| For Symptomatic Calcium Channel Blocker |
| (if bradycardic, QRS >0.12 secs, heart block, hypotension, lethargy, slurred speech, nausea, vomiting) |
| • Calcium chloride 20 mg/kg slow IVP over 10 minutes |
| • Sodium bicarbonate 1 mEq/kg slow IVP over 2 minutes. |

| MC | Consider and treat for other types of overdoses or poisonings. |
First intercostal space is below the clavicle at the sternal border. The first palpable space at the sternal border is considered the second intercostal space.

V1—4th intercostal space at the right sternal border
V2—4th intercostal space at the left sternal border
V3—Directly between V2 and V4
V4—5th intercostal space at midclavicular line
V5—5th intercostal space at anterior axillary line
V6—5th intercostal space at midaxillary line
<table>
<thead>
<tr>
<th>Location</th>
<th>STEMI</th>
<th>Reciprocal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Septal</td>
<td>V1, V2</td>
<td>None</td>
</tr>
<tr>
<td>Anterior</td>
<td>V3, V4</td>
<td>None</td>
</tr>
<tr>
<td>Anteroseptal</td>
<td>V1, V2, V3, V4</td>
<td>None</td>
</tr>
<tr>
<td>Lateral</td>
<td>I, aVL, V5, V6</td>
<td>II, III, aVF</td>
</tr>
<tr>
<td>Anterolateral</td>
<td>I, aVL, V3, V4, V5, V6</td>
<td>II, III, aVF</td>
</tr>
<tr>
<td>Inferior</td>
<td>II, III, aVF</td>
<td>V1, V2, V3, V4</td>
</tr>
<tr>
<td>Posterior</td>
<td>None</td>
<td>V1, V2, V3, V4</td>
</tr>
</tbody>
</table>

The image contains a table and a diagram illustrating the anatomic location and corresponding ST segment elevation myocardial infarction (STEMI) and reciprocal changes in electrocardiography (ECG). The diagram aligns with the table, indicating which leads are affected in various locations: Lateral, Inferior, Septal, Anterior, Anteroseptal, Lateral, Anterolateral, Inferior, and Posterior. The STEMI columns list the affected leads, and the Reciprocal columns list the corresponding reciprocal changes for each location.
<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Events leading to arrest  
• Estimated down time  
• Past medical history  
• Medications  
• Terminal illness  
• Signs of rigor/lividity  
• DNR | • Unresponsive  
• Apneic  
• Pulseless | • Medical vs. trauma  
• V-fib/ pulseless v-tach  
• Asystole  
• PEA |

### Universal Care Protocol

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Criteria for Death/ No Resuscitation?</th>
<th>B</th>
</tr>
</thead>
</table>

| B | CPR  
Interrupt compressions only as per AED prompt or every 2 minutes (5 cycles of CPR) | B |
|---|--------------------------------------|---|

| B | AED  
• If witnessed or bystander CPR in progress, apply immediately  
• If unwitnessed, use after 2 minutes of CPR | B |
|---|--------------------------------------|---|

<table>
<thead>
<tr>
<th>I/P</th>
<th>Assess Rhythm (do not use AED mode), Refer to appropriate protocol/algorithm</th>
<th>I/P</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EN</th>
<th>IV or IO Procedure</th>
<th>EN</th>
</tr>
</thead>
</table>

### Cardiac Arrest: General Management

#### Pearls:
- Change compressors every 2 minutes.
- Allow full chest recoil.
- Check femoral/carotid pulse to verify effective CPR.

### CPR

| B | Advanced Airway Management  
Ventilate no more than 10/min (1 breath every 6-8 seconds) | B |
|---|------------------------------------------------------------|---|

<table>
<thead>
<tr>
<th>I/P</th>
<th>Capnography Procedure if advanced airway is in place.</th>
<th>I/P</th>
</tr>
</thead>
</table>
## Asystole / Pulseless Electrical Activity

<table>
<thead>
<tr>
<th>History:</th>
<th>Physical:</th>
<th>Differential Diagnoses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Past medical history</td>
<td>• Pulseless</td>
<td>• Device error</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Apneic</td>
<td>• Hypoxia</td>
</tr>
<tr>
<td>• Events leading to arrest</td>
<td></td>
<td>• Hypothermia</td>
</tr>
<tr>
<td>• End stage renal disease</td>
<td></td>
<td>• Hydrogen ion (acidosis)</td>
</tr>
<tr>
<td>• Estimated down time</td>
<td>• Suspected hypothermia</td>
<td>• Hypo-/Hyperkalemia</td>
</tr>
<tr>
<td>• Suspected overdose</td>
<td>• Suspected hypothermia</td>
<td>• Hypoglycemia</td>
</tr>
<tr>
<td>• DNR</td>
<td></td>
<td>• Hypovolemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trauma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trauma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tension pneumothorax</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Thrombosis coronary/pulmonary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Toxins</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tamponade</td>
</tr>
</tbody>
</table>

### Pearls:
Vasopressin should be administered only one time in place of either the first or second epinephrine dose.
### Asystole / Pulseless Electrical Activity

<table>
<thead>
<tr>
<th>B</th>
<th>General Cardiac Arrest protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/P</td>
<td>Confirm asystole in more than one lead if applicable</td>
<td>I/P</td>
</tr>
</tbody>
</table>
| I/P | Administer vasopressin 40 units (one time dose)  
    Begin epinephrine after 3-5 minutes | I/P |
| I/P | Consider and treat for reversible causes as listed in differential diagnoses | I/P |
| I/P | Atropine 1 mg IV/IO every 3-5 minutes up to 3 doses if rate <60 bpm | I/P |
| I/P | 1 mg epinephrine (1:10,000) IV/IO every 3-5 minutes up to 3 doses before considering termination of arrest. | I/P |
| MC | Contact Medical Command for special resuscitation situations | MC |
| MC | Termination of Care Policy | MC |
# Atrial Fibrillation/Flutter

## History
- Medications
  - Aminophylline, diet pills, thyroid supplements, decongestants, digoxin
- Drugs
  - Nicotine, caffeine
- Past medical history
- History of palpitations
- Syncope/ near syncope
- Use and compliance of anticoagulants

## Physical
- HR >150/min
- QRS <0.12 secs
- Rhythm is irregularly irregular
- Dizziness, CP, SOB

## Differential Diagnoses
- Heart Disease (WPW)
- Sick Sinus Syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, pain, stress
- Fever
- Hypoxia
- Hypovolemia or anemia
- Drug effects
- Hyperthyroidism
- Pulmonary embolus

## Pearls:
- Energy settings for cardioversion should be per manufacturer recommendation. Pharmacological rate control is preferred over cardioversion unless the patient is unstable.
- Unstable is defined as BP less than 90 mmHg, altered mental status, or signs of decreased perfusion.
- Adenosine is not effective in converting atrial fibrillation or flutter.
- Document all rhythm changes with monitor strips.
- Determine onset of symptoms (chronic vs. onset <48 hours).
- Atrial fibrillation/flutter generally does not need to be treated for HR < 150.
# Atrial Fibrillation/Flutter

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EN</strong></td>
<td><strong>IV Procedure</strong></td>
<td><strong>EN</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>For a stable patient who is symptomatic with a ventricular rate 150 or greater, consider metoprolol (Lopressor) 5 mg IV. May be repeated every 10 minutes to a max of 15 mg to achieve ventricular rate of 120 or less.</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>For an unstable patient, synchronized cardioversion (total of 2 attempts).</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>For patients who do not respond to cardioversion or who have recurrent tachycardia, metoprolol (Lopressor) 5 mg IV prior to repeated cardioversion.</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>MC</strong></td>
<td>Amiodarone 150 mg in 100 mL of D5W IV Piggyback over 10 minutes</td>
<td><strong>MC</strong></td>
</tr>
<tr>
<td><strong>MC</strong></td>
<td>Midazolam 2-5 mg IV if needed prior to synchronized cardioversion</td>
<td><strong>MC</strong></td>
</tr>
</tbody>
</table>
# Bradycardia

<table>
<thead>
<tr>
<th><strong>History</strong></th>
<th><strong>Physical</strong></th>
<th><strong>Differential Diagnoses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Past medical history</td>
<td>• HR &lt; 60</td>
<td>• Acute myocardial infarction</td>
</tr>
<tr>
<td>• Medications Beta blockers Calcium channel blockers Clonidine Digitalis ACE Inhibitors</td>
<td>• Chest pain</td>
<td>• Hypoxia</td>
</tr>
<tr>
<td>• Pacemaker</td>
<td>• Respiratory distress</td>
<td>• Hypothermia</td>
</tr>
</tbody>
</table>

### Pearls:

- Unstable is defined as BP less than 90 mmHg, altered mental status, or signs of decreased perfusion.
- TCP is the preferred treatment in 2nd degree, Type II and 3rd degree blocks. Transplanted hearts will not respond to atropine.
- Fluid therapy should be initiated as an adjunct to rate therapies. Administer fluid cautiously to patients with symptomatic bradycardia.
# Bradycardia

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>I/P</td>
<td>For a symptomatic patient, consider atropine 1mg repeated every 3-5 minutes as needed to a maximum of 3 mg.</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>For patients who have not responded to TCP and atropine, consider dopamine (Intropin) 5 to 20 mcg/kg/min to maintain BP of 90 mmHg.</td>
<td>I/P</td>
</tr>
<tr>
<td>MC</td>
<td>Consider Midazolam (Versed) 2-5 mg IV if needed during TCP when BP &gt;90 mmHg.</td>
<td>MC</td>
</tr>
</tbody>
</table>
# Chest Pain/ Acute Coronary Syndrome

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age</td>
<td>• Chest Pain (pain, pressure, aching, tightness)</td>
<td>• Trauma vs. medical</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Location (substernal, epigastric, arm, jaw, neck, shoulder)</td>
<td>• Angina vs. STEMI</td>
</tr>
<tr>
<td>• Use of Viagra, Cialis, Levitra or herbal equivalents</td>
<td>• Pale, diaphoretic</td>
<td>• Pericarditis</td>
</tr>
<tr>
<td>• Past medical history</td>
<td>• Dyspnea</td>
<td>• Pulmonary embolism</td>
</tr>
<tr>
<td>• Recent physical exertion</td>
<td>• Nausea, vomiting</td>
<td>• Asthma/ COPD</td>
</tr>
<tr>
<td>• Onset</td>
<td>• Anxiety</td>
<td>• Pneumothorax</td>
</tr>
<tr>
<td>• Palliation/ Provocation</td>
<td></td>
<td>• Aortic dissection or aneurysm</td>
</tr>
<tr>
<td>• Quality</td>
<td></td>
<td>• Reflux or hiatal hernia</td>
</tr>
<tr>
<td>• Radiation</td>
<td></td>
<td>• Esophageal spasm</td>
</tr>
<tr>
<td>• Severity</td>
<td></td>
<td>• Pleuritic pain</td>
</tr>
<tr>
<td>• Time</td>
<td></td>
<td>• Cocaine overdose</td>
</tr>
</tbody>
</table>

**Pearls:**
- If use of Viagra or Levitra use within the past 24 hours or Cialis within 72 hours, contact medical command.
- Inferior STEMI’s are preload dependent and may not tolerate NTG or morphine well, use IV fluids as needed.
- Use of nitropaste may be preferable to SL NTG if hypotension is likely to occur.
- Diabetics, females, and geriatric patients often present with atypical chest pain or generalized complaints.
## Chest Pain/ Acute Coronary Syndrome

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Transmit 12 Lead ECG, Consult Medical Command for possible STEMI alert</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>Transport to cath lab facility for known or suspected MI.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>Aspirin 325mg (4 baby aspirin) chewed.</td>
<td>B</td>
</tr>
</tbody>
</table>

### IV Procedure

<table>
<thead>
<tr>
<th>EN</th>
<th>Apply 1 inch 2% Nitropaste (15 mg) topically keeping BP &gt;100 mmHg.</th>
<th>EN</th>
</tr>
</thead>
</table>

| J | Nitroglycerin 0.4 mg every 5 minutes as needed. No max. Keep BP >100 mmHg. | J |

| I/P | For vomiting, consider ondansetron 4 mg IV repeated in 10 minutes if needed. | I/P |

| I/P | For persistent vomiting after two doses of ondansetron, consider promethazine 12.5 mg IV. If > 65 years, reduce to promethazine 6.25 mg IV | I/P |

| I/P | Consider morphine sulfate 2 mg slow IV. May be repeated every 5-10 minutes to a max of 6mg keeping BP >100mmHg | I/P |

| I/P | Refer to hypotension and dysrhythmia protocols as indicated | I/P |
# Narrow Complex Tachycardia - Paroxysmal SVT

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Medications  
  Aminophylline  
  Diet pills  
  Thyroid supplements  
  Decongestants  
  Digoxin  
  Drugs  
  nicotine  
  cocaine  
  MSG toxicity  
  • Past medical history  
  • History of palpitations  
  • Syncope/ near syncope | • HR >150  
  • QRS <0.12 secs  
  • Dizziness  
  • CP  
  • Dyspnea  
  • Poor perfusion/ peripheral pulses | • Heart disease  
  • Sick sinus syndrome  
  • Myocardial infarction  
  • Electrolyte imbalance  
  • Exertion, pain, stress  
  • Fever  
  • Hypoxia  
  • Hypovolemia or anemia  
  • Drug effect or overdose  
  • Hyperthyroidism  
  • Pulmonary embolism |

### Pearls:
- “Stable” is defined as a patient who is symptomatic with normal perfusion, normal vitals, and no alteration in mental status.
- Adenosine should be administered in a proximal injection port followed by a 20 mL flush.
- Metoprolol should be avoided if cocaine, methamphetamine, or other sympathomimetic use is known or suspected.
- Use manufacturer recommendations for escalating energy settings.
- Document all rhythm changes with monitor strips.
## Narrow Complex Tachycardia - Paroxysmal SVT

<table>
<thead>
<tr>
<th></th>
<th>Universal Care Protocol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EN</strong></td>
<td>IV Procedure</td>
<td><strong>EN</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>If patient is stable, attempt vagal maneuvers.</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>If symptomatic, adenosine 6 mg rapid IVP. If no response, adenosine 12 mg rapid IVP.</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>If patient is unstable, synchronized cardioversion. May repeat cardioversion for a total of two attempts.</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>If no response to cardioversion or recurrent or refractory arrhythmias, metoprolol 5 mg slow IV push.</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>MC</strong></td>
<td>If no response to metoprolol, amiodarone 150 mg IV piggyback over 10 minutes</td>
<td><strong>MC</strong></td>
</tr>
<tr>
<td><strong>MC</strong></td>
<td>Contact Medical Command for 3rd cardioversion attempt after metoprolol or amiodarone has been infused.</td>
<td><strong>MC</strong></td>
</tr>
<tr>
<td><strong>MC</strong></td>
<td>Midazolam 2-5 mg IV if needed prior to synchronized cardioversion</td>
<td><strong>MC</strong></td>
</tr>
</tbody>
</table>
Ventricular Fibrillation/ Pulseless
Ventricular Tachycardia

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Estimated down time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Past medical history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Events leading to arrest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• DNR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Unresponsive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Apneic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pulseless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ventricular fibrillation or ventricular tachycardia on ECG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Torsades</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Asystole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Artifact/device failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Endocrine/Metabolic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drugs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pearls:

- Interruption of CPR should be minimal and occur only in 2 minute intervals.
- Follow manufacturers recommendations for energy settings.
- Treatment priorities are uninterrupted compressions, defibrillation, IV/IO access, airway control.
- Medic level providers should utilized AED’s only when manual defibrillation is not possible.
# Ventricular Fibrillation/ Pulseless Ventricular Tachycardia

<table>
<thead>
<tr>
<th>B</th>
<th>Cardiac Arrest Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Ensure quality CPR</td>
<td>B</td>
</tr>
</tbody>
</table>
| I/P | Defibrillate per manufacturer’s recommendation  
• immediately if witnessed or bystander CPR  
• after 2 min CPR if unwitnessed | I/P |
| EN | IV or IO Procedure | EN |
| I/P | Vasopressin 40 units IV/ IO X 1 dose. (Use epinephrine after 3-5 minutes.) | I/P |
| I/P | Epinephrine (1:10,000) 1 mg IV/ IO every 3-5 minutes. | I/P |
| I/P | After 3rd shock, amiodarone 300 mg IVP. May repeat once at 150 mg. | I/P |
| I/P | Consider magnesium sulfate, 1-2 grams IVP for torsades. | I/P |
| I/P | Search for and treat reversible causes. | I/P |
| MC | Termination of Care Policy | MC |
# Wide Complex Tachycardia
(Ventricular Tachycardia with Pulse)

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • History Wolff-Parkinson-White (WPW)  
• Onset  
• Medications  
• Palpitations | • Diaphoresis  
• Pallor  
• Altered mental status  
• Labored respirations | • Pulseless v-tach  
• Polymorphic V-tach (torsades)  
• Reentry tachycardia  
• Bundle branch blocks |

## Universal Care Protocol

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>I/P</td>
<td>If patient is stable, amiodarone 150 mg in 100 mL D5W IV piggyback over 10 minutes. May repeat in 10 minutes if no response.</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>If patient is unstable, synchronized cardioversion at 100j and repeat with escalating energy per manufacturer recommendations.</td>
<td>I/P</td>
</tr>
<tr>
<td>MC</td>
<td>Midazolam 2-5 mg IV if needed prior to synchronized cardioversion</td>
<td>MC</td>
</tr>
</tbody>
</table>

## Pearls:

“Stable” is defined as a patient who is symptomatic with normal perfusion, normal vitals, and no alteration in mental status.  
“Unstable” is defined as BP less than 90 mmHg, altered mental status, or signs of decreased perfusion.  
Follow manufacturer’s recommendations for escalating energy settings.  
When drawing up amiodarone, use a large bore needle, draw slowly, and do not draw in air to avoid bubbling.
## Special Resuscitation: Hypothermic Arrest

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Confirm pulselessness for 30 seconds. Refer to CPR and AED protocol if needed.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>Remove wet garments. Protect from further heat loss. Apply heat packs if patient is responsive.</td>
<td>B</td>
</tr>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>I/P</td>
<td>Modify ACLS algorithms for cardiac arrest. Administer one round of IV medications. Attempt one defibrillation. Repeat medications and defibrillation as temperature rises.</td>
<td>I/P</td>
</tr>
<tr>
<td>MC</td>
<td>Consider termination of efforts if no response to initial therapy and prolonged time to definitive care.</td>
<td>MC</td>
</tr>
</tbody>
</table>

**Pearls:**
If patient is centrally cold to touch, consider severely hypothermic.
## Post Cardiac Arrest: Induced Hypothermia

### Confirm patient is a candidate:
- Return of spontaneous circulation after cardiac arrest
- Unresponsive
- Not pregnant

### Chose and apply the most clinically appropriate method(s) depending upon the patient scenario (ice packs, cooling blankets, chilled IV fluid therapy).
- To expedite the cooling process, 2 liters of cold normal saline are administered rapidly
- Place ice packs to the armpits, neck, torso, groin, and limbs

### Withdraw cooling protocol if patient develops hemodynamic or cardiac electrical instability.

### Contact medical command for continuation if patient regains consciousness
Think F.A.S.T.

Face: Ask the person to smile. Does one side of the face droop?

Arms: Ask the person to hold both arms up evenly. Does one arm drift downward?

Speech: Ask the person to repeat a simple sentence. Are the words slurred or mixed up?

Time: If the person shows any of these symptoms, call 911 immediately.

