NORTHWEST ARKANSAS REGIONAL EMS PROTOCOLS

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INTRODUCTORY STATEMENT

The following protocols, guidelines, and instructional material were developed as a collective effort by a group of dedicated, charitable, and knowledgeable paramedics, EMS educators, and Medical Directors of the EMS agencies of Northwest Arkansas. These individuals, who recognized a need for a “Standard of Excellence” voluntarily formed a regional Task Force which initiated, researched and reviewed the following algorithms and have chosen to implement them as guidelines and as a basis for the standard of care in our area.

This collaborative effort provides a dynamic document that is based on national and state standards of care to include but not limited to:

- Arkansas Department of Health
- American Heart Association—Advanced Cardiac Life Support
- American Academy of Pediatrics—Pediatric Advanced Life Support
- American College of Surgeons—Advanced Trauma Life Support
- American College of Surgeons
- National Association of Emergency Medical Technicians
- National EMS Scope of Practice and Instructional Guidelines
- American College of Emergency Physicians

This protocol booklet is meant to be reviewed continuously and updated as national, state and regional standards change and scientific research and literature support.

The purpose of the following algorithms is multifaceted. The primary purpose is to establish a foundation and a minimum standard of care for the pre-hospital care delivered in our area. The intent is to provide current, well-researched, and accepted standards with the ultimate goal of minimizing the morbidity and mortality of our patients and to provide guidelines for the treatment of specific emergency conditions in the pre-hospital setting. This is best served by active EMS Medical Directors and dedicated Paramedics/EMT’s supported by continued education, review and quality improvement, and continuous pursuit of excellence.

Although no document can specifically address every possible variation of injury or disease, this manual provides a foundation for the acute care of the patients we serve. The education, experience, and judgment of the pre-hospital provider should be recognized as the paramount part of sound clinical decision-making processes regarding pre-hospital care. The complexity of emergency medicine and the pre-hospital setting require a team-approach use of every appropriate, accepted, and available resource to provide optimal patient care. In many cases, that resource is On-line Medical Control for consultation, advice, guidance, and authorization or modification for treatment not specifically addressed in this manual. The specifics of this requirement are to be determined by the Medical Director responsible for that particular EMS service and the paramedics they oversee, and is intentionally not addressed in this manual, for that reason.

The departmental policies are the responsibility of that individual agency and Medical Director due to the specifics of that EMS agency, but are encouraged to support the premise of regional care and collective effort these guidelines were founded on.

The provision of emergency care does not, and should not, occur in isolation. It requires many individuals and organizations working together towards a common goal—optimizing our patient's clinical outcome. We hope that the efforts provided by this founding Task Force and the resultant work provides a basis for the future development of a regional EMS approach to the "Standard of Excellence" we strive for in the care of our patients and the people of Northwest Arkansas.
2017 REVISION PARTICIPANTS

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Leon Cheatham      OEMS
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Grant Wilson       NWACC
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Matt Perkins       BFD
Aaron Beauford     SFD
Kody Stewart       Pulse
James Hales        SFD
## Northwest Arkansas EMS
### Regional Protocol Participating Agencies

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Northwest Arkansas Regional EMS Protocols

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Use of this document or its contents as guidelines or protocols for non-participating EMS providers or services is prohibited without the written permission of the publisher.

Use of these protocols – Protocols in brackets with grey on the sides are Advanced Procedures Utilized by paramedics only.

Non Grey sides are skill sets for all levels of licensure:

All Levels of Licensure

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**Northwest Arkansas EMS**

2017 Revision

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**MEDICAL DIRECTOR**

**2017 - Revisions**

As Medical Director for: ________________________________

I have reviewed the Revised Northwest Regional Protocol Manual for 2017 and approve it for use. Portions that are not used or changed have been amended and my signature attached to that amendment page.

Signature:

___________________________    ______________

Date

2017 Revision i
NOTES:
- A patient care report (PCR) must be completed for every patient contact. Patient report must be left in ER prior to leaving ER—either short form or completed encounter form. If the short form is left, a regular report must be filed with hospital within 24 hours.
- Pediatric patient (for these protocols) are patients who are from birth to adolescent (puberty).
- The initial assessment must be appropriate to patient’s condition, mechanism of injury and severity of illness.
- Vascular access utilizing IO should only be considered after attempting a peripheral/AC IV or no visible veins on a seriously or critically ill patient.
- If hazardous conditions are present (such as swift water, hazardous materials, electrical hazard, or confined space) contact an appropriate agency before approaching the patient. Wait for the designated specialist to secure the scene and patient as necessary.
- Reassess the patient frequently.
- Cardiac monitor and pulse oximetry is recommended on all cardiac, respiratory and serious trauma patients, and as appropriate for other patients.
- This protocol should be used as the approach to all situations.
Chemical Exposure (HAZMAT)

History
- Identity of substance
- Type of exposure (ingestion, inhalation, contact)
- Length of exposure
- Quantity of exposure/size of incident
- Number of patients
- S/S of responders, others exposed
- Past medical history
- Other Trauma
- Fire Department HAZMAT response
- Decontamination?

Signs and Symptoms
- Burns, pain, swelling
- Eye irritation (burning, tearing, redness)
- Dyspnea
- CNS effects (headache, dizziness, altered mental status, seizure, coma)
- Cardiac dysrhythmia
- Nausea/Vomiting

Differential
- Trauma
- Thermal burns
- Cardiac
- Respiratory (asthma)
- Other medical (history)
- Anxiety (hyperventilation)
- Psychological
- Overdose/Poisoning

Notes:
- 1st arriving units must perform a risk assessment. Situations involving gases and vapors noticeably effecting victims, bystanders and responders require SCBA minimum to remove patients from the area.
- The act of removing patients from the exposure area reduces exposure to the patient and caregiver substantially. Do not treat patients in the hazard area.
- Emergency decontamination will reduce the risk still further and eliminate almost all risk to the caregiver. Emergency Decontamination is the most important treatment when the chemicals are causing the symptoms.
- Exam: ABCs, vital signs, mental status, skin, HEENT, neck, heart, lungs, abdomen, back, extremities, neurological.
- Receiving hospitals must be notified early of chemical name(s), type of exposure, decontamination performed, and number of patients. Notify with the information you have and update as newer information is received.
- Medical control may order high dose atropine (2-5 mg) for Organophosphate poisoning.
- Reference the Emergency Response Guide (ERG)
CHEMICAL SEDATION FOR VIOLENT PATIENT

### History
- Drug Use
- Severe
- Anxiety
- Trauma
- Acidosis
- Overdose
- Diabetes
- Hypoxia
- Epilepsy
- Uremia
- Psychiatric
- Poisoning
- Stroke
- Shock

### Signs and Symptoms
- Elevated HR
- Uncontrolled Rage
- Disorientation

### Differential
- Head Injury
- Hypoxia
- Tumor
- Hypo/hyper glycemic
- Electrolyte imbalance
- Hypertensive Crisis

### Universal Patient Care Protocol

1. **Determine Cause of Altered LOC if Possible**
2. **Is the Patient using physical force with the intent to harm one’s self or another person?**
   - Yes
     - Can Police restrain Pt for a reasonable period of time?
       - Yes
         - Select one of the medications and use until maxed out on dosage, if no success, contact medical control for possible additional drug
       - No
         - Retreat and stage
   - No
     - Consider reducing amount of medication initially for patients who are elderly, pediatric, or have co-morbidity

### Medications
- Haldol
- Or
- Geodon/Ziprasidone
- Or
- Midazolam
- Or
- Ketamine

### NOTES:
- **Definition of VIOLENT PATIENT**: Any patient using physical force with the intent to harm one’s self or another person.
- **Definition of EXCITED DELIRIUM**: Combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent/ bizarre behavior, insensitivity to pain, hyperthermia, and increased strength. Can be a result of cocaine, crack cocaine, methamphetamine, amphetamines, and other stimulant agents.
- IV access should be accomplished prior to chemical sedation whenever possible. If not possible due to safety concerns, obtain as soon as possible after chemical sedation.
- Consider physically restraining the patient after chemical sedation.
- Constantly reassess any chemically or physically restrained patient for asphyxiation. Do NOT transport face down.
- ETCO2 monitoring for any sedated patient if available.
- Avoid the use of Ketamine with patients who have a psychiatric history. Contact Medical control prior to administration of Ketamine for these patients.
PAIN MANAGEMENT

History
- Age
- Location
- Duration
- Severity on 1-10 Scale
- Past Medical History
- Medications
- Drug Allergies

Signs and Symptoms
- Severity
- Quality
- Radiation
- Relation to Respiration
- Increased with Palpation

Differential
- Per the Specific Protocol

NOTES:
- Use of Pulse Oximetry and/or capnography should be considered when using pain medication
- Use of a Benzodiazepine may be indicated for cocaine and or meth overdose with Chest pain.
- Exam: Mental status, area of pain, neuro, vital signs – these should be assessed prior to administration of any pain medication.
- Cardiac related pain is usually treated with MS, if the patient has a right sided Infarct – Fentanyl is the drug of choice.
- If B/P is below normal, Ketamine or Fentanyl are the preferred medication for pain control.
- Contraindications to Morphine include decreased LOC, hypotension, head injury, severe COPD, depressed respiratory drive.
- For patients allergic to Morphine, use Ketamine or Fentanyl.
- Vital signs should be obtained before and after and at disposition with all pain medication.
- Document all drug allergies before administering pain medications.
- Toradol (Ketorolac Tromethamin) has been shown to be effective when used for kidney stone pain and migraine pain.

Universal Patient Care Protocol

Acute Coronary Syndrome with Chest Pain
- Morphine Sulfate for persistent ACS chest pain following NTG therapy if SBP > 90 mmHg

Pain Related to IO Use
- Lidocaine - administer slowly prior to IO bolus or flush on alert/conscious patient

General/Other Pain
- Refer to specific protocol

Fentanyl and/or Morphine and/or Ketamine
- May Consider Adding

Benzodiazepine - (Diazepam, Midazolam)
- B/P based (max dose is pressure based)

Reassess & Monitor

Contact Medical Control

2017 Revision
### Regional Protocol

**Medication – Protocol**

**Regional Protocol**

**Medication – Protocol**

### SPINAL RESTRICTION

#### History
- Mechanism of Injury
- Unknown history with unresponsiveness

#### Signs and Symptoms
- Neck pain, back pain
- Tenderness, crepitus, or deformity on palpation of spine
- Numbness, tingling-parasthesia
- Limited range of motion

#### Differential
- Muscular-lateral neck or back pain

---

#### Spinal Restriction:

If the patient is ambulatory, place an appropriately sized C Collar & Position the patient directly on the Cot in the position of comfort, limiting movement of the spine during the process. Utilize the cot securing straps/system to secure patient.

Supine/Prone Patients should be moved to the cot utilizing an appropriate device. Patients who are stable, alert and without neurological deficits who are sitting or standing may be allowed to self-extricate to the ambulance cot after placement of a cervical collar - limit movement of the spine during the process.

If a Long Spine Board or Scoop Stretcher, etc. is used for extrication or patient movement, the patient should be taken off the device (if time allows) & Placed directly on the EMS Cot using an appropriate technique that minimizes movement of the spine.

---

### NOTES:
- Refer to Safety Equipment Removal Guidelines if patient is wearing Safety gear
- If Patient’s condition may be worsened by spinal restriction, then spinal restriction may not be prudent for that patient.
- The decision to NOT implement spinal restriction in a patient is the responsibility of the EMS provider; if there is concern, perform spinal restriction.
- The decision not to apply spinal restriction should be thoroughly documented on the patient care report.
- Patient’s range of motion should not be assisted. The patient should touch their chin to chest, extend their neck (look up) and turn their head from side to side (shoulder to shoulder) without pain.
- Major injuries which may distract a patient’s awareness to pain include pelvic fracture, femur fracture, extensive burns or soft tissue injury, acute abdomen, or significant chest injury.
- Proper restraints on the EMS cot should be adhered to for all spinal injured patients. Use padding when necessary to limit movement.
- Consider leaving children in their car seats unless they need immediate treatment or the car seat is damaged. Remove seriously injured children from the child seat, or if it is potentially damaged in the crash. Seriously injured children may require spinal restriction.

---

**SPINAL RESTRICTION**
Notes:
- When performing I.O.-Proximal Humeral or Tibial Placement may be used.
- When performing I.O.-Large Adult needle is necessary for Proximal Humeral placement
- In cases of severe illness or injury requiring immediate fluid or drug administration, an IO may be considered prior to peripheral IV attempts if IV assess is unlikely or impossible
- Consider pain management for conscious patients receiving IO placement.
- In post-mastectomy patients, avoid IV, blood draw, or injection in arm on affected side.
- In the setting of cardiac arrest, any preexisting dialysis shunt may be used but should otherwise be avoided.
- Lower extremity IV sites are discouraged in patients with vascular disease or diabetes.
- Any venous catheter which has already been accessed prior to EMS arrival may be considered.
- Proximal humeral IO placement results in better circulation of medications, especially during cardiac arrest.
OXYGEN ADMINISTRATION AND TITRATION

History
- COPD
- Asthma
- Emphysema
- Trauma
- Obstruction

Signs and Symptoms
- Poor perfusion
- Low O2 Saturation
- Inadequate Ventilation
- Skin color changes
- LOC changes

Differential
- Chronic Disease
- Physical obstruction
- Shock
- Drug Overdose
- CO Poisoning

Indications:
- The overall goal of oxygen therapy is to avoid tissue hypoxia
- The most common indications for oxygen saturation in the acute setting are the presence of arterial hypoxemia or a failure of the oxygen-hemoglobin transport system
- Arterial hypoxemia is defined as an oxygen saturation of less than 88% and may result from impaired gas exchange in the lung, inadequate alveolar ventilation or a shunt that allows venous blood into the arterial circulation
- A failure of the oxygen-hemoglobin transport system can result from a reduced oxygen carrying capacity in the blood (e.g., Anemia, carbon monoxide poisoning) or reduced tissue perfusion (e.g., Shock)
- If accuracy of Pulse ox is suspected and hypoxia is suspected, or in doubt – administer oxygen

Continue with 100% O2 in any patient with suspected carrying capacity:
- Known or expected anemia (i.e., Trauma, GI Bleed, etc)
- Presence of Toxin such as Carbon monoxide, Methemoglobin, or cyanide. (Note Paraquat poisoning is a contraindication to oxygen unless below 88%)

COPD?, ASThma?, or Chronic neuromuscular disease with difficult Breathing?

Yes

Titrated O2 target range of 88 – 92% in patients with exacerbation of COPD, Asthma and Chronic neuromuscular disease with difficulty breathing.

No

No supplemental O2 is recommended for cardiac and CVA patients with SpO2 ≥ 94%. If O2 is required to achieve SpO2 ≥ 94% titrate to ≤ 99%

Notes:
- Hyperoxia resulting from high FiO2 administration producing saturations higher than 94-96% (or PaO2 > 100) in acute conditions can cause structural damage to the lungs, as well as potentially cause increases in free radicals and post reperfusion tissue damage. In addition, patients who are chronically hypoxic (COPD, ALS, MS etc.) have shifted their oxygen dissociation curve and require lower oxygen saturations.
- With prolonged oxygen therapy there is an increase in blood oxygen level, which may suppress peripheral chemoreceptors, depress ventilation/perfusion balance (V/Q) and cause an increase in dead space to tidal volume ratio and increase in PCO2.

OXYGEN ADMINISTRATION AND TITRATION
GENERAL AIRWAY MANAGEMENT

### General Information

**History**
- Trauma
- Head Injury
- CVA
- Asthma
- COPD
- Known difficult airway
- Facial fractures
- Pulmonary edema
- Respiratory Distress

**Signs and Symptoms**
- Hoarseness
- Limited neck movement
- Limited mouth opening
- Short thyromental distance
- Short heavy neck
- Receding mandible/overbite
- Large swollen tongue
- Obesity
- Long incisors

**Differential**
- LOC
- Airway injury
- Airway swelling
- Burns
- Foreign body
- Epiglottitis

---

**Flowchart Diagram**

1. **Universal Patient Care Protocol**
   - **Airway, Ventilation, and Level of Consciousness Adequate**
     - Yes: **Oxygen Administration and Titration Protocol**
     - No: **Manual Airway Maneuver, OPA, NPA and/or Bag-Valve-Mask Ventilation, Suction CO2 Monitoring (if available)**

2. **Airway Obstructed?**
   - Yes: **AHA BLS Guidelines for Foreign Body Airway Obstruction**
   - No: **Need for Advanced Airway Procedures**

3. **Need for Advanced Airway Procedures?**
   - Yes: **Proceed to Advanced Airway Management Protocol**
   - No: **Oxygen Administration and Titration Protocol**

---

**NOTES:**
- Keep it simple – use progressively invasive maneuvers only as necessary
- Pulse Oximetry & Capnography should be used for all airway/ventilation problems
- Maintain spinal precautions, neutral alignment when trauma suspected
- Only use hyperventilation for head injuries when signs of herniation are present:
  - Decerebrate posturing or flaccidity
  - Pupils asymmetrical or fixed and dilated
  - Initial GCS is less than 8 and there is a drop of 2 or more during your care
## Advanced Airway Management

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Injury</td>
<td>Hoarseness</td>
<td>LOC</td>
</tr>
<tr>
<td>Asthma</td>
<td>Limited Neck Movement</td>
<td>Airway Injury</td>
</tr>
<tr>
<td>COPD</td>
<td>Limited Mouth Opening</td>
<td>Airway Swelling</td>
</tr>
<tr>
<td>Known Difficult Airways</td>
<td>Short Thyromental Distance</td>
<td>Burns</td>
</tr>
<tr>
<td>Facial Fractures</td>
<td>Short Heavy Neck</td>
<td>Foreign Body</td>
</tr>
<tr>
<td>Pulmonary Edema</td>
<td>Receding Mandible/Overbite</td>
<td>Epiglottitis</td>
</tr>
<tr>
<td>Respiratory Distress</td>
<td>Obesity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long Incisors</td>
<td></td>
</tr>
</tbody>
</table>

### Signs and Symptoms
- Hoarseness
- Limited Neck Movement
- Limited Mouth Opening
- Short Thyromental Distance
- Short Heavy Neck
- Receding Mandible/Overbite
- Obesity
- Long Incisors

### Differential
- LOC
- Airway Injury
- Airway Swelling
- Burns
- Foreign Body
- Epiglottitis

### Notes:
- Document ET or Supraglottic Tube Placement at transfer of patient.
- Keep it simple – Use progressively invasive maneuvers only when necessary.
- Clinical End Tidal CO2 monitoring should be used with all advanced airways.
- Pulse Oximetry is used for all airway/ventilation problems…when circulation allows and maintained above 90% at all times.
- Maintain spinal precautions, neutral alignment when trauma is suspected.
- Once ET or Supraglottic tube is placed and confirmed apply cervical collar and maintain C spine immobilization to prevent displacement.
- Only use hyperventilation for head injury when signs of herniation are present. (Pupils unequal, decerebrate or decorticate posturing, flaccidity.)

---

**ADVANCED AIRWAY MANAGEMENT**

**2017 Revision**
Indications
- Altered mental status where loss of airway is inevitable
- Airway compromise is a real possibility before or during transport
- Breathing is not adequate and likely require intubation during transport
- Patients with trauma injuries not able to protect their airway
- Multi System trauma affecting adequacy of ventilations
- Inability to maintain O2 Sat. of >90% with BVM and NPA/OPA

!!!!! CONTRA-INDICATIONS !!!!!!!!
- (PAI) is not approved in patients < 8 YO in Arkansas
- Do NOT attempt (PAI) if Cricothyrotomy would NOT be possible in the case of a failed (PAI) Attempt
- Do not attempt (PAI) if ventilations and intubation would be difficult or impossible such as Epiglottis or partial airway obstruction

Start Here For Crash Airway
Induction Phase Immediately Prior to Laryngoscopy

YES
Ketamine
Contra-indicated if Hypertensive

NO

Succinylcholine
Time of onset may be up to 30 sec.