Sponsored by the Virginia Acute Stroke Telehealth Program

Primary Stroke Center
# Altered Level of Consciousness

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Known diabetic</td>
<td>• Change in baseline mental status</td>
<td>• Head trauma</td>
</tr>
<tr>
<td>• Drugs</td>
<td>• Bizarre behavior</td>
<td>• Stroke</td>
</tr>
<tr>
<td>• Past medical history</td>
<td>• Cool, diaphoretic skin (hypoglycemia)</td>
<td>• Seizure</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Warm, dry skin, signs of dehydration (hyperglycemia)</td>
<td>• Tumor</td>
</tr>
<tr>
<td>• History of trauma</td>
<td>• Fruity breath odor</td>
<td>• Infection/sepsis</td>
</tr>
<tr>
<td></td>
<td>• Kussmaul respirations</td>
<td>• Cardiac dysrhythmia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Thyroid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Shock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Diabetes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Toxins</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Intoxication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Acidosis/alkalosis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exposure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hypoxia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Electrolyte abnormality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Psychiatric disorders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Diabetic ketoacidosis</td>
</tr>
</tbody>
</table>

**Pearls:**
- Medications are a common cause of altered mental status. Glucometers may be helpful but used cautiously, particularly if values are borderline.
- Intubated patients should not receive naloxone unless hemodynamically unstable.
- Goal of reversal therapy is to reverse respiratory and circulatory collapse. Repeated administration of small doses is desirable. Naloxone must be split into two doses. Max of 2mL per injection site.
## Altered Level of Consciousness

<table>
<thead>
<tr>
<th></th>
<th>Universal Care Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Spinal immobilization if indicated.</td>
</tr>
</tbody>
</table>
| J | 1. Glucagon 1mg IM.  
2. Naloxone 0.8 mg IM or slow IVP for suspected narcotic overdose. |
| EN | IV Procedure. |
| EN | 1. Dextrose 50% 25 grams slow IVP.  
2. Glucagon 1 mg IM if no IV access. |
| EN | Naloxone 0.8 mg IV or IM titrated to respirations. May repeat up to 4 mg. |
| EN | For hyperglycemia (BS >400 mg/dl), infuse 1 liter NS over 30-60 minutes, followed by NS at 250 mL/hr. |
Seizures

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reported/witnessed seizure activity</td>
<td>• Altered mental status</td>
<td>• Head trauma</td>
</tr>
<tr>
<td>• Previous seizure history</td>
<td>• Sleepiness</td>
<td>• Tumor</td>
</tr>
<tr>
<td>• Medic alert information</td>
<td>• Incontinence</td>
<td>• Metabolic, hepatic, or renal failure</td>
</tr>
<tr>
<td>• Seizure medications</td>
<td>• Observed seizure activity</td>
<td>• Hypoxia</td>
</tr>
<tr>
<td>• History of trauma</td>
<td>• Evidence of trauma</td>
<td>• Electrolyte imbalance</td>
</tr>
<tr>
<td>• History of diabetes</td>
<td>• Unconsciousness</td>
<td>• Medication non-compliance</td>
</tr>
<tr>
<td>• History of pregnancy</td>
<td></td>
<td>• Infection/fever</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alcohol withdrawal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Eclampsia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stroke</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hyperthermia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hypoglycemia</td>
</tr>
</tbody>
</table>

Pearls:
Care during the post-ictal phase should be supportive only.
Status epilepticus is defined as a prolonged seizure without recovery interval; it is a true emergency.
Generalized seizures: loss of consciousness, incontinence, and tongue trauma.
Focal seizures: come from one area in the brain and often affect only one part of the body, usually not associated with loss of consciousness.
Complex partial seizures: altered but no loss of consciousness.
# Seizures

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Protect patient. Do not attempt to restrain.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>If patient is pregnant and no history of seizure, refer to OB/GYN Eclamptic Seizure protocol</td>
<td>B</td>
</tr>
<tr>
<td>J</td>
<td>Glucagon 1mg IM.</td>
<td>J</td>
</tr>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>EN</td>
<td>Dextrose 50% 25 grams slow IVP for suspected hypoglycemia. Glucagon 1 mg IM if no IV access.</td>
<td>EN</td>
</tr>
<tr>
<td>I/P</td>
<td>Diazepam 5mg IVP if actively seizing. May repeat as needed.</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>Midazolam 5 mg IM if no IV access. May repeat as needed.</td>
<td>I/P</td>
</tr>
</tbody>
</table>
# Stroke

## History
- Previous CVA or TIA
- Previous cardiac or vascular surgery
- Diabetes
- Hypertension
- Coronary artery disease
- Atrial fibrillation
- Mediations (blood thinners)
- History of trauma

## Physical
- Altered mental status
- Weakness/paralysis
- Blindness or other sensory loss
- Aphasia
- Syncope
- Vertigo/dizziness
- Vomiting
- Headache
- Seizures

## Differential Diagnoses
- TIA
- Seizure
- Hypoglycemia
- Thrombotic or embolic stroke
- Hemorrhagic stroke
- Tumor
- Trauma
- Migraine

**Pearls:**
Obtain and document onset of symptoms (time), medications, and contact information for medical decision maker.
Determine whether or not the patient is taking warfarin (Coumadin) or other anticoagulants (heparin, clopidagrel, Lovenox).
# Stroke

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Identify witness to last time pt was seen normal. Transport with pt if possible or obtain contact info for immediate contact by ED physician upon arrival.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>Focused neurological exam. Cincinnati Prehospital Stroke Scale. Repeat every 15 minutes.</td>
<td>B</td>
</tr>
<tr>
<td>B</td>
<td>Instant glucose 15 grams for suspected hypoglycemia and able to maintain airway.</td>
<td>B</td>
</tr>
<tr>
<td>J</td>
<td>Glucagon 1 mg IM.</td>
<td>J</td>
</tr>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>EN</td>
<td>Dextrose 50% 25 grams IV for suspected hypoglycemia Glucagon 1 mg IM if no IV access.</td>
<td>EN</td>
</tr>
<tr>
<td>MC</td>
<td>For onset of symptoms &lt;3 hours, contact medical command immediately for possible stroke alert and expedite transport.</td>
<td>MC</td>
</tr>
</tbody>
</table>

**Pearls:**
Time of onset is established as last time patient was seen normal. All efforts should be made to establish the onset without delaying transport. Advise witness to expect contact by ED physician.
Looking for an incredibly unique career in Fire & Rescue? .... Give us a try!
Respiratory Distress: General Management

Universal Patient Care Protocol

Oxygen, Pulse Ox, ETCO2*, Cardiac Monitoring

Airway and IV Protocols

Consider Differential Diagnoses

Pulmonary Edema/CHF  Bronchospasm/COPD  Pneumonia  Unknown/Does not fit protocol

Contact Medical Command

*if available
# CHF/ Pulmonary Edema

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CHF</td>
<td>• JVD</td>
<td>• Myocardial Infarction</td>
</tr>
<tr>
<td>• Cardiac history</td>
<td>• Peripheral Edema</td>
<td>• Asthma</td>
</tr>
<tr>
<td>• Digoxin, Lanoxin, Nitrates</td>
<td>• Rales, wheezes, or rhonchi</td>
<td>• Anaphylaxis</td>
</tr>
<tr>
<td>• Diuretics (furosemide, Bumex)</td>
<td>• Pink, frothy sputum</td>
<td>• Aspiration</td>
</tr>
<tr>
<td>• Orthopnea</td>
<td>• Diaphoresis</td>
<td>• COPD</td>
</tr>
<tr>
<td>• Gradual or sudden onset</td>
<td>• Anxiety</td>
<td>• Pneumonia</td>
</tr>
<tr>
<td>• Weight gain</td>
<td>• Air hunger</td>
<td>• Pulmonary Embolism</td>
</tr>
<tr>
<td></td>
<td>• Chest pain</td>
<td>• Toxic Exposure</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
<td>• Exposure</td>
</tr>
<tr>
<td></td>
<td>• Altered LOC</td>
<td>• Anxiety</td>
</tr>
</tbody>
</table>

**Pearls:**
- All wheezing is not asthma.
- Lasix is not a first line drug.
- Allow position of comfort.
- Use of nitropaste may be preferable to SL NTG if hypotension is likely to occur.
- Avoid NTG with use of Viagra, Cialis, or Levitra or herbal equivalents within past 24 hours.
- Use of IV fluids to treat hypotension may be harmful. Auscultate breath sounds prior to administration of IV fluids.
# CHF/ Pulmonary Edema

<table>
<thead>
<tr>
<th></th>
<th>General Respiratory Distress Protocol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Consider CPAP protocol</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td><strong>IV Procedure</strong></td>
<td></td>
</tr>
<tr>
<td>EN</td>
<td>NTG 0.4 mg SL every 3-5 min if BP &gt;100 mmHg. Repeat as needed until BP &lt;140 mmHg.</td>
<td>EN</td>
</tr>
<tr>
<td>EN</td>
<td>1 inch nitropaste if BP &gt;100.</td>
<td>EN</td>
</tr>
<tr>
<td>B</td>
<td>12 Lead EKG, proceed to Chest Pain protocol if acute coronary syndrome is suspected</td>
<td>B</td>
</tr>
<tr>
<td>I/P</td>
<td>Morphine 2-4 mg slow IV push if BP &gt;100mmHg</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>Consider dopamine 2 to 20 mcg/kg/min for BP &lt;90 mmHg</td>
<td>I/P</td>
</tr>
</tbody>
</table>
### COPD/Bronchospasm

#### History
- Tobacco use
- Smoked or inhaled drugs
- COPD/Emphysema
- Chronic Bronchitis
- Asthma
- Sudden weather change
- Home O2
- Prescribed MDI
- Prescribed steroids
- Prescribed bronchodilators

#### Physical
- Air hunger
- Diaphoresis
- Retractions
- Accessory muscle use
- Tripoding
- Cyanosis
- Clubbed fingernails
- Barrel Chest
- JVD
- Wheezes
- Silent chest

#### Differential Diagnoses
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pneumonia
- Pulmonary Embolism
- Pneumothorax
- Cardiac (MI or CHF)
- Hyperventilation
- Inhaled toxin
- Anxiety
- Pulmonary edema

| B | General Respiratory Distress Protocol, Refer to Allergic Reaction Protocol if needed | B |
| B | Assist with prescribed MDI, may repeat in 5 min | B |
| B | Consider CPAP Procedure | B |
| J | Albuterol 2.5 mg/ipratropium 0.5 mg neb. May repeat treatments of albuterol as needed. | J |
| EN | IV Procedure | EN |
| EN | Consider methylprednisolone 125 mg slow IV push if not relieved after first albuterol treatment. | EN |

**Pearls:**
- Silent chest is a sign of impending respiratory arrest.
- Increased PEEP with CPAP may increase risk of barotrauma to COPD patients.

**55**
# Pneumonia

## History
- Decreased oral intake
- Chills
- Exertional dyspnea
- General illness
- Altered mental status
- Prescribed or OTC medications

## Physical
- Fever
- Productive cough
- Chest pain
- Nausea/vomiting
- Tachycardia
- Tachypnea
- Rales or decreased breath sounds
- Hypotension (sepsis, dehydration)
- Poor skin turgor

## Differential Diagnoses
- Asthma
- Aspiration
- Cardiac (CHF, MI)
- COPD
- Septic shock
- Pulmonary effusion

### General Respiratory Distress Protocol

- **B** General Respiratory Distress Protocol
- **B** Consider CPAP Protocol
- **J** Albuterol 2.5 mg/ ipratropium 0.5 mg neb if wheezing
- **EN** IV Procedure
### Childbirth, Cephalic Presentation

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Due date</td>
<td>• Spasmodic pain</td>
<td>• Abnormal presentation</td>
</tr>
<tr>
<td>• Time contractions started, interval</td>
<td>• Vaginal discharge or bleeding</td>
<td>• Prolapsed cord</td>
</tr>
<tr>
<td>• Rupture of membranes</td>
<td>• Crowning</td>
<td>• Placenta previa</td>
</tr>
<tr>
<td>• Vaginal bleeding</td>
<td>• Urge to push</td>
<td>• Abruptio placenta</td>
</tr>
<tr>
<td>• Sensation of bowel movement</td>
<td>• Meconium</td>
<td></td>
</tr>
<tr>
<td>• Past medical and delivery history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drug use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gravida/ Para status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High risk pregnancy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pearls:**

A pregnant patient in cardiac arrest should be managed per ACLS guidelines with rapid transport. Do not delay transport for delivery of the placenta. Manual vaginal exams should not be performed in the field. If birth is imminent, stay and deliver the baby. If high risk, attempt delivery en-route to hospital. Seizures during pregnancy represent a medical emergency, contact medical command promptly. If amniotic sac has not ruptured, it should be ruptured manually.
### Childbirth, Cephalic Presentation

<table>
<thead>
<tr>
<th>Action</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Universal Care Protocol</strong></td>
<td>B</td>
</tr>
<tr>
<td><strong>Visualize perineum for crowning and imminent delivery.</strong></td>
<td>B</td>
</tr>
<tr>
<td><strong>Transport 3rd trimester patients in left lateral recumbent position. If immobilized, tilt spine board to left.</strong></td>
<td>B</td>
</tr>
<tr>
<td><strong>Assess for amniotic sac rupture.</strong></td>
<td>B</td>
</tr>
<tr>
<td>If not ruptured and delivery is in progress, tear membrane.</td>
<td>B</td>
</tr>
<tr>
<td>Support infant’s head over perineum.</td>
<td>B</td>
</tr>
<tr>
<td>Once head appears, suction mouth then nostrils with bulb syringe.</td>
<td>B</td>
</tr>
<tr>
<td>Check for cord around the neck.</td>
<td>B</td>
</tr>
<tr>
<td>Apply gentle traction downward on head until anterior shoulder appears.</td>
<td>B</td>
</tr>
<tr>
<td>Guide infant upward to deliver posterior shoulder.</td>
<td>B</td>
</tr>
<tr>
<td>Keep infant at same level of placenta.</td>
<td>B</td>
</tr>
<tr>
<td>Clamp cord at 8 inches and 10 inches from the infant.</td>
<td>B</td>
</tr>
<tr>
<td>Cut cord between the clamps.</td>
<td>B</td>
</tr>
<tr>
<td>Keep infant warm, particularly the head.</td>
<td>B</td>
</tr>
<tr>
<td>Record time of birth.</td>
<td>B</td>
</tr>
<tr>
<td><strong>Assess and record APGAR at 1 and 5 minutes.</strong></td>
<td>B</td>
</tr>
</tbody>
</table>
**Childbirth, Breech Birth**

<table>
<thead>
<tr>
<th></th>
<th>Universal Care Protocol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>Visualize perineum for crowning and imminent delivery.</td>
<td><strong>B</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>IV Procedure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EN</strong></td>
<td></td>
<td><strong>EN</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Support the baby’s extremities or buttocks until the upper back appears.</th>
<th><strong>B</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>Grasp the baby’s hips and apply gently downward traction.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Do not apply traction to baby’s legs or back.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Swing the infant’s body in the direction of least resistance.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>By alternate swinging, both shoulders will deliver posteriorly.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Splint the humerus and apply gentle traction so the arms can be delivered.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Gentle abdominal compression of the uterus to engage baby’s head.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Apply downward traction until the baby’s hair is visible.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Grasp iliac crests to swing legs upward until the body is in vertical position which delivers head.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Suction mouth then nostrils using bulb syringe.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Clamp and cut cord at 8 inches and 10 inches from baby.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Record time of birth.</td>
<td><strong>B</strong></td>
</tr>
</tbody>
</table>

|   | Assess and record APGAR’s at 1 and 5 minutes. | **B** |

**Pearls:**
Always contact medical command for guidance with any complicated delivery.
Seizures during pregnancy represent a medical emergency, contact medical command promptly.
# Childbirth, Prolapsed Cord/ Limb Presentation

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Visualize perineum for crowning and imminent delivery.</td>
<td>B</td>
</tr>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>B</td>
<td>Do not attempt to push the cord or limb back in. Insert 2 fingers of gloved hand into vagina to raise presenting part off cord. Check cord for pulsations in vagina. Push baby’s head away to keep pressure off cord and maintain. Place mother in knee-chest position. If unable, use Trendelenburg instead. Continue to hold pressure off cord. Keep cord moist with sterile saline. Transport immediately with early notification to ED.</td>
<td>B</td>
</tr>
</tbody>
</table>

**Pearls:**
- Always contact medical command for guidance with any complicated delivery.
- Seizures during pregnancy represent a medical emergency, contact medical command promptly.
# Eclamptic Seizures

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Past medical history</td>
<td>• Seizures</td>
<td>• Pre-eclampsia</td>
</tr>
<tr>
<td>• Hypertension meds</td>
<td>• Hypertension</td>
<td>• Eclampsia</td>
</tr>
<tr>
<td>• Prenatal care</td>
<td>• Severe headache</td>
<td></td>
</tr>
<tr>
<td>• Gravida/ Para</td>
<td>• Visual changes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Edema of hands and face</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RUQ pain</td>
<td></td>
</tr>
</tbody>
</table>

## Universal Care Protocol

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>MC</td>
<td>Magnesium Sulfate 10% 2 to 4 grams IVP at no greater than 1 gram per minute until seizure stops or 4 grams has been given. (To obtain 10% solution, dilute with 8 mL NS).</td>
<td>MC</td>
</tr>
</tbody>
</table>

**Pearls:**

Hypertension in the pregnant patient is defined as 140/90 or an increase of 30 mmHg systolic or 20 mmHg diastolic from patient's normal BP.
Seizures during pregnancy represent a medical emergency, contact medical command promptly.
Side effect of magnesium include muscle weakness and respiratory depression. Treat with IV calcium as a reversal agent.
# Sexual Assault

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Witness or</td>
<td>• Vaginal bleeding</td>
<td>• Non-traumatic vaginal bleeding</td>
</tr>
<tr>
<td>alleged sexual</td>
<td>• Emotional upset</td>
<td>• Criminal abortion</td>
</tr>
<tr>
<td>assault</td>
<td>• Signs of trauma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Abdominal cramping</td>
<td></td>
</tr>
</tbody>
</table>

## Universal Care Protocol

- **B** Confirm scene safety.
- **B** Do not examine genitalia unless a hemorrhage requires bleeding control.
- **B** Save any clothing and place in paper bag.
- **B** Advise patient not to urinate, defecate, douche, or wash before ED evaluation.
- **B** Transport to facility with sexual assault examiner capabilities.

**Consider IV Procedure**

**Pearls:**

- Obtain only pertinent facts related to the trauma.
- Do not question about prior events or information not directly related to care (assailant description, etc).
- Ensure law enforcement has been informed.
- Transport with provider of same gender if possible.
### Vaginal Bleeding

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time of onset</td>
<td>• Vaginal bleeding</td>
<td>• Placenta previa</td>
</tr>
<tr>
<td>• Amount of bleeding</td>
<td>• Rigid abdomen</td>
<td>• Abruptio placetae</td>
</tr>
<tr>
<td>• Presence of clots or products of conception</td>
<td>• Presence of contractions</td>
<td>• Sponatneous abortion</td>
</tr>
<tr>
<td>• Recent sexual intercourse</td>
<td>• Signs of shock</td>
<td>• Abnormal menses</td>
</tr>
<tr>
<td>• Abdominal Pain</td>
<td></td>
<td>• Trauma related</td>
</tr>
<tr>
<td>• Diagnosis of placental complications</td>
<td></td>
<td>• Hematuria</td>
</tr>
<tr>
<td>• History of current pregnancy</td>
<td></td>
<td>• Endometriosis</td>
</tr>
<tr>
<td>• Prenatal care</td>
<td></td>
<td>• Ectopic pregnancy</td>
</tr>
<tr>
<td>• Last exam? By whom?</td>
<td></td>
<td>• Other non-obstetric causes</td>
</tr>
<tr>
<td>• Start of Last menstrual period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Prior non-menstrual bleeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Ovarian cysts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• History of ectopic pregnancies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Endometriosis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Universal Care Protocol

- **B** Collect any tissue or fetal parts for physician examination.

- **B** If hypotensive, refer to hypotensive protocol.

- **EN** Consider IV Procedure

### Pearls:

Determine last menstrual emergency; contact medical comstrual period. Always consider pregnancy and complications in women of child bearing age. 3rd trimester bleeding may constitute a medmand promptly.
# Trauma: General Management

<table>
<thead>
<tr>
<th><strong>History</strong></th>
<th><strong>Physical</strong></th>
<th><strong>Differential Diagnoses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time and mechanism of injury</td>
<td>• Deformity</td>
<td>• Chest Tension pneumothorax</td>
</tr>
<tr>
<td>• Damage to structure or vehicle</td>
<td>• Contusion</td>
<td>• Flail chest</td>
</tr>
<tr>
<td>• Location in structure or vehicle</td>
<td>• Abrasions</td>
<td>• Pericardial tamponade</td>
</tr>
<tr>
<td>• Others injured or dead</td>
<td>• Punctures, penetrations</td>
<td>• Open chest wound</td>
</tr>
<tr>
<td>• Speed and details of MVC</td>
<td>• Burns</td>
<td>• Hemothorax</td>
</tr>
<tr>
<td>• Restraints/protective devices</td>
<td>• Lacerations</td>
<td>• Intra-abdominal bleeding</td>
</tr>
<tr>
<td>• Past medical history</td>
<td>• Tenderness</td>
<td>• Pelvis/ femur fracture</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Swelling</td>
<td>• Spinal fracture/ cord injury</td>
</tr>
</tbody>
</table>

**Pearls:**

GCS should be assessed and documented.
**Trauma: General Management**

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Spinal immobilization if indicated.</td>
</tr>
<tr>
<td>B</td>
<td>Notify MedCom if possible trauma alert (red or yellow category): Advise mechanism of injury, age and sex of patient, sites of injury, vitals if available, ETA.</td>
</tr>
<tr>
<td>B</td>
<td>For evisceration, cover with moist sterile dressing then with plastic. Do not push organs back into abdominal cavity.</td>
</tr>
<tr>
<td>B</td>
<td>For open chest wound, cover immediately with occlusive dressing.</td>
</tr>
<tr>
<td>B</td>
<td>Maintain patient warmth.</td>
</tr>
<tr>
<td>EN</td>
<td>IV Procedure</td>
</tr>
<tr>
<td>EN</td>
<td>Needle Chest Decompression Procedure if absent breath sounds and symptoms of shock</td>
</tr>
<tr>
<td>I/P</td>
<td>Morphine sulfate up to 10 mg slow IVP with BP &gt;90 mmHg for moderate to severe pain from isolated distal extremity fracture/dislocation</td>
</tr>
<tr>
<td>MC</td>
<td>Consider cessation of efforts for patients in traumatic cardiac arrest if transport time is greater than 15 minutes.</td>
</tr>
</tbody>
</table>
# Amputation

**History**  
- Mechanism of injury  
- Time of injury  
- Wound contamination  
- Medical history  
- Medications

**Physical**  
- Deformity  
- Diminished pulse, capillary refill

**Differential Diagnoses**  
- Complete amputation  
- Incomplete amputation

## Universal Care Protocol

- **B** Spinal Immobilization.
- **B** Apply direct pressure to control hemorrhage. Elevate and consider tourniquet procedure.
- **B** If incomplete amputation, splint entire digit or limb in physiological position.
- **B** Place part in damp gauze, place in plastic bag, wrap in trauma dressing, place on ice/water mix.

## IV Procedure

- **I/P** Morphine sulfate up to 10 mg slow IVP with BP >90 mmHg for moderate to severe pain.

**Pearls:**  
- Tourniquets should be used with the smallest amount of pressure over the widest area.  
- Never freeze the part by placing directly on ice.
# Burns

## History
- Type of exposure
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness
- Tetanus status

## Physical
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension
- Airway compromise
- Singed facial or nasal hair
- Hoarseness/wheezing

## Differential Diagnoses
- Superficial
- Partial thickness
- Full thickness
- Chemical
- Thermal
- Electrical
- Radiation

## Pearls:
- In electrical burns, search for additional traumatic injury.
- In thermal burns, assess for carbon monoxide exposure.
- Remove jewelry and non-adherent clothing.
- Avoid establishing IV distal to extremity burn.
- Severe burns should not receive succinylcholine.
- Early intubation should be considered if airway edema is present or likely to develop.
<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Universal Care Protocol</td>
</tr>
<tr>
<td>B</td>
<td>Apply dry sterile dressings.</td>
</tr>
<tr>
<td>B</td>
<td>Spinal immobilization if indicated.</td>
</tr>
<tr>
<td>B</td>
<td>Irrigate chemical burn with water if water is appropriate to chemical. If powdered chemical, brush off.</td>
</tr>
<tr>
<td>B</td>
<td>Splint fractures after applying dressing.</td>
</tr>
<tr>
<td>EN</td>
<td>Advanced airway management</td>
</tr>
<tr>
<td>EN</td>
<td>IV Procedure</td>
</tr>
<tr>
<td>I/P</td>
<td>Morphine sulfate up to 10 mg slow IVP with BP &gt;90mmHg for moderate to severe pain. May repeat in 4 mg increments to a max of 20 mg.</td>
</tr>
</tbody>
</table>
# CNS Injuries

## History
- Time of injury
- Mechanism of injury
- Loss of consciousness
- Bleeding
- Medical history
- Medications
- Evidence of multitrauma
- Helmet use or damage

## Physical
- Pain, swelling, bleeding
- Altered mental status
- Unconsciousness
- Respiratory distress/failure
- Vomiting
- Significant mechanism of injury

## Differential Diagnoses
- Skull fracture
- Brain injury
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

## Universal Care Protocol

| B | Spinal immobilization if indicated. |
| B | Elevate patient’s head if not hypotensive. Elevate head of spine board if immobilized. |
| B | Maintain patient warmth. |
| EN | Advanced airway management |
| EN | IV Procedure |

**Pearls:**
- GCS should be assessed and documented.
- Hyperventilation (10 breaths over normal ventilation) only if evidence of herniation (blown pupil, posturing, or bradycardia) to a capnography reading of 30-35 mmHg.
- Intracranial pressure may cause hypertension, bradycardia, and altered respiratory rate.
- Haloperidol should not be administered to these patients.
- Avoid advanced airway procedures if there is any indication of an intact gag reflex.
### Pediatric: Allergic Reaction

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Onset and location  
• Insect sting or bite  
• Food allergy/exposure  
• Medication allergy/exposure  
• New clothing, soap, detergent  
• Past history of reactions  
• Past medical history  
• Medication history  
• Is this a reaction that your MD advised you to use the epi-pen? | • Itching or hives  
• Coughing or wheezing  
• Chest or throat constriction  
• Difficulty swallowing  
• Hypotension or shock  
• Edema | • Rash only  
• Anaphylaxis  
• Shock  
• Angioedema  
• Aspiration/airway obstruction  
• Asthma |

**Pearls:**
Any patient receiving epinephrine must be transported.
Pediatric: Allergic Reaction

- Universal Care Protocol, with emphasis on adequate oxygenation
- Remove from source of exposure.
- Assist with prescribed auto injector (Epi-Jr 0.15 mg) for severe hives, inadequate perfusion, or respiratory distress.

**EN**
1. Epinephrine (1:1000) 0.01 mg/kg SQ or IM. Max 0.3 mg. May repeat in 10 minutes.
2. Albuterol 2.5 mg nebulized for wheezing/bronchospasm.
3. Diphenhydramine 1 mg/kg IM or IV. Max 50 mg.
4. Methylprednisolone 125 mg IV over 1 minute for severe hives or difficulty breathing.

**EN**
IV Procedure

**MC**
Consider additional doses of Epinephrine.
Pediatrics: Hyperthermia

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age</td>
<td>• Altered mental status</td>
<td>• Fever</td>
</tr>
<tr>
<td>• Exposure to increased temperature or humidity</td>
<td>• Hot, dry or sweaty</td>
<td>• Dehydration</td>
</tr>
<tr>
<td>• Past medical history/medications</td>
<td>• Hypotension</td>
<td>• Drugs</td>
</tr>
<tr>
<td>• Extreme exertion</td>
<td>• Seizures</td>
<td>• Hyperthyroidism</td>
</tr>
<tr>
<td>• Time and length of exposure</td>
<td>• Nausea</td>
<td>• Delirium tremens</td>
</tr>
<tr>
<td>• Poor PO intake</td>
<td></td>
<td>• Heat cramps</td>
</tr>
<tr>
<td>• Fatigue</td>
<td></td>
<td>• Heat exhaustion</td>
</tr>
<tr>
<td>• Muscle cramping</td>
<td></td>
<td>• Heat stroke</td>
</tr>
<tr>
<td>• History of fever/chills/illness</td>
<td></td>
<td>• CNS lesions or tumors</td>
</tr>
<tr>
<td>• Environmental condition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Universal Care Protocol, with emphasis on adequate oxygenation

Move to cooler environment, remove excess clothing, protect from further heat gains.

For heat exhaustion, PO water if patient can tolerate. Cool with wet towels or fans.

For heat stroke, use aggressive evaporation (fine mist water spray, ice packs to groin and axillae).

Pearls:
The major difference between heat exhaustion and heat stroke is CNS impairment. Avoid dramatic decreases in temperature which can cause shivering and increase temperature. Dehydration and volume depletion may not occur in classic heat stroke. Vigorous fluid administration may result in pulmonary edema, particularly in the very young.
### Pediatric: Near Drowning

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Submersion in water</td>
<td>• Unresponsive</td>
<td>• Trauma</td>
</tr>
<tr>
<td>• Associated trauma</td>
<td>• Altered mental status</td>
<td>• Pre-existing medical problem</td>
</tr>
<tr>
<td>• Duration of immersion</td>
<td>• Decreased vital signs</td>
<td>• Pressure injury</td>
</tr>
<tr>
<td>• Temperature of water</td>
<td>• Vomiting</td>
<td>• Pressure injury barotrauma</td>
</tr>
<tr>
<td>• Fresh vs. salt water</td>
<td>• Cough</td>
<td>decompression sickness</td>
</tr>
<tr>
<td>• Time patient was removed from</td>
<td>• Aspiration</td>
<td></td>
</tr>
<tr>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Contamination of water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Submersion in water</td>
<td>• Unresponsive</td>
<td>• Trauma</td>
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<tr>
<td>• Associated trauma</td>
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<td></td>
</tr>
<tr>
<td>water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Contamination of water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **B** Universal Care Protocol, with emphasis on adequate oxygenation | **B** |
| **B** Remove from water if trained and safe to do so. | **B** |
| **B** Spinal immobilization if indicated. | **B** |
| **B** Prevent heat loss, refer to hypothermia protocol if indicated. | **B** |

**IV Procedure**

**EN** Refer to specific cardiac arrhythmias protocol as needed. **EN**

**I/P** Refer to specific cardiac arrhythmias protocol as needed. **I/P**

**Pearls:**
Most near drowning victims will be hypothermic to some extent. Assess type of incident (surface impacted, object strike, propeller trauma). Assess water conditions (depth of submersion, length of time, water temp). Complications can appear up to 24 hours later. Transport should be highly encouraged.
Pediatric: Poisoning/ Overdose

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ingestion/ exposure of toxic substance</td>
<td>• Mental status change</td>
<td>• Tricyclic antidepressants</td>
</tr>
<tr>
<td>• Route and quantity of substance ingested</td>
<td>• Hypo-/ hypertension</td>
<td>• Acetaminophen</td>
</tr>
<tr>
<td>• Time of ingestion/ exposure</td>
<td>• Decreased respiratory rate</td>
<td>• Depressants</td>
</tr>
<tr>
<td>• Reason (suicide, accident)</td>
<td>• Tachycardia</td>
<td>• Stimulants</td>
</tr>
<tr>
<td>• Available medications near patient</td>
<td>• Dysrhythmias</td>
<td>• Anticholinergics</td>
</tr>
<tr>
<td>• Past medical history, medications</td>
<td>• Seizures</td>
<td>• Cardiac medications</td>
</tr>
<tr>
<td></td>
<td>• Behavioral changes</td>
<td>• Solvents, cleaning agents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Insecticides (organophosphates)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Aspirin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Smoke inhalation</td>
</tr>
</tbody>
</table>

Pearls:
Intubated patients should not receive naloxone unless in cardiac arrest.
Tachycardia is not a contraindication to atropine administration.
Poison control should be consulted on all complex toxicology at 434-924-5543 or 1-800-451-1428.
Aeromedical resources will not transport contaminated patients.
**Universal Care Protocol, with emphasis on adequate oxygenation**

**Identify substance and assure decontamination.**

**Flush skin/membranes with appropriate solution if indicated.**

**IV Procedure**

- Naloxone 0.1 mg/kg IV or IM for suspected narcotic overdose. Max 2 mg.

- Diphenhydramine 1 mg/kg slow IV or IM for dystonic reaction (max dose of 50 mg).

**For Symptomatic Tricyclic Antidepressant:**

- If QRS >0.10 secs, hypotension, or dysrhythmia
  - Sodium bicarbonate 1mEq/kg slow IVP over 2 minutes

**For Symptomatic Calcium Channel Blocker:**

- If bradycardic, QRS >0.12 secs, heart block, hypotension, lethargy, slurred speech, nausea, vomiting
  - Calcium chloride 10 mg/kg slow IV over 10 minutes
  - Sodium bicarbonate 1 mEq/kg slow IVP over 2 minutes.

**For Symptomatic Organophosphate Poisoning:**

- Secretions, bronchospasm, seizures, bradycardia
  - Atropine 0.05 mg/kg IV doubled every 5-10 minutes until decreased secretions.
# Pediatrics: General Management of Cardiac Arrest or Pre-Arrest

## History
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Suspected abuse

## Physical
- Pulseless
- Apneic

## Differential Diagnoses
- Respiratory failure
- Foreign body
- Secretions
- Infection
- Hypovolemia
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Toxin or medication
- Hypoglycemia
- Acidosis
- SIDS

## Pearls:
- If pediatric pads are not available, use of adult pads is acceptable. Ensure they do not touch.
- IV medications should be followed by a 10 mL bolus NS.
- ETT doses are less desirable, flush with 2-3 mL NS.
- ETT placement should be confirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitation tape.
## Pediatrics: General Management of Cardiac Arrest or Pre-Arrest

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>Universal Care Protocol, with emphasis on adequate oxygenation</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Check adequacy of CPR. Perform chest compressions if HR persistently &lt;60 in child/infant or &lt;80 in newborn. 15:2 for multiple rescuer / 30:2 for single rescuer</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>AED protocol using pediatric pads if stand alone defibrillator. Use adult pads when using multifunction device in AED mode. Ensure pads do not touch.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Ensure patient warmth.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Transport immediately with BLS measures while requesting ALS.</td>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>EN</strong></td>
<td>IV or IO Procedure</td>
<td><strong>EN</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>Airway management</td>
<td><strong>I/P</strong></td>
</tr>
<tr>
<td><strong>I/P</strong></td>
<td>Evaluate cardiac rhythm. Go to appropriate protocol for further management.</td>
<td><strong>I/P</strong></td>
</tr>
</tbody>
</table>
# Pediatrics: Asystole/ PEA

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Trauma • Past medical history • Medications • Evaluate history of respiratory illness • Evaluate history consistent with possible shock</td>
<td>• Pulseless • Apneic</td>
<td>• Congenital heart disease • Device error • Hypoxia • Hypothermia • Hydrogen ion (acidosis) • Hypo-/Hyperkalemia • Hypoglycemia • Hypovolemia • Trauma • Tension pneumothorax • Thrombosis coronary/pulmonary • Toxins • Tamponade</td>
</tr>
</tbody>
</table>

| B | Universal Care Protocol, with emphasis on adequate oxygenation | B |
| B | Pediatric General Management of Cardiac Arrest Protocol | B |
| I/P | Epinephrine IV/IO (1:10,000) 0.01 mg/kg max 1 mg Repeat every 3-5 minutes | I/P |
| I/P | Identify and treat reversible causes | I/P |

**Pearls:**
- IV medications should be followed by a 10 mL bolus NS.
- ETT placement should be confirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitation tape.
## Pediatrics: Bradycardia

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Past medical history</td>
<td>• Cyanosis</td>
<td>• Respiratory distress</td>
</tr>
<tr>
<td>• Foreign body</td>
<td>• Mottled, cool skin</td>
<td>• Respiratory obstruction</td>
</tr>
<tr>
<td>• Respiratory distress</td>
<td>• Hypotension</td>
<td>• Foreign body Secretions</td>
</tr>
<tr>
<td>• Apnea</td>
<td>• Altered mental status</td>
<td>• Croup/epiglotitis</td>
</tr>
<tr>
<td>• Toxic or poison exposure</td>
<td>• Decrease capillary refill</td>
<td>• Hypovolemia</td>
</tr>
<tr>
<td>• Congenital disease</td>
<td></td>
<td>• Hypothermia</td>
</tr>
<tr>
<td>• Medication (maternal or infant)</td>
<td></td>
<td>• Infection/sepsis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Medication or toxin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hypoglycemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trauma</td>
</tr>
</tbody>
</table>

### Pearls:
- Bradycardia is commonly a manifestation of hypoxia.
- IV medications should be followed by a 10 mL bolus NS.
- ETT placement should be reconfirmed every time the patient is moved or for change of status.
- Continuous ETCO2 is mandatory in intubated patient.
- Consider orogastric tube for abdominal distention.
- Use length-based resuscitation tape.
Pediatrics: Bradycardia

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol, with emphasis on adequate oxygenation</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>If HR is persistently &lt;60 for child/infant or &lt;80 for neonates, begin CPR. Refer to General Management of Cardiac Arrest or Pre-arrest protocol</td>
<td>B</td>
</tr>
<tr>
<td>EN</td>
<td>IV or IO Procedure</td>
<td>EN</td>
</tr>
<tr>
<td>I/P</td>
<td>Epinephrine IV/IO (1:10,000) 0.01 mg/kg max 1 mg Repeat every 3-5 minutes</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>Atropine sulfate 0.02 mg/kg IV/IO repeat every 5 minutes Max single dose for child 0.5 mg: total max 1mg</td>
<td>I/P</td>
</tr>
<tr>
<td>I/P</td>
<td>Identify and treat reversible causes</td>
<td>I/P</td>
</tr>
<tr>
<td>MC</td>
<td>Consider transcutaneous pacing</td>
<td>MC</td>
</tr>
</tbody>
</table>
# Pediatrics: Narrow Complex Tachycardia

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Past medical history</td>
<td>• Heart rate</td>
<td>• Congenital heart disease</td>
</tr>
<tr>
<td>• Medications or ingestion</td>
<td>• Pale or cyanotic</td>
<td>• Hypoxemia or anemia</td>
</tr>
<tr>
<td>Aminophylline</td>
<td>• Diaphoresis</td>
<td>• Hypovolemia</td>
</tr>
<tr>
<td>Thyroid supplements</td>
<td>• Tachypnea</td>
<td>• Hyperthermia</td>
</tr>
<tr>
<td>Decongestants</td>
<td>• Vomiting</td>
<td>• Electrolyte imbalance</td>
</tr>
<tr>
<td>Digoxin</td>
<td>• Hypotension</td>
<td>• Tamponade</td>
</tr>
<tr>
<td>• Congenital heart disease</td>
<td>• Altered level of</td>
<td>• Tension pneumothorax</td>
</tr>
<tr>
<td>• Respiratory distress</td>
<td>consciousness</td>
<td>• Anxiety, pain, stress</td>
</tr>
<tr>
<td>• Syncope or near syncope</td>
<td>• Pulmonary congestion</td>
<td>• Fever, infection, sepsis</td>
</tr>
<tr>
<td></td>
<td>• Syncope</td>
<td>• Hypoxia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hypoglycemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Medication, toxins, drugs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trauma</td>
</tr>
</tbody>
</table>

**Pearls:**
Treatment of sinus tachycardia should be aimed at searching for and treating reversible causes.
# Pediatrics: Narrow Complex Tachycardia

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol, with adequate oxygenation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>IV/IO Procedure</td>
</tr>
</tbody>
</table>
| I/P | **Probable Sinus Tachycardia:**  
(P waves present and normal, variable R-R with constant P-R  
child rate <180, infant rate <220)  
Search for and treat potential causes as listed above in differential diagnoses. |
| I/P | **Probable Supraventricular Tachycardia:**  
(QRS <0.08 secs, P waves absent, abrupt change to or from normal, child rate >180, infant rate >220)  
Consider vagal maneuvers if stable |
| MC | Adenosine 0.1 mg/kg rapid IV/IO max initial dose 6 mg, may repeat one time at twice the first dose to a max of 12 mg. |
| MC | Synchronized cardioversion 0.5 to 1 j/kg may increase up to 2 j/kg if ineffective |
| MC | Consider midazolam 0.1 mg/kg IV/IO max single dose 2 mg.  
Do not delay cardioversion. |
## Pediatrics: Ventricular Fibrillation/ Pulseless VT