YES
Apneic Oxygenation
Increase NC O2 to 10-15 lpm
[End Nasal Cannula; Maintain until Intubation has been confirmed]

NO

YES
Apneic Oxygenation
(Preparation)
[Apply Nasal Cannula; End Tidal CO2 at 6 lpm]

NO

YES
End Tidal CO2 at 6 lpm

NO

Does mild Shock or Hypotension exist?

YES

NO

PRE-OXYGENATION PHASE
(100% Oxygen)
(3 – 5 Minutes) Prior to Laryngoscopy

YES

NO

IF Succinylcholine Is Contra-Indicated
Use Medical Director Approved Non-Depolarizing Paralytic

YES

NO

Orotracheal Intubation

YES

NO

Post Intubation Management

YES

NO

Midazolam
Titrated to effect or Systolic BP of >90

YES

NO

Rocuronium
Time of onset may be up to 1 min.

YES

NO

PHARMACOLOGICAL ASSISTED INTUBATION (PAI)

NOTES:
- SPO2 will be maintained above 90% at all times.
- Capnography Must be established and monitored at all times before, during and post procedure
- Contra-Indications: Midazolam - Hypotension, or suspected shock.
- Contra-Indications: Ketamine - Hypertension, status seizure activity or PMH of epilepsy
- Ketamine – May be used for continued sedation in the post intubation management phase for the hypotensive patient when Midazolam is contra-Indicated.
- Use Caution when administering Midazolam at 0.2 mg/kg, strong likelihood of adverse effects on BP in people who are elderly, debilitated, or critically ill
- Succinylcholine: Has a long list of Contra-Indications; See drug sheet for list of Contra-Indications.
- Unsuccessful Intubation Attempts:
  a. A secondary airway device will be attempted immediately (Supraglottic Airway).
  b. Ventilations will be maintained with a BVM in conjunction with an OPA/NPA as needed
  c. In the event a patient cannot be ventilated by ANY OTHER MEANS, perform a Surgical Cricothyrotomy (ONLY AS THE LAST RESORT)
- A PCR, ADH RSI (PAI) Form must be completed immediately following a (PAI) Procedure
- If absolutely needed Rocuronium may be repeated at the same dosage in the Post Management Phase only if extreme cases of inadequate paralysis are noted: (pulse rate, BP, Capnography Clefts, muscle twitches etc.)
- ONLY One instance of Systolic BP <90 mmHg or SpO2 <90% dramatically increases mortality in persons suffering from TBI
- If Rocuronium is unavailable use Medical Director Approved Non Depolarizing Paralytic
ALLERGIC REACTION—ANAPHYLAXIS

History
- Known allergic reaction to bites, stings, food, medications etc.
- Possible ingestion of or contact with allergin.

Signs and Symptoms
- Dyspnea, often with sneezing, wheezing, or coughing
- Facial swelling
- Urticaria
- Abdominal cramps
- Nausea, vomiting, diarrhea
- Tachycardia
- Falling blood pressure

Differential
- Asthma
- Pulmonary embolism
- History of ACE Inhibitor use – angioedema
- Capnography – determine if bronchospasm is present

NOTES:
- Consider Epinephrine IM, & diphenhydramine early in the allergic process, administration prior to histamine release will provide more rapid results. When signs of histamine release are noted, the process is well under way and will require aggressive treatment.
- Epinephrine has a short half-life and may require repeat doses.
- Closely monitor patients for rebound signs and symptoms. Any patients suffering from an allergic reaction should be evaluated by a physician.
**ASTHMA**

### History
- Asthma
- COPD: Emphysema, Bronchitis
- CHF: Congestive Heart Failure
- Home Oxygen use
- Home Nebulizer Use
- Medications: Steroids, Inhalation of: Possible Chemical or biological agents
- Exposure to chemical or biological agents

### Signs and symptoms
- Shortness of breath
- Purse-Lip breathing
- Accessory muscle use, retractions, nasal flaring, fatigue
- Inability to speak in sentences
- Audible Wheezing or rhonchi
- Fever, cough
- Cyanosis

### Differential
- COPD
- CHF, Pulmonary Edema
- Anaphylaxis
- Pneumonia
- Pulmonary Embolus
- Cardiac
- Hyperventilation
- Inhaled toxin
- DKA
- Pneumothorax

---

### Notes:
- If Asthma/COPD in severe distress, treatment may occur simultaneous with IV, EKG and 12-Lead. Consideration of Mag Sulfate in the updraft or IV as directed by Medical Control.
- Pulse Oximetry & Capnography should be monitored continuously for all patients with respiratory distress and/or respiratory failure.
- Remember: almost all cardiac problems produce some degree of respiratory distress.
- Patients with a history of asthma, who have had prior hospitalization for asthma, and/or present with initial $O_2$ saturations of <90% are at increased risk for rapid decline in spite of initial improvement with your treatments.
- A silent chest in the setting of severe respiratory distress is a pre-respiratory arrest sign.
- Consult Medical Control prior to administering epinephrine in patients who are >50 years of age, have a history of cardiac disease, or if the patient’s heart rate is $> 150$. Epinephrine may precipitate cardiac ischemia.
- Respiratory distress can be the result of metabolic acidosis from overdose and/or DKA, head injury, trauma.
### History
- Asthma
- COPD: Emphysema, Bronchitis
- CHF: Congestive Heart Failure
- Home Oxygen Use
- Medications: Inhaled Steroids
- Inhalation of: Possible Chemical or biological agents
- Exposure to chemical or biological agents

### Signs and Symptoms
- Shortness of Breath
- Pursed-Lip breathing
- Accessory muscle use, retractions, nasal flaring, fatigue
- Inability to speak in sentences
- Audible Wheezing or rhonchi
- Fever, Cough
- Cyanosis

### Differential
- Asthma
- CHF, Pulmonary Edema
- Anaphylaxis
- Pneumonia
- Pulmonary Embolus
- Cardiac
- Hyperventilation
- Inhaled Toxin
- DKA
- Pneumothorax

---

#### Universal Patient Care Protocol

#### Oxygen Administration Protocol

#### General Airway Management Protocol

#### 12-lead ECG
(As Soon As Possible - not to delay therapy)

#### Consider Bi-PAP if available

#### If wheezing is present, consider Bronchodilator Nebulized Tx. Ipratropium is preferred for COPD

#### Add Ipratropium Bromide to 1st or 2nd treatment

#### If ventilation efforts are not sufficient to deliver bronchodilators effectively, consider a brief period of placing the bronchodilator in line with CPAP/BIPAP. Careful attention to patient’s level of consciousness and ventilations must be maintained.

#### Consider Advanced Airway

---

**NOTES:**
- COPD patients in severe respiratory distress should have oxygen delivery titrated to a Pulse OX greater than or equal to 92%.
- If Asthma/COPD in severe distress, treatment may occur simultaneous with IV, EKG, and 12-lead. Consideration of Mag Sulfate in the updraft or IV as directed by Medical Control.
- Remember: almost all cardiac problems produce some degree of respiratory distress.
- A silent chest in the setting of severe respiratory distress is a pre-respiratory arrest sign.
- Respiratory distress can be the result of metabolic acidosis from overdose and/or DKA, head injury, trauma.
- Preferred: Pulse Oximetry & Capnography should be monitored continuously for all patients with respiratory distress and/or respiratory failure.
- NIVP- noninvasive Ventilation pressures – accomplished without intubation, preferably with BIPAP.
PULMONARY EDEMA

History
- Congestive heart failure
- Past medical history
- Medications (Digoxin, Lanoxin, Lasix)
- Viagra
- Cardiac history
- Prior MI

Signs and Symptoms
- Respiratory distress
- Bilateral Rales with lung sounds
- Jugular venous distension
- Dependent edema (pedal, ascites)
- Pink frothy sputum
- Apprehension, orthopnea
- Hepato-Jugular reflux
- 3rd & 4th heart sound murmurs

Differential
- MI
- Asthma
- Pulmonary Hypertension
- COPD, Cor Pulmonale
- Anaphylaxis
- Pleural Effusion, Pneumonia
- Pulmonary Embolus
- Drug Overdose, Toxic Exposure
- Cardiac Tamponade

Universal Patient Care Protocol

General Airway Management Protocol

Anxiety from CPAP?

Yes

Consider CPAP/BiPAP

Nitroglycerine

Morphine Sulfate

If Wheezing is present consider Albuterol

Consider Bag-Mask ventilation (awake positive pressure ventilation)

If BP > 100 Systolic?

Yes

Consider Nasal or Oral Intubation

If Wheezing is present consider Albuterol

Consider Cardiogenic Shock Dopamine

12 Lead EKG (as soon as possible, not to delay therapy)

If BP>100 mmHg Systolic, may repeat (or initiate) Nitroglycerine

If patient becomes fatigued with increased work of breathing secondary to hypoxia- go to Advanced Airway Protocol

Frequent Causes:
- Hypovolemia
- Hypoxia
- Hyper/hypokalemia
- Hypothermia
- Hypoglycemia
- Tablets/ID
- Tamponade
- Tension pneumothorax
- Thrombosis-coronary
- Thrombosis-pulmonary

PULMONARY EDEMA

NOTES:
- If CPAP treatment has begun, notify ER so they can obtain a CPAP/BiPAP to continue the CPAP/BiPAP treatment upon arrival.
- Caution with NTG if systolic BP < 120.
- Consider tachycardia as the cause of pulmonary edema (especially V-tach.) Treat the tachycardia.
- Use Nitroglycerin with caution if acute inferior myocardial infarction in progress.
- Consider Nitro Drip if available
- Furosemide may be considered for use in Pulmonary Edema. Follow AHA guidelines regarding use of Furosemide.
### Stridor (Upper Airway Obstruction)

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent Intubation</td>
<td>• Shortness of breath</td>
<td>• Epiglottitis, Croup</td>
</tr>
<tr>
<td>Respiratory syncytial virus (RSV)</td>
<td>• Tripod positioning</td>
<td>• CHF, Pulmonary Edema</td>
</tr>
<tr>
<td>Respiratory Failure</td>
<td>• Neck extended</td>
<td>• Anaphylaxis</td>
</tr>
<tr>
<td>Inhaled Toxins</td>
<td>• Drooling</td>
<td>• Pneumonia</td>
</tr>
<tr>
<td>Bronchiolitis Medications: Inhaled Steroids</td>
<td>• Barking cough</td>
<td>• Pulmonary embolus</td>
</tr>
<tr>
<td>Inhalation of: Possible Chemical or biological agents</td>
<td>• Inhaled Steroids</td>
<td>• Cardiac</td>
</tr>
<tr>
<td>Exposure to chemical or biological agents</td>
<td>• Accessory muscle use, retractions, nasal flaring, fatigue</td>
<td>• Hyperventilation</td>
</tr>
</tbody>
</table>

### Signs and Symptoms
- Shortness of breath
- Tripod positioning
- Neck extended
- Drooling
- Barking cough
- Pursed-lip breathing
- Accessory muscle use, retractions, nasal flaring, fatigue
- Inability to speak in sentences
- Audible stridor
- Cyanosis

### Differential
- Epiglottitis, Croup
- CHF, Pulmonary Edema
- Anaphylaxis
- Pneumonia
- Pulmonary embolus
- Cardiac
- Hyperventilation
- DKA
- Pneumothorax
- Asthma, COPD

---

**NOTES:**
- If heart rate increases greater than 20 beats per minute (bpm) while administering nebulized Racemic Epinephrine, or EPI 1:1000, then further dilute the treatment or stop administration.
- Use Humidified Oxygen
- Refrain from oropharynx manipulation

---

**STRIDOR (UPPER AIRWAY OBSTRUCTION)**
ACUTE CORONARY SYNDROMES

**History**
- Onset and Location of Pain
- Provocation
- Quality of Pain on 1-10 Scale
- Radiation
- Severity
- Relationship to Exertion and Breathing
- Previous Cardiac History
- Risk Factors

**Signs and Symptoms**
- Radiating Pain (Jaw Pain)
- Diaphoresis
- Dyspnea
- Palpitations
- Weakness
- Nausea or Vomiting
- Feeling of Impending Doom

**Differential**
- Pulmonary Problems
- Ulcers/GI Disorders
- Medications
- Anaphylaxis
- Recent Trauma
- Hyperventilation/Anxiety
- Dissecting Thoracic Aneurysm

---

**Universal Patient Care Protocol**

- ≤ 10 Minutes obtain Monitor & 12 EKG
- Obtain a 12 lead while proceeding with other treatment – Repeat 12 Lead Q 5 – 10 Minutes or at rhythm change
- See Bradycardia Protocol or Ventricular Tachycardia/ SVT Protocol as appropriate
- Rate Problem?
- Yes
- Aspirin
- No
- NTG
  - May repeat Q 3-5 minutes until pain is controlled or B/P drops below 90 Systolic
  - Pain Management: Morphine Sulfate Titrated to total of 20 mg
  - Contact Med Control if pain persists
- AMI Suspected?
- Yes
- If AMI is suspected in absence of ST elevation – consider 12 lead with V7 V8
- If AMI Inferior is suspected (II,III,aVF elevated or ST depression in V1 – V4)
  - Obtain a V4-R 12 Lead
- If STEMI or AMI is suspected – ASA and NTG within 5 minutes
  - If STEMI or AMI is suspected – ASA and NTG within 5 minutes
  - If Right sided MI is suspected – withhold SL NTG and titrate fluids to B/P & Lung Sounds

---

**Notes:**
- Consider a Nitroglycerin Drip if chest pain does not resolve with oral administration of NTG.
- Fentanyl should be considered first if B/P is marginal, allergies to Morphine, or if Morphine is not effective. Call medical control if you already administered Morphine and wish to administer Fentanyl.
- Use caution when administering NTG if B/P < 120 systolic, without venous access.
- Chest pain that has moved or migrated should raise suspicion of an aortic dissection.
### AUTOMATED DEFIBRILLATION / CPR

#### History
- Events Leading to Arrest
- Estimated Down Time / Last known well time
- Past Medical History
- Medications
- Existence of Terminal Illness

#### Signs and Symptoms
- Unresponsive
- Apneic
- Pulseless

#### Differential
- Medical Arrest
- Trauma Arrest
- DNR or Living Will
- Lividity, Rigor Mortis

---

Utilization of current:
American Heart Association standards when performing CPR and/or Using the automated defibrillator.

These change frequently and are not listed specifically here.

---

**NOTES:**
- Exam: ABCs, Vital Signs, Mental Status
- Remember: Cardiac arrest in kids is usually due to respiratory failure/arrest. Aggressive efforts should be made toward airway management and restoring circulation.
- Defibrillation should be done immediately if you witness the arrest, otherwise perform 2 minutes of CPR prior to defibrillation.
DEATH/WITHOLDING RESUSCITATION

Purpose:
The purpose of this protocol is to honor those who have obviously expired prior to EMS arrival and to honor the advanced directives of the patient as required by law.

Procedure:
CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid written “Do Not Resuscitate” order is present.
If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:
- Body decomposition
- Injuries incompatible with life or entrapment with prolonged extrication time, decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction
- Rigor mortis
- Dependent lividity
- *Extended downtime with asystole on the EKG
  * = must perform 4 lead ECG to verify asystole on the monitor looking in three leads minimum
If a bystander or EMR has initiated CPR or automatic defibrillation prior to paramedic arrival and any of the above criteria (signs of obvious death) are present, CPR and ALS therapy may be discontinued by the Paramedic.
Once resuscitation is initiated, continue resuscitation efforts until either:
- Resuscitation efforts meet the criteria for implementing the Termination of Resuscitation Protocol.
- Patient care responsibilities are transferred to another appropriate caregiver.
If doubt exists, or there is any question about the validity of a DNR order start resuscitation immediately. If there is a misunderstanding with family members or others present at the scene or if there are other concerns about following the DNR orders, contact the attending physician or medical control for guidance.
When a DNR order is present unless otherwise specifically restricted, care shall be administered to provide comfort or alleviate pain except those practices described as cardiopulmonary resuscitation. Depending on the needs of the patient this may include:
- Basic airway management (BLS) including suctioning
- Oxygen administration (including CPAP)
- Pain Management
- Trauma care
- Transport
- Family support

Do Not Resuscitate Form
A DNR Order executed properly requires EMS personnel to withhold or withdraw cardiopulmonary resuscitation to include intubation and advanced airway management, artificial ventilation, defibrillation, administration of cardiac resuscitation medications, and related procedures, from the patient in the event of a cardiac or respiratory arrest. The DNR Order form may be any document that includes the words “DNR”, “No Code” or similar language, the physician’s signature and the date. Copies of the original are acceptable. The form may be found (but is not limited to) the back door of the patient’s bedroom, the nightstand by the patient’s bed, the door of the refrigerator or the patient’s wallet. The patient, attending physician, or healthcare proxy may revoke the EMS/DNR order at any time. Document the presence of the DNR Order on the Patient Care Report. Include a copy of the DNR order with the PCR unless impracticable (ie single copy left with coroner)
DO NOT RESUSCITATE

INDICATION

An EMS/DNR Order form approved by the Department of Health executed properly requires EMS personnel to withhold or withdraw cardiopulmonary resuscitation to include intubation and advanced airway management, artificial ventilation, defibrillation, administration of cardiac resuscitation medications, and related procedures, from the patient in the event of a cardiac or respiratory arrest.

PROCEDURE

The EMS/DNR Order form must be a document as approved by the Arkansas Board of Health, or one created or used by a physician that include the words “DNR”, “No Code” or similar language, the physician’s signature and the date. Copies of the original are acceptable.

The form may be found (but is not limited to):
- The back of the door of the patient’s bedroom.
- The nightstand by the patient’s bed.
- The door of the refrigerator
- The patient’s wallet

Care shall be administered to provide comfort or alleviate pain except those practices described above as cardiopulmonary resuscitation. Depending on the needs of the patient this may include:
- Basic airway management (BLS) including suctioning
- Oxygen administration
- Pain Management
- Trauma care
- Transport
- Family support

If there is a misunderstanding with family members or others present at the scene or if there are other concerns about following the EMS/DNR orders, attempt to contact the attending physician or medical control for guidance. If there is any question about the validity of an EMS/DNR order, resuscitate while contacting medical control.

The patient, attending physician, or healthcare proxy may revoke the EMS/DNR order at any time.

Document the presence of the EMS/DNR Order on the Patient Care Report. Include a copy of the EMS/DNR order with the PCR unless impracticable (ie single copy left with coroner)

DO NOT RESUSCITATE
TERMINATION OF RESUSCITATION PROTOCOL

Unsuccessful Cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.

INDICATIONS

- Unsuccessful Cardiopulmonary resuscitation (CPR) and other advanced life support (ALS) interventions may be discontinued prior to transport or arrival at the hospital when this procedure is followed.
- The purpose of this protocol is to allow for the discontinuation of prehospital resuscitation after delivery of adequate and appropriate ALS therapy.
- ET CO$_2$ < 10 for 10 minutes of high quality CPR

PROCEDURE

1. The following criteria must be met before consulting Medical Control for discontinuation of prehospital resuscitation attempts:
   - Patient must be 18 years of age or older
   - Adequate CPR has been administered
   - Endotracheal intubation or other advanced airway has been successfully accomplished with adequate ventilation
   - Vascular access has been achieved
   - No evidence or suspicion of any of the following:
     - Drug/toxin overdose
     - Active internal bleeding
     - Hypothermia
   - Rhythm-appropriate medications and if indicated defibrillation have been administered according to protocol for a total of 3 cycles of drug therapy (epinephrine) without return of spontaneous circulation (palpable pulse)
   - All Paramedic personnel involved in patient care agree that discontinuation of the resuscitation is appropriate

2. If all of the above criteria are met and discontinuation of prehospital resuscitation is desired, Consult Medical Control
**ASYSTOLE**

### History
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Suspected hypothermia
- Suspected drug overdose
- DNR or Living Will
- Estimated down time

### Signs and Symptoms
- Pulseless
- Apneic
- No electrical activity on ECG

### Differential
- Medical or Trauma
- Hypoxia
- Potassium (Hypo / Hyper)
- Drug Overdose
- Acidosis
- Hypothermia
- Device (ECG Lead) error
- Death

### Universal Patient Care Protocol

1. **Criteria for Death/No Resuscitation?**
   - Yes → Withhold Resuscitation
   - No → CPR

2. **Does patient meet criteria for Termination of Resuscitation?**
   - Yes → Termination of Resuscitation Protocol
   - No → Continue Resuscitation: Reassess, CPR, and Repeat Medications

### Frequent Causes:
- Hypovolemia
- Hypoxia
- Hydrogen ion-acidosis
- Hyper-/Hypokalemia
- Hypothermia
- Hypoglycemia
- Tablets/OD
- Tamponade
- Tension pneumothorax
- Thrombosis-coronary
- Thrombosis-pulmonary

### NOTES:
- Exam: ABCs, Vital Signs, Mental Status.
- Always confirm Asystole in 3 or more leads.
- Efforts should be toward determining the cause of the arrest.
- Higher dose epinephrine may be indicated in presence of Beta Blocker or Calcium Channel Blocker Overdose or anaphylactic shock with cardiac arrest.

**ASYTOLE**
**BRADYCARDIA**

<table>
<thead>
<tr>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Past History of Bradycardia</td>
</tr>
<tr>
<td>• Medications: Beta Blockers, Clonidine, Calcium Channel Blockers, Digitalis</td>
</tr>
<tr>
<td>• Pacemaker</td>
</tr>
<tr>
<td>• Nausea and Vomiting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>• HR &lt; 60/min</td>
</tr>
<tr>
<td>• Chest Pain</td>
</tr>
<tr>
<td>• Respiratory Distress</td>
</tr>
<tr>
<td>• Acute Coronary Syndrome</td>
</tr>
<tr>
<td>• Hypotension</td>
</tr>
<tr>
<td>• Decreased LOC</td>
</tr>
<tr>
<td>• Weakness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>• AMI</td>
</tr>
<tr>
<td>• Hypoxia</td>
</tr>
<tr>
<td>• Hypothermia</td>
</tr>
<tr>
<td>• Stroke</td>
</tr>
<tr>
<td>• Head Injury</td>
</tr>
<tr>
<td>• Vasovagal</td>
</tr>
<tr>
<td>• Athletes</td>
</tr>
</tbody>
</table>

**Frequent Causes:**
- Hypovolemia
- Hypoxia
- Hydrogen ion - acidosis
- Hyper-Hypokalemia
- Hypothermia
- Hypoglycemia
- Tablets/OD
- Tamponade
- Tension pneumothorax
- Thrombosis-coronary
- Thrombosis-pulmonary

**NOTES:**
- Atropine is often ineffective for third-degree heart block or Mobitz type II second-degree heart block.
- Consider and treat causes of Bradycardia.
- Atropine should be used with caution in patients with suspected AMI.
- Attempting to increase the rate of an asymptomatic patient is contraindicated.
- Right ventricular infarction may present with bradycardia, consider fluid challenge in the absence of pulmonary edema.
- PVCs may occur if the rate falls below 30-40 beats/min. Do not treat PVCs in bradycardic arrhythmias.
- Versed 2.5 mg slow IV, max of 5 mg, may use as a sedative agent in conjunction with pain management for Pacing.
- Do not delay pacing in high degree AV block or critical patients presenting in bradycardia.
CARDIAC ARREST

**History**
- Events leading to cardiac arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Signs of lividity, or rigor mortis
- State DNR or Living Will

**Signs and Symptoms**
- Unresponsive
- Apneic, agonal
- Pulseless

**Differential**
- Medical vs. Trauma
- Ventricular Fibrillation, Pulseless Ventricular Tachycardia
- Asystole
- PEA

---

**NOTES:**
- CPR should not be interrupted, except under certain circumstances—endotracheal intubation, moving patient up or down stairs.
- If prolonged BLS prior to arrival consider NG/OG tube placement.
- In unwitnessed arrest—apply AED as soon as possible, and if shock indicated, deliver 1 shock without delay. If un-witnessed, perform 2 minutes of CPR prior to defibrillation.
- Ketamine may be used for Post Resuscitation ssedation if to maintain intubated patient if Versed is contraindicated
- Cardiopulmonary resuscitation may be discontinued. See Termination of Resuscitation Protocol.
- If cardiac arrest associated with exsanguination (trauma, dissecting aortic aneurysm) initiate 2 large bore IVs of Normal Saline as per Hypovolemia protocol.
- If diabetic condition suspected, check blood glucose. If overdose suspected, administer Narcan and proceed to the appropriate Protocol.
- Be aware of any appropriate DNR, call medical control if you are uncertain on how to proceed.
- Use of Mechanical CPR device is appropriate and should be used if available if patient meets criteria for it's use.
**POST RESUSCITATION**

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac Arrest</td>
<td>Return of Pulse</td>
<td>Continue to address specific differentials associated with original dysrhythmia</td>
</tr>
<tr>
<td>Respiratory Arrest</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OTES:**
- A 12 lead EKG should be obtained as soon as possible to determine the presence of an acute coronary syndrome.
- ETT and/or alternate airway device should not be removed unless Medical Control is contacted.
- Versed may be used for sedation in order to maintain a controlled airway.
- Narrow Complex Tachycardia in the post resuscitation phase may be due to Epinephrine and/or Atropine therapy and usually does not require treatment-monitor BP.
- Consider NG/OG tube placement for gastric decompression.
- Place second IV if possible.
- Consider temperature regulation; allow mild hypothermia and treat hyperthermia.
### PULSELESS ELECTRICAL ACTIVITY

#### History
- Events leading up to arrest
- Estimated down time
- Past medical history/medications
- Renal failure/dialysis
- DNR
- Hypothermia
- Suspected Overdose (digitalis, tricyclics, Beta-blockers, Calcium channel blockers)

#### Signs and Symptoms
- Unresponsive, Apneic, pulseless with organized electrical activity

#### Differential
- Medical vs. Trauma etiology
- Hypovolemia (Trauma, AAA, GI)
- Hypothermia
- Drug Overdose
- Massive Myocardial Infarction
- Hypoxia
- Tension Pneumothorax
- Pulmonary Embolism
- Acidosis
- Hyperkalemia

---

#### NOTES:
- Hypoxia is the most common cause of reversible PEA
- Use Atropine for Vagal stimulation in Cardiac Arrest to increase heart rate.
- For trauma patients determine the underlying cause of arrest and provide definitive treatment i.e. fluid resuscitation, pleural decompression.
- Reassess ETT placement frequently, i.e. after every patient move, change in patient condition.
- For hypothermic patients pharmacologic treatment may not be effective until patient is warmed, see Hypothermia Protocol.
SUPRAVENTRICULAR TACHYCARDIA

**History**
- Medications (Aminophylline, decongestants, thyroid supplements, diet pills, Digoxin)
- Diet
- Illicit drugs (methamphetamine, cocaine, stimulants)
- Past Medical History
- History of Palpitations/heart racing
- Syncope
- Near Drowning

**Signs and Symptoms**
- HR >150/min
- QRS <0.12 sec
- Dizziness, chest pain, shortness of breath
- Potential presenting rhythm
  - Sinus Tachycardia
  - Atrial Fibrillation/ Flutter
  - Multifocal Atrial Tachycardia

**Differential**
- Heart Disease (WPW, Valvular)
- Sick Sinus Syndrome
- Myocardial Infarction
- Electrolyte Imbalance
- Exertion, Pain, Emotional Stress, Fever
- Hypoxia
- Hypovolemia or anemia
- Drug Effect/ Overdose
- Hyperthyroidism
- Pulmonary Edema
- Sinus Tach

**NOTES:**
- Establish rapid heart rate as cause of signs and symptoms.
- If Wolfs Parkinsons White (WPW) is suspected – do not administer Adenosine or Calcium Channel Blockers
- Note/record EKG changes during Vagal maneuvers and Adenosine administration.
- Prior to cardioversion of Atrial Fib or Atrial Flutter consider the duration of the dysrhythmia and the potential for embolic complications.
- Promptly cardiovert hemodynamically unstable—the more unstable the patient, the more urgent the need for cardioversion.
- Monitor for respiratory depression and hypotension associated with sedation medication.
- Document all rhythm changes and therapeutic interventions with EKG strips.
- Adenosine 3 mg if patient is taking diprydamole or Cobalasine
- Adenosine may be useful in determining if underlying rhythm is Atrial fib/flutter.
### VENTRICULAR FIBRILLATION

#### History
- Estimated down time
- Past medical history/medications
- Events leading to arrest
- Renal failure/dialysis
- DNR
- Hypothermia
- Electrocution

#### Signs and Symptoms
- Unresponsive, Apneic, pulseless

#### Differential
- Medical vs. Trauma etiology
- Artifact
- Asystole
- Device failure

---

### Universal Patient Care Protocol

**Withhold Resuscitation**

CPR until defibrillator available.

**Criteria for Death/No Resuscitation?**

- **Yes**: Withhold Resuscitation
- **No**: CPR until defibrillator available.

**Defibrillation per manufacturers recommendation**

- Then Proceed directly to 2 minutes of CPR

- **Epinephrine**

**Perform 2 minutes of CPR then evaluate rhythm**

- Do this after each shock

**If V-Fib or Pulsless V-Tach is present**

- Resume attempt to defibrillate – one shock.

**Amiodarone, consider repeating at after 3-5 minutes**

**If V-Fib or Pulsless V-Tach if present**

- Resume attempt to defibrillate – one shock.

**Consider Sodium Bicarbonate**

**Consider Magnesium Sulfate**

**Continue Resuscitation**

---

**NOTES:**

- Left Ventricular Assist Device (LVAD) patients may not have a palpable pulse – this does not indicate that perfusion is compromised, check color and LOC. See guideline section for further details on LVAD.
- Reassess ETT placement frequently, i.e. after every patient move, change in patient condition.
- If defibrillation is successful and patient rearrests, return to previously successful Joule setting.
- Defibrillation takes precedence over all treatment once the defibrillator is available.
- For hypothermic patients defibrillation may not be effective, see Hypothermia Protocol.
- Spinal restriction protocol for electrocution patients.
- For trauma patients determine the underlying cause of arrest and provide definitive treatment i.e. fluid resuscitation, pleural decompression.
- If patient successfully converted with Automatic Implantable Cardiac Defibrillator (AICD), consider antiarrhythmic therapy, contact Medical Control.
- Magnesium Sulfate for V-fib refractory to above treatments, for digoxin toxicity, and for Torsades.
- If patient converts with Amiodarone, consider infusion.
- Wide Complex of uncertain type? Regular? – Adenosine may be indicated prior to Amiodarone or Lidocaine administration.
- If Amiodarone is contraindicated – Lidocaine may be used.
VENTRICULAR TACHYCARDIA

**History**
- Prior cardiac history

**Signs and Symptoms**
- Heart rate typically > 150/min
- Wide Complex

**Differential**
- Aberrantly conducted SVT

**Frequent Causes:**
- Hypovolemia
- Hypoxia
- Hypo/hyperkalemia
- Hypothermia
- Hypoglycemia
- Tamponade
- Tension pneumothorax
- Torsades-de-pointes
- Thrombosis-coronary
- Thrombosis-pulmonary

**NOTES:**
- Polymorphic: more than one origin (shape); Monomorphic: one origin (shape.)
- 90% of wide complex tachycardias are V-Tach.
- Irregular wide complex tachycardia may be Atrial Fibrillation with WPW
- Look for dissociated P waves on EKG.
- Medications may be given simultaneously with cardioversion. **Promptly cardiovert for hemodynamic instability!**
- Check medications already on board—do not mix medications that prolong the QT interval.
- If origin of wide complex tachycardia is unclear: Adenosine, Cardioversion and/or Amiodarone are indicated.
- Do not mix the use of antiarrhythmic medications.
- May go directly to synchronized cardioversion as in unstable. Check for V-Tach clues and/or 12 lead
- If stable V-Tach does not respond to the first antiarrhythmic agent, Cardiovert as Unstable V-Tach.
- If defibrillator does not fire while in the Synchronizer mode, turn off Synchronizer and defibrillate
- Do not administer Calcium Channel Blockers for V Tach or suspected V Tach or unknown wide complex tachycardia
- If Amiodarone is contraindicated – Lidocaine may be used

**Universal Patient Care Protocol**

1. **12 Lead EKG**
   - No
     - See V-Fib Protocol
   - Yes
     - **Check Pulse**
     - Yes: Consider Precordial Thump or cough (if witnessed)
     - No: Hemodynamically Unstable: Pulmonary Edema or Decreased LOC

2. **Monomorphic Wide Complex Tachycardia Ventricular Tachycardia**
   - Adenosine
   - Amiodarone, repeat PRN Q 10 minutes. If effective start infusion.
   - Cardiovert if Unstable V-Tach

3. **One dose of antiarrhythmic may be tried**
   - Cardiovert @ 100,200,300,360 Joules Monophasic or Biphasic equivalent
   - Note: Consider Sedation

4. **Stop or avoid all meds that prolong the QT interval: i.e. Amiodarone, Procainamide**
   - Magnesium IV
   - Un synchronous Cardiovert as in Unstable V-Tach @ 200J
   - Consider External overdrive pacing

**Frequent Causes:**
- Hypovolemia
- Hypoxia
- Hydrogen ion-acidosis
- Hyper-Hypokalemia
- Hypothermia
- Hypoglycemia
- Tablets/CO
- Tamponade
- Tension pneumothorax
- Torsades-de-pointes
- Thrombosis-coronary
- Thrombosis-pulmonary

**If Amiodarone is contraindicated – Lidocaine may be used**
ABDOMINAL PAIN

History
- Age
- Past medical, surgical history
- Medications
- Onset of pain
- Provokes: Improvement or worsening with food or activity
- Quality of character of pain: cramp, constant, sharp, dull, etc.
- Radiation of pain
- Time/duration of pain (constant, intermittent)
- Fever
- Time of last meal
- Last bowel movement/emesis
- Menstrual history (pregnancy)

Signs and Symptoms
- Pain (location/migration)
- Tenderness (palpation)
- Nausea/Vomiting
- Constipation
- Vaginal bleeding/discharge
- Pregnancy
- Associated symptoms: Fever, headache, weakness, malaise, myalgias, cough, mental status changes, rash

Differential
- Pneumonia
- Liver (hepatitis, CHF)
- Peptic Ulcer Disease/Gastritis
- Gallbladder
- Myocardial Infarction
- Pancreatitis
- Kidney Stone
- Abdominal Aneurysm
- Appendicitis
- Bladder/Prostate Disorder
- Pelvic (PID, Ectopic Pregnancy, Ovarian Cyst)
- Spleen Enlargement
- Diverticulitis
- Bowel Obstruction
- Gastroenteritis (infection)

NOTES:
- Document the mental status and vital signs prior to administration of pain meds.
- Diabetic patients should have blood sugar documented.
- Abdominal pain in women of child-bearing age should be treated as ectopic pregnancy until proven otherwise.
- Gastroenteritis or “the flu” should not be diagnosed by EMS.
- Appendicitis presents with vague, peri-umbilical pain which migrates to the RLQ over time.
- Narcotics may mask signs and symptoms of abdominal pain. Fentanyl has a shorter half-life and is preferred for ABD pain if narcotic is indicated.
NOTES:

- Thrombolytic therapy may be possible with any acute stroke defined by duration of symptoms of less than 3-4 1/2 hours. Scene times and transport times should be minimized in this setting.
- Onset of symptoms is defined as the last witnessed time the patient was symptom free (i.e., awakening with stroke symptoms would be defined as an onset time of the previous night when the patient was symptom free).
- All possible causes of altered mental status should be considered. (AEIOUTIPS)
- Elevated blood pressure is commonly present with CVA. Contact Medical Control and consider treatment if diastolic is > 120 mmHg or systolic > 230 mmHg. Be alert for airway problems (swallowing difficulty, vomiting).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Select IV site in compressible area. Document all unsuccessful IV attempts. (in case of thrombolytic therapy)
- Radio report to receiving hospital should include the last known well time and LA stroke evaluation results
ALTERED LEVEL OF CONSCIOUSNESS/MENTATION

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known diabetic, medic alert tag</td>
<td>Weakness/paralysis</td>
<td>Hypoxia</td>
</tr>
<tr>
<td>Seizures</td>
<td>Changes in baseline mental status</td>
<td>Cardiac Dysrhythmias</td>
</tr>
<tr>
<td>Drugs, drug paraphernalia</td>
<td>Bizarre behavior</td>
<td>Diabetic Emergency</td>
</tr>
<tr>
<td>Report of illicit drug use or possible overdose/ingestion</td>
<td>Hypoglycemia/hyperglycemia</td>
<td>Stroke, Tumor</td>
</tr>
<tr>
<td>Past medical history</td>
<td>Syncope</td>
<td>Head trauma</td>
</tr>
<tr>
<td>History of trauma</td>
<td>Vertigo/dizziness</td>
<td>Central nervous system injury</td>
</tr>
<tr>
<td>Fever/febrile illness</td>
<td>Headache</td>
<td>Seizure, Sepsis, infection</td>
</tr>
<tr>
<td></td>
<td>Seizures</td>
<td>Toxic ingestion/Overdose</td>
</tr>
<tr>
<td></td>
<td>Respiratory pattern change</td>
<td>Alcohol intoxication</td>
</tr>
<tr>
<td></td>
<td>Hypertension/hypotension</td>
<td>Environmental exposure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychiatric disorder</td>
</tr>
</tbody>
</table>

NOTES:
- All possible causes of altered mental status should be considered. (AEIOUTIPS)
- Observe and assess environment to gather information for medical control.
- Proceed to more specific protocol when cause of Altered LOC determined.
- Be alert for airway problems (swallowing difficulty, vomiting) AND MANAGE AGGRESSIVELY.
- Hypoglycemia can present as a localized neurological deficit, especially in the elderly.
- Consider restraints if necessary for patient’s and/or personnel safety.
- Consider stimuli to wake patients PRN. If patient does respond to stimuli, there may still be an underlying medical condition that requires attention.
- Consider antipsychotic or sedative for acute psychosis or severe agitation.

Universal Patient Care Protocol

Is it a Syncopal Episode? Does patient regain consciousness spontaneously?

No

Determine Cause.

Unknown Origin

12 Lead EKG

Yes

Blood Glucose check, <60 or >350?

Yes

Proceed to Diabetic Protocol

No

Proceed to appropriate Protocol

Trauma

Cardiac

Psychosis

See Notes

Stroke
Bites, Stings, and Envenomations

**History**
- Type and time of bite
- Location of bite
- Prior first aid given
- Past medical history
- Progression of signs and symptoms

**Signs and Symptoms**
- Parasthesias, pain
- Chills/weakness
- Nausea/vomiting
- Headache
- Hypotension
- Discoloration, edema
- Difficulty breathing or swallowing
- Cardio – Respiratory Arrest
- Dysrhythmias

**Differential**
- AMI
- Medical illness
- Other toxic exposure
- Anaphylaxis

**NOTES:**
- Do not apply ice or constrictive bandage (tourniquet) to site.
- All dog bites/attacks must be reported to law enforcement.
- Progression of swelling should be marked every five minutes in order to monitor.
- Identification of the animal/substance should be made only if rescuer safety is not compromised.
- Patients who appear asymptomatic should be transported for observation. Some signs and symptoms may take up to 24 hours to appear.
- Human bites should always be transported to ED due to high possibility of infection.
- Stingers should be removed by using a scraping motion. Never use tweezers to remove stingers.
- For black widow bites with severe abdominal contractions – contact medical control for possible Calcium order.
- Maintain affected extremity below level of heart – dependent.