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Estimated down time  
  • Past medical history  
  • Medications  
  • Events leading to arrest | • Pulseless  
  • Apneic | • Asystole  
  • Artifact/device failure  
  • Congenital heart disease  
  • Hypoxia  
  • Hypothermia  
  • Hydrogen ion (acidosis)  
  • Hypo-/ Hyperkalemia  
  • Hypoglycemia  
  • Hypovolemia  
  • Trauma  
  • Tension pneumothorax  
  • Thrombosis coronary/ pulmonary  
  • Toxins  
  • Tamponade |

**Pearls:**
Sodium bicarbonate should not be used during brief resuscitation attempts. If pediatric pads are not available, use of adult pads is acceptable. Ensure they do not touch. IV medications should be followed by a 10 mL bolus NS. ETT placement should be confirmed every time the patient is moved or for change of status. Continuous ETCO2 is mandatory in intubated patient. Consider orogastric tube for abdominal distention. Use length-based resuscitation tape.
**Pediatrics: Ventricular Fibrillation/ Pulseless VT**

<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol, with emphasis on adequate oxygenation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>General Management of Cardiac Arrest Protocol</td>
</tr>
<tr>
<td>B</td>
<td>AED protocol using pediatric pads if stand alone defibrillator. Use adult pads when using multifunction device in AED mode. Ensure pads do not touch.</td>
</tr>
<tr>
<td>I/P</td>
<td>Attempt defibrillation at 2 j/kg</td>
</tr>
<tr>
<td>I/P</td>
<td>Epinephrine IV/IO (1:10,000) 0.01 mg/kg max 1 mg Repeat every 3-5 minutes</td>
</tr>
<tr>
<td>I/P</td>
<td>Attempt defibrillation at 4 j/kg after 2 minutes of CPR. Continue every 2 minutes.</td>
</tr>
<tr>
<td>MC</td>
<td>Consider amiodarone 5 mg/kg IV/IO</td>
</tr>
</tbody>
</table>
# Pediatrics: Wide Complex Tachycardia (VT with Pulse)

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Medical history  
• Time of onset  
• Medications  
• Congenital heart disease  
• Prolonged QT syndrome  
• Renal disease | • Pallor  
• Diaphoresis  
• Hypotension  
• Delayed capillary refill | • Pulseless ventricular tachycardia  
• Medication effects |

| | Universal Care Protocol, with emphasis on adequate oxygenation | | **B** |
|---|---|---|
| **B** | Universal Care Protocol, with emphasis on adequate oxygenation | **B** | Universal Care Protocol, with emphasis on adequate oxygenation |
| **EN** | IV or IO Procedure | **EN** | IV or IO Procedure |
| **I/P** | Confirm QRS >0.08 sec | **I/P** | Confirm QRS >0.08 sec |
| **I/P** | If unstable, synchronized cardioversion 0.5 to 1 j/kg, may increase up to 2 j/kg if ineffective. | **I/P** | If unstable, synchronized cardioversion 0.5 to 1 j/kg, may increase up to 2 j/kg if ineffective. |
| **MC** | Consider amiodarone 5 mg/kg IV/IO over 10 to 20 minutes | **MC** | Consider amiodarone 5 mg/kg IV/IO over 10 to 20 minutes |
| **MC** | Consider midazolam 0.1 mg/kg IV/IO. Do not delay cardioversion. | **MC** | Consider midazolam 0.1 mg/kg IV/IO. Do not delay cardioversion. |

**Pearls:**
- VT is uncommon in the pediatric patient.
- The ventricular rate may vary from near normal to near 400 bpm.
- Slow rates may be well tolerated.
- The majority of children who develop VT have underlying structural heart disease or prolonged QT syndrome.
- IV medications should be followed by a 10 mL bolus NS.
## Pediatric: Newborn Resuscitation

<table>
<thead>
<tr>
<th><strong>History</strong></th>
<th><strong>Physical</strong></th>
<th><strong>Differential Diagnoses</strong></th>
</tr>
</thead>
</table>
| • Due date and gestational age  
• Multiple gestation  
• Meconium  
• Delivery difficulties  
• Congenital disease  
• Maternal medications  
• Maternal risk factors (substance abuse) | • Apneic  
• Central cyanosis  
• Unresponsive  
• Bradycardic  
• Pulseless | • Airway failure  
• Secretions  
• Respiratory drive  
• Infection  
• Maternal medication effect  
• Hypovolemia  
• Hypoglycemia  
• Congenital heart process  
• Hypothermia |

**Pearls:**
IV fluids should be administered over less than 20 minutes.  
IO access should be attempted if no peripheral access in 2 attempts or 90 seconds.
# Pediatric: Newborn Resuscitation

| B | Universal Care Protocol, with emphasis on adequate oxygenation | B |
| B | Assess ABC’s using base of umbilical cord, brachial or femoral artery, or auscultation of heart sounds. | B |
| B | Place newborn on back with neck in neutral position. | B |
| B | Suction mouth prior to nose. Note any meconium presence. | B |
| B | After delivery, use mild stimulation (dry, warm, suction). If effective respirations are not present after 5-10 seconds of stimulation, BVM at 40-60 breaths/minute. | B |
| B | If heart rate is <80 bpm with no improvement after BVM for 30 seconds, begin CPR. | B |
| B | Dry the newborn, wrap in blanket, head cap to maintain warmth. Do not allow newborn to become hypothermic. | B |
| EN | Evaluate or treat for hypoglycemia. Dextrose 12.5% 4 mL/kg IV or IO | EN |
| B | Record APGAR’s at 1 and 5 minutes. | B |
| I/P | IO if required for medication administration. | I/P |
| I/P | Follow specific algorithms for bradycardia, tachycardia, or cardiac arrest. | I/P |
# Pediatric: Altered Level of Consciousness

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Known diabetic</td>
<td>• Change from baseline mental status</td>
<td>• Head trauma</td>
</tr>
<tr>
<td>• Drugs, paraphernalia</td>
<td>• Bizarre behavior</td>
<td>• Stroke</td>
</tr>
<tr>
<td>• Report of drug use or toxic ingestion</td>
<td>• Cool, diaphoretic skin (hypoglycemia)</td>
<td>• Tumor</td>
</tr>
<tr>
<td>• Past medical history</td>
<td>• Warm, dry skin with signs of dehydration (hyperglycemia)</td>
<td>• Seizure</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Fruity breath odor</td>
<td>• Infection/sepsis</td>
</tr>
<tr>
<td>• History of trauma</td>
<td>• Kussmaul respirations</td>
<td>• Thyroid</td>
</tr>
</tbody>
</table>

**Pearls:**
Poison Control cannot act as medical command, contact for advise only. Do not use patient’s glucometer.
<table>
<thead>
<tr>
<th>B</th>
<th>Universal Care Protocol, with emphasis on adequate oxygenation</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>IV Procedure</td>
<td>EN</td>
</tr>
</tbody>
</table>
| EN | **Administer glucose:**  
- **Children >8 years**, Dextrose 50% 1mL/kg IV or IO.  
- **Children 1 month to 8 years**, Dextrose 25% 2 mL/kg IV or IO.  
- **Neonates <1 month**, Dextrose 12.5% 4 mL/kg IV or IO. | EN |
| EN | Glucagon 1 mg IM if no IV access. | EN |
| EN | Naloxone 0.1 mg/kg IV, IO, or IM for suspected narcotic overdose with respiratory depression. Max 2 mg. | EN |
## Pediatric: Seizures

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever • Prior history of seizure • Seizure medications • Head trauma • Congenital abnormality</td>
<td>Observed seizure activity • Altered mental status • Hot, dry skin • Elevated body temperature</td>
<td>Fever • Infection • Head trauma • Medication or toxin • Hypoxia • Hypoglycemia • Metabolic abnormality • Tumor</td>
</tr>
</tbody>
</table>

### Universal Care Protocol, with emphasis on adequate oxygenation

**EN**

**IV Procedure**

**Administer glucose:**
- **Children >8 years**, Dextrose 50% 1mL/kg IV or IO.
- **Children 1 month to 8 years**, Dextrose 25% 2 mL/kg IV or IO.
- **Neonates <1 month**, Dextrose 12.5% 4 mL/kg IV or IO

**EN**

**Glucagon 1mg IM if no IV access.**

**I/P**

Diazepam 0.1 mg/kg IV max single dose 5 mg. May repeat once in 5 minutes for persistent seizure.

**I/P**

Midazolam 0.1 mg/kg IM if no IV access, max single dose 5 mg. May repeat once in 5 minutes for persistent seizure.

**MC**

Contact medical command if seizure persists after two doses of benzodiazepines.

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## Pediatric: Respiratory Distress

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
</table>
| • Time of onset  
• Possibility of foreign body  
• Medical history  
• Medications  
• Fever or respiratory infection  
• Sick siblings  
• History of trauma | • Wheezing or stridor  
• Retractions  
• Increased heart rate  
• Altered LOC  
• Anxious appearance  
• Nasal flaring  
• Delayed capillary refill | • Asthma  
• Aspiration  
• Infection (pneumonia, croup)  
• Congenital heart disease  
• Medication or toxin  
• Trauma  
• Airway obstruction |

| B | Universal Care Protocol, with emphasis on adequate oxygenation | B |
| B | Allow child to assume position of comfort. | B |
| B | Assist patient with prescribed Metered Dose Inhaler. | B |
| J | Albuterol 2.5 mg and ipratropium nebulizer for bronchospasm. May repeat albuterol as long as patient is symptomatic. | J |
| EN | NS 2-3 mL nebulized for suspected croup or epiglottitis | EN |
| EN | IV Procedure | EN |
| I/P | Epinephrine (1:1000) 2 mg plus 1 mL NS (total volume of 3 mL) nebulized for moderate to severe patients with suspected croup or epiglottitis. | I/P |
| MC | Epinephrine (1:1000) 0.01 mg/kg SQ, single max dose 0.3 mg for severely symptomatic patient. May repeat every 20 minutes for a max of 3 doses if still symptomatic. | MC |
| MC | Methylprednisolone 1 mg/kg IV for severe asthma or croup. | MC |

**Pearls:**

“Severely symptomatic” is defined as inability to speak normally, severe wheezing, absent or diminished breath sounds, and/or poor perfusion.

In upper airway airway disorders, invasive airway maneuvers should be avoided if possible.

Consider aeromedical request for prolonged transports.
| B | Universal Care Protocol, with emphasis on adequate oxygenation | B |
| B | Spinal immobilization if indicated. | B |
| B | Notify MedCom if possible trauma alert (red or yellow category): Advise mechanism of injury, age and sex of patient, sites of injury, vital if available, ETA. | B |
| B | For evisceration, cover with moist sterile dressing then with plastic. Do not push organs back into abdominal cavity. | B |
| B | Maintain patient warmth. | B |
| EN | IV or IO Procedure. | EN |
| EN | Needle Chest Decompression Procedure if indicated | EN |
| I/P | Morphine sulfate up to 0.1 mg/kg slow IVP or IM for moderate to severe pain from isolated distal extremity fracture/dislocation. Max dose 10 mg. | I/P |
| MC | Consider cessation of efforts for patients in traumatic cardiac arrest. | MC |
### Pediatric: General Trauma Management

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time and mechanism of injury</td>
<td>• Altered mental status</td>
<td>• Chest</td>
</tr>
<tr>
<td>• Damage to structure or vehicle</td>
<td>• Hypotension</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>• Location in structure or vehicle</td>
<td>• Arrest</td>
<td>Flail chest</td>
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<tr>
<td>• Others injured or dead</td>
<td>• Deformity</td>
<td>Pericardial tamponade</td>
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<tr>
<td>• Speed and details of MVC</td>
<td>• Contusions</td>
<td>Open chest wound</td>
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<td>• Restraints/protective devices</td>
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<td>• Punctures/penetrations</td>
<td>Pulmonary contusion</td>
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<td>• Burns</td>
<td>• Intra-abdominal bleeding</td>
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<td>• Tenderness</td>
<td>• Pelvis/femur fracture</td>
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<td></td>
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<td>• Cord injury/spinal fracture</td>
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<td>• Swelling</td>
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<td>• Extremity trauma</td>
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<td></td>
<td>• HEENT trauma</td>
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<td></td>
<td></td>
<td>• Hypothermia</td>
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</tbody>
</table>

**Pearls:**
GCS should be assessed and documented.
Preservation of body heat is paramount.
# Pediatric: Amputation

<table>
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<th>Physical</th>
<th>Differential Diagnoses</th>
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<td>• Medications</td>
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</tbody>
</table>

## Physical Evaluation
- Blood loss
- Diminished pulse, capillary refill

## Differential Diagnoses
- Complete amputation
- Incomplete amputation

### Universal Care Protocol
- With emphasis on adequate oxygenation

### Spinal Immobilization

### Apply direct pressure to control hemorrhage. Elevate and consider tourniquet if needed.

### If incomplete amputation, splint entire digit or limb in position found.

### Place part in damp gauze, place in plastic bag, wrap in trauma dressing, place on ice/water mix.

### IV Procedure
- Morphine sulfate up to 0.1 mg/kg slow IV/IO/IM. Max dose 10 mg.

### Pearls:
- Tourniquets should be used with the smallest amount of pressure over the widest area.
- Never freeze the part by placing directly on ice.
## Pediatric: Burns

### History
- Type of exposure
- Inhalation injury
- Time of injury
- Past medical history
- Other trauma
- Medications
- Loss of consciousness

### Physical
- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension
- Airway compromise
- Singed facial or nasal hair
- Hoarseness/wheezing

### Differential Diagnoses
- Superficial
- Partial thickness
- Full thickness
- Chemical
- Thermal
- Electrical
- Radiation
- Abuse

| B | Universal Care Protocol, with emphasis on adequate oxygenation |
| B | Apply dry sterile dressings. |
| B | Irrigate chemical burn with water if water is appropriate to chemical. If powdered chemical, brush off. |
| EN | Airway management |
| EN | IV Procedure |
| I/P | Morphine sulfate up to 0.1 mg/kg slow IVP or IM for moderate to severe pain. Repeat as needed up to 10 mg. |

**Pearls:**
- In electrical burns, search for additional traumatic injury.
- In thermal burns, assess for carbon monoxide exposure.
- Remove jewelry and nonadherent clothing.
- Avoid establishing IV distal to extremity burn.
### Pediatric Trauma: CNS Injuries

<table>
<thead>
<tr>
<th>History</th>
<th>Physical</th>
<th>Differential Diagnosis</th>
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</thead>
<tbody>
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<td>• Subarachnoid hemorrhage</td>
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<td>• Medications</td>
<td>• Significant mechanism of injury</td>
<td>• Spinal injury</td>
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<tr>
<td>• Evidence of multi-trauma</td>
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<td>• Abuse</td>
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<tr>
<td>• Helmet use or damage</td>
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</tr>
</tbody>
</table>

#### Differential Diagnosis
- Skull fracture
- Brain injury
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse

#### Universal Care Protocol, with emphasis on adequate oxygenation
- Spinal immobilization if indicated.
- Maintain patient warmth.
- Airway management
- IV or IO Procedure

**Pearls:**
GCS should be assessed and documented.

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Procedure Section
sponsored by
the Department of
Community Relations, Outreach, and Service
Accessing Central Venous Lines

Central venous catheters encountered in the field commonly include dialysis catheters, Porta-Caths, Hickman or Groshong style central lines, and PICC lines (peripherally inserted central catheters). These devices are used in patients who require regular central venous access for medication administration, blood sampling, or hemodialysis, or who have had repeated difficulties with venous access. They typically involve a surgical procedure to place the line and, particularly in patients with chronic illnesses, may have been placed because there is no longer any available peripheral venous access. Many patients have had significant complications with their indwelling lines including infections, multiple line placements, and clot formation either in the catheter or in the central venous system. In these patients, their central line represents a particularly valuable and sometimes fragile component of their care. In addition, some catheters such as large bore dialysis catheters are “blocked” with heparin (as much as 10,000 units per lumen) and inadvertent administration of the heparin could cause dangerous hemorrhagic complications. Proper technique in accessing the lines is important to avoid damage to the line and to avoid complications such as contamination and infection of the line.

Central lines of any sort should only be accessed in the field by providers who are familiar with their use; training in the use of central lines is not a component of current ALS curricula but in some cases may have been provided as part of supplemental training. There is no “blanket” approval for the use of central venous lines at any pre-hospital certification level. Central venous lines should only be used in the case of the need for emergency medication administration, such as resuscitation drugs in a cardiac or near cardiac arrest situation. They are not to be accessed for fluid administration or adjunctive drug therapy (e.g. corticosteroids, pain medications, sedatives). Outside of a cardiac arrest situation, their use is “medical command” only from on-line medical command.

Capnography

Capnography should be used when available on all endotracheal or King airways. It may also be used with spontaneously breathing patients whose respiratory status may be further evaluated with the use of side-stream capnography.

Procedure:
1. Attach capnography sensor to King airway, endotracheal tube, nebulizer, or oxygen delivery device.
2. Note CO2 level and waveform changes.
3. The capnometer shall remain in place and be monitored throughout transport.
4. Documentation of initial reading and reading at the time of transfer of care should be recorded. Both strips should be attached to regional airway form. Attaching a copy of the strips to the PPCR is also recommended.
Cardiopulmonary Resuscitation

Indications: A patient who is pulseless and apneic

Procedure:
1. Compressions should be performed at a ratio of 30:2 with the following exceptions:
   a. Two rescuer CPR on child or infant (15:2)
   b. After an advanced airway has been placed, compressions should be continuous at a rate >100 and ventilations should occur asynchronously with one breath delivered over 1 second
2. Ventilations should be given over 1 second with enough volume to cause the chest to begin rising (avoid over ventilating with both rate and volume of air).
3. Allow full chest recoil between compressions.
4. Provider performing compressions should be rotated every 2 minutes.
5. Pulse and rhythm checks should only be performed every 2 minutes (5 cycles CPR) with minimal time off the chest (less than 10 seconds).
6. Chest compressions should continue while the defibrillator is charging. Use extreme caution to ensure the patient is cleared prior to defibrillation.
7. Adequacy of CPR can be assessed by palpating femoral pulse while compressions are performed and assessing improved perfusion of the patient.

Cardioversion

Indications:
• Unstable patient with rapid atrial fibrillation, supraventricular tachycardia, or ventricular tachycardia with pulse.

Procedure:
1. Ensure patient is properly attached to monitor/defibrillator.
2. Set energy selection to appropriate setting per manufacturer recommendations.
3. Set monitor to synch mode.
4. Charge the device.
5. Ensure the patient is clear of all personnel.
6. Press and hold the button to cardiovert. Stay clear until energy has been delivered (there may be a delay from the time the shock button is pushed until the energy is delivered).
7. Note response and perform immediate defibrillation if indicated.
8. If patient’s condition is unchanged, repeat using escalating energy until maximum setting or the rhythm stabilizes.
9. Document procedure, response, time, and energy settings on PPCR.
CISM Activation Procedure

Request or Notification:
Field personnel contact Charlottesville Fire Department: (434) 980-3240. Ask for the Officer in Charge indicating that they have a CISM request.
Or
Field personnel contact Charlottesville Emergency Communications Center: (434) 977-9041, ask for the Shift Supervisor and advise them they have a CISM request.