**BITES, STINGS, AND ENVENOMATIONS**
DIABETIC EMERGENCIES

History
- Known diabetic, medic alert tag
- Possible illicit drug use
- Chronic alcohol abuse
- Medications
- History of trauma
- Excessive thirst, hunger or urination

Signs and Symptoms
- Decreased mental status
- Bizarre behavior
- Cool diaphoretic skin
- Fruity, ketotic breath
- Kussmaul respirations
- Signs of dehydration

Differential
- Head trauma
- CVA, seizure, sepsis
- Cardiac
- Shock
- Toxic ingestion/ alcohol intoxication
- Environmental exposure
- Psychiatric disorder

Universal Patient Care Protocol

Blood Glucose Level?

Glucose <60
- If alert, consider oral glucose
- Dextrose IV
- If no IV access, Glucagon IM

Glucose 60-350
- No, < 60
- Consider repeat Dextrose IV, or Glucagon IM or IV

Glucose >350
- If Altered LOC consider other causes
- Normal Saline 250 cc fluid bolus

LOC improved?
- Reassess Blood Glucose
- Proceed to Appropriate Protocol

If alert, consider oral glucose

Observe

NOTES:
- Underlying coronary disease including AMI or CVA should also be considered with middle aged – elderly patients presenting as diabetic emergencies.
- Perform blood glucose checks on ALL patients with altered mental status.
- Consider Narcan if LOC is not improving with D50.
- Consider oral glucose in the alert diabetic patient who is expected to maintain his/her own airway.
- Perform blood glucose checks on all seizure patients including pediatrics; undiagnosed DKA in pediatrics will often precipitate seizure activity.
- Consider endotracheal intubation in patients with altered blood glucose levels who do not respond to D50W or Narcan.
- Ascertain the patient’s insulin regimen (dosage) for ED reference.
- If you administer medication and the patient then refuses transport you should remain on scene until you witness the patient eat foods high in carbohydrates.
HEAT EMERGENCIES

**History**
- Age
- Exposure to increased temperatures and/or humidity
- Past medical history/medications
- Extreme exertion
- Time and length of exposure
- Poor PO intake
- Fatigue and/or muscle cramping
- Not conditioned for hot/humid environment

**Signs and Symptoms**
- Altered mental status or unconsciousness
- Hot, dry or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

**Differential**
- Fever
- Dehydration
- Medications
- Hyperthyroidism
- Delirium tremens
- Heat cramps
- Heat exhaustion
- Heat stroke
- CNS lesions or tumors

---

**Flowchart**

1. **Increased subjective body temperature**
   - Temp > 101°F or 38°C?

   **Yes**
   - Remove from heat source
   - Remove clothing

   **Immediate Cooling is required if Heat Stroke is suspected.**
   - Cool until core body temperature is 101 – 102°F

   **Normal Saline 250 cc bolus**

   **If Patient is being cooled in ice bath, continue cooling until core temp is 101°F – 102°F (38°C - 39°C) before transporting to hospital.**

   **Monitor and Reassess**

   **Treat patient symptoms and proceed to appropriate Protocol**

---

**NOTES:**
- Extremes of age are more prone to heat emergencies (i.e. young, old).
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, amphetamines, and salicylates may elevate body temperature.
- Sweating generally disappears as body temperature rises above 104°F (40°C).
- Intense shivering may occur as patient is cooled.
- Heat Cramps: benign muscle cramping secondary to dehydration and not associated with an elevated temperature.
- Heat Exhaustion: dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs: tachycardia, hypotension and elevated temperature.
- Heat Stroke: dry skin, dehydration, tachycardia, hypotension, temperature > 104°F (40°C) and an altered mental status. True emergency, must be RAPIDLY cooled.
HYPERTENSIVE CRISIS

History
- Documented Hypertension
- Medications
- Pregnancy
- Viagra
- Diabetic/Renal impairment
- Recent trauma

Signs and Symptoms
- Headache
- Chest pain
- Dyspnea
- Blurred vision
- Signs & symptoms Acute Ischemic Attack/CVA
- Weakness
- Vertigo
- Epistaxis

Differential
- Central nervous system injury
- AMI
- Aneurysm
- Preeclampsia
- Hypertensive Encephalopathy
- Emotional Crisis

NOTES:
- See Preeclampsia/Eclampsia Protocol if patient is pregnant and has no previous history of hypertension.
- Do not attempt to rapidly decrease the BP if the patient is exhibiting signs and symptoms of Acute Ischemic Attack/CVA.
- Patient should be transported with the head elevated if possible.
- Nitroglycerine may be indicated if Labetalol is not available.
- Avoid Nitroglycerine if the patient has taken Erectile Dysfunction Medication within the last 24 hours.
- Reassess BP after each medication administration.

HYPERTENSIVE CRISES
HYPOTENSION—SYMPTOMATIC

**History**
- Blood loss: GI, vaginal, acute abdominal aneurysm
- Fluid loss: vomiting, diarrhea, fever, infection
- Cardiac: AMI, CHF
- Medications: narcotics, antihypertensives, anticoagulants
- Allergic reaction
- Pregnancy
- Recent surgery or long bone fracture

**Signs and Symptoms**
- Restlessness, thirst
- Confusion, change in level of consciousness/mentation
- Weak/rapid pulse
- Pale, cool, diaphoretic, clammy skin
- Hemodynamic instability
- Delayed capillary refill
- Signs of poor perfusion

**Differential**
- Shock: hypovolemic, cardiogenic, septic, neurogenic, anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect/Overdose
- Vasovagal/Syncope

**NOTES:**
- Maintain a Mean Arterial Pressure (MAP) above 60.
- Oxygen is still the most important drug to administer to patients in shock.
- It is always a good idea to ask patients what their normal BP is, if known.
- Consider all possible causes of shock and treat per appropriate protocol.
- Patients in profound septic shock may require significant fluid resuscitation and/or Dopamine.
- A systolic BP between 90-100 mm Hg may be normal for a healthy, physically fit individual.
- Patients with GI bleeds, if asked, will often report a history of chocolate colored emesis and/or black tarry stools.
- 3rd trimester pregnant patients will become hypotensive when placed supine—be sure to place them left-laterally recumbent or elevate right side.
- Pregnant patients will shunt blood away from the fetus. Aggressive fluid resuscitation may be necessary. When in doubt, contact medical control.
- A Dopamine infusion should not be abruptly stopped, but should be titrated.
- In children—Maintain perfusion with fluid resuscitation, systolic BP of 70 + 2 x age if over 1 year old. Increased BP can cause increased bleeding at injury site.
HYPOTHERMIA

History
- Extremes of age
- Past medical history/medications
- Exposure to environment even in normal temperatures
- Exposure to extreme cold
- Drug use, alcohol, barbiturates
- Wet
- Infection, Sepsis
- Length of exposure

Signs and Symptoms
- Cold, clammy skin
- Shivering
- Altered mental status or unconsciousness
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential
- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS Dysfunction: stroke, head injury, spinal cord injury

Universal Patient Care Protocol

Remove wet clothing

Known or suspected Core Temperature < 95°F (35°C)?

Yes
- Handle Gently
  - Monitor EKG
- Re-warming – Core
  - Apply Hot Packs and Blankets

No
- Rewarm, vital signs, history, transport

Vascular Access – Consider Warm Fluids

Dysrhythmia Protocol

Hypotension Protocol

Altered Level of Consciousness Protocol

NOTES:
- NO PATIENT IS PRONOUNCED DEAD UNTIL WARM AND DEAD.
- Hypothermia is defined as core temperature (rectal) of 95°F (35°C) or below.
- Deliver one shock and first line medications, then warm patient before further treatments.
- Care should be taken to insulate and cover the patient’s head to reduce heat loss.
- Extremes of age are more prone to cold emergencies (i.e. young, old).
- With temperature less than 88°F (31°C) ventricular fibrillation is a common cause of death. Handling patients gently may prevent this. (Rarely responds to defibrillation.)
- Hypothermia may cause severe bradycardia.
- The patient must be rewarmed before treatments will be effective. In cardiac arrests, provide first round defibrillations and vasopressors as rewarming occurs while withholding antiarrhythmic’s until patient is rewarmed to 86°F or 30C. (Withhold repeat efforts until rewarmed) then antiarrhythmic’s may be given if indicated at prolonged intervals until the patients temp is 93°F or 34C at which time refer to appropriate ACLS protocol.
- Shivering stops below 90°F (32°C).
- Hot packs should be placed in the armpits and groin. Care should be taken not to place the packs in direct contact with the skin. Use a towel or 4X4 as a barrier.
- Hypothermia may be predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
### Regional Protocol

#### Medication – Protocol

### NAUSEA—VOMITING—DIARRHEA

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
</table>
| • Time of last meal | • Pain – OPQRST  
• Abdominal Distension  
• Fever  
• Headache  
• Blurred vision  
• Nausea increases with movement  
• Weakness  
• Diaphoresis  
• Bradycardia/tachycardia | • Myocardial Infarction  
• CNS (Headache, stroke, recent head trauma)  
• GI bleed  
• Drugs (antibiotics, narcotics, chemotherapy)  
• Diabetic Ketoacidosis  
• Pneumonia  
• Influenza  
• Food or Toxin induced  
• Pregnancy  
• Vertigo  
• Vagal Response |
| • Onset/duration of complaint | • Other sick contacts  
• Coffee ground emesis, dark tarry stools  
• Past medical history  
• Recent surgery or trauma  
• Medications: new meds  
• Menstrual history/pregnancy  
• Radiation/chemotherapy  
• Toxic exposure  
• Motion sickness | |
| • Other sick contacts | • Coffee ground emesis, dark tarry stools  
• Past medical history  
• Recent surgery or trauma  
• Medications: new meds  
• Menstrual history/pregnancy  
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• Motion sickness | |
| • Medications: new meds | • Menstrual history/pregnancy  
• Radiation/chemotherapy  
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• Motion sickness | |
| • Menstrual history/pregnancy | • Radiation/chemotherapy  
• Toxic exposure  
• Motion sickness | |
| • Radiation/chemotherapy | • Toxic exposure  
• Motion sickness | |
| • Toxic exposure | • Motion sickness | |
| • Motion sickness | | |

### Universal Patient Care Protocol

1. **Monitor EKG 12 Lead**

2. **Orthostatic symptoms? (dizziness, syncope, tachycardia)**
   - **Yes**
     - **Normal Saline 250 cc bolus**
   - **No**
     - **Nausea and/or Vomiting?**
       - **No**
         - **Monitor EKG 12 Lead**
       - **Yes**
         - **Anti-emetic administration**

### Anti-emetics:
- Ondansetron
- Promethazine
- Hydroxyzine

### Notes:
- Diabetic patients should have blood glucose check prior to fluid bolus.
- Silent AMI may present with Nausea/Vomiting.
- Take necessary precautions to protect yourself (gloves, eye protection, etc.) from patient’s body fluids.
- Always check allergies prior to administration of every medication.
- Consider pharmacological treatment of nausea anytime it develops in the patient.
NEAR DROWNING/DROWNING

<table>
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<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Diving/SCUBA Diving</td>
<td>• Apnea</td>
<td>• Trauma</td>
</tr>
<tr>
<td>• Events leading to submersion</td>
<td>• Hypothermia</td>
<td>• Pre-existing medical condition</td>
</tr>
<tr>
<td>• Drug use, alcohol, barbiturates</td>
<td>• Paralysis</td>
<td>• Drug/alcohol ingestion</td>
</tr>
<tr>
<td>• Length of time submerged</td>
<td>• Shortness of Breath</td>
<td></td>
</tr>
<tr>
<td>• Type and temperature of water</td>
<td>• Arrhythmias</td>
<td></td>
</tr>
<tr>
<td>• Extremes of age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Past medical history/medications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Universal Patient Care Protocol

Consider CPAP

Body Temperature < 95°F (35°C)?

Yes ➔ Hypothermia Protocol

No ➔ Vascular Access

Isotonic Solution (Warmed if Possible)

Monitor EKG, 12 Lead

Monitor for complications and Proceed to appropriate Protocol as necessary.

NOTES:
- Near drowning patients who have any resuscitation efforts should always be transported to the hospital due to secondary pulmonary edema.
- Asymptomatic patients should be transported for observation. Symptoms may be delayed for 24 hours.
- Blood glucose should be assessed in patients with extended submersions.
- If the safety of rescuers is not compromised, patients found in the water should have spinal restriction protocol before removal from water.
- Consider the use of PEEP.
OVERDOSE/TOXIC EXPOSURE

**History**
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity, time
- Reason (suicidal, accidental, criminal), prior history
- Available medications in home
- Past medical history, medications

**Signs and Symptoms**
- Mental status changes
- Hypotension/Hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- Pupils status
- Signs of illicit drug use

**Differential**
- Reasons for Coma (AEIOUTIPS)
- Tricyclic antidepressants
- Acetaminophen (Tylenol)
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning Agents.

**NOTES:**
- Perform ET tube placement prior to NG/OG tube in unresponsive patients.
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, emesis to ED.
- Consider poly substance (multiple drugs).
- An NG/OG tube is required for charcoal administration in all patients with mental status changes.
- Consider restraints if necessary for patient’s and/or personnel protection.
- **Cardiac Meds:** dysrhythmias and mental status changes
- **Tricyclic Antidepressants:** 4 major areas of toxicity - seizures, dysrhythmias, hypotension, decreased mental status or coma; Rapid progression from alert mental status to death.
- **Acetaminophen:** Initially normal or N/V. If not detected and treated, causes irreversible liver failure.
- **Depressants:** ↓HR, ↓BP, ↓respirations, ↓temperature, nonspecific pupils.
- **Stimulants:** ↑HR, ↑BP, ↑respirations, ↑temperature, dilated pupils, seizure.

**Universal Patient Care Protocol**
Consider NG/OG tube

Determine:
- What?
- When?
- How much?

Normal Saline bolus
Seizure, Hypotensive, Dysrhythmia?

Yes
Sodium Bicarbonate

Magnesium if prolonged QT interval

**Common:**
- Elavil - Amitriptyline
- Sinequan - Doxepin
- Pamelor - Nortriptyline
- Anafranil, Tofranil

**Blood glucose <60 or >350?**
- Yes → Proceed to Diabetic Protocol
- No

**General Airway Management Protocol**

**Consider sedation for combative patient, and tachycardia**

**Valium Or Versed**

**Seizure, Hypotensive, Dysrhythmia?**
- Yes

**Sodium Bicarbonate**

**Magnesium if prolonged QT interval**

**Common:**
- Valium
- Xanax
- Klonopin
- Restoril
- Librium
- Halcion
- Ativan
- Serax

**Airway Management as indicated**

**Consult Medical Control for further treatment specific to ingestion or exposure.**
**SEIZURE**

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Documented seizure disorder</td>
<td>- Decreased mental status</td>
<td>- CNS Injury</td>
</tr>
<tr>
<td>- Medications</td>
<td>- Sleepiness</td>
<td>- Tumor</td>
</tr>
<tr>
<td>- Pregnancy</td>
<td>- Incontinence</td>
<td>- Hypoxia</td>
</tr>
<tr>
<td>- Trauma</td>
<td>- Observed seizure activity</td>
<td>- Fever</td>
</tr>
<tr>
<td></td>
<td>- Evidence of Trauma</td>
<td>- Eclampsia</td>
</tr>
</tbody>
</table>

**Signs and Symptoms**
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of Trauma

**NOTES:**
- Anticonvulsants should only be used when patient exhibits **ACTIVE, CONTINUOUS** seizure.
- See Preeclampsia/Eclampsia protocol if patient is pregnant and has period of recovery or consciousness.
- Be prepared to control airway and assist respiratory effort; consider nasal airway and blind nasal intubation for patients with clenched jaw.
- Assess possibility of recent traumatic event and drug abuse (i.e. stimulants).
- Consider positioning the patient in lateral recumbent, recovery position.
- Remember, febrile seizures in infants and children are relatively benign; most common cause of seizure in pediatric patient – should be transported to the ED for physician evaluation.
- Valium may be administered rectally if IV access is not available.
- If pseudoseizures are a consideration, consider stimulus.
- If PAI is used to control airway, note that seizure activity may still be present but not visible
**SEPSIS**

### History
- Fever
- Recent history of diagnosed infection
- Recent surgery
- Compromised immune system
- Age (more common in very young and very old)
- Suspected infection
- Indwelling catheter

### Signs and Symptoms
- Altered level of consciousness
- Heart rate > 90 beats per minute
- Respiratory rate > 20 breaths per minute
- Decreased urine output
- Abdominal pain
- Delayed capillary refill
- Temperature > 101°F or < 96.8°F

### Differential
- Overdose
- Shock-hypovolemic, cardiogenic, anaphylactic
- Dehydration
- Drug interaction

### Universal Patient Care Protocol

1. **Diagnosed or suspected infection and any two of the following:**
   - Altered Mental Status
   - Heart Rate > 90 BPM
   - Respiratory Rate > 20 BPM
   - Systolic BP < 90 mmHg systolic
   - Temperature > 101°F or < 96.8°F
   - $\text{ETCO}_2$ < 26 mmHg without hyperventilation present

2. **Administer Fluids:**
   - LR or NS 250-500 ml
   - Confirm clear bilateral lung sounds

3. **Start second large bore IV if possible**

4. **Reassess vital signs and indication:**
   - If patient is still tachycardic and/or hypotensive, may repeat fluid bolus to a max of 3 L

5. **Consider Vasopressor**

6. **Contact Medical Control**

### NOTES:
- Early detection of sepsis is critical to patient survival. Notify receiving facility if sepsis is suspected.
- A history of dialysis or CHF do not contraindicate aggressive fluid therapy. Be cautious with fluid administration in these patients and monitor lung sounds and other signs of pulmonary edema frequently. If pulmonary edema is detected, stop fluid infusion and contact medical control for possible vasopressor administration.
- Increased serum lactate is commonly used to diagnose sepsis. As lactate increases, $\text{ETCO}_2$ decreases, making capnography an excellent indicator of sepsis in the field.
### History
- Cardiac, stroke, seizure
- Occult blood loss, GI, Ectopic rupture
- Last Menstrual Period, vaginal bleeding, pregnancy
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications
- Emotion, stressful event

### Signs and Symptoms
- Loss of Consciousness with recovery
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure
- Numbness and/or tingling in extremities
- Carpal/ pedal spasms

### Differential
- Vasovagal
- Cardiac syncope
- Urination/defecation
- Psychiatric
- Stroke
- Shock
- Hypoglycemia
- Seizure
- Toxicological (overdose/alcohol)
- Medication
- Hyperventilation

### SYNCOPE

**Universal Patient Care Protocol**

- Vasovagal
- Orthostatic Hypotension
- Cardiac (Reduced Cardiac Output–Brady, Tachy)
- Carotid Sinus Stimulation
- Psychiatric crisis

**Patient loses consciousness and postural tone. Syncopal Episode. Determine Cause.**

- Unknown Origin
  - General Airway Management Protocol
  - Monitor EKG 12 Lead

**Degradation**

- Continue to Monitor
- Blood Glucose check, <60 or >350?
- Yes: Proceed to Diabetic Protocol
- No: Overdose

**NOTES:**
- Assess for signs and symptoms of trauma if associated or possible fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy and seizure as possible causes of syncope.
- Patients suffering syncopal episodes should be transported.
- Over 25% of geriatric syncope is dysrhythmia based.
- Be alert for airway problems (swallowing difficulty, vomiting) AND MANAGE AGGRESSIVELY.
**BURNS**

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

### Signs and Symptoms
- TBSA of burn
- Degree of burn
- Location/surface burned
- Hypotension/shock
- Soot around mouth
- Burns to face
- Airway compromise/hoarseness
- Singed facial or nasal hair
- Other signs and symptoms of trauma
- Body temperature

### Differential
- Superficial (1<sup>st</sup> degree-red and painful)
- Partial thickness (2<sup>nd</sup> degree-blistery, painful)
- Full thickness (3<sup>rd</sup> degree-painless, leathery, gray, charred skin, non-blanching)
- Chemical burn
- Electrical
- Radiation
- Multi-system/organ trauma

### Notes:
- Electrical burn injuries may be worse than they appear. * Electrical – rescuer safety must be first priority.
- Stop the burning process by initially flushing burned area with room temperature water.
- Critical burn = >20% 2<sup>nd</sup> & 3<sup>rd</sup> TBSA (total body surface area); or, 3<sup>rd</sup> degree burn >10% TBSA; or, 2<sup>nd</sup> or 3<sup>rd</sup> degree burns to face, neck, hands, feet, eyes, genitalia, or circumferential. Infant Critical burn >5% BSA 3<sup>rd</sup> degree burn. See Appendix for Child and Infant Rule of Nines.
- Electrical burns involve significantly more damage than indicated by BSA. Give initial fluid bolus 20 ml/kg if significant burn. Look for dysrhythmias.
- Consider Trauma Alert
- Moderate to minor burns in infants and elderly may be potentially lethal due to immune status.
- Consider early pharmacological intervention for intubation for significant inhalation and burn injuries. All significantly burned patients should receive high flow oxygen for possible CO
- Do not apply creams or other material to burned area.
- Chemical Burns: Remove clothing. Remove solid materials by brushing before flushing with water. Use large amounts of water.
- Never apply ice. Do not continue to cool burns that involve >10% TBSA. Look for and treat for hypothermia. After exposing child to look for injuries: Cover non-burned area with blankets & keep ambulance warm.
- Explosion injury and/or falls often occur in burn patients. Assess for and appropriately treat accompanying trauma.
## CHEST TRAUMA

### History
- Time and Mechanism (blunt, penetrating, crushing, etc.) of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints/protective equipment
- Past medical history/medications

### Signs and Symptoms
- Pain—specific or general
- Cyanosis
- Dyspnea/increased work of breathing
- Anxiety
- Tachycardia
- Hypotension
- Bruising/hematoma
- Bleeding
- Fractured ribs
- Abnormal breath sounds
- Open/sucking wounds
- Crepitus, paradoxical movement
- Decreased ventilatory compliance
- Sub Cutaneous Emphysema

### Differential
- Trauma vs. Medical
- Angina/AMI/CHF
- Pericarditis
- Pulmonary embolism
- Asthma/COPD
- Pneumothorax (tension, spontaneous)
- Hemotherax
- Aortic dissection or rupture
- Blunt vs. penetrating

### Universal Patient Care Protocol

#### Rapid Trauma Assessment
- Control Bleeding

#### Trauma Alert?

#### Transport Decision
- See Destination Protocol

### Flail Chest
- Stabilize with 2" tape or bulky dressing
- Assist Ventilations
- Or CPAP if Tolerated

### Sucking Chest Wound
- Immediately apply gloved hand
- Cover with occlusive dressing (commercial device is preferred)

### Rib Fractures
- Stabilize with pillow or hand, or splint arm against injured chest wall
- Encourage patient to breath deeply

### Tension Pneumothorax
- Pleural decompression

### Other Chest Injuries

### Consider Advanced Airway Management Protocol
- Monitor EKG, 12 Lead while enroute – if time allows

### NOTES:
- Consider air transport when indicated.
- Do not waste time on scene to prepare equipment for procedures.
- Significant chest injuries must be addressed – treated immediately when found – definitive care is surgery – rapid transport.
- For Large flail sections without pneumothorax – consider positive pressure ventilation
- If possible sternal fracture – consider underlying cardiac contusion. Obtain a 12-Lead EKG if available and time permits.
- Monitor sucking chest wound for development of tension pneumothorax

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2017 Revision 45
DESTINATION PROTOCOL

(Always use the current Destination Protocol approved by NW TRAC)
Regional Destination Protocol for the Northwest Arkansas Trauma
Regional Advisory Council Area (NW TRAC) Approved per NWA TRAC- 3/16/2012

Trauma Transport Destination Guideline
Northwest Arkansas Regional Trauma Advisory Council

The following reflects the Pre-hospital Triage and Decision Scheme of the ADOH Rules and Regulations for Trauma Systems, and American College of Surgeons Field Triage Decision Scheme.

All trauma patients shall have a trauma band and be evaluated against the criteria to determine the need for rapid transport to the appropriate level trauma center.

If the trauma patient meets any one of the MAJOR or MODERATE criteria listed below consider the patient a trauma alert and notify dispatch as soon as possible.

On scene times for patients meeting the trauma alert criteria shall be 10 minutes or less. Destination shall be determined by the severity of injury and the distance to the closest appropriate Trauma Center.

Transport of the trauma alert patient to the receiving facility shall be in the emergency mode, unless otherwise determined by Medical Control.

Always utilize the most current NW TRAC Destination Protocol, as of publication of this document, the following pages were currently being utilized.

Helicopter transport should be considered when time is critical and transport to a higher level appropriate Trauma Center is warranted from the scene. Early activation and concurrent dispatch of helicopter transport should be considered when the dispatcher identifies the potential for MAJOR or MODERATE trauma injuries.

Inability to establish or maintain an adequate airway or control excessive hemorrhage for trauma patients requires transport to the closest appropriate facility.

Multiple trauma patient situations may require interaction with Arkansas Trauma Communications Center (ATCC) or area trauma centers distribute trauma patients to avoid overtaxing the trauma centers.

ATCC should be notified for all Moderate and Major Trauma Injuries

(This Protocol is continued on next two pages)
Field Triage Decision Scheme: The Arkansas Trauma Triage Protocol

Measure vital signs and level of consciousness

Glasgow Coma Scale ≤ 13
Systolic Blood Pressure < 90 mmHg or age appropriate hypotension
Respiratory Rate <10 or >20 breaths/minute
    (>20 in infant < one year) or need for ventilatory support

No

Assess anatomy of injury

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee
- Chest wall instability or deformity (e.g. flail chest)
- Two of more long bone fractures
- Crushed, degloved, mangled, or pulseless extremity
- Amputation proximal to wrist and ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis

Major

No

Assess mechanism of injury and evidence of high-energy impact

FALLS
- Adults > 20 feet (one story is equal to 10 feet)
- Children > 10 feet or two or three time the height of the child

HIGH-RISK ACUTE CRASH
- Intrusion > 12 in. occupant site: > 18 in. any site
- Death in same passenger compartment
- Vehicle telemetry data/kinematics consistent with high risk of injury

Auto vs Pedestrian
- Bicyclist Thrown, Run Over, or with Significant (>20 mph) Impact
- Motorcycle/ATV Crash > 20 mph with separation from vehicle

Moderate

No

Assess special patient or system considerations

Older Adults
- Risk of injury/death increases after age 55 years
- SBP < 110 might represent shock after age 65 years
- Low impact mechanisms (e.g. ground level falls) might result in severe injury

Children
- Should be triaged preferentially to pediatric-capable trauma centers

Burns
- Without other trauma mechanism: Triage to burn facility
- With trauma mechanism: Triage to trauma center

Pregnancy > 10 weeks
- EMS provider judgment

Special Considerations

Yes

Contact the ATCC and transport to the most appropriate hospital

No

Transport according to local protocol

When in doubt, contact the ATCC

DESTINATION PROTOCOL
# GLASGOW COMA SCORE

## ADULT

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<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
</tr>
</thead>
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<tr>
<td>Obeys commands</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Localizes</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
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<td>1</td>
</tr>
<tr>
<td>Extension</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
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</tr>
</tbody>
</table>

**Obeys commands**: 6 points; **Spontaneous**: 4 points; **Oriented**: 5 points

## PEDIATRIC - recommended from 4 years of age to adult

<table>
<thead>
<tr>
<th>MOTOR RESPONSE</th>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obeys commands</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Localizes</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Flexion-withdrawal</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Flexion-abnormal</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Obeys commands**: 6 points; **Spontaneous**: 4 points; **Oriented & converses**: 5 points

## INFANT - recommended for birth to 4 years of age

<table>
<thead>
<tr>
<th>MOTOR RESPONSE</th>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Localizes pain</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Withdraws in response to pain</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Abnormal flexion in response to pain</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Abnormal extension in response to</td>
<td>2</td>
<td>No response</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Spontaneous**: 6 points; **Smiles, oriented to sound, interacts appropriate**: 5 points

**Localizes pain**: 5 points; **Crying - consoleable Interacts - inappropriate**: 4 points

**Withdraws in response to pain**: 4 points; **Crying - inconsistently consolable; interacts – restless**: 3 points

**Abnormal flexion in response to pain**: 3 points; **Crying - inconsoleable Interacts - restless**: 2 points

**Abnormal extension in response to pain**: 2 points; **No response**: 1 point

---

GLASGOW COMA SCORE

2017 Revision
DIVING EMERGENCIES (SCUBA)

**History**
- Diving/SCUBA Diving
- Events leading to dive/ascent
- Dive within 36 hours of event
- Depth of dive
- Length of dive
- Description of ascent

**Signs and Symptoms**
- Headache, disorientation, vertigo
- Nausea, abdominal pain
- Chest Pain, Dyspnea, visual disturbances
- Joint pain, paralysis
- Seizure, decreased LOC
- Pulmonary Edema
- Cardiac Arrest

**Differential**
- AMI, CVA, Seizure
- Diabetic condition
- Trauma
- Carbon monoxide/toxins

**NOTES:**
- Decompression symptoms usually manifest within 20 minutes of surfacing.
- Pt’s who receive oxygen may become symptom free but still require hyperbaric treatment
- Air embolism is the most serious complication of pulmonary barotraumas.
- If diver loses consciousness immediately after surfacing, an air embolism should be suspected.
- Evaluate patient for presence of pneumothorax.
- If possible bring the divers dive records (Dive Tables) to the hospital with the patient.
- DAN (Diver Alert Network): (919)-684-8111 or (919)-684-4326

**Universal Patient Care Protocol**

- Oxygen at 100% - high flow

- Ascent > 20 minutes ago?

- Supine Position

- Body Temperature ≤ 95 F (35 C)?
  - Yes → Hypothermia Protocol
  - No → Monitor EKG, 12 Lead

- Glasgow Coma Score and SMC’s repeated q 10 minutes for Decompression Sickness/Bends

- Monitor for complications and Proceed to appropriate Protocol as necessary.

- Transport – See Destination Protocol
  - Notify ER As Soon as Possible
  - Consider Facility with Hyperbaric Chamber
### EXTREMITY TRAUMA

#### History
- Type of injury
- Mechanism: crush, penetrating, amputation
- Time of injury
- Open vs. closed wound or fracture
- Wound contamination
- Age
- Past medical history
- Medications

#### Signs and Symptoms
- Pain, swelling,
- Deformity
- Altered sensation or motor function
- Diminished pulse or capillary refill
- Decreased extremity temperature

#### Differential
- Abrasion
- Contusion
- Laceration
- Sprain/Strain
- Dislocation
- Fracture
- Amputation

---

#### Universal Patient Care Protocol

1. **Rapid Trauma Assessment**
   - Control Bleeding
   - Use a tourniquet if needed to control bleeding.

2. **TRAUMA ALERT?**

3. **Transport Decision**
   - See Destination Protocol

4. **Manual Stabilization of Injured Extremity**
   - Gently move extremity to position of function until distal pulse present

5. **Distal Pulse, Sensation, Movement?**
   - Yes
   - No

6. **Pulse Return?**
   - Yes
   - No

7. **Amputation?**
   - Yes
   - No

---

### Amputation?
- Clean wound of debris
- Apply Sterile Dressing
- SPLINT extremity in position of function unless severe pain.
- Reassess distal pulse, motor and sensation

---

### Emergency Transport and Notify Receiving Facility
- Clean debris from amputated part,
  - Wrap in moist Sterile Saline

---

### Consider Immediate Transport to Most Appropriate Facility - Consult Medical Control as necessary
- Keep amputated part cool, in an air tight container, and on ice - if possible. Do not freeze.

---

### NOTES:
- If evidence of open fracture exists it is permissible to administer antibiotic (Cefazolin) to patient
- In amputations and pulseless extremities, time is critical. Transport and notify medical control immediately.
- Notify hospital of Trauma Alert as soon as practical.
- Document and mark distal pulses.
- Hip, knee, and elbow fractures and/or dislocations have a high instance of vascular compromise.
- Splint in position found unless: no distal pulse, unable to transport patient in position found, there is severe pain with angulation.
- Do not attempt to realign open fractures unless necessary for transport, document exposed bone ends.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations must be evaluated for repair within 6 hours of the injury.
- Extremity injuries must be managed and splinted with appropriate splinting device following any immediate interventions required to manage the patient’s ABC’s.
- Splint, elevate, and cool injured extremity as indicated.
**SHOCK - TRAUMA**

### History
- Amputation
- Blunt of Penetrating Trauma
- Multiple Long Bone Fractures
- Flail Check
- Major Abdominal Injury
- Pelvic Fracture

### Signs and Symptoms
- Restlessness, thirst
- Confusion, change in level of consciousness/mentation
- Weak/rapid pulse
- Pale, cool, diaphoretic, clammy skin
- Hemodynamic instability
- Delayed capillary refill
- Signs of poor perfusion

### Differential
- Shock: hypovolemic, cardiogenic, septic, neurogenic, anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect/Overdose
- Vasovagal/Syncope

### Universal Patient Care Protocol
- **Pt showing signs of Compensated Shock or Decompensated Shock?**
- **IV Fluid Bolus – Titrate to B/P of 90 systolic**
- **Lung Sounds Clear? 250cc of IV Fluid**
- **Mechanism (blunt or penetrating) suggesting potential for major hemorrhage?**
- **Known Time of Injury < 3 hours old?**
- **Objective signs of hemorrhagic shock associated with trauma (B/P < 90 or HR > 115)?**
- **Patient older than 16?**
- **Tranexamic Acid (TXA) if Available and not contraindicated**
- **Destination Protocol**

### Notes:
- Once Blood pressure is at 90 systolic for hemorrhagic shock, fluid should be titrated to maintain at 90 and not higher due to risk of increased bleeding
- TXA is contraindicated in: patients under 16, Renal Failure, Allergy to TXA, History of Thromboembolism, Known aneurismal SAH (Sub arachnoid hemorrhage, and in injuries greater than 3 hours old.
- Do not delay fluid bolus for administration of TXA
TASER REMOVAL

### History
- Traumatic Injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

### Signs and Symptoms
- Shortness of Breath
- Chest Pain
- Numbness/Weakness
- Altered LOC
- Intoxication/Substance Abuse
- Signs of Trauma
- Palpitations

### Differential (Life Threatening)
- Psychiatric Illness
- Substance Abuse
- Traumatic Injury
- Traumatic Brain Injury
- Cardiac Dysrhythmia
- Spinal Injury

---

**Universal Patient Care Protocol**

- Penetration to face, eye, neck, areola/nipple, genitalia, spine, feet, hands, or joints?
  - Yes
    - Insure patient is secure by law enforcement and taser probe is disarmed and removed from tazer gun.
  - No
    - Penetration to face, eye, neck, areola/nipple, genitalia, spine, feet, hands, or joints?
      - Yes
        - Transport immediately or have Police Transport to have probe removed by physician. Do not remove probe.
      - No
        - Excited Delirium?
          - Yes
            - See Chemical Sedation for the Violent Patient Protocol
          - No
            - Chest Pain, Palpitations or SOB?
              - Yes
                - Monitor with 4 or 12 ECG, if >35y/o consider 12 lead ECG
              - No

**Remove Probe:**
1. Stretch surrounding skin around probes till taught;
2. Grip probe itself and not wire;
3. Grasp probe firmly and pull straight out from embedded area with one hard jerk;
4. Wipe with alcohol swab and apply band-aid;
5. Repeat procedure for second probe;

**NOTE:** If probe does not remove after second attempt, stop and transport to Emergency Department.

**Transport to ER if:**
- Barb is lodged in sensitive area listed above
- Patient has previous cardiac history of cardiac sign/symptoms
- Age > 65 y/o
- Patient has SMC deficits
- Examination of barb reveals missing probes

---

2017 Revision
### Regional Protocol

#### Medication – Protocol

**TRAUMA**

<table>
<thead>
<tr>
<th><strong>History</strong></th>
<th><strong>Signs and Symptoms</strong></th>
<th><strong>Differential (Life Threatening)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Type of injury</td>
<td>• Pain, swelling,</td>
<td>• Chest - Tension Pneumothorax,</td>
</tr>
<tr>
<td>• Mechanism of injury, damage to structure or vehicle</td>
<td>• Deformity, lesions, bleeding</td>
<td>Flail/ Sucking/Open Chest Wound,</td>
</tr>
<tr>
<td>• Location in vehicle or structure</td>
<td>• Altered mental status or unconscious</td>
<td>Pericardial Tamponade, Hemothorax</td>
</tr>
<tr>
<td>• Others injured or dead</td>
<td>• Hypotension or shock</td>
<td>• Intra-abdominal Bleeding</td>
</tr>
<tr>
<td>• Speed or other details of MVC</td>
<td>• Cardio–Respiratory Arrest</td>
<td>• Pelvis/Femur Fracture</td>
</tr>
<tr>
<td>• Restraints, protective equipment</td>
<td></td>
<td>• Spine Fracture/Cord Injury</td>
</tr>
<tr>
<td>• Past medical history</td>
<td></td>
<td>• Head Injury (see Head Trauma)</td>
</tr>
<tr>
<td>• Medications</td>
<td></td>
<td>• Extremity Fracture/Dislocation</td>
</tr>
</tbody>
</table>

#### Universal Patient Care Protocol

- **Rapid Trauma Assessment**
  - Consider:
    - Chest trauma Protocol
    - Extremity Protocol
    - Burns Protocol
    - Diving Emergency Protocol
    - Traumatic Brain Injury Protocol

- **Assess Perfusion**
  - Normal Saline bolus, repeat PRN to achieve perfusion of 80 – 90 systolic
  - **Poor**
  - **Adequate**

- **Transport Decision**
  - Mode, rate, destination?