CFD/ECC notifies CISM for one of the following:
- Pediatric trauma resulting in death
- Line of duty death or severe injury of squad member, firefighter or police officer
- Suicide or unexpected death of squad member, firefighter or police officer
- An accident involving an ambulance, fire apparatus or police vehicle resulting in injury
- Mass casualty incident
- Prolonged events > 90 minutes
- Any event in which a dispatcher or officer has concerns for the mental health of providers
- Any person calling and requesting CISM services

Obtaining Information:
CFD/ECC will obtain the following information to be given to the CISM investigator for a confirmed request: (defusing, debriefing or on-scene)

- Name of person to call
- Agency name
- Phone number(s) w/area code(s) to call the individual back
- Tell them a CISM investigator will call them back within 30 – 45 minutes

If CFD/ECC is just notifying about an incident without an actual request or message of a potential defusing, debriefing or on-scene request, the information can be snap-paged to a CISM Coordinator. See 5.0

Notification Procedure:
CFD/ECC alerts the CISM Coordinator or one of the investigators on the call down list. (Note – First three (3) can be group paged on snap if preferred). See 5.0 Coordinator should return page within 15 minutes. If not, Re-page the Coordinator. If no response again after 10 minutes, Group Page CISM or page in order down the call list (See 5.0)
Once an investigator has answered the page, CFD will give the information obtained in section 2.1 or 2.2.

Other Information:
The CISM Coordinator will notify CFD/ECC of any on call changes or changes to the notification procedure via telephone and/or memo.
In case of some strange or unusual circumstances where CFD/ECC was unable to reach the first three investigators, and investigators #5.4, 5.5, and 5.6 were unable to be reached – call the Clinical Coordinator:
Clinical Coordinator – Christy Miller
  H – (434) 296-5439
  P – (434) 923-7009 Cell
Continuous Positive Airway Pressure (CPAP) Procedure

Continuous positive airway pressure (CPAP) is a treatment modality that is used in conjunction with medical therapy in the management of pulmonary edema. Pulmonary edema most frequently occurs due to cardiac causes (congestive heart failure), although it can also occur from non-cardiac causes such as near drowning and fluid overload from renal failure. CPAP maintains a positive pressure in the respiratory system throughout the respiratory cycle and can reduce the work of breathing and improve oxygenation in patients with pulmonary edema. This protocol has been developed for use with the s Whisperflow CPAP system, but the general principles apply to any CPAP system. CPAP is a non-invasive therapy that can be used by both ALS and BLS providers.

Indications for CPAP:

- Pulmonary edema due to CHF, fluid overload, or near-drowning
- Hypoxia – pulse oximetry less than 90%
- Significant respiratory distress including use of accessory muscles and retractions
- Associated signs of CHF including edema of the legs, neck vein distention, and rales/ wheezing on chest examination

Contraindications for CPAP include:

- Lack of spontaneous respiration
- Unconsciousness
- Inability to maintain an open airway
- Pneumothorax
- Significant trauma to the face or chest
- Hypotension (systolic BP < 90)
- Uncontrolled vomiting

Procedure for applying CPAP in the field using the WhisperFlow device: (these procedures may need to be modified for other devices per manufacturer recommendations)

1. Attach the CPAP generator to an oxygen source capable of providing 50 psi (portable O2 bottle or wall mounted adaptor, not low flow regulator).
2. Attach air filter to the generator
3. Attach patient circuit tubing to the generator and to the patient mask.
4. Attach pressure valve to the patient mask
5. Attach head straps to the patient mask
6. Allow the patient to hold the mask over their face in order to feel the fit of the mask and become accustomed to the gas flow from the generator.
7. Once the patient has become accustomed to the mask, extend the head straps around the patient’s head and adjust for a snug fit, adjust if leaks around the mask are identified.
Monitor patient’s vital signs:
If the patient is unable to tolerate the CPAP mask, therapy may need to be discontinued and high flow oxygen therapy re-instituted.

The CPAP mask must be removed if the patient begins vomiting, and not reapplied until vomiting is controlled.

If the patient’s condition deteriorates to the point they lose consciousness or they lose the ability to maintain their posture and the seal of the mask, then CPAP will need to be discontinued and BVM assistance of respiration initiated.

If the patient’s blood pressure drops below 90 systolic, discontinue CPAP therapy.

If the patient has adapted to using the CPAP mask and the system is operating properly, and oxygen saturations remain less than 90%, increase the inspired oxygen concentration by attaching standard oxygen tubing to the port just below the pressure valve adapter and add oxygen using the low pressure oxygen regulator – begin at flow rates of 2 L/minute and increase by 2 L/minute until saturations improve to 90% or better.

If the patient does not seem to be responding to CPAP:

Double check connections from the oxygen source to the generator and from the generator to the patient circuit.

Make sure that your oxygen source has adequate reserve to power the generator – gas flow to the patient is dependent on the high pressure flow (50 psi) from the oxygen source to the generator.

CPAP requires a closed system to maintain positive pressures, so check for leaks around the mask and the connections.

Inform the receiving hospital that CPAP therapy has been initiated so that a CPAP generator can be made available when the patient reaches the emergency department.

The corrugated patient circuit tubing, the mask and head straps, and the pressure valve are single patient use only.

The air filter may be re-used unless it becomes contaminated or is visibly dirty and then it should be replaced with a clean filter.
Drug Box Contamination

Procedures for cleaning rescue squad drug boxes that are contaminated with VRE, GRE, and MRSA.

1. Contamination is defined as known or suspected exposure to blood or body fluid.

2. In order to avoid contamination of the drug box, ensure that the contents of the drug box must only be touched by ‘clean’ hands. If a gloved worker just touched a patient, they would have to remove the gloves, cleanse their hands, handle the drugs, then put gloves back on. Or the other worker could be considered ‘clean’ and not touch anything dirty and be responsible for handling the drugs.

3. If at any time contamination is suspected, proceed with the following decontamination procedure.

4. Two providers will be needed. First provider holds clean basin (obtain from ED staff). Be sure that clean basin is not placed on any contaminated surface. Second provider wears gloves and empties all drugs in plastic bags into clean basin. All drugs that are not in plastic bags will be discarded into Contaminated Materials Boxes.

5. Empty drug box, along with contaminated surfaces in ambulance, will be sprayed with Sanimaster III and left wet for 10 minutes. Don’t forget bottom of drug box. Drug box and ambulance surfaces can be dried after 10 minutes.

6. Rewrite ambulance report form on a clean form. ADD: “Drug box has been decontaminated. Drugs not in plastic bags have been placed in CMC box and drugs in plastic bags have been returned in clean basin.”

7. If narcotics were not in plastic bags or have been contaminated, waste the drugs in the presence of the shift manager and have shift manager sign as witness.

8. Bring clean drug box, rewritten call sheet (signed by M.D.) and basin of clean drugs to pharmacy for drug box exchange.
Endotracheal Tube Introducer (Bougie) Guideline

The bougie, often called a gum elastic bougie (GEB), is a long, flexible stylet which is introduced through the glottic opening before the ETT, whether visualization of the vocal cords can be achieved or not. The distal end is curved upward, and there are markings at 10 cm intervals to measure ETT insertion depth. This shape and size of the GEB are designed to be easier to place in the trachea than the ETT when faced with a difficult airway. The following guideline is meant to facilitate the use of this highly efficient and easy-to-use difficult airway tool.

Indications:
1. Unsuccessful intubation attempts
2. Predicted difficult intubation

Contraindications:
1. Age less than eight (8)
2. ETT size less than 6.5 mm

Procedure:
1. Select proper ETT without stylet, test the cuff and prepare suction.
2. Lubricate the distal end and cuff of the ETT and the distal ½ of the bougie (note: Failure to lubricate the Bougie and the ETT may result in failure)
3. Visualize the vocal cords using laryngoscopy and introduce the bougie with curved tip anteriorly. The tip should be seen passing through the vocal cords or above the arytenoids if the cords cannot be visualized.
4. Once inserted, gently advance the bougie until you meet resistance (“hold-up”) or movement of the tip on the tracheal rings (“washboard”). If resistance is not met and/or tracheal rings are not felt then a probable esophageal intubation has occurred and insertion should be attempted again.
5. Once the tip has been properly placed, a second provider should be used to load the ETT and hold proximal control of the bougie to keep it in the trachea while the operator is still holding laryngoscopic pressure.
6. Gently advance the bougie and loaded ETT until you feel hold-up or tracheal rings again, thereby assuring proper placement.
7. While maintaining a firm grasp on the proximal bougie, slide the ETT over the bougie to the appropriate depth.
8. If you are unable to advance the ETT into the trachea and the bougie and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90 degrees COUNTER–clockwise to turn the bevel of the ETT posteriorly. If this technique fails, direct laryngoscopy while advancing the ETT might be necessary (this will require an assistant to maintain the position of the bougie and advance the ETT)
9. Once the ETT is correctly placed, hold it securely and remove the bougie.
10. Confirm tracheal placement with all pertinent methods, secure tube, and reassess frequently.
External Jugular Cannulation

Indications:

- Critically ill patient who is > 12 years of age and requires IV access for fluid or medication administration when an extremity cannulation is not possible.
- Can be attempted initially in life threatening situations where no obvious peripheral site is noted.
- Consider intraosseous insertion as a viable alternative.

Procedure

1. Use personal protective equipment.
2. Gather all necessary equipment. Attach extension tubing when possible.
3. Place the patient in a supine, head down position. This helps distend the vein and decreases the chance for air embolism.
4. Turn the patient's head toward the opposite site of insertion site if no risk of cervical injury exists.
5. Prep the site as per the peripheral IV.
6. Align the catheter with the vein and aim toward the same side shoulder.
7. “Tourniqueting” the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle to cannulate the vein in the usual method.
8. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
9. Label with “field”, date, and initials of person performing procedure.
10. Set proper flow rate.
11. Use caution to not inadvertently pull out the line.
12. Document procedure, time, type of fluid, flow rate, total infusion at the time of transfer, provider who performed procedure, and response to treatment.
Immobilization Decision Matrix

Standard Trauma Evaluation
Includes patients 18 years and older

LOW RISK Mechanism of Injury?

- YES
  - Reliable Patient History/Examination?
    - alert and oriented
    - not intoxicated
    - no psychological/psychiatric
    - no head injury (includes LOC)
    - no distracting injuries
    - able to communicate adequately
      - YES
      - Spine Pain or Tenderness?
        - palpate entire axial spine
        - may need to log roll
          - NO
          - IMMOBILIZE
        - YES
          - IMMOBILIZE
      - NO
      - Normal Sensory/Motor Exam?
        - ability to move
        - symmetrical movement of all extremities
        - assess light touch
          - Normal
          - Consider NO Immobilization*
          - Abnormal
          - IMMOBILIZE

* Document "Backboard Protocol followed"
Impedance Threshold Device

The ResQPOD® is an impedance threshold device that prevents air from entering the chest during the decompression phase of CPR. When air is prevented from rushing into the lungs as the chest wall recoils, the vacuum (negative pressure) in the thorax pulls more blood back to the heart, resulting in a doubling of blood flow to the heart and brain.

- Cardiopulmonary arrest in patients 12 years or older

Contraindications

- Traumatic Cardiopulmonary arrest
- Patients under 12 years of age

Procedure

A. Confirm absence of pulse and begin CPR immediately. Assure that chest wall recoils completely after each compression.

B. **Using the ResQPOD on a facemask:**
   1. Connect ResQPOD to the facemask.
   2. Connect ventilation source (BVM) to top of ResQPOD.
   3. **Establish and maintain a tight face seal with mask throughout chest compressions. Use a two-handed technique or head strap.**
   4. Do not use the ResQPOD’s timing lights during CPR utilizing a facemask for ventilation.
   5. Follow the appropriate ACLS algorithm.
   6. Prepare for endotracheal intubation when clinically feasible and appropriate.

C. **Using the ResQPOD on an endotracheal tube, Combitube or King Airway:**
   1. Endotracheal intubation is the preferred method of managing the airway when using the ResQPOD.
   2. Place advanced airway, confirm placement, and secure the tube.
   3. Move the ResQPOD from the facemask to the advanced airway and turn on timing assist lights (remove clear tab).
   4. Continue CPR with minimal interruptions:
      a. Provide continuous (no pauses) chest compressions (approximately 10 per light flash) and ventilate asynchronously over 1 second when light flashes (10/min).
   5. Perform ACLS interventions as appropriate.
   6. If perfusion is restored, remove the ResQPOD and assist ventilations as needed.

Special Considerations

- Do not delay chest compressions if the ResQPOD is not readily available.

- The two minute cycles of CPR should not be interrupted. If at an assessment interval the patient has a change in ECG and a palpable pulse, discontinue use of the ResQPod. If the patient re-arrests, resume CPR with the ResQPOD.

- Always place ETCO₂ detector between the ResQPOD and the ventilation source.
**B.I.G™ Bone Injector Gun**

**INDICATIONS:** The B.I.G™ is approved for patients greater than 12 years of age. The pediatric B.I.G™ is approved for patients 12 years of age or younger. Placement is indicated when a patient is in or approaching extremis and either intravascular fluid resuscitation or medications are essential to resuscitation efforts, but traditional vascular access techniques are not possible or require multiple or prolonged attempts. Such patients should undergo two **RAPID** IV attempts prior to utilizing the B.I.G™ system.

Appropriate Patient Examples (not all inclusive): near arrest, status epilepticus (no response to IM versed), patients in profound shock with or without altered level of consciousness, severe burns, cardiac arrest; post resuscitation; profoundly hypoglycemic patients with no response to glucagon after 5-10 minutes.

**Patients who are NOT appropriate candidates:** unconscious but without significant trauma or hemodynamic instability; seizure.

**CONTRAINDICATIONS:**
- Fracture of the bone you intend to place the IO in (tibia)
- Previous orthopedic procedures (i.e. knee replacement) in the area of intended insertion (as indicated by a large scar)
- The extremity is compromised by a pre-existing condition (i.e. tumor)
- Skin infection at the insertion site (i.e. redness, skin lesions)
- Inability to locate landmarks
- Excessive tissue over the insertion site.

If any of these contraindications are noted, check another extremity for possible insertion.

**EQUIPMENT:**
- Appropriate B.I.G™ for patient size (pediatric B.I.G™ is red).
- 10ml syringe
- Alcohol or Chlorhexidine swabs
- Extension set
- IV Fluid, Tape or Gauze
- Pressure bag and/or bolus fluid administration setup
PROCEDURE:
1. Observe BSI precautions and aseptic techniques
2. Locate the proper site for B.I.G™ use (tibia only for adult and pediatric patients)
3. Clean the insertion site thoroughly using alcohol or Chlorhexidine for at least a 3” diameter around the site.
4. Adjust the penetration depth.
5. Insert the IO cannula using the B.I.G™
6. Attach a 10 cc syringe and attempt to aspirate marrow (no aspirate alone does not indicate improper placement)
7. Flush the IO with 10cc’s NS
8. Confirm placement with one or more of the following criteria:
   • Firm 90 degree position
   • Blood at the tip of the stylet
   • Aspiration of marrow
   • The device flushes easily and fluids flow freely without subcutaneous swelling or fluid leakage.
13. Attach the infusion, secure and stabilize the catheter to the insertion site.
14. Monitor for any change in placement and remove as necessary.
15. Assure that you can fully visualize the area of insertion so that you can fully assess.
16. Ongoing assessment should include frequent palpation and inspection of the placement site both anteriorly and posteriorly to assure there is no infiltration or extravasation of fluid.
17. Due to the anatomy of the IO space, flow rates may be slower compared with normal IV catheters. Use a pressure bag for rapid infusions, or administer by slow bolus via syringe.
   PEDIATRICS: administration should be by syringe bolus only.
18. Apply wristband to patient to identify that an IO has been placed (optional).
20. For pain with fluid administration, administer 2% lidocaine (preservative free) 20-40 mg for adults, 0.5 mg/kg for children. Use extreme dosage precautions to avoid medication error.

REMOVAL
If there is indication of improperly placed B.I.G™ cannula, attempt in another extremity.

NEVER ATTEMPT A SECOND IO IN THE SAME BONE AS A PREVIOUS ATTEMPT.

If improper placement is suspected, gently pull out the needle, seal off the access and advise hospital staff on your arrival of improper placement, so that the site can be properly monitored for any complications during the patient’s hospital course.

This policy and procedure is based upon a similar one provided through the courtesy of Sabina Braithwaite, MD, FACEP and Albemarle County Fire Rescue
INTRAOSSEOUS INSERTION, EZ-IO®

INDICATIONS: The EZ-IO® is approved for patients weighing 40kg (88lbs) or more. The EZ-IO PD® is approved for patients weighing 3-39kg (6.5-85lbs). Placement is indicated when a patient is in or approaching extremis and either intravascular fluid resuscitation or medications are essential to resuscitation efforts, but traditional vascular access techniques are not possible or require multiple or prolonged attempts. Such patients should undergo two RAPID IV attempts prior to utilizing the EZ-IO® System.

Appropriate Patient Examples (not all inclusive): near arrest, status epilepticus (no response to IM versed), patients in profound shock with or without altered level of consciousness, severe burns, cardiac arrest; post resuscitation; profoundly hypoglycemic patients with no response to glucagon after 5-10 minutes.

Patients who are NOT appropriate candidates: unconscious but without significant trauma or hemodynamic instability; seizure.

CONTRAINDICATIONS:
- Fracture of the bone you intend to place the IO in (tibia or humerus)
- Previous orthopedic procedures (i.e. knee replacement) in the area of intended insertion (as indicated by a large scar)
- The extremity is compromised by a pre-existing condition (i.e. tumor)
- Skin infection at the insertion site (i.e. redness, skin lesions)
- Inability to locate landmarks
- Excessive tissue over the insertion site. (If the 5mm mark on the IO needle is not visible once the needle has been placed through the skin, but has not reached to the bone, then there is too much tissue.)

If any of these contraindications are noted, check another extremity for possible insertion.

EQUIPMENT:
- EZ-IO® driver and appropriate needle set for patient size (EZ-IO PD® is pink).
- 10ml syringe
- Alcohol or Chlorhexidine swabs
- Extension set or EZ-Connect
- IV Fluid, Tape or Gauze
- Pressure bag and/or bolus fluid administration setup

PROCEDURE:
Observe BSI precautions and aseptic techniques
Locate the proper site for EZ-IO® insertion (tibia only for pediatric patients, tibia or humerus for adult)

Adult tibial insertion: With the leg extended, locate the patella (kneecap), feel the anterior surface of the leg just below the patella, approximately 2 finger widths. This round, oval bump is the tibial tuberosity. From the tibial tuberosity move 1 finger width medial (towards the centerline of the body) to the flat part of the tibia. This is the insertion site.

Adult humeral insertion: Expose the shoulder and place the patient’s arm against the patient’s body, resting the elbow on the stretcher or ground and the forearm resting on the abdomen. Note the humeral head on the anterior-superior aspect of the upper arm or the anterior-lateral shoulder. Palpate and identify the mid-shaft humerus and continue palpating toward the proximal end (humeral head). Near the shoulder feel for a small protrusion, this is the base of the greater tubercle and the insertion site. With the opposite hand, "pinch" the anterior and inferior aspects of the humeral head, while confirming the identification of the greater tubercle. This will help ensure that you have located the midline of the humerus.