- **TRAUMA ALERT?**

- **Physical Exam**
  - **Poor**
  - **Adequate**

- **Pregnancy Trauma**
  - Position patient left side 15 degrees. Fluid bolus 200 – 500cc for Moderate or severe trauma if fluid has not yet been administered

- **Abdominal Injury**
  - If evisceration is present, place moist ABD on intestines to keep moist. Keep warm

### NOTES:
- Mechanism is an indicator of serious injury.
- If transport delayed begin IV fluids on scene, otherwise establish IVs enroute.
- Consider Blood Y tubing for second IV with Normal Saline.
- Attempt to maintain perfusion with fluid resuscitation, systolic BP of 80-90 mmHg. Systolic BP of > 100 mmHg can lead to increased bleeding at injury site.
- Consider MAST or other pelvic/extremity stabilization device for pelvic and lower extremity fractures if available
- Pregnant trauma patients can lose up to 2 liters of blood before showing signs and symptoms of shock.
TRAUMATIC BRAIN INJURY

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Type and time of injury</td>
<td>• Hematoma, depressions, lacerations</td>
<td>• Traumatic brain injury</td>
</tr>
<tr>
<td>• Mechanism of injury, damage to structure or vehicle</td>
<td>• Altered mental status</td>
<td>• Skull fracture</td>
</tr>
<tr>
<td>• Location in vehicle or structure</td>
<td>• Unresponsiveness</td>
<td>• Epidural or subdural hematoma</td>
</tr>
<tr>
<td>• Loss of consciousness</td>
<td>• Nausea/Vomiting</td>
<td>• Spinal injury</td>
</tr>
<tr>
<td>• Restraints, protective equipment (helmet use, or damage to helmet?)</td>
<td>• Pupil status</td>
<td>• Physical abuse/Assault</td>
</tr>
<tr>
<td>• Evidence of multi-system trauma</td>
<td>• Abnormal respiratory pattern</td>
<td>• CVA</td>
</tr>
<tr>
<td>• Seizures</td>
<td>• Apnea</td>
<td>• Diabetic emergency</td>
</tr>
<tr>
<td>• Preceding events</td>
<td>• Antegrade or retrograde amnesia</td>
<td>• Seizure</td>
</tr>
<tr>
<td>• Past medical history</td>
<td>• Blood from nose or ears</td>
<td>• Syncope</td>
</tr>
<tr>
<td>• Medications</td>
<td>• Exposed brain tissue</td>
<td>• Substance ingestion (drugs, alcohol, other)</td>
</tr>
</tbody>
</table>

**NOTES:**
- If GCS < 14, consider Air and/or rapid transport to most appropriate facility. Also refer to the Destination Protocol.
- Consider Trauma Alert.
- If head injured patient is combative with an unprotected airway – consider pharmacological intervention and intubation.
- Hyperventilate (20/min and/or ETCO₂ 28-32 Torr) the patient ONLY if evidence of herniation (blown pupil & flaccidity or decerebrate posturing).
- Hyperventilate (25/min children 35/min for infants and/or PCO₂ 28-32) ONLY if evidence of herniation (blown pupil, flaccidity and/or decerebrate posturing). Normal ventilation for others: 20/min for children 30/min for infants. Avoid fluid bolus if isolated head injury.
- 75% of patients with significant head trauma have serious injuries to other organ systems: Do complete assessments.
- Hypotension in head injury patients increases mortality by 50%. Titrate fluids to maintain a systolic BP of at least 100 mmHg in adults.
- Increased intracranial pressure (ICP) may cause bradycardia and hypertension (Cushing’s Response).
- Patients with suspected head trauma should be closely monitored and reassessed for any change in their mental status.
- Anticipate vomiting. Have suction and airway equipment ready and close at hand.
- Scalp lacerations can result in significant blood loss. Apply bulky dressings with moderate pressure PRN.
CHILDBIRTH

History
- Length of gestation
- Parity and gravidity/Twins?
- Previous cesarean delivery
- Prenatal care/physician
- Alcohol or drug use
- Infectious disease status
- Previous OB/GYN emergencies (eclampsia, diabetes, premature labor, ectopic pregnancy, etc.)

Signs and Symptoms
- Membranes ruptured
- Contraction frequency and intensity
- Urge to push/bear down
- Crowning
- Bloody show – mucus plug
- Vaginal bleeding
- Cramps
- Meconium

Differential
- Braxton Hicks
- Contractions following trauma
- Multiple fetuses
- Premature
- Abdominal pain

NOTES:
- Oxygen should be administered to all mothers during delivery.
- There may still be time to transport to the hospital before delivery, when contractions < 2 minutes apart, and patient not crowning.
- Do not rupture membranes unless the baby’s head has been delivered and the membranes must be cleared from the mouth and nose.
- The mother may need coaching, support and guidance (breathing, when to push etc.) through the birthing process.
- Abruptio placenta, placenta previa, and ruptured uterus are maternal complications that may be encountered in the pre-hospital setting. These situations may present with severe abdominal pain, hypotension, and/or significant vaginal bleeding. Rapid transport.
- Enlist the help of Midwife, or staff if at a Birthing Facility.
Regional Protocol

COMPLICATIONS IN CHILDBIRTH
(Multiples/Prolapsed Limb/Nuchal & Prolapsed Cord/Pre-Term)

History
- Length of gestation
- Parity and gravidity
- Previous cesarean delivery
- Alcohol or drug use
- Infectious disease status
- Previous OB/Gyn emergencies (eclampsia, diabetes, premature labor, ectopic pregnancy etc.)

Signs and Symptoms
- Membranes ruptured
- Contraction frequency and intensity
- Urge to push/bear down
- Crowning
- Bloody show—mucous plug
- Vaginal bleeding
- Cramps
- Meconium

Differential
- Braxton Hicks
- Contractions following trauma
- Multiple fetuses
- Premature
- Abdominal pain

NOTES:
- The above Protocols were developed to serve as a guide for the pre-hospital setting in the event that birth is imminent and complications occur.
- Contact should be made with Medical Control as soon as possible for assistance.
- Rapid Transport for all complications in childbirth.
- A key to neonatal resuscitation is keeping the baby warm.

COMPLICATIONS IN CHILDBIRTH
COMPLICATIONS IN CHILDBIRTH (Shoulder Dystocia/Breech)

### History
- Length of gestation
- Parity and gravidity
- Previous cesarean delivery
- Alcohol or drug use
- Infectious disease status
- Previous OB/GYN emergencies (eclampsia, diabetes, premature labor, ectopic pregnancy, etc.)

### Signs and Symptoms
- Membranes ruptured
- Contraction frequency and intensity
- Urge to push/bear down
- Crowning
- Bloody show—mucous plug
- Vaginal bleeding
- Cramps
- Meconium

### Differential
- Braxton Hicks
- Contraindications following trauma
- Multiple fetuses
- Premature
- Abdominal pain

### COMPLICATIONS IN CHILDBIRTH (Shoulder Dystocia/Breech)

#### Shoulder Dystocia
- Check for prolapsed cord or imminent delivery
- Rapid Transport if Possible while proceeding
- Apply downward pressure on the baby’s head, slide the other hand down the baby’s back and sweep your hand forwards toward the baby’s chest, sweeping the top arm over the baby’s chest and out of the birth canal.
- Have mother pull her knees to her chest. This may change the position of the pelvis and allow for delivery of the baby.
- Raise the baby upward with one hand and slide your other hand down the baby’s back and sweep your hand forwards toward the baby’s chest, sweeping the baby’s bottom arm forward over the baby’s chest and bring the arm out of the birth canal.
- If more room is needed, do a midline episiotomy with bandage scissors. Remember that whatever is cut is double in the circumference.
- The rest of the delivery should proceed normally
- Prepare for a depressed baby and Proceed to appropriate Protocol
- Continue with Protocol for Precipitous Birth

#### Breech
- Place patient on a flat elevated surface with buttocks over the edge.
- Do not pull on baby or try to free legs until the body is born to the navel.
- Bring legs down, upper leg first.
- After delivery to the navel, pull down a loop of umbilical cord.
- Once the baby is out this far, be sure there is a free airway to the baby in 4 minutes.
- Cover the baby with a clean warm towel.
- Support baby’s hips with both hands, never pull on the baby.
- Have mother push constantly until the baby’s nose is clear of the perineum.
- Deliver the shoulders and arms one at a time by sweeping your hand up the baby’s back, over the top of the shoulder and drawing the baby’s arm down over the chest and out. Lower the baby’s body for the top shoulder and raise the body for the bottom shoulder.
- Clear the airway as soon as the mouth and nose are exposed.
- Deliver the rest of the head as slowly as possible.
- Note the Time of Birth

### Notes:
- Dystocia—difficult birth, may be produced when the size of the fetus is larger than the size of the pelvic outlet.
- During complicated deliveries the fetus may become bradycardic and hypoxic. Complications during birth can be life threatening to the mother and the fetus.
- Rapid transport.
- Prepare to manage a depressed baby. Hypoxia, hypothermia, and hypoglycemia should be addressed. Proceed to the Appropriate Newborn Resuscitation Protocol.
ECLAMPSIA-PREECLAMPSIA

### History
- Pregnancy
- Advanced maternal age
- Chronic hypertension
- Chronic renal disease
- Diabetes
- Lupus
- Multiple gestation

### Signs and Symptoms
- Hypertension - 140/90 mm/Hg or a rise of 20 mm/Hg systolic and 10 mm/Hg diastolic over pregnant BP
- Proteinuria
- Excessive weight gain with Edema
- Headache, dizziness, confusion
- Seizure, coma
- Blurred vision
- Nausea/vomiting
- Fetal Distress

### Differential
- Seizure disorder

### Universal Patient Care Protocol

1. **Assess Blood Sugar and Treat as needed with D50**

2. **Is patient actively seizing?**
   - Yes: **Magnesium Sulfate**
   - No: **Exspidite Transport**

3. **Consult Medical Control**

4. **If altered LOC and Eclampsia is imminent, Magnesium Sulfate is indicated**

### NOTES:
- Handle the patient GENTLY and minimize sensory stimulation (e.g. darken ambulance lights) to avoid precipitating seizures.
- Eclampsia can occur from 20 weeks gestation and up to 1 month postpartum.
- Preeclampsia may affect previously healthy, normotensive mothers.
- Significant increase in risk to the mother and fetus – TRUE EMERGENCY!
- Place the mother in the left lateral recumbent position to maintain or improve uteroplacental blood flow and to minimize risk of insult to the fetus.
- Anticipate seizures at any moment, and be prepared to provide airway, ventilatory, and circulatory support.
- Eclampsia may be associated with apnea during the seizures.
- Labor can begin spontaneously and progress rapidly.
POST-PARTEM CARE

**History**
- Pregnancy
- Length of gestation
- Parity and gravidity/Twins?
- Previous cesarean delivery
- Prenatal care/physician
- Alcohol or drug use
- Infectious disease status
- Previous OB/Gyn emergencies (eclampsia, diabetes, premature labor, ectopic pregnancy, etc.)

**Signs and Symptoms**
- Delivery of baby within 48 hours
- Shock
- Significant vaginal bleeding
- Estimated blood loss (EBL) - # of pads soaked?

**Differential**
- Trauma
- Gynecological procedure/Surgery

---

**Universal Patient Care Protocol**

Put baby to mother’s breast to nurse.  
Keep baby warm.

Place the side of your hand just above the pubic bone and compress firmly until the hemorrhage stops.  
(Fundal Massage)

**Signs of Decreased Perfusion?**

Yes

Fluid Bolus 250 - 500 ml

No

Monitor EKG

---

**NOTES:**
- This protocol addresses significant hemorrhage after the placenta has delivered. Do not confuse with treatment for patients experiencing significant hemorrhage during delivery.
- Consider Pitocin. Call Medical Control for advice about administering Pitocin
- Rapid transport.
NEWBORN RESUSCITATION - Pediatric

**History**
- Difficult delivery
- Fetal distress
- Term

**Signs and Symptoms**
- Apnea, Cyanosis
- Bradycardia, pulseless
- Meconium

**Differential**
- Hypothermia
- Hypoglycemia

---

### Universal Care Protocol

- **If Indicated:** Suction the infant’s MOUTH then NOSE with a bulb syringe as soon as the infant’s head is delivered and before delivery of the body.

- **After delivery of body:**
  - **Significant MECONIUM present and infant depressed?**
    - Yes
      - **Suction with tracheal tube & meconium aspirator until clear or heart rate falls below 100/min “If heart rate below 100/min- use BVM”**
    - No

- **Dry, warm, position, suction**

- **Ventilation Adequate?**
  - No
    - If ventilation is inadequate, stimulate by gently rubbing the back and flicking the soles of feet.
    - Still inadequate after brief stimulation and persistent cyanosis, begin assisted ventilation @ 40 to 60/minute with BVM 100% oxygen

- **Heart Rate?**
  - (Auscultation or palpation of umbilical stump)
    - <60/min
      - Chest compression/ventilation @ 120/minute (3 compressions/1 ventilation)
    - >100/min
      - Heart rate between 60 and 100/min, continue BVM with 100% oxygen
      - Heart rate over 100/min, continue oxygen

- **Blood Glucose (heel stick):** If < 40
  - D50W - 5 ml/kg for depressed neonate, or resuscitation

- Transport
  - Reassess heart rate and respirations frequently

---

**NOTES:**
- **All newborns:** once the body is delivered, dry the baby, replace wet towels with dry ones, and wrap the baby in a thermal blanket or dry towel.
- **Cover the head to preserve warmth.**
- **If infant is already breathing or crying, tracheal suctioning may be omitted if meconium is present.**
- **Tracheal doses of epinephrine should always be 1:10,000 for newly born.**
- **Do not use concentrated doses of medications—cerebral hemorrhage may result.**
- **APGAR at 1 and 5 minutes.**
UNIVERSAL PATIENT CARE - Pediatric

NOTES:
- This protocol provides general guidelines for patient management. Refer to additional protocols for treatment of specific conditions.
- A length-based resuscitation tape or other care guide shall be available to assist EMS personnel to quickly determine appropriate equipment size, normal vital signs, and correct medication doses.
- If hazardous conditions are present (such as swift water, hazardous materials, electrical hazard, or confined space) contact an appropriate agency before approaching the patient. Wait for the designated specialist to secure the scene and patient as necessary.
- Reassess the patient frequently.
- Expose the child only as necessary to perform further assessments. Maintain the child’s body temperature throughout the examination.
- If the child’s condition is critical or unstable, initiate transport. Perform focused history and detailed physical examination en route to the hospital if patient status and management of resources permit.
- If the child’s condition is stable, perform focused history and detailed physical examination on the scene, then initiate transport.
- Contact Medical Control for additional instructions.
- If spinal trauma is suspected, continue manual stabilization, place in rigid cervical collar, and apply an immobilization device.

UNIVERSAL PATIENT CARE PEDIATRIC
**AIRWAY MANAGEMENT - Pediatric**

**History**
- Trauma
- Head Injury
- Asthma
- COPD
- Known difficult airway
- Facial fractures
- Pulmonary edema

**Signs and Symptoms of Difficult Airway**
- Hoarseness
- Limited neck movement
- Limited mouth opening
- Short thyro-mental distance
- Short heavy neck, obesity
- Receding mandible/overbite
- Large swollen tongue
- Long incisors

**Differential**
- LOC
- Airway injury
- Airway swelling
- Burns
- Foreign body
- Epiglottitis

**NOTES:**
- Intubation is not necessarily required for adequate ventilation, which is the goal. BVM may be adequate.
- Keep it simple…when possible — use progressively invasive maneuvers ONLY when necessary.
- Clinical End-Tidal CO₂ (capnography) monitoring should be used with all advanced airways.
- Only use hyperventilation for head injury when signs of herniation are present — ventilate to torr CO₂ of 28 - 32.
- Assess for signs of respiratory distress, failure, or arrest. If present, refer to the appropriate protocol for treatment options.
- If the child is not breathing or breathing is inadequate, initiate assisted ventilation using a bag-valve-mask device with high flow, 100% oxygen. Begin with 2 slow, deep breaths of about 1-1/2 seconds duration until chest rises, then ventilate at 20 breaths/minute for all ages (except neonates at 40). If abdominal distention arises, consider placing an orogastric tube to decompress the stomach.
- If breathing is adequate administer oxygen to an oxygen saturation of 93 – 99% in infants and children (see newborn for administration to newborns).
**ALLERGIC REACTION – ANAPHYLAXIS - Pediatric**

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known allergic reaction to bites, stings, food, medications etc.</td>
<td>Dyspnea, often with sneezing, wheezing, or coughing</td>
<td>Asthma</td>
</tr>
<tr>
<td>Possible ingestion of or contact with allergen.</td>
<td>Facial swelling</td>
<td>Pulmonary embolism</td>
</tr>
<tr>
<td></td>
<td>Urticaria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abdominal cramps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea, vomiting, diarrhea</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Falling blood pressure</td>
<td></td>
</tr>
</tbody>
</table>

**ALLERGIC REACTION**

- (Mild symptoms)
  - Urticaria, erythema, mild wheezing, etc.

**Anaphylaxis:**
- (Moderate & Severe)
  - Hypoxemia, hypotension, history of allergic reactions, etc.

**Pediatric Universal Care Protocol**

**Stable?**
- Yes
- No

- **Allergic Reaction:**
  - Diphenhydramine
  - Albuterol
  - Consider Ipratropium (Atrovent) or levalbuterol if Albuterol is ineffective
  - Fluid Bolus 250-500 cc
  - Consider Epinephrine

- **No**
  - Monitor and Observe for rebound effects
  - Fluid Bolus 250-500 cc, repeat bolus titrate to BP
  - Diphenhydramine
  - Albuterol Updraft
  - Consider Decadron or Solu-Medrol
  - Continued Hypotension? Decreased peripheral perfusion? Shock?
    - Yes
    - Glucagon
    - Refer to the Hypotension Protocol
    - No

**NOTES:**
- Consider Epinephrine IM, diphenhydramine early in the allergic process, administration prior to histamine release will provide more rapid results. When signs of histamine release are noted, the process is well under way and will require aggressive treatment.
- Epinephrine has a short half-life and may require repeat doses.
- Closely monitor patients for rebound signs and symptoms. Any patients suffering from an allergic reaction should be evaluated by a physician.
- For patients with signs of anaphylaxis – hypotensive, despite treatment, consult medical control for a glucagon order. Can be repeated every 5 minutes until hypotension resolves.
## ASTHMA - Pediatric

### History
- Asthma
- COPD: Emphysema, Bronchitis
- CHF: Congestive Heart Failure
- Home Oxygen use
- Home Nebulizer Use
- Medications: Steroids, Inhalation, Possible Chemical or biological exposure

### Signs and symptoms
- Shortness of breath
- Purse-Lips breathing
- Accessory muscle use, retractions, nasal flaring, fatigue
- Inability to speak in sentences
- Audible Wheezing or rhonchi
- Fever, cough
- Cyanosis

### Differential
- Asthma, COPD
- CHF, Pulmonary Edema
- Anaphylaxis
- Pneumonia
- Pulmonary Embolus
- Cardiac
  - Hyperventilation
  - Inhaled toxin
- DKA
- Pneumothorax
- Epiglottis, Croup

### Notes:
- In severe distress, treatment may occur simultaneous with IV, EKG. Consideration of Mag Sulfate in the updraft or IV as directed by Medical Control.
- Remember: almost all cardiac problems produce some degree of respiratory distress.
- Pulse Oximetry should be monitored continuously for all patients with respiratory distress and/or respiratory failure.
- Patients with a history of asthma, who have had prior hospitalization for asthma, and/or present with initial \( O_2 \) saturations of <90% are at increased risk for rapid decline in spite of initial improvement with your treatments.
- A silent chest in the setting of severe respiratory distress is a pre-respiratory arrest sign.
- Versed may be administered prior to intubation of a conscious patient who is in extremis and has not responded to treatment.
- Use all available personal protective equipment and clothing if toxic inhalation or exposure is a possible etiology.
- Provide high flow \( O_2 \) and transport for patients who are hyperventilating when the cause is unknown.
- Respiratory distress can be the result of metabolic acidosis from overdose and/or DKA, head injury, trauma.
Regional Protocol

ASYSTOLE/PULSELESS ELECTRICAL ACTIVITY - Pediatric

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
</table>
| - Events leading up to arrest  
- Estimated down time  
- Past medical history/ medications  
- Renal failure/dialysis  
- DNR  
- Hypothermia  
- Suspected Overdose (Digitalis, Tricyclics, Beta-blockers, Calcium channel blockers  
- Respiratory failure | - Unresponsive, Apneic, Pulseless with organized electrical activity | - Medical vs. Trauma etiology  
- Hypovolemia (Trauma, AAA, GI)  
- Hypothermia  
- Drug Overdose  
- Massive Myocardial Infarction  
- Hypoxia  
- Tension Pneumothorax  
- Pulmonary Embolism  
- Acidosis  
- Hyperkalemia  
- Device error (lead off)  
- Death |

NOTES:
- For trauma patients determine the underlying cause of arrest and provide definitive treatment i.e. fluid resuscitation, pleural decompression.
- Reassess Advanced Airway placement frequently, i.e. after every patient move, change in patient condition.
- For hypothermic patients pharmacologic treatment may not be effective until patient is warmed; see Hypothermia Protocol.
- Considerations for Sodium Bicarb-known preexisting hyperkalemia, bicarbonate responsive acidosis (e.g. Diabetic ketoacidosis), or overdose (e.g. Tricyclics, cocaine, diphenhydramine) to alkalize the urine in aspirin or other overdose.
- Atropine administration is indicated for poisoning from organo phosphates.