Pediatric tibial insertion: If the tibial tuberosity CAN be palpated, the insertion site is one finger width below the tuberosity and then medial along the flat aspect of the tibia. If the tibial tuberosity CANNOT be palpated, the insertion site is two finger widths below the patella and then medial along the flat aspect of the tibia. EZ-IO PD Pediatric is ONLY for tibial insertion, not humerus.
1. Clean the insertion site thoroughly using alcohol or Chlorhexidine for at least a 3" diameter around the site.
2. Prepare the EZ-IO®
3. Remove the driver and one EZ-IO® cartridge.
4. Open the cartridge and attach the proper size needle set to the driver (you should feel a “snap” as the set connects to the driver)
5. Remove the needle set from the cartridge
6. Remove the safety cap from the needle set. With the needle facing you, grasp the cap tightly and rotate clockwise to loosen and remove. (Attempting to pull the cap may remove the needle set from the driver, and rotating counterclockwise will cause the catheter and stylet to separate.)
7. Insert the EZ-IO® needle set
8. Hold the driver in one hand, and stabilize the insertion site laterally with the opposite hand. Make sure your hands and fingers are out of the path of insertion, and that the patient is prevented from moving suddenly (i.e. do not position your hand behind the extremity).
9. Position the driver at the insertion site with the needle at a 90 degree angle to the bone.
10. Power the needle set through the skin at the insertion site until it encounters the bone surface. If in doubt, verify that there is enough needle length (not too much tissue) by observing the 5mm mark.
11. Apply firm and steady pressure on the driver and apply power, ensuring the driver is maintained at a constant 90 degree angle to the bone. This indicates entry into the marrow cavity. “STOP WHEN YOU FEEL THE POP.”
12. Stop when the needle flange touches the skin or a sudden decrease in resistance is felt.
13. Remove the driver from the needle set.
14. Support the needle set in on hand, gently pull straight up on the driver and lift away.
15. Remove the stylet from the catheter by grasping the hub firmly with one hand, rotate the stylet counter clockwise (unscrew the stylet from the catheter). Pull the stylet out and place in a sharps container.
16. Attach a 10 cc syringe and attempt to aspirate marrow (no aspirate alone does not indicate improper placement)
17. Flush the IO with 10cc’s NS
18. Confirm placement with one or more of the following criteria:
   • Firm 90 degree position
   • Blood at the tip of the stylet
   • Aspiration of marrow
   • The device flushes easily and fluids flow freely without subcutaneous swelling or fluid leakage.
19. Attach the infusion, secure and stabilize the catheter to the insertion site.
20. Monitor for any change in placement and remove as necessary.
21. Assure that you can fully visualize the area of insertion so that you can fully assess.
22. Ongoing assessment should include frequent palpation and inspection of the placement site both anteriorly and posteriorly to assure there is no infiltration or extravasation of fluid.
23. Due to the anatomy of the IO space, flow rates may be slower compared with normal IV catheters. Use a pressure bag for rapid infusions, or administer by slow bolus via syringe. PEDIATRICS: administration should be by syringe bolus only.
24. Apply wristband to patient to identify that an IO has been placed (optional).
25. Document use of EZ-IO® on PPCR with indication and placement confirmation method per #18.
26. For pain with fluid administration, administer 2% lidocaine (preservative free) 20- 40 mg for adults, 0.5 mg/kg for children. Use extreme dosage precautions to avoid medication error.

**REMOVAL**

If there is indication of improperly placed EZ-IO®, attempt in another extremity. NEVER ATTEMPT A SECOND IO IN THE SAME BONE AS A PREVIOUS ATTEMPT. If improper placement is suspected, seal off the access and advise hospital staff on your arrival of improper placement, so that the site can be properly monitored for any complications during the patient's hospital course. Removal should be a smooth clockwise rotation of the needle, NOT a rocking motion.

This policy and procedure is provided through the courtesy of Sabina Braithwaite, MD, FACEP and Albemarle County Fire Rescue
Intraosseous Infusion with Jamshidi Needle

Indications:
- Patients requiring access when rapid, intravenous access is unavailable including:
  - Cardiac arrest
  - Multisystem trauma
  - Vascular collapse with loss of consciousness
  - Respiratory failure or arrest

Contraindications:
- Fracture proximal to injection site
- Previous IO insertion in same bone

Procedure:
1. Use personal protective equipment.
2. Gather needed equipment.
3. Select NS fluid and microdrip (60 gtt set) with 3-way stop cock attached.
4. Identify landmark. This should be 2 finger widths (1-2 cm) below the bony prominence that is located on the medial side of the proximal tibia just below the knee cap (tibial tuberosity).
5. Clean the site with alcohol.
6. Insert the needle at a 90 degree angle pointed toward the feet to avoid the growth plate. Insertion of the needle should be with a twisting, boring motion until a “pop” or sudden decrease in resistance is felt. Do not advance the needle any further.
7. Remove the stylet and place in sharps container.
8. Attach syringe filled with 5 mL NS and attempt to aspirate bone marrow and then inject 5 mL NS to clear the lumen of the needle. This may be performed through the use of the 3 way stop cock.
9. Attach the IV line and adjust flow rate.
10. Fluid boluses should be drawn into a syringe and pushed via the 3-way stop cock to ensure precise fluid administration and avoid inadvertent fluid overload.
11. Stabilize needle and secure needle in manner to ensure it remains as clean as possible.
12. Following administration of IO medications, flush the line with 10 mL NS.
13. Document the procedure, time, and provider performing the procedure, type of fluid, rate of fluid administration, total volume of infusion at time of transfer, and response to treatment.
King Airway

**Description:** Sterile single use latex–free device. Curved tube with ventilation ports between 2 cuffs. Both cuffs are inflated using a single valve/pilot balloon. The cuffs are designed to seal the esophagus and oropharynx.

**Indications:** Airway Management in the patients over 35 inches in height.

**Contraindications:**
1. Responsive patients with intact gag reflex.
2. Patients with known esophageal disease.
3. Patients who have ingested caustic substances.

**Warnings:**
1. King airway does not protect the airway from aspiration or regurgitation.
2. High airway pressures may leak air into the stomach or atmosphere.
3. Intubation of the trachea is possible (although not reported).
4. Lubricate only the posterior surface of the King airway.

**Insertion:**
1. Check baseline breath sounds.
2. Choose correct size:
   - Green connector **#2** for patients **35-45 inches or 12-25 kg**.
   - Orange connector **#2.5** for patients **41-51 inches or 25-35 kg**.
   - Yellow connector **# 3** for patients **4-5 feet in height**.
   - Red connector **# 4** for patients **5-6 feet in height**.
   - Purple connector **# 5** for patients **over 6 feet in height**.
3. Test cuffs with maximum recommended volume of air.
   - Green **#2 fill with 35 mL** of air.
   - Orange **#2.5 fill with 40 mL** of air.
   - Yellow **# 3 fill with 60 mL** of air.
   - Red **# 4 fill with 80 mL** of air.
   - Purple **# 5 fill with 90 mL** of air.
4. Apply lubricant to beveled distal tip and posterior side of tube avoiding air ports.
5. Pre-oxygenate, if possible
6. Position head in “sniffing” (ideal) or neutral position.
7. Hold tube at colored connector end with dominant hand. With non-dominant hand open mouth open and apply chin lift.
8. Hold tube rotated laterally such that the blue line is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue.
9. As tip passes under tongue, rotate tube back to midline. Blue line will face chin.
10. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
11. Inflate cuffs with volume as above.
12. Attach bag/valve. While gently bagging, simultaneously withdraw airway until ventilation is easy and free flowing.
13. Note cm depth markings.
14. Confirm proper position by auscultation, chest movement and verification of CO2 by capnography if available.
15. Readjust cuff volume to just seal airway.
16. Secure airway with tape or tube holder device.

**Removal:** Airway is well tolerated until the return of protective reflexes.
1. Turn on suction and place patient on side.
2. Deflate cuffs.
3. Withdraw tube.
4. Re-assess ABC’s
Manual Defibrillation

Indications:
- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia.

Procedure:
1. Ensure adequate chest compressions. This includes:
   - Palpable femoral pulse with compressions,
   - Ratio of 30:2 for adults or 15:2 for pediatrics
   - Adequate depth of compression
   - Adequate chest recoil

2. Defibrillation should occur immediately when the cardiac arrest is witnessed. If the arrest is not witnessed and bystander CPR was not performed, defibrillation should occur after 2 minutes of CPR.

3. Apply defibrillation pads.

4. Set the appropriate energy setting per manufacturer recommendation. If appropriate energy setting is unknown, use 200j for biphasic devices.

5. Charge the defibrillation while continuing chest compressions.

6. Stop compressions and “clear” the patient visually and verbally ensuring no person is contact with the patient and the oxygen source has been adequately removed.

7. Press the shock button to deliver the shock.

8. Immediately resume compressions. Pulse check should not be performed after the defibrillation if the cardiac monitor shows an obviously non-perfusing rhythm (ventricular fibrillation or asystole).

9. After 2 minutes of CPR, assess rhythm and check pulse if appropriate for rhythm.

10. Repeat procedure every 2 minutes with energy settings per manufacturer recommendation. If appropriate energy setting is unknown, use 200j for biphasic devices.

11. Limit interruptions of CPR and limit pulse checks to every 2 minutes. Any interruption in CPR should ideally be less than 10 seconds.
Needle Cricothyrotomy

A needle cricothyrotomy airway is a standing-order, medic-level procedure designed for the viable patient whose airway cannot be successfully managed with the available non-invasive (BVM) or invasive airway devices/procedures, which include the supraglottic devices and endotracheal intubation. This procedure provides limited, short term oxygenation but provides little ventilation. It should be used only as a temporary airway. Providers performing one of these skills must be released at their designated skill levels and be approved by the medical director.

Level of Care: EMT–Intermediate, Paramedic

Indications:
1. Massive facial trauma
2. Foreign body aspiration
3. Laryngoedema
4. Laryngospasms
5. Airway burns
6. Laryngeal fracture
7. Epiglottitis

Complications:
1. Vocal cord injury
2. Failure to place catheter in trachea

Procedure:
1. Place patient in a supine position and hyperextend the neck using stable positioning. Consider keeping the trauma patient’s head in a neutral position.
2. Prepare equipment including 14 ga Jelco type needle, 10 cc syringe, ventilation tubing (pre-made kits should consist of short piece of IV tubing with hub in tact with the other end inserted and taped into a piece of oxygen tubing in which a slit has been made).
3. Secure the larynx laterally between thumb and forefinger. Identify the cricothyroid membrane puncture site which is bounded superiorly by the thyroid cartilage and inferiorly by the cricoid cartilage.
4. Cleanse the area properly with alcohol.
5. Insert 14 ga catheter at a 45 degree angle toward the feet.
6. Attach a 10 cc syringe and attempt to aspirate air.
7. Thread the catheter completely to hub.
8. Connect tip to adapter with 15 L O2.
9. Occlude the slit that has been cut into the oxygen tubing to provide a breath for the patient. The slit should be covered for one second and uncovered for 3 seconds to allow for the necessary prolonged expiratory phase.
10. Additional needles may be placed in the cricothyroid membrane as needed and there is space to do so. Placement of additional catheters will allow for better ventilation. The hubs of all catheters should be occluded for one second inhalation and uncovered for 3 second exhalation.
11. Assess placement and secure.
12. Documentation should include person performing procedure, indication for procedure, other methods of airway interventions that were attempted, time of procedure, and response to treatment. A regional airway form should also be completed.
Needle Decompression

Indications:
- Patient with hypotension, clinical signs of shock, and absent breath sounds on one side.
- Patient is in traumatic arrest with chest trauma for whom resuscitation is indicated. Bilateral decompression may be required if breath sounds are absent.

Procedure:
1. Use gloves and eye protection.
2. High flow oxygen.
3. Identify the intercostal space between the 2nd and 3rd ribs at the midclavicular line on the affected side.
4. Cleanse the site with alcohol.
5. Select a 14 ga needle at least 2 inches in length from the drug box. Note Jelco needles are supplied in the medication drawer.
6. Insert the catheter into the skin over the top of the 3rd rib into the intercostal space.
7. Advance the catheter until a “pop” is felt and either air or blood is noted from the catheter.
8. Remove the needle, leaving the catheter in place.
9. Secure the catheter hub to the chest wall.
10. Consider placing a finger cut from a glove over the hub after cutting a small hole in the end of the finger to make a flutter valve.

Orogastric Tube Insertion

Indications:
- Gastric decompression in intubation or ventilated patients.

Procedure:
1. Estimate length of insertion by measuring from corner of mouth, around ear, to the xiphoid process.
2. Lubricate the distal end of the tube.
3. Pass through the patient's mouth along the tongue.
4. Continue to advance tube until appropriate depth of insertion as measured above is reached.
5. Confirm placement by using a Toomey syringe filled with air. Auscultate over the stomach for a “swish” of air or bubbling. Aspiration of gastric contents may also be attempted.
6. Secure the OG tube to the patient’s face with tape.
7. Decompress the stomach by connecting tube to suction (100 mmHg) or manually aspirating with Toomey syringe.
8. Document procedure, time, and person performing procedure.
Pulse Oximetry

Indications:

- Patients with suspected hypoxia.

Procedure:

1. Apply probe to patient’s finger. For children, use of toe or earlobe may be necessary.
2. Allow machine to register SAO2.
3. Record time and note either room air or oxygen delivery at the time of reading (98% on 15L NRB).
4. Verify pulse rate on machine correlates to patient’s actual pulse.
5. Monitor continuously during transport and document with vital signs and in response to any treatments provided.
6. Generally, normal SAO2 is 97-99%. Below 94%, respiratory compromise should be suspected and ALS assessment should be requested.
7. The SAO2 reading should not be used to withhold oxygen. Oxygen should be applied when clinically indicated without regard to good readings.
8. Reliability of the pulse oximeter can be affected by:
   - Decrease perfusion to extremity (blood volume, hypotension, hypothermia
   - Excessive motion of the device
   - Fingernail polish
   - Carbon monoxide poisoning (expect a falsely high reading)
   - Irregular cardiac rhythms
   - Jaundice
   - Placement of BP cuff or tourniquet on same extremity
RSI Program

Requirements for RSI Pilot program:
1. NREMT-P certification, current, preferably CCEMT-P or equivalent training with approval of OMD
2. Second provider on scene who is cleared to perform intubation.
3. Drugs will only be pushed by RSI cleared provider.
4. Written approval by OMD of agency where RSI will be used.
5. There will be 100% QI review of pilot program patient encounters

Maintenance of RSI certification:
1. RSI recert quarterly, documented appropriately with OMD or designee.
   a. includes practical demonstration/ scenarios
   b. may include pharmacology quiz or written test
   c. may include required reading on which (b) may be based
2. Continued approval of agency medical director.

Contents of RSI pack:
(Pack to be stored in secured area like drug boxes) (Pack to be stored in secured area like drug boxes)
(2) Etomidate 20 mg  19 ga needles
(2) Vecuronium 10 mg with filter needles
   (2) 10 cc sterile water diluent 30 cc syringe
(1) Succinylcholine 200 mg  10 cc syringes

Indications for RSI:
(RSI may be done under standing orders if needed)
1. Age over 18 unless specific permission given prior to procedure by medical command.
2. Need for intubation:
   a. Burns with suspected significant inhalation injury
   b. GCS < 8 related to traumatic injury
   c. Acute or impending airway loss (including inability to protect airway), RR <
      10 or > 30
3. No known contraindication to RSI drugs

Procedure:
1. Preparation
   • monitoring (continuous ECG and SpO2, and BP pre- and post-)
   • functional laryngoscope and BVM with high flow oxygen
   • endotracheal tube(s), stylet, 10cc syringe
   • alternate airway (i.e.,Combitube) and cricothyrotomy equipment immediately available
   • all medications drawn up and labeled
   • patent IV
   • assess for difficult intubation: LEMON
   • suction on and ready
   • tube confirmation equipment available (EtCO2 + EDD)
2. Preoxygenation
   • Either 100% oxygen x 5 minutes or 8 vital capacity (deep) breaths on 100% O2
   • minimize BVM ventilation and gastric distention
   • patient on continuous pulse oximeter monitoring
3. Paralysis and Induction
   - Etomidate 0.3 mg/kg (20-30 mg)
   - Succinylcholine 1.5 mg/kg (120 mg)
   - **contraindicated** with
     - burns >24 hrs old
     - crush injury > 72 hrs old
     - denervation process (ex: para/quadriplegia)
     - risk of hyperkalemia (ex: ESRD)

4. Protection
   - Sellick’s maneuver: hold from pretreatment through proof of proper placement

5. Placement with Proof
   - place ETT, confirm with 3 or 4 methods
   - breath sounds auscultated over lungs, no gastric sounds
   - end-tidal CO2 color change or proper waveform
   - EDD/bulb aspiration
   - oxygen saturations maintained > 95% at 1 min and 5 min
   - secure endotracheal tube, note position

6. Postintubation management
   - long-term paralytic: Vecuronium 0.1 mg/kg (9 mg)
   - sedation: Midazolam 0.1 mg/kg/hr

Paperwork:
1. PPCR
2. Airway form
3. RSI form:

Exchange:
Kit will be exchanged in return for PPCR + Airway form + RSI form ONLY
RSI Medications

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<tbody>
<tr>
<td>IV Etomidate 0.3 mg/kg</td>
</tr>
<tr>
<td>50 kg=15 mg=7.5 mL</td>
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<tr>
<td>75 kg=22.5 mg=11 mL</td>
</tr>
<tr>
<td>100 kg=30 mg=15 mL</td>
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<tr>
<td>125 kg=37.5 mg=19 mL</td>
</tr>
</tbody>
</table>

| IV Succinylcholine 1.5 mg/kg |
| 50 kg=75 mg=4 mL |
| 75 kg=110 mg=5.5 mL |
| 100 kg=150 mg=7.5 mL |
| 125 kg=187 mg=9 mL |

<table>
<thead>
<tr>
<th>Post-placement/ paralysis</th>
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<tbody>
<tr>
<td>IV Vecuronium 0.1 mg/kg</td>
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<tr>
<td>50 kg=5 mg=5 mL</td>
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<tr>
<td>75 kg=7.5 mg=7.5 mL</td>
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<td>100 kg=10 mg=10 mL</td>
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<td>125 kg=12.5 mg=12.5 mL</td>
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<table>
<thead>
<tr>
<th>Sedation</th>
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<tr>
<td>IV Midazolam 0.02-0.2 mg/kg</td>
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<tr>
<td>Check BP first. Will produce hypotension.</td>
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<tr>
<td>Start low and titrate PRN</td>
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<tr>
<td>50 kg=1-5 mg</td>
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<tr>
<td>75 kg=1.5 - 7.5 mg</td>
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<tr>
<td>100 kg=2-10 mg</td>
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<tr>
<td>125 kg=2.5-12.5 mg</td>
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</tbody>
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S.T.A.R.T. Triage

VENTILATIONS

Is patient breathing?

YES

> 30 breaths/min

RED Tag

<30 breaths/min

CIRCULATION

Control Bleeding

RADIAL PULSE

Radial Pulse Not Present

RED Tag

Radial Pulse Present

MENTAL STATUS

Can patient follow simple commands?

NO

RED Tag

YES

YELLOW Tag

Or

GREEN Tag

Is patient breathing now?

YES

RED Tag

NO

BLACK Tag
Subcutaneous / Intramuscular Injections

Indication:
• Patient needing medication administration when the specific medication must be given via the SQ or IM route or as an alternative route in selected medications.

Procedure:
1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication, expelling air from the syringe. Use of a filter needle is required for withdrawing medications from a glass ampule.
3. Explain the procedure to the patient and reconfirm allergies.
4. The most common site for SQ injections is the arm. Injection volume should not exceed 1 mL.
5. The possible injections sites for IM injection include the arm, buttock, and thigh. Injection should not exceed 1 mL for the arm and not more than 2 mL in the thigh or buttock.
6. Pediatric patients <3 years should receive injections in the thigh only with total volume not more than 1 mL.
7. Expose the selected area and cleanse with alcohol.
8. Insert the needle into the skin with a smooth, steady motion.
   o SQ- the angle of insertion is 45 degrees with skin pinched
   o IM- the angle of insertion is 90 degrees with skin flattened
10. If no blood is seen, inject the medication.
11. If blood is seen, withdraw the syringe without injecting medication and chose another site.
12. Withdraw the needle and dispose in Sharp’s container without recapping needle.
13. Monitor patient for desired therapeutic effects as well as any possible side effects.
14. Documentation should include medication, dosage, site, route, time, person administering medication, and response to treatment.
Surgical Cricothyrotomy

A surgical airway is a standing–order, medic–level procedure designed for the viable patient whose airway cannot be successfully managed with the available non–invasive (BVM) or invasive airway devices/procedures, which include the supraglottic devices (LMA, King, Combitube) and endotracheal intubation. Providers performing one of these skills must be released at their designated skill levels and be approved by the medical director.