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BRADYCARDIA - Pediatric

**History**
- Respiratory
- Medications: Beta Blockers, Clonidine, Calcium Channel Blockers, Digitalis
- Pacemaker
- Nausea and Vomiting
- Past cardiac history

**Signs and Symptoms**
- HR < 60/min
- Respiratory distress/Failure
- Nausea/Vomiting
- Cardiopulmonary Failure
- Hypotension
- Decreased LOC
- Weakness

**Differential**
- Respiratory Failure/Hypoxia
- Hypothermia
- Toxic Exposure/Overdose
- Head Injury
- Vasovagal
- Cardiac
- CVA

---

**Frequent Causes:**
- Hypovolemia
- Hypoxia
- Hydrogen ion - acidosis
- Hyper-Hypokalemia
- Hypothermia
- Hypoglycemia
- Tablets/CD
- Tamponade
- Tension pneumothorax
- Thrombosis coronary
- Thrombosis-pulmonary

---

**NOTES:**
- Respiratory failure is the usual cause of bradycardia in pediatric patients—assist ventilations.
- Epinephrine is more effective than Atropine for hypoxic bradycardia.
- CPR should be started if ventilation fails to improve heart rate.
- Atropine is not indicated unless history of heart disease or vagal cause of bradycardia is suspected.
- Attempting to increase the rate of an asymptomatic patient is contraindicated.
- Adult pads should be used in patients down to the age of 1 year so long as they do not touch; if adult pads are too large, use pediatric pads.
- Versed 0.1 mg/kg IV, max of 5 mg or appropriate Benzodiazepine, may be used as a sedative agent when needed for pacing discomfort.

---

BRADYCARDIA PEDIATRIC
DIABETIC EMERGENCIES - Pediatric

**History**
- Known diabetic, medic alert tag
- Change in routine, meds, or diet
- Recent illness or infection
- Possible illicit drug use
- Alcohol abuse
- Medications
- History of trauma

**Signs and Symptoms**
- Decreased mental status/Seizures
- Bizarre behavior
- Cool diaphoretic skin
- Fruity, ketotic breath
- Kussmaul respirations
- Signs of dehydration
- Excessive thirst, hunger, or urination

**Differential**
- Head trauma
- CVA, seizure, sepsis
- Cardiac
- Shock
- Toxic ingestion/alcohol intoxication
- Environmental exposure
- Psychiatric disorder

### Normal blood glucose range:
- Neonate: 40-110
- Children: 60-110

**Blood Glucose Level?**
- <60
- 60-250
- >250

**If alert consider oral glucose**
- Dextrose
- or
- Glucagon

**LOC improved?**
- Yes, >60
- No, <60

**Reassess Blood Glucose**
- May repeat Dextrose in 5 minutes if no improvement

**If still altered LOC, consider other causes**

**NS fluid bolus 10-20 ml/kg and Reassess, repeat if needed for significant hypotension.**

**Differential**
- Head trauma
- CVA, seizure, sepsis
- Cardiac
- Shock
- Toxic ingestion/alcohol intoxication
- Environmental exposure
- Psychiatric disorder

**Diabetic Emergency Protocol**

**Pediatric Universal Patient Care Protocol**

**To mix D25W:**
1 part D50W to 3 parts sterile water or normal saline

**To mix D12.5W:**
1 part D50W to 1 part sterile water or normal saline

**Normal blood glucose range:**
- Neonate: 40-110
- Children: 60-110

**If still altered LOC, consider other causes**

**Diabetic Emergencies Pediatric**

**Notes:**
- If glucagon is given and patient responds, remember that glucagon depletes glucose stores so dextrose must be administered soon.
- Perform blood glucose checks on ALL patients with altered mental status.
- Glucometer reading from 60–80 in a patient with serious symptoms may indicate hypoglycemia—Administer Dextrose.
- If in doubt about glucometer reading—administer Dextrose.
- Consider oral glucose in the alert diabetic patient who is expected to maintain his/her own airway.
- Consult Medical Control for Thiamine administration for patients suspected of malnutrition i.e. history of chemotherapy, etc.
- Perform blood glucose checks on all seizure patients. Undiagnosed DKA and hypoglycemia from other causes can precipitate seizure activity.
- Consider endotracheal intubation in patients with altered blood glucose levels who do not respond to Dextrose and Narcan.
- Ascertain the patient’s insulin regimen (dose, type, & schedule) for ED reference.
NOTES:
- Approximately 60% of multiple trauma patients have a concomitant head injury.
- Unrecognized hemorrhage the leading cause of preventable death in trauma care. Increasing heart rates often reflect untreated hemorrhage.
- Maintain perfusion with fluid resuscitation, systolic BP of 70 + 2 x age if over 1 year old. Increased BP can cause increased bleeding at injury site.
- Mechanism of injury is the earliest predictor of serious injury.
- If transport delayed begin IV fluids on-scene, otherwise establish enroute. Consider Blood-Y tubing for second IV.
- Remove seriously injured children from the child seat if potentially damaged in the crash. Seriously injured children require supine immobilization.
- Attempt to keep siblings, parents, and or friends together.
OVERDOSE/TOXIC EXPOSURE - Pediatric

### History
- Suspected toxic exposure
- Age of patient
- Substance, route, quantity, time
- Reason (suicidal, accidental, criminal, terrorism), prior history
- Available medications in home
- Past medical history, medications

### Signs and Symptoms
- Mental status changes
- Hypotension/Hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures
- Pupils status
- Signs of illicit drug use

### Differential
- Reasons for Coma (AEIOUTIPS)
- Tricyclic antidepressants
- Acetaminophen (Tylenol)
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning Agents

---

### Universal Patient Care Protocol

1. **Determine:**
   - What?
   - When?
   - How much?

2. **Blood glucose <60?**
   - Yes: Proceed to Diabetic Protocol
   - No: Notify Medical Control when possible before medication administration.

3. **Consider NG/OG tube**

4. **Narcotics?**
   - If respiratory depression – Narcan, titrated to patient response.

5. **Stimulants?**
   - Consider sedation for Combative patient, and tachycardia, administer Benzodiazepine

6. **Tricyclics?**
   - Normal Saline bolus 10-20 ml/kg
   - Unconscious? Hypotensive? Seizures?
     - Yes: Sodium Bicarbonate
     - No: Magnesium if prolonged QT interval

7. **Benzodiazepines?**
   - Normal Saline bolus, 10 - 20 ml/kg

8. **Other?**
   - Blood glucose check
   - Consult Medical Control for further treatment of specific ingestion

9. **If respiratory depression –** Narcan, titrated to patient response.

---

### NOTES:
- Many ingestions in under 5 year age group are minor—usually single agent ingestions. Assess thoroughly!
- Do not force administration of oral antidotes or NG/OG tube in the alert/semi-alert child.
- Teenagers often have multiple agent ingestions. Assess for trauma and suicide attempts.
- Perform ET tube placement prior to NG/OG tube in unresponsive patients.
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Attempt to bring bottles, contents, emesis to ED.
- Consider restraints if necessary for patient’s and/or personnel protection.
- Consider Calling Poison Control – American Association of Poison Control – 800-222-1222

- **Cardiac Meds:** dysrhythmias and mental status changes
- **Tricyclic Antidepressants:** 4 major areas of toxicity-seizures, dysrhythmias, hypotension, decreased mental status or coma; Rapid progression from alert mental status to death.
- **Acetaminophen:** Initially normal or N/V. If not detected and treated, causes irreversible liver failure.
- **Depressants:** HR, BP, respirations, temperature, nonspecific pupils.
- **Stimulants:** HR, BP, respirations, temperature, dilated pupils, seizure.
- **Beta Blockers/Ca²⁺ Channel Blocker** HR BP give glucagon

---

**OVERDOSE/TOXIC EXPOSURE PEDIATRIC**
## POST RESUSCITATION - Pediatric

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
</table>
| • Cardiac Arrest  
• Respiratory Arrest | • Return of Pulse  
• Increasing heart rate  
• Skin color change | • Continue to address specific differentials associated with original dysrhythmia |

### Signs and Symptoms
- Return of Pulse  
- Increasing heart rate  
- Skin color change

### Differential
- Continue to address specific differentials associated with original dysrhythmia

### NOTES:
- Find and treat cause of cardiac arrest. Respiratory failure is the most frequent cause in pediatric patients.
- A 12 lead EKG should be obtained as soon as possible to determine the presence of an acute coronary syndrome.
- Continuously recheck tube placement. Secure tube then immobilize patient with CID to prevent tube dislodgement.
- Assess ventilation and respiratory status—treat as indicated.
- Benzodiazepines may be used for sedation in order to maintain a controlled airway.
- Narrow Complex Tachycardia in the post resuscitation phase may be due to epinephrine therapy and usually does not require treatment—monitor BP.
- Consider OG tube placement for gastric decompression.
- Consider temperature regulation. Correct hyperthermia, allow mild hypothermia.

### POST RESUSCITATION PEDIATRIC
SEIZURE - Pediatric

History
- Documented seizure disorder
- Medications
- Pregnancy
- Trauma – Recent or Remote
- Recent illness
- Diabetes
- Fever

Signs and Symptoms
- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of Trauma
- Photophobia
- Increased sensitivity to touch and sound

Differential
- Fever
- Hypoxia
- Hypoglycemia
- CNS injury or Tumor
- Eclampsia
- Renal failure
- Drug use
- Infection
- Alcohol/illicit drug withdrawal
- Metabolic disorder
- Electrolyte imbalance

Pediatric Universal Patient Care Protocol

PAT

Consider Spinal restriction protocol. Do not restrict seizing patients unnecessarily.

Supportive Care and Transport

Blood Glucose check, as soon as possible.

- < 60?
  - Yes
  - Dextrose
  - Or
  - Glucagon

- No
  - Is patient actively seizing?
    - Febrile? If so see notes
      - Yes
        - Administer Benzodiazepine
          - To mix D25W - 1 part D50W to 1 part sterile water or normal saline
          - To mix D12.5W - 1 part D50W to 3 parts sterile water or normal saline
      - No
        - Re-evaluate patient for continued seizure activity - Consult Medical Control

NOTES:
- Short-term febrile seizures in infants and children are relatively benign; most common cause of seizure in pediatric patient—should be transported to the ED for physician evaluation. Rapid change in temperature is typical cause. Evaporative cooling to bring temp down.
- Anticonvulsants should only be used when patient has ACTIVE, CONTINUOUS seizures or no ALERT period between seizures.
- Hypoxia & hypoglycemia during status can cause permanent brain damage—ensure good airway breathing circulation and blood sugar.
- Status may exist if patient continues to have any focal seizure activity after generalized seizure (the brain may still be seizing).
- Be prepared to control airway and assist ventilation; consider nasal trumpet airway and nasal intubation for patients with clenched jaw.
- Assess possibility of recent traumatic event and drug abuse or toxic exposure (i.e. stimulants)
- Consider positioning the patient in lateral recumbent, recovery position.

SEIZURE PEDIATRIC
STRIDOR (UPPER AIRWAY OBSTRUCTION) - Pediatric

History
- Recent Intubation
- Respiratory syncytial virus (RSV)
- Respiratory Failure
- Inhaled Toxins
- Bronchiolitis
- Medications: Steroids, Inhalation, Possible Chemical or biological exposure

Signs and symptoms
- Shortness of breath
- Tripod positioning
- Neck extended
- Drooling
- Barking cough
- Purse-Lips breathing
- Accessory muscle use, retractions, nasal flaring, fatigue
- Inability to speak in sentences
- Audible stridor
- Cyanosis

Differential
- Epiglottitis, Croup
- CHF, Pulmonary Edema
- Anaphylaxis
- Pneumonia
- Pulmonary Embolus
- Cardiac
- Hyperventilation
- DKA
- Pneumothorax
- Asthma, COPD

Notes:
- If heart rate increases greater than 20 beats per minute while administering nebulized Racemic Epinephrine or Epi 1:1,000 the further dilute the treatment or stop administration.
- Stridor is caused by narrowing of the upper airway structures above the carina. Prompt identification and proper treatment is imperative.
- Stridor is commonly noted during Anaphylaxis, Croup, trauma to the trachea, or burns to the upper airway.
- Beta 2 agonist/Bronchodilators have little to no effect when used to treat Stridor.
- Pulse Oximetry should be monitored continuously for all patients with respiratory distress and/or respiratory failure.
- A silent chest in the setting of severe respiratory distress is a pre-respiratory arrest sign.
- Use all available personal protective equipment and clothing if toxic inhalation or exposure is a possible etiology.
- Provide humidified oxygen for pediatric patients in stridor.

Universal Protocol

Nebulized Racemic Epinephrine
(if available)

Or

Nebulized Epinephrine 1:1,000

12-Lead ECG (soon as possible not to delay care)

Apply waveform Capnography

Croup / Epiglottitis

Foreign Body Obstruction

Nebulized Racemic Epinephrine
(if available) Or Nebulized Epinephrine 1:1,000

Methyprednisolone or Decadron (if available)

Consider Epinephrine IM or IV if above treatment are not effective

STRIDOR (UPPER AIRWAY OBSTRUCTION) - PEDIATRIC
### TACHYCARDIA - Pediatric

#### History
- Medications (Aminophylline, decongestants, thyroid supplements, diet pills, Digoxin)
- Diet, N/V, dehydration
- Congenital Heart Disease
- Illicit drugs (methamphetamine, cocaine, stimulants)
- Past Medical History
- History of palpitations/heart racing
- Syncope
- Near Drowning

#### Signs and Symptoms
- HR > 180/min
- QRS < 0.08 sec vs. > 0.08 sec
- Dizziness, chest pain, shortness of breath
- Sudden onset
- Potential presenting rhythm:
  - Sinus Tachycardia
  - Atrial Fibrillation/ Flutter
  - PSVT
  - Ventricular Tachycardia

#### Differential
- Congenital Heart Disease (WPW, Long QT syndrome, Valvular)
- Myocardial Infarction
- Electrolyte imbalance
- Exertion, pain, emotional stress, fever
- Hypoxia
- Hypovolemia or anemia
- Drug effect/overdose
- Hyperthyroidism
- Pulmonary Edema

#### NOTES:
- Abnormal tachycardias in children are rare. Rate changes with activity, respirations in Sinus Tach.
- Establish rapid heart rate as cause of signs and symptoms.
- Note/record EKG changes during Vagal maneuvers and Adenosine administration.
- Signs of poor perfusion: LOC change, weak or absent radial pulses, poor capillary refill, pale, mottled or cyanotic skin, or low blood pressure.
- A child with narrow QRS Tach: Dehydration or volume depletion usually indicate Sinus Tachycardia. Do not use this protocol. Use Hypotension Protocol.
- Promptly cardiovert hemodynamically unstable, the more unstable the patient, the more urgent the need for cardioversion.
- Continuous pulse oximetry for all Tachycardia patients.
- Document all rhythm changes and therapeutic interventions with EKG strips.
- Calcium Channel Blockers (Cardizem, Verapamil etc.) are contraindicated in patients with WPW.
- QRS > 0.08 sec (2 little squares) means Ventricular Tachycardia.
VENTRICULAR FIBRILLATION/PULSELESS V-TACH - **Pediatric**

<table>
<thead>
<tr>
<th>History</th>
<th>Signs and Symptoms</th>
<th>Differential</th>
</tr>
</thead>
</table>
| - Estimated down time  
- Past medical history/medications  
- Events leading to arrest  
- Hypothermia  
- Electrocutation  
- Toxins  
- Heart Hx/ WPW / Long QT syndrome | - Unresponsive, Apneic, pulseless | - Medical vs. Trauma etiology  
- Artifact  
- Asystole  
- Device failure |

### Universal Patient Care Protocol

- **Criteria for Death/No Resuscitation**:  
  - Yes → **Withhold Resuscitation**  
  - No → **CPR until defibrillator available or AED Available.**

- **Witnessed Arrest? Defibrillation 2 J/kg**
  - Rhythm after defibrillation & CPR?  
    - No → **CPR**  
    - Yes → **Proceed to appropriate Protocol**

- **Advanced Airway**
  - **Vascular Access**
    - **Epinephrine**
      - Resume attempts to defibrillate.
    - **Amiodarone**
      - Resume attempts to defibrillate at 4-10 J/kg.
    - **Consider Sodium Bicarbonate**
      - Consider Magnesium Sulfate

### NOTES:
- Pattern should be drug- CPR- shock, drug- CPR- shock, etc.
- Reassess ETT placement frequently, i.e. after every patient move, change in patient condition.
- Search for cause of Cardiac Arrest.
- If defibrillation is successful and patient rearrests, return to previously successful Joule setting and administer antiarrhythmic medicine.
- Defibrillation takes precedence over all treatment once the defibrillator is available.
- For hypothermic patients defibrillation may not be effective, see Hypothermia Protocol.
- Spinal immobilize electrocution patients.
- For trauma patients determine the underlying cause of arrest and provide definitive treatment i.e. fluid resuscitation, pleural decompression.
- If patient successfully converted with Defibrillation: Start antiarrhythmic therapy as above.
- Considerations for Sodium Bicarb: known preexisting hyperkalemia, bicarbonate responsive acidosis (e.g. Diabetic ketoacidosis), or overdose (e.g. Tricyclics, cocaine, diphenhydramine) to alkalize the urine in aspirin or other overdose.
- Adult pads should be used in patients down to the age of 1 year so long as they do not touch; If adult pads are too large, use pediatric pads.

**VENTRICULAR FIBRILLATION/PULSELESS V-TACH PEDIATRIC**

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MEDICATION SECTION

This section is protocol. Not all medications listed here will be carried or used by your service. Drugs included here are listed because they are referenced in the previous protocol section either in the diagram or in the notes section.

Please see your service policy on which drugs you carry and use for the individual protocols in the previous section.