Level of Care: EMT–Paramedic

Indications:
1. Massive facial trauma
2. Foreign body aspiration
3. Laryngoedema
4. Laryngospasms
5. Airway burns
6. Laryngeal fracture
7. Epiglottitis

Complications:
1. Severe bleeding
2. Vocal cord injury
3. Failure to place catheter in trachea

Procedure:
1. Place patient in a supine position and hyperextend the neck using stable positioning. Consider keeping the trauma patient’s head in a neutral position.
2. Secure the larynx laterally between thumb and forefinger. Identify the cricothyroid membrane puncture site which is bounded superiorly by the thyroid cartilage and inferiorly by the cricoid cartilage.
3. Cleanse the area properly with betadine swab
4. With scalpel, make a 1.0 cm shallow, vertical incision over the skin. Have fingers on either side providing mild to moderate spreading pressure to open the landmarks are obscured by marked obesity or subcutaneous air, make a 2.0 cm vertical incision through the skin, and dissect bluntly down to identify the cricothyroid membrane.
5. Once the membrane has been located, make a 1.0 cm horizontal puncture.
6. Enlarge the incision with the handle of the scalpel or other appropriate surgical instrument. NEVER enlarge the incision with the scalpel blade. A bougie can be used to determine whether the incision was made all the way through the anterior wall of the trachea. While moving the bougie, proper positioning should be indicated by feeling a “washboard” feeling as the bougie tip rubs against the tracheal rings.
7. Insert the appropriate size tracheostomy tube (in the absence of a tracheostomy tube, an endotracheal tube may be used). Insert the tube only until the cuff enters the trachea, then inflate the cuff. Remove the obturator, ventilate and confirm successful airway placement:
   - Observe chest wall rise on ventilation
   - Auscultate for bilateral breath sounds
   - ETCO₂ waveform / SpO₂ monitoring are both required to determine and maintain correct tracheal tube placement
8. Secure the tube with twill tape.
Tourniquet Procedure

1. Select either a commercial tourniquet, a multilayered bandage folded to 4 inches wide, or a BP cuff.
2. Wrap the bandage twice around the extremity.
3. Tie a single knot and place a stick on the top of it.
4. Tie a square knot over the stick, and then twist the stick until the bleeding stops.
5. Secure the stick so that it will not unwind.
6. Write “TK” and the exact time you applied the tourniquet on the patient’s forehead.
7. Notify the hospital personnel in radio report and upon arrival in the emergency department.

Transcutaneous Pacing

Indications:

• Heart rate less than 60 beats per minute with signs and symptoms of inadequate perfusion as evidenced by hypotension and/or altered mental status.

Procedure:

1. Attach cardiac monitor leads.
2. Apply multifunction or pacing pads with anterior/posterior placement per manufacturer recommendation.
3. Select pacing function on cardiac monitor.
4. Set heart rate to 80 bpm for adult and 100 bpm for child.
5. Note pacer spikes on ECG screen.
6. Slowly increase output (mA) from the lowest setting until electrical capture is attained. Electrical capture occurs when the pacer spike immediately precedes the QRS complex.
7. If unable to capture while at maximum current output, turn the pacer off.
8. If electrical capture is attained, check the patient for corresponding pulse (mechanical capture) and assess vital signs.
9. Consider use of sedation or analgesia if indicated when BP >100 mmHg.
10. Document response to pacing. Attachment of ECG strips to the PPCR is recommended.
Venous Access

Indications:
- Any medical or traumatic patient where either fluid or medication therapies are needed or the need for such may arise.

Procedure:
1. Gather necessary equipment.
2. Select appropriate fluid and administration set.
   - NS is generally the fluid of choice.
   - Use macrodrip (15 gtt sets) for trauma patients and medical patients where fluid overload is unlikely and infusion of IV medications is not anticipated
   - Use microdrip (60 gtt sets) when possibility of fluid overload is a concern (CHF or pediatric patients) or when infusion of IV medications may be indicated (dopamine or amiodarone drips)
   - Use of extension tubing is required on all insertions.
     - Use of the short or long extension tubing is at the discretion of the provider according to patient condition.
3. Apply personal protective equipment.
4. Select appropriate site.
   - Begin with the most distal site suitable. Avoid the use of both hands if establishing bilateral IV’s. Cardiac arrest and SVT should have antecubital IV.
   - Avoid extremities with injury or where venous access is contraindicated (radical mastectomies, dialysis, etc).
   - Lower extremities should be avoided in patients with poor distal circulation such as diabetics.
5. Perform the IV insertion using aseptic technique.
6. Set the appropriate rate.
   - KVO or TKO rates are 30-60 mL/hr.
   - Fluid boluses when indicated should generally be 500 mL and can be repeated until a maximum of 3 liters, BP reaches 100 mmHg, or fluid is auscultated in the lung fields.
   - Fluid boluses of less than 500 mL may be indicated according to patient condition. It is appropriate to use less than 500 mL when indicated per patient condition.
   - Pediatric fluid boluses should be 20 cc/kg repeated as needed for poor perfusion.
   - Neonatal (<30 days) boluses should be 10 cc/kg as needed for poor perfusion.
7. Secure the IV in a manner to ensure it remains as clean as possible.
   - Use of commercial products such as Tegaderms are encouraged when available.
   - Sterile dressing can be folded and placed over the hub of the catheter prior to taping.
   - Taping should be applied in a manner that uses the least amount of tape feasible and reasonably allows tubing to be disconnected.
   - All field insertions should be labeled with “Field” and the gauge of catheter.
8. Consider insertion of second line when shock is present or anticipated.
9. Document procedure, time, provider performing insertion, number of attempts, type of fluid, rate of administration, total infusion at the time of transfer, and any response to fluid therapy.
12 Lead ECG Procedure

- Providers of all levels should be trained to acquire 12-lead ECG. Continuing cardiac (rhythm) monitoring remains an EMT-I/P skill.
- 12-lead ECG may be indicated for chest pain or severe dyspnea (difficulty breathing).
- Obtaining a 12-lead ECG should not delay patient transport more than 2-3 minutes. Initiating care of the unstable patient takes precedence over 12-lead ECG; whenever possible patient care and 12-lead ECG to take place simultaneously.
- Once a 12-lead ECG has been obtained, the patient will be transported, and every effort will be made by a BLS provider to obtain ALS-level care for the patient.
- If an acute ischemic event is suspected on the 12-lead ECG, it should be transmitted for Medical Command review if possible. If transmission is not possible, the computer interpretation of the 12 lead should be discussed with Medical Command.
- If an acute ischemic event is suspected, Medical Command physician should be contacted promptly, the care of the patient discussed, and additional resources may be mobilized as necessary to expedite patient care (i.e., potentially including re-toning ALS, ALS rendezvous, critical care transport, Medevac). When contacting UVA for medical command on possible myocardial infarction, the attending physician should be requested.
- Obtaining the field 12-lead ECG is valuable for comparison to later 12-lead ECG's.
- There will be no change in patient destination unless patient requested receiving facility diverts through Med Com.

For EMT-Basic and Enhanced level providers:

- If 12-lead ECG trained, obtain 12-lead ECG and transmit if possible. Leave 12-lead electrodes in place in case a repeat ECG is desired, and disconnect the leads and turn off the monitor until ALS assistance is secured.
- If no ALS is immediately available, and the software interpretation indicates an acute ischemic event, contact MedCom and advise you are an EMT requesting physician consultation for a chest pain patient.

For Intermediate and Paramedic Providers:

- Repeat ECG with change in patient's condition. If there is any significant change demonstrated on the 12-lead ECG, request medical command and re-transmit 12-lead ECG to MedCom if possible.
- “Normal” 12-lead does not allow non-transport, nor does it allow transfer to BLS level care.

Procedure:

1. Expose chest and prep as necessary.
2. Apply chest leads and extremity leads using following landmarks:
   - V1—4th intercostal space at the right sternal border
   - V2—4th intercostal space at the left sternal border
   - V3—Directly between V2 and V4
   - V4—5th intercostal space at midclavicular line
   - V5—5th intercostal space at anterior axillary line
   - V6—5th intercostal space at midaxillary line
3. Instruct patient to hold still.
4. Press appropriate button to acquire 12 Lead.
5. Print and transmit ECG include patients sex and age
Reference Section Sponsored by:

Center for Emergency Management

Medcom
Fusion Center
Pegasus Air and Ground
Emergency Transport Team
Blue Ridge Poison Center
Emergency Preparedness
Life Support Learning Center
Special Events Medical Management
Neonatal Emergency Transport System
Prehospital Education Program
**Wong-Baker FACES Pain Rating Scale**

Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. Face 0 is very happy because he doesn’t hurt at all. Face 1 hurts just a little bit. Face 2 hurts a little more. Face 3 hurts even more. Face 4 hurts a whole lot. Face 5 hurts as much as you can imagine, although you don’t have to be crying to feel this bad. Ask the person to choose the face that best describes how he is feeling.

Rating scale is recommended for persons age 3 years and older.

**Brief word instructions:** Point to each face using the words to describe the pain intensity. Ask the child to choose face that best describes own pain and record the appropriate number.


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**Pediatric Blood Pressure**

- Minimal systolic BP = 70 + (2 x age)
- Normal systolic BP = 90 + (2 x age)

**Pediatric Endotracheal Tube Size**

- ETT Size = 4 + \(\frac{\text{age}}{4}\)

**Estimation of Pediatric Weight**

- \((2 \times \text{age}) + 8 = \text{weight in kg}\)
A-B is the flat respiratory baseline when no CO2 is present. It represents late inspiration and early expiration.

B-C is the expiratory upstroke showing arrival of CO2 at the sampler. This should be a sharp and quick rise unless there is a delay getting CO2 exhaled.

C-D is the plateau when the flow of CO2 molecules should be constant.

D marks the point when maximum CO2 is exhaled and is the recorded value. It begins the inspiratory phase.

D-E is the inspiratory phase when the presence of CO2 returns to 0.

Normal Value is 35-45 mmHg
**Glasgow Coma Scale**

I. Motor Response
6 - Obey commands fully
5 - Localizes to noxious stimuli
4 - Withdraws from noxious stimuli
3 - Abnormal flexion, i.e. decorticate posturing
2 - Extensor response, i.e. decerebrate posturing
1 - No response

II. Verbal Response
5 - Alert and Oriented
4 - Confused, yet coherent, speech
3 - Inappropriate words and jumbled phrases consisting of words
2 - Incomprehensible sounds
1 - No sounds

III. Eye Opening
4 - Spontaneous eye opening
3 - Eyes open to speech
2 - Eyes open to pain
1 - No eye opening

**APGAR Score**

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<thead>
<tr>
<th>Heart rate</th>
<th>&gt;100/ min</th>
<th>2</th>
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<tbody>
<tr>
<td></td>
<td>&lt;100/min</td>
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<tr>
<td></td>
<td>Absent</td>
<td>0</td>
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<table>
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<tr>
<th>Respirations</th>
<th>Good, crying</th>
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</thead>
<tbody>
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</tr>
<tr>
<td></td>
<td>Absent</td>
<td>0</td>
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</table>

<table>
<thead>
<tr>
<th>Muscle tone</th>
<th>Active motion</th>
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</thead>
<tbody>
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<td></td>
<td>Some flexion</td>
<td>1</td>
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<tr>
<td></td>
<td>Limp</td>
<td>0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Reflex irritability</th>
<th>Cough or sneeze</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grimece</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No response</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Color</th>
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</thead>
<tbody>
<tr>
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<td>Pink with blue ext.</td>
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</tr>
<tr>
<td></td>
<td>Blue or pale</td>
<td>0</td>
</tr>
</tbody>
</table>

1 minute APGAR

<table>
<thead>
<tr>
<th>Score</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10</td>
<td>no intervention needed</td>
</tr>
<tr>
<td>4-6</td>
<td>stimulate, suction, O2</td>
</tr>
<tr>
<td>0-3</td>
<td>ventilations and compressions</td>
</tr>
</tbody>
</table>

Obtain AGPAR at 1 and 5 minutes

**UVa TRCCS System**
(for follow up on trauma patients)

Retrieval steps:

(You will notice "Physician ID" and "Patient ID" mentioned in the prompt. This is because the system is designed for physicians to communicate lab results to their patients.)

Dial 1-888-888-3803
"Physician ID" number prompt – Enter 33447
"Patient ID" number prompt – Enter 98765 and the last four digits of your patient’s pre-hospital report or flight number.
Philips MRx

Defibrillation
Cardioversion
  SVT, V-tach with pulse
  Atrial fibrillation
  Atrial flutter
Pediatric defibrillation
Pediatric synchronized cardioversion

Defibrillation
Cardioversion
  SVT, V-tach with pulse
  Atrial fibrillation
  Atrial flutter
Pediatric defibrillation
Pediatric synchronized cardioversion

Medtronic/Lifepak 12

Medtronic devices are designed to be re-configured by the user.
Factory default setting for defibrillation are 200j-300j-360j
Per the regional OMD committee, use of 100 j as the standard setting for
synchronized cardioversion is accepted for this region.

Zoll Monophasic

Defibrillation
Synchronized cardioversion
Pediatric defibrillation

Zoll Biphasic

Defibrillation
Synchronized cardioversion
Pediatric defibrillation
**ADENOSINE**
EMT-I, EMT-P
(ADENOCARD)
*Medical Command for Pediatrics*

**INDICATIONS**
Supraventricular tachycardia (SVT)

**CONTRAINDICATIONS**
ventricular arrhythmias including ventricular tachycardia, 2nd and 3rd degree heart blocks, or sick sinus syndrome
Interaction precautions: aminophylline will negate effects of adenosine. Persantine will markedly potentiate bradycardic side effects.

**EFFECTS**
Slows conduction through the AV node

**SIDE EFFECTS**
Bradydysrhythmias

**HOW SUPPLIED**
6 mg/2 mL

**QUANTITY**
3

**DOSAGE AND ROUTE**
6 mg IV rapidly over 1-2 seconds. If no effect after 2 minutes, give 12 mg IV rapidly over 1-2 seconds.

**Pediatric:** 0.1 mg/kg
10 kg child = 0.33 mL

---

**ALBUTEROL**
EMT-J, EMT-E, EMT-I, EMT-P, Park Medic
(PROVENTIL)

**INDICATIONS**
Bronchospasm related to asthma, chronic bronchitis, emphysema, and allergy

**CONTRAINDICATIONS**
Tachydysrythmias

**EFFECTS**
Bronchodilation

**SIDE EFFECTS**
Tachycardia, anxiety, nausea & vomiting

**HOW SUPPLIED**
2.5 mg/3 mL

**QUANTITY**
6

**DOSAGE & ROUTE**
1 unit dose of 2.5 mg/3 mL through hand-held nebulizer with oxygen flow at 4-6 liters. May repeat if necessary. A modified nebulizer may be used with a BVM or a simple facemask.

**Pediatric:** Same as adult.
**AMIODARONE**  
EMT-I, EMT-P  
(Cordarone)  
*Medical Command Only for Pediatrics*

**INDICATIONS**  
Used for treatment of arrhythmias including ventricular tachycardia, ventricular fibrillation, and supra-ventricular arrhythmia

**CONTRAINDICATIONS**  
None in cardiac arrest situation; bradycardia, heart block, hypotension, pregnancy

**EFFECTS**  
Antiarrhythmic, several different effects, primarily beta-blockade acutely

**SIDE EFFECTS**  
Hypotension, bradycardia, increased heart block

**HOW SUPPLIED**  
150 mg/ 3 mL vials

**QUANTITY**  
3

**DOSAGE & ROUTE**  
Cardiac arrest situations, 300 mg IV push.  
Unstable arrhythmias, 150 mg IV over 10 minutes mixed in 100mL D5W, may be repeated once if needed for recurrent arrhythmia  
**Pediatrics:** 5 mg/kg medical command only  
10 kg child = 1 mL

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**ASPIRIN**  
All Levels

**INDICATIONS**  
Chest pain of suspected cardiac origin

**CONTRAINDICATIONS**  
Trauma, active bleeding, or allergy to medication

**EFFECTS**  
Inhibits platelet aggregation

**SIDE EFFECTS**  
None

**HOW SUPPLIED**  
81 mg chewable tabs

**QUANTITY**  
1 bottle

**DOSAGE & ROUTE**  
4- 81 mg tabs chewed after first Nitroglycerin
**ATROPINE SULFATE**  
EMT-I, EMT-P

**INDICATIONS**  
Bradycardia with hypotension, asystole; organophosphate poisoning

**CONTRAINDICATIONS**  
Glaucoma

**EFFECTS**  
Increased heart rate

**SIDE EFFECTS**  
Blurred vision, headache, dilated pupils, thirst, flushed skin, dysuria

**HOW SUPPLIED**  
1 mg/10 mL

**QUANTITY**  
4

**DOSAGE & ROUTE**  
**Bradydardia:** 1 mg IV up to total 3 mg  
**Asystole:** 1 mg IV up to total of 3 mg  
**Organophosphate poisoning:** 2 mg IV every 5-10 min (0.05 mg/kg child).  
**Pediatric:** 0.02 mg/kg (Minimum dose 0.1 mg, max dose of 0.5 mg)  
10 kg child = 2 mL

**CALCIUM CHLORIDE 10%**  
EMT-I, EMT-P

**INDICATIONS**  
Used for calcium channel blocker toxicity, hypermagnesemia, and hyperkalemia

**CONTRAINDICATIONS**  
VF, digitalis toxicity, hypercalcemia

**EFFECTS**  
Electrolyte

**SIDE EFFECTS**  
Extravasation causes necrosis, dysrhythmias, hypotension, CNS changes

**HOW SUPPLIED**  
1 gm/10 mL

**QUANTITY**  
1

**DOSAGE & ROUTE**  
20 mg/kg slow IV  
**Pediatric:** 10 mg/kg IV or IO slowly  
10 kg child = 1 mL
50% DEXTROSE  EMT-E, EMT-I, EMT-P, Park Medic
(D50)

INDICATIONS
Unconscious diabetics; altered level of consciousness; seizures due to hypoglycemia

CONTRAINDICATIONS
Known intracranial hemorrhage

EFFECTS
Increases blood sugar

SIDE EFFECTS
Rare, neurologic symptoms in alcoholics; tissue necrosis if extravasation

HOW SUPPLIED  25 gm/50 mL
QUANTITY  2

DOSEAGE & ROUTE
25 gm bolus in free flowing IV
Pediatric: 0.5 gm/kg. See dilution on pediatric dosage chart.

DIAZEPAM  EMT-I, EMT-P (Valium)

INDICATIONS
Prolonged seizure, severe agitation

CONTRAINDICATIONS
Pregnancy

EFFECTS
CNS depressant

SIDE EFFECTS
Hypotension, stupor, respiratory arrest

HOW SUPPLIED  10 mg/2mL
QUANTITY  1

DOSEAGE & ROUTE
2.5 – 5 mg slow IV
Pediatric: 0.1 mg/kg
10 kg child = 0.2 mL
**DIPHENHYDRAMINE HCL** (BENADRYL)  
**EMT-J, EMT-E, EMT-I, EMT-P, Park Medic**

**INDICATIONS**
Anaphylaxis; allergic reactions, dystonic reaction

**CONTRAINDICATIONS**
Asthma, nursing mothers

**EFFECTS**
Block histamine effects, antiemetic, sedative, to reverse side effects of phenothiazines

**SIDE EFFECTS**
Hypotension, headache, tachycardia, and sedation

**HOW SUPPLIED** 50 mg/mL

**QUANTITY** 2

**DOSAGE & ROUTE**
25-50 mg IV or deep IM per specific guideline
Pediatric: 1.0 mg/kg slow IV push (over 2 minutes) maximum dose of 50 mg

10 kg child = 0.2 mL

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**DOPAMINE HCL** (INOTROPIN)  
**EMT-I, EMT-P**

**INDICATIONS**
Cardiogenic & septic shock, refractory bradycardia

**CONTRAINDICATIONS**
Use only after volume deficit is corrected in cardiogenic and septic shock

**EFFECTS**
Increases heart rate, contractile force, and blood pressure; constricts small blood vessels

**SIDE EFFECTS**
Ventricular tachyarrhythmias, hypertension

**HOW SUPPLIED** 200 mg/5 mL

**QUANTITY** 1

**DOSAGE & ROUTE**
Drip only: 200 mg in 250 mL D5W IV piggyback 2 to 20 mcg/kg/min titrated to BP of 90 mmHg systolic

Quick calculation: drops/min = kg x micrograms/kg/min x 0.075
**EPINEPHRINE 1:1000**
(ADRENALIN)
EMT-J, EMT-E, EMT-I, EMT-P, Park Medic

*Medical Command for Asthma*

**INDICATIONS**
Anaphylaxis; severe asthma

**CONTRAINDICATIONS**
None in anaphylaxis.
Do not give: If over the age of 50 yrs with cardiac history; if pulse is greater than 140/min in adult or 180/min in child; if hypertensive.

**EFFECTS**
Bronchodilation; increases BP and heart rate

**SIDE EFFECTS**
Palpitations, hypertension, and dysrhythmias

**HOW SUPPLIED**
1 mg/mL

**QUANTITY**
4

**DOSAGE & ROUTE**
0.3 mg SQ. May repeat every 10-20 min
**Pediatric:** 0.01 mg/kg SQ
10 kg child = 0.1 mL

---

**EPINEPHRINE 1:10,000**
EMT-I, EMT-P
(ADRENALIN)

**INDICATIONS**
Asystole; ventricular fibrillation; ventricular tachycardia with no pulse; PEA

**CONTRAINDICATIONS**
None

**EFFECTS**
Increases heart rate, force, & automaticity

**SIDE EFFECTS**
Tachyarrhythmias

**HOW SUPPLIED**
1 mg/10 mL

**QUANTITY**
8

**DOSAGE & ROUTE**
Cardiac arrest: 1 mg IV every 3-5 min.
**Pediatric:** 0.01 mg/kg, repeat every 3-5 min
10 kg child = 1 mL
**FUROSEMIDE**  
*EMT-I, EMT-P*  
*(LASIX)*  
*Medical Command Only*

**INDICATIONS**  
CHF; pulmonary edema

**CONTRAINDICATIONS**  
Hypotension, pregnancy, hypokalemia

**EFFECTS**  
Increases urine output, vasodilation

**SIDE EFFECTS**  
Dehydration, decreases potassium

**HOW SUPPLIED**  
40mg/4 mL

**QUANTITY**  
3

**DOSAGE & ROUTE**  
40 mg IV over 2-3 min. May consider higher dose for patients already on diuretics

Pediatric: 1-2 mg/kg

10 kg child = 1-2 mL

---

**GLUCAGON**  
*EMT-J, EMT-E, EMT-I, EMT-P, Park Medic*

**INDICATIONS**  
Hypoglycemia if unable to establish IV

**CONTRAINDICATIONS**  
Rare

**EFFECTS**  
Causes breakdown of glycogen to glucose

**SIDE EFFECTS**  
Rare

**HOW SUPPLIED**  
1 unit (1 mg/mL to be mixed)

**QUANTITY**  
1

**DOSAGE & ROUTE**  
1 unit (1 mL) IM

Pediatric: Same as adult
HALOPERIDOL  
EMT-I, EMT-P  
(Haldol)

INDICATIONS
Severe agitation, acute psychosis

CONTRAINDICATIONS
Parkinsonism, lactation, pregnancy, children under 18, history of prolonged QT syndrome, suspected or known cardiac arrhythmias.

EFFECTS
Antipsychotic

SIDE EFFECTS
Extrapyramidal symptoms, (treat with Benadryl), hypotension, seizures, respiratory depression and cardiac arrhythmias.

HOW SUPPLIED  
2- 5mg/mL vials

DOSAGE & ROUTE
5 mg IM for adults, 2 mg IM for over 65 to control acute agitation

IPRATROPIUM  
EMT-J, EMT-E, EMT-I, EMT-P, Park Medic  
(Atrovent)

INDICATIONS
Bronchospasm related to asthma, chronic bronchitis, and emphysema

CONTRAINDICATIONS
Tachydysrhythmias

EFFECTS
Bronchodilation

SIDE EFFECTS
Tachycardia, myocardial ischemia

HOW SUPPLIED  
0.5 mg/3mL

QUANTITY  
1

DOSAGE & ROUTE
1 unit dose of 0.5 mg/3mL through hand-held nebulizer with oxygen flow at 4-6 liters. Mixed with 1st dose of albuterol. A modified nebulizer maybe used with a BVM or a simple face mask.
**MAGNESIUM SULFATE** EMT-I, EMT-P  
*Medical Command for Eclampsia*

**INDICATIONS**  
Refractory VT/VF; eclampsia

**CONTRAINDICATIONS**  
None

**EFFECTS**  
Changes calcium transport in the cells

**SIDE EFFECTS**  
Flushing, nausea

**HOW SUPPLIED**  
1 gm/2 mL

**QUANTITY**  
4

**DOSAGE & ROUTE**  
Refractory VF – 1 to 2 grams of 50% solution diluted in 10 mL of NS slow IV push (Dilute each gram of Magnesium with 8cc of NS).

Eclampsia – *Medical Command only* - 10% solution 2 to 4 grams IV push at no greater than 1 gram per minute, until seizure stops or a maximum dose of 4 grams have been given.

---

**METOPROLOL** EMT-I, EMT-P  
*(Lopressor)*  
*Medical Command only for STEMI*

**INDICATIONS**  
Used for hypertension, acute MI, adult v-fib, pulseless wide complex tachycardia

**CONTRAINDICATIONS**  
Shock, 2nd or 3rd degree AV heart block, sinus bradycardia, CHF, bronchial asthma

**EFFECTS**  
B1-blocker

**SIDE EFFECTS**  
Hypotension, dysrhythmias, CHF, N/V, CNS changes

**HOW SUPPLIED**  
5 mg in 5 mL ampules

**QUANTITY**  
3

**DOSAGE & ROUTE**  
5 mg IV once over 2 minutes, may repeat every 10 minutes to a max of 15 mg to achieve ventricular rate of 120 or less
METHYLprednisolone  EMT-E, EMTI, EMT-P, Park Medic
(Solu-Medrol)

INDICATIONS
Used for anaphylaxis, severe allergic reaction and asthma/COPD

CONTRAINDICATIONS
None in anaphylaxis; premature infants; pregnancy

EFFECTS
Anti-inflammatory, natural glucocorticoid

SIDE EFFECTS
CHF, HTN, N/V

HOW SUPPLIED  125 mg/ 2 mL
QUANTITY  1

DOSAGE & ROUTE
125 mg IV over 1 minute
Pediatrics:  1mg /kg IV
10 kg child = 0.16 mL

MIDAZOLAM  EMT-I, EMT-P, Park Medic
(Versed)

INDICATIONS
Used for sedation and seizures

CONTRAINDICATIONS
Shock, acute narrow angle glaucoma

EFFECTS
CNS depressant, anticonvulsant and amnesic

SIDE EFFECTS
Respiratory depression, hypotension, decreased HR

HOW SUPPLIED  5mg/mL
QUANTITY  2

DOSAGE & ROUTE
Adult sedation: 2-5 mg IV; seizures 5 mg IM if no IV
Pediatric:
sedation: 0.1mg/kg IV, max 2 mg
seizures 0.1mg/kg IM
10 kg child = 0.2 mL
MORPHINE SULFATE  
EMT-I, EMT-P, Park Medic

INDICATIONS
Pulmonary edema; pain in AMI; & pain associated with identifiable injuries such as fractures, burns, etc.

CONTRAINDICATIONS
Hypotension; head injury

EFFECTS
CNS depressant; vasodilator; decreases venous return to heart; decreases pain

SIDE EFFECTS
Hypotension, bradycardia, respiratory depression, dizziness

HOW SUPPLIED  10 mg/1 mL

QUANTITY  2

DOSAGE & ROUTE
IV: 2-5 mg slow IV push every 5-10 min titrated to desired effect (max 15 mg)
IM: 5-10 mg
Pediatric: 0.1 mg/kg IV or IM
10 kg child = 0.1 mL

NALOXONE HCL  
(NARCAN)  
EMT-J, EMT-E, EMT-I, EMT-P, Park Medic

INDICATIONS
Suspected narcotic OD

CONTRAINDICATIONS
Intubated patients

EFFECTS
Reverses effects of narcotics

SIDE EFFECTS
Withdrawal syndrome

HOW SUPPLIED  4 mg/10 mL

QUANTITY  1

DOSAGE & ROUTE
up to 0.8 mg slow IV, IM, titrated to respirations. Repeat dose 1.6 mg.
Pediatric: 0.1 mg/kg IV, IO or IM up to 2 mg
10 kg child = 2.5 mL
**Nitroglycerine**

**EMT-J, EMT-E, EMT-I, EMT-P, Park Medic**

**Indications**
Chest pain of suspected cardiac origin; pulmonary edema;

**Contraindications**
Hypotension, trauma, ICH, use in consultation with Medical Control Physician with patients using Viagra, Levitra and Cialis or herbal equivalent, BP < 100 mmHg

**Effects**
Vasodilation

**Side Effects**
Headache, hypotension, and dizziness

**How Supplied**
0.4 mg (tablet), 1/150th grain

**Quantity**
1 bottle

**Dosage & Route**
1 tablet SL titrated to pain relief or normalization of BP

**Nitropaste**

**EMT-J, EMT-E, EMT-I, EMT-P, Park Medic**

**Indications**
Pulmonary edema; chest pain of suspected cardiac origin;

**Contraindications**
Hypotension, trauma, ICH, Use in consultation with Medical Control Physician with patients using Viagra, Levitra and Cialis, or herbal equivalents

**Effects**
Vasodilation

**Side Effects**
Hypotension, dizziness (wipe off if side effects occur)

**How Supplied**
1 inch of paste in prefilled packets

**Quantity**
2

**Dosage & Route**
1-2 inches topically
**Ondansetron**  
EMT-E, EMT-I, EMT-P  
(Zofran)

**INDICATIONS**  
Treatment and prevention of nausea and vomiting

**CONTRAINDICATIONS**  
Hypersensitivity

**EFFECTS**  
Antiemetic

**SIDE EFFECTS**  
Headache, malaise, bronchospasm, rare cardiac arrhythmia

**HOW SUPPLIED**  
4mg /2mL vials

**QUANTITY**  
2

**DOSAGE & ROUTE**  
4 mg IV, slow over 2-5 minutes, may repeat 4 mg IV in 20 minutes.  
Pediatric: 0.1 mg/kg up to 20 kg, for greater than 20 kg give adult dose  
10 kg child = 0.5 mL

**PROMETHAZINE**  
EMT-I, EMT-P, Park Medic  
(PHENERGAN)

**INDICATIONS**  
Nausea, vomiting

**CONTRAINDICATIONS**  
Acute asthma attack

**EFFECTS**  
Anti-emetic

**SIDE EFFECTS**  
Drowsiness, anxiety, euphoria, confusion, hypotension, tachycardia, increased secretions, wheezing, rash, nasal stuffiness, blurred vision

**HOW SUPPLIED**  
25 mg/ 1 mL

**QUANTITY**  
2

**DOSAGE & ROUTE**  
Adult: 12.5 – 25 mg IV, 25 mg IM  
Pediatric: 0.5 mg/kg IM  
10 kg child = 0.2 mL  
**must be diluted for IV administration**
**SODIUM BICARBONATE**  EMT-I, EMT-P 8.4%

**INDICATIONS**
Cardiac arrest only after prolonged anoxia, tricyclic antidepressant overdose, known acidosis

**CONTRAINDICATIONS**
Not to be given as initial drug therapy

**EFFECTS**
Increases pH

**SIDE EFFECTS**
Metabolic alkalosis, increased sodium

**HOW SUPPLIED**  50 mEq/50 mL

**QUANTITY**  2

**DOSAGE & ROUTE**
1 mEq/kg IV followed by 1/2 the initial dose every 10 min.  
**Pediatric:** 1 mEq/kg. Dilute 1:1 with IV fluid  
10 kg child = 10 mL plus 10 mL NS

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**VASOPRESSIN**  EMT-I, EMT-P  
(Pitressin)

**INDICATIONS**
Used in ventricular fibrillation, pulseless v-tach, asystole, PEA

**CONTRAINDICATIONS**
None in Cardiac Arrest

**EFFECTS**
Stimulates smooth muscle resulting in vasoconstriction

**SIDE EFFECTS**
None applicable in cardiac arrest

**HOW SUPPLIED**  20 unit/mL

**QUANTITY**  2

**DOSAGE & ROUTE**
40 units IV
Drug Dose Calculations

2 X age + 8 = approximate weight in kg

weight in pounds / 2.2 = weight in kg

\[
\text{Desired Dose (mg)} = \text{mL to administer}
\]
amount in 1 mL
Dopamine Drip

Establish primary IV line with 15 gtt set TKO
Draw up dopamine 200 mg into 10 mL syringe
Open 250 mL bag D5W
Clean medication addition port and inject dopamine
Label 250 mL bag with “medication added” label
Spike 250 mL bag with 60 gtt set and clear tubing of air
Clean medication port on primary line and connect 250 mL bag
Hang the 250 mL bag higher than your primary IV bag
Ensure primary line is TKO and open to the desired flow rate
Observe drip chamber to ensure dopamine is infusing

Mix 200 mg in 250 mL of D5W (800 mcg/mL) as above:

<table>
<thead>
<tr>
<th>Weight in kg</th>
<th>mcg/kg/min 2</th>
<th>mcg/kg/min 5</th>
<th>mcg/kg/min 10</th>
<th>mcg/kg/min 15</th>
<th>mcg/kg/min 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 kg</td>
<td>6</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>50 kg</td>
<td>8</td>
<td>18</td>
<td>38</td>
<td>56</td>
<td>76</td>
</tr>
<tr>
<td>60 kg</td>
<td>10</td>
<td>22</td>
<td>45</td>
<td>68</td>
<td>90</td>
</tr>
<tr>
<td>70 kg</td>
<td>10</td>
<td>26</td>
<td>52</td>
<td>78</td>
<td>104</td>
</tr>
<tr>
<td>80 kg</td>
<td>12</td>
<td>30</td>
<td>60</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>90 kg</td>
<td>14</td>
<td>34</td>
<td>68</td>
<td>102</td>
<td>136</td>
</tr>
<tr>
<td>100 kg</td>
<td>15</td>
<td>38</td>
<td>75</td>
<td>112</td>
<td>150</td>
</tr>
</tbody>
</table>

Mcg per minute (or mL per hour)
Epinephrine Drip

Establish primary IV line with 15 gtt set TKO
Draw up epinephrine 1mg
Open 250 mL bag D5W
Clean medication addition port and inject epinephrine
Label 250 mL bag with “medication added” label
Spike 250 mL bag with 60 gtt set and clear tubing of air
Clean medication port on primary line and connect 250 mL bag
Hang the 250 mL bag higher than your primary IV bag
Ensure primary line is KV
Open to the desired flow rate
Observe drip chamber to ensure epinephrine is infusing

Mix 1 mg epinephrine in 250 mL of D5W as above:

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>Drip Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mcg/min</td>
<td>15 drops/min</td>
</tr>
<tr>
<td>2 mcg/min</td>
<td>30 drops/min</td>
</tr>
<tr>
<td>3 mcg/min</td>
<td>60 drops/min</td>
</tr>
</tbody>
</table>

Amiodarone Drip
(Patients with a Pulse)

Establish primary IV line with 15 gtt set TKO
Draw up Amiodarone 150 mg into 3 mL syringe
Open 100 cc bag D5W
Clean medication addition port and inject amiodarone
Label 100 cc bag with “medication added” label
Spike 100 cc bag with 60 gtt set and clear tubing of air
Clean medication port on primary line and connect 100 cc bag
Hang the 100 cc bag higher than your primary IV bag
Ensure primary line is KVO
Open the 100 cc bag to run wide open over 10 minutes
Observe drip chamber to ensure amiodarone is infusing
<table>
<thead>
<tr>
<th>Medication</th>
<th>Medication</th>
<th>Neonate &lt;30</th>
<th>10 kg</th>
<th>20 kg</th>
<th>30 kg</th>
<th>40 kg</th>
<th>50 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenosine</td>
<td>0.1 mg/kg</td>
<td>0.33 mL</td>
<td>0.66 mL</td>
<td>1 mL</td>
<td>1.3 mL</td>
<td>1.7 mL</td>
<td></td>
</tr>
<tr>
<td>Amiodarone</td>
<td>5 mg/kg</td>
<td>1 mL</td>
<td>2 mL</td>
<td>3 mL</td>
<td>3 mL</td>
<td>3 mL</td>
<td></td>
</tr>
<tr>
<td>Atropine</td>
<td>0.02 mg/kg</td>
<td>2 mL</td>
<td>4 mL</td>
<td>4 mL</td>
<td>4 mL</td>
<td>4 mL</td>
<td></td>
</tr>
<tr>
<td>Calcium chloride</td>
<td>10 mg/kg</td>
<td>1 mL</td>
<td>2 mL</td>
<td>3 mL</td>
<td>4 mL</td>
<td>5 mL</td>
<td></td>
</tr>
<tr>
<td>Dextrose</td>
<td>0.5 mg/kg</td>
<td>20 mL D12.5%</td>
<td>20 mL D25%</td>
<td>40 mL D25%</td>
<td>30 mL D50%</td>
<td>40 mL D50%</td>
<td>50 mL D50%</td>
</tr>
<tr>
<td>Diazepam</td>
<td>0.1 mg/kg</td>
<td>0.2 mL</td>
<td>0.4 mL</td>
<td>0.6 mL</td>
<td>0.8 mL</td>
<td>1 mL</td>
<td></td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>1 mg/kg</td>
<td>0.2 mL</td>
<td>0.4 mL</td>
<td>0.6 mL</td>
<td>0.8 mL</td>
<td>1 mL</td>
<td></td>
</tr>
<tr>
<td>Epi 1:000</td>
<td>0.1 mg/kg</td>
<td>0.2 mL</td>
<td>0.1 mL</td>
<td>0.3 mL</td>
<td>0.3 mL</td>
<td>0.3 mL</td>
<td></td>
</tr>
<tr>
<td>Epi 1:10, 000</td>
<td>0.01 mg/kg</td>
<td>0.5 mL</td>
<td>1 mL</td>
<td>2 mL</td>
<td>3 mL</td>
<td>4 mL</td>
<td>5 mL</td>
</tr>
<tr>
<td>Glucagon</td>
<td>1 unit</td>
<td>1 mL</td>
<td>1 mL</td>
<td>1 mL</td>
<td>1 mL</td>
<td>1 mL</td>
<td>1 mL</td>
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<tr>
<td>Methylprednisolone</td>
<td>1 mg/kg</td>
<td>0.16 mL</td>
<td>0.32 mL</td>
<td>0.48 mL</td>
<td>0.64 mL</td>
<td>0.8 mL</td>
<td></td>
</tr>
<tr>
<td>Midazolam</td>
<td>0.1 mg/kg</td>
<td>0.2 mL</td>
<td>0.4 mL</td>
<td>0.6 mL</td>
<td>0.8 mL</td>
<td>1 mL</td>
<td></td>
</tr>
<tr>
<td>Morphine</td>
<td>0.1 mg/kg</td>
<td>0.1 mL</td>
<td>0.2 mL</td>
<td>0.3 mL</td>
<td>0.4 mL</td>
<td>0.5 mL</td>
<td></td>
</tr>
<tr>
<td>Naloxone</td>
<td>0.1 mg/kg</td>
<td>1.25 mL</td>
<td>2.5 mL</td>
<td>5 mL</td>
<td>5 mL</td>
<td>5 mL</td>
<td></td>
</tr>
<tr>
<td>Normal Saline</td>
<td>20 mL/kg</td>
<td>50 mL</td>
<td>100 mL</td>
<td>200 mL</td>
<td>300 mL</td>
<td>400 mL</td>
<td>500 mL</td>
</tr>
<tr>
<td>Ondansetron</td>
<td>0.1 mg/kg</td>
<td>0.5 mL</td>
<td>2 mL</td>
<td>2 mL</td>
<td>2 mL</td>
<td>2 mL</td>
<td></td>
</tr>
<tr>
<td>Sodium bicarb</td>
<td>1 mEq/kg</td>
<td>10 mL + 10 mL NS</td>
<td>20 mL + 20 mL NS</td>
<td>30 mL + 30 mL NS</td>
<td>40 mL + 40 mL NS</td>
<td>50 mL + 50 mL NS</td>
<td></td>
</tr>
</tbody>
</table>