It is necessary to have multiple drugs for individual protocols due to drug shortages and availability.
<table>
<thead>
<tr>
<th>NAME</th>
<th>ADENOSINE (Adenocard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Endogenous nucleoside, miscellaneous antidysrhythmic agent</td>
</tr>
<tr>
<td>ACTION</td>
<td>Adenosine slows supraventricular tachycardias (SVTs) by decreasing electrical conduction through the AV node without causing negative inotropic effects.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION      | Onset: Immediate  
Duration: 10 seconds |
| INDICATIONS         | Diagnosis and treatment of SVT, in adults and pediatric patients. Monomorphic Wide Complex Tachycardia |
| CONTRAINDICATIONS   | • Second or third degree AV block, or sick sinus syndrome  
• Hypersensitivity to adenosine  
• Atrial flutter, atrial fibrillation, ventricular tachycardia (Adenosine is usually not effective in converting these rhythms to sinus rhythm)  
• Wolff-Parkinson-White syndrome |
| ADVERSE REACTIONS   | • Hypotension  
• Shortness of Breath  
• Transient periods of sinus bradycardia, sinus pause or bradyasystole  
• Nausea |
| DOSE AND ROUTE      | Adult:  
Rx: SVT & Monomorphic Wide Complex Tachycardia: 6 mg IV rapidly over 1-3 seconds. Flush with 20 ml bolus of NS, elevate IV arm. If no effect in 1-2 minutes, give 12 mg over 1-3 seconds. May repeat 12 mg bolus one more time.  
Pediatric:  
Rx: SVT & Monomorphic Wide Complex Tachycardia: 0.1-0.2 mg/kg IV, IO rapidly, up to 6 mg. If no effect, may double dose. Maximum: 12 mg total dose. |
<p>| NOTES               | Run monitor strip while administering Adenosine. This will often allow you to see the underlying rhythm when the rate slows. If underlying rhythm is Atrial Fib or Atrial Flutter, discontinue Adenosine and consult medical control. Stimulants such as caffeine may cause Adenosine to be ineffective. |</p>
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th><strong>ALBUTEROL (Proventil, Ventolin)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Sympathomimetic, Bronchodilator, Beta₂ agonist</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Albuterol is a sympathomimetic that is selective for beta₂ adrenergic receptors. It relaxes smooth muscles of the bronchial tree and peripheral vasculature by stimulating adrenergic receptors of the sympathetic nervous system.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: 5 – 15 min after inhalation  
Duration: 3-4 hours after inhalation |
| **INDICATIONS** | Relief of bronchospasm in-patients with reversible obstructive airway disease  
In: COPD, Asthma, Pulmonary Edema, Allergic Reaction |
| **CONTRAINDICATIONS** | • Prior hypersensitivity reaction to albuterol  
• Cardiac dysrhythmias associated with tachycardia |
| **ADVERSE REACTIONS** | • Usually dose related  
• Restlessness, apprehension  
• Dizziness  
• Palpitations, tachycardia  
• Dysrhythmias |
| **DOSE AND ROUTE** | **Adult:**  
Rx: Bronchospasm secondary to COPD, Asthma, Pulmonary Edema, Allergic Reaction: 1.25-2.5 mg (0.25-0.5 ml) mixed in 3 ml normal saline in nebulizer  
**Pediatric:** (Infant (Birth to 12 month))  
Rx: Bronchospasm secondary to reactive airway disease: Asthma, Bronchiolitis, Croup: 0.03 ml/kg nebulized; maximum: 1 ml of fluid  
(Use adult dose in pediatric patients older than 1 yrs. of age.) When in doubt consult medical control. |
| **NOTES** | • Some physicians recommend Albuterol updrafts in patients with possible pneumonia and/or CHF. When in doubt, consult medical control.  
• Because Albuterol increases the heart rate, it should be used with caution in patients with tachycardia with signs and symptoms of AMI.  
• Albuterol can be given in continuous updrafts to both adult and pediatric patients with severe bronchospasm or reactive airway disease. |
<table>
<thead>
<tr>
<th>NAME</th>
<th>AMIODARONE (Cordarone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Class III Antidysrhythmic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Amiodarone is a unique antidysrhythmic agent with multiple mechanisms of action. The drug prolongs duration of the action potential and effective refractory period.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: Within minutes  
Duration: Variable |
| INDICATIONS | Initial treatment and prophylaxis of frequently recurring VF and hemodynamically stable VT in patients refractory to other therapy. May also be useful in rapid atrial dysrhythmias to slow the ventricular rate in patients with impaired left ventricular function. |
| CONTRAINDICATIONS | Pulmonary congestion  
Cardiogenic shock  
Hypotension  
Sensitivity to Amiodarone  
2nd or 3rd degree Block  
Sensitivity to iodine  
If patient is taking other drugs that prolong the QT such as procainamide  
QT Interval greater than 0.46 |
| ADVERSE REACTIONS | Hypotension  
Headache  
Dizziness  
Bradycardia  
AV conduction abnormalities  
Flushing  
Abnormal salivation |
| DOSE AND ROUTE | **Adult:**  
Cardiac Arrest: VF/VT: 300 mg IVP. May repeat 150 mg IVP in 3-5 minutes  
Stable Wide Complex Tachycardia with a pulse:  
Rapid Infusion: 150 mg IV over 10 minutes. (mix 150 mg in 100 ml of NS or D5W and run at 10ml/min (Set Pump to 600 ml/hr) May repeat 150 mg in 10 min. (Monitor B/P closely and if it drops below 90 systolic, withhold amiodarone until medical control is contracted.)  
Pediatric:  
Cardiac Arrest V Tach: 5 mg/kg IV/IO (administer over 10 minutes for V Tach with pulse) |
<p>| Notes: | Amiodarone may also be helpful for controlling the ventricular rate in rapid atrial dysrhythmias in patients with severely impaired left ventricular function. If pregnancy is suspected, use of Lidocaine is preferred over Amiodarone due to possible fetal development malformations. |</p>
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th><strong>ASPIRIN (ASA)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Analgesic, anti-inflammatory, antipyretic, antiplatelet</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Aspirin blocks pain impulses in the CNS, dilates peripheral vessels and decreases platelet aggregation. The use of aspirin is strongly recommended for all acute MI patients.</td>
</tr>
<tr>
<td><strong>ONSET/DURATION</strong></td>
<td>Onset: 15-30 Minutes  Duration: 4-6 Hours</td>
</tr>
<tr>
<td><strong>INDICATIONS</strong></td>
<td>• AMI  • Prevention of platelet aggregation in ischemia and thromboembolism  • Unstable angina/Chest Pain of Cardiac Origin</td>
</tr>
<tr>
<td><strong>CONTRAINDICATIONS</strong></td>
<td>• Hypersensitivity to salicylates  • GI bleeding  • Active ulcer disease  • Stroke  • Bleeding disorders  • Children with flu-like symptoms (19 Y/O and younger)  • Possible dissecting thoracic aortic aneurysm</td>
</tr>
<tr>
<td><strong>ADVERSE REACTIONS</strong></td>
<td>• Stomach irritation  • Heartburn or indigestion  • Nausea or vomiting  • Allergic reaction  • Asthma induces by NSAIDS</td>
</tr>
<tr>
<td><strong>DOSE AND ROUTE</strong></td>
<td>Adult Rx: Acute Myocardial Infarction: 160-325 mg PO (2 – 4 low dose ASA)</td>
</tr>
<tr>
<td><strong>NOTES</strong></td>
<td>Adult patients should be carefully assessed for signs and symptoms of thoracic aneurysm and/or GI bleeding prior to administration of aspirin in the prehospital setting.</td>
</tr>
<tr>
<td><strong>NAME</strong></td>
<td><strong>ATROPINE SULFATE</strong></td>
</tr>
<tr>
<td>------------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>CLASS</strong></td>
<td>Anticholinergic agent, Vagolytic</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Atropine sulfate (a potent parasympatholytic), inhibits actions of acetylcholine at postganglionic parasympathetic (primarily muscarinic) receptor sites. In emergency care, it is primarily used to increase the heart rate in life-threatening or symptomatic bradycardia, and to antagonize excess muscarinic receptor stimulation caused by organophosphate insecticides or chemical nerve agents.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: Rapid  
Duration: 2-6 Hours |
| **INDICATIONS** | - Hemodynamically significant bradycardia  
- Organophosphate or nerve gas poisoning |
| **CONTRAINDICATIONS** | - Tachycardia  
- Hypersensitivity to atropine |
| **ADVERSE REACTIONS** | - Tachycardia  
- Paradoxical bradycardia when pushed too slowly or when used at doses less than 0.5 mg (Adult) or 0.1 mg (Pediatric)  
- Palpitations  
- Dysrhythmias  
- Headache  
- Dizziness  
- Nausea and Vomiting  
- Flushed, hot, dry skin  
- Allergic reactions |
| **DOSE AND ROUTE** | **Adult:**  
Rx: Symptomatic Bradycardia: 0.5 mg IV push fast q 3-5 minutes; up to 3 mg total dose  
Rx: Organophosphate or Carbamate Insecticide poisoning: 2.5 mg IV/IO q 5 - 10 minutes Until secretions dry or HR increases (No max dose in OPP)  
**Pediatric:**  
Rx: Bradydysrhythmias: 0.02 mg/kg IV, IO. Minimum dose is 0.1 mg. May be repeated in 5 minutes for a maximum total dose of 1.0 mg for a child and 2.0 mg for an adolescent  
Rx: Organophosphate or Carbamate Insecticide poisoning: 0.05 mg/kg IV/IO q 5 min. Minimum dose is 0.1 mg. Until secretions dry or HR increases. Max dose is 5 mg |
| **NOTES** | - Atropine causes pupillary dilation rendering the pupils nonreactive.  
- Atropine should be cautiously used in the presence of AMI because excessive increases in rate may worsen ischemia or increase the zone of infarction.  
- Atropine may not be effective in high degree heart block.  
- Large or repeated doses may decrease respiratory drive. |
<table>
<thead>
<tr>
<th>NAME</th>
<th><strong>CEFAZOLIN</strong> (Ancef)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Cephalosporins, 1st Generation</td>
</tr>
<tr>
<td>ACTION</td>
<td>Bactericidal; inhibits cell wall mucopeptide synthesis</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td></td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Patients with evidence of an open fracture (i.e. deformity with break in the overlying/adjacent skin)</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Hypersensitive to drug/class/components</td>
</tr>
</tbody>
</table>
| ADVERSE REACTIONS | • Neutropenia  
• Thrombocytopenia  
• Anaphylaxis  
• Stevens-Johnson syndrome  
• Nephrotoxicity  
• Seizures  
• C Diff  
• Diarrhea  
• Rash  
• Vomiting  
• Abd pain  
• Anorexia  
• Urticaria  
• Thrombophlebitis |
| DOSE AND ROUTE | Adult:  
Rx: Open Fracture:  
weight > 120 kg administer 3000mg  
weight > 20 – 120 kg administer 2000 mg  
Pediatric:  
Rx: weight < 20 kg give 50 mg/kg |
| NOTES        | • Reconstitute with 0.9% NS and inject in 100 ml 0.9% NS – infuse over 10 minutes  
• Using a 100c bag, and a 10 gtts set – infuse at 100gt/min |
<table>
<thead>
<tr>
<th>NAME</th>
<th>CETACAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Topical Anesthetic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Cetacaine is used for rapid, brief superficial anesthesia of nasal pharynx and oral pharynx.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: 5-10 minutes</td>
</tr>
<tr>
<td></td>
<td>Duration: Transient</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>To provide surface anesthesia of the upper airway mucosa to reduce resistance during tracheal intubation.</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>Hypersensitivity to Cetacaine</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Burning or stinging sensation</td>
</tr>
<tr>
<td></td>
<td>• Irritation</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult</td>
</tr>
<tr>
<td></td>
<td>Aid in oral intubation: Topical spray—aerosol – spray 1 to 2 seconds into back of throat to allow numbing effect and reduce gag reflex.</td>
</tr>
<tr>
<td></td>
<td>Pediatric</td>
</tr>
<tr>
<td></td>
<td>Aid in oral intubation: Topical spray—aerosol – spray 1 to 2 seconds into back of throat to allow numbing effect and reduce gag reflex.</td>
</tr>
<tr>
<td>NOTES</td>
<td>Reassure the patient and inform them about the procedure for intubation.</td>
</tr>
<tr>
<td>NAME</td>
<td>DEXAMETHASONE (DECADRON, HEXADROL)</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Glucocorticoid/Corticosteroid</td>
</tr>
<tr>
<td>ACTION</td>
<td>Glucocorticoids cause varied metabolic effects. They modify the body’s immune responses to diverse stimuli. Inflammatory cytokines are inhibited. Suppresses acute and chronic inflammation; immunosuppressive effects</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset – Unknown Half Life- 1.8 hours to 3.5 hours</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>Severe Allergic Reaction, Asthma, Croup, COPD</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>Systemic sepsis, Bacterial infection, Hypersensitivity to product</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>Hypertension, Sodium and water retention, Gastrointestinal bleeding, TB, None from single dose</td>
</tr>
</tbody>
</table>
| DOSE AND ROUTE  | Adult: 10 mg IV/IO or IM  
Pediatric: .5mg/kg IV/IO or IM Max dose 10mg |
<p>| NOTES           | Unknown safety in pregnancy |</p>
<table>
<thead>
<tr>
<th>NAME</th>
<th>DEXTROSE 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Carbohydrate, Hypertonic Solution</td>
</tr>
<tr>
<td>ACTION</td>
<td>10% dextrose solution (D\textsubscript{10}) is used in emergency care to treat hypoglycemia, and in the management of coma of unknown origin.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: 1-3 min</td>
</tr>
<tr>
<td></td>
<td>Duration: Depends on the degree of hypoglycemia</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Hypoglycemia</td>
</tr>
<tr>
<td></td>
<td>• Altered level of consciousness</td>
</tr>
<tr>
<td></td>
<td>• Coma of unknown etiology</td>
</tr>
<tr>
<td></td>
<td>• Seizure of unknown etiology</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Intracranial hemorrhage</td>
</tr>
<tr>
<td></td>
<td>• Increased intracranial pressure</td>
</tr>
<tr>
<td></td>
<td>• Known or suspected CVA in the absence of hypoglycemia</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Warmth, pain, burning from medication infusion</td>
</tr>
<tr>
<td></td>
<td>• Hyperglycemia</td>
</tr>
<tr>
<td></td>
<td>• Thrombophlebitis</td>
</tr>
<tr>
<td>DILUTION RESULTS</td>
<td>250cc Bag NS – remove 50 cc- then inject 50cc D\textsubscript{50} into bag and mix.- you now have 250cc of D\textsubscript{10} solution</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult:</td>
</tr>
<tr>
<td></td>
<td>Rx: Diabetic Emergencies (Hypoglycemia): administer up to 2 ml/kg of D\textsubscript{10} solution. May repeat if needed</td>
</tr>
<tr>
<td></td>
<td>Pediatric:</td>
</tr>
<tr>
<td></td>
<td>Rx: Hypoglycemia, Seizures if Blood glucose level unknown: 2.5 ml/kg of D\textsubscript{10} solution. May repeat if needed</td>
</tr>
<tr>
<td></td>
<td>Neonate:</td>
</tr>
<tr>
<td></td>
<td>2-3 ml/kg of D\textsubscript{10} solution. May repeat if needed</td>
</tr>
<tr>
<td>NOTES</td>
<td>• Normal blood glucose range = 60-110 mg/dl</td>
</tr>
<tr>
<td></td>
<td>• Infiltration of IV sites during administration of D\textsubscript{10} may produce tissue necrosis at the site but is much safer than D\textsubscript{50}.</td>
</tr>
<tr>
<td></td>
<td>• A blood glucose of &lt; 40mg/dl indicates hypoglycemia in an infant. Administer appropriate doses and recheck blood sugar.</td>
</tr>
<tr>
<td>NAME</td>
<td>DIAZEPAM (Valium)</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Benzodiazepine</td>
</tr>
<tr>
<td>ACTION</td>
<td>Diazepam acts on the limbic, thalamic, and hypothalamic regions of the CNS to potentiate the effects of inhibitory neurotransmitters, raising the seizure threshold in the motor cortex.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset:  
(IV) 1-5 min  
(IM) 15-30 min  
(PR) 4 – 10 min  
Duration:  
(IV) 15 min- 1 hour  
(IM) 15 min – 1 hour |
| INDICATIONS | • Acute anxiety states  
• Acute alcohol withdrawal  
• Skeletal muscle relaxation  
• Seizure Activity  
• Premedication prior to counter shock or TCP |
| CONTRAINDICATIONS | • Hypersensitivity to the drug  
• Substance abuse (use with caution)  
• Coma (unless the patient has seizures, severe muscle or myoclonus)  
• Shock  
• CNS depression as a result of head injury  
• Respiratory depression |
| ADVERSE REACTIONS | • Hypotension  
• Reflex tachycardia (rare)  
• Respiratory depression  
• Ataxia  
• Psychomotor impairment  
• Confusion  
• Nausea |
| DOSE AND ROUTE | Adult:  
Rx: Status Generalized Motor Seizures, Overdose toxic exposure seizures, Eclampsia seizures, Skeletal Muscle Relaxation, Pain, Premedication prior to Cardioversion or Pacing: 5-10 mg IV, over 2 minutes may be given IM, or IO  
May repeat q 10-15 minutes prn up to total dose of 30 mg guided by B/P and Respiratory effort  
Acute Anxiety or Acute Alcohol – 2-10 mg IV, IM, IO.  
Pediatric:  
Rx: Status Seizures: Infants-5 yrs of age: 0.2-0.5 mg/kg slow IV, IO q 2-5 minutes to maximum dose of 5 mg. Children > 5 yrs: 1 mg IV slow q 2-5 minutes to maximum dose of 10 mg  
Rectal Valium: (PR) Double recommended IV dose |
| NOTES | • Respiratory depression, although a rare occurrence, should be anticipated when administering valium. Prepare to assist ventilations.  
• Remember, the Broselow® Tape, Pedi Wheel®, EMS Field Guide, Handtevy provide quick and accurate drug dosing information that is weight-based for pediatric patients. |
**NAME** | **DILTIAZEM (Cardizem)**
---|---
**CLASS** | Slow Calcium Channel Blocker
**ACTION** | Calcium channel blocking agent that slows cardiac cell conduction, increases refractoriness in AV node and causes coronary and peripheral vasodilation. The drug is used to control ventricular response rates in patients with atrial fibrillation or flutter, multifocal atrial tachycardia, and SVT.
**ONSET/DURATION** | Onset: 2 – 5 minutes  
Duration: 1 – 3 hours
**INDICATIONS** | • SVT  
After consult with medical control:  
  o Accelerated Atrial Fibrillation  
  o Atrial Flutter
**CONTRAINDICATIONS** | • WPW  
• 2nd or 3rd degree block  
• Hypotension (< 90 mm Hg)  
• Cardiogenic shock  
• Hypersensitivity to drug  
• Ventricular Tachycardia  
• Wide complex tachycardia of unknown origin  
• AMI
**ADVERSE REACTIONS** | • Hypotension  
• Bradycardia  
• 2nd and 3rd degree Block  
• Syncope  
• Ventricular dysrhythmias  
• Nausea and Vomiting  
• Dyspnea  
• Chest Pain
**DOSE AND ROUTE** | **Adults:**  
Rx: Supraventricular Tachycardia, Atrial fib, Atrial flutter: Bolus initial dose 10mg IV SLOW over 2 - 5 minutes (up to 0.25mg/kg). May be repeated in 15 minutes at 0.35 mg/kg IV over 2-5 minutes  
**Pediatrics:**  
Not indicated for use in pediatric patients.
**NOTES** | Hypotension is the most common side effect (Manage with fluid bolus if lungs are clear)  
PVCs are common on conversion of SVT to sinus rhythm
<table>
<thead>
<tr>
<th>NAME</th>
<th>DIPHENHYDRAMINE (Benadryl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Antihistamine</td>
</tr>
<tr>
<td>ACTION</td>
<td>Antihistamines prevent the physiologic actions of histamine by blocking H1 and H2 receptor sites. Antihistamines are indicated for conditions in which histamine excess is present (e.g., acute urticarial), but also are used as adjunctive therapy (with epinephrine, for example) in the treatment of anaphylactic shock.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: 10 – 20 min  
Duration: 6 – 12 hours |
| INDICATIONS | • Moderate to severe allergic reactions (administer epinephrine first if severe)  
• Anaphylaxis  
• Acute extrapyramidal reactions (EPS) |
| CONTRAINDICATIONS | • Hypersensitivity  
• Narrow angle glaucoma (relative)  
• Newborns and nursing mothers |
| ADVERSE REACTIONS | • Dose-related drowsiness  
• Sedation  
• Disturbed coordination  
• Hypotension  
• Palpitations  
• Tachycardia, bradycardia |
| DOSE AND ROUTE | **Adult:**  
Rx: Allergic Reactions, Anaphylaxis: 25mg (IV) or 50 mg (Deep IM), may be repeated x1.  
**Pediatric:**  
Rx: Allergic Reactions, Anaphylaxis: 1mg/kg IV (max initial dose 25mg)  
2mg/kg IM (max initial dose 50mg) |
| NOTES | When used in anaphylaxis, will be in conjunction with epinephrine and / or corticosteroids  
Not used in infants or in pregnancy |
**NAME** | DOPAMINE (Intropin)
---|---
**CLASS** | Sympathomimetic
**ACTION** | At low doses dopamine acts on dopaminergic receptors causing renal, mesenteric, and cerebral vascular dilation. At moderate doses ("cardiac doses"), dopamine stimulates beta adrenergic receptors causing enhanced myocardial contractility, increased cardiac output, and a rise in blood pressure. At high doses ("vasopressor doses"), dopamine has an alpha-adrenergic effect, producing peripheral arterial and venous constriction.
**ONSET/DURATION** | Onset: 2-4 min
Duration: 10-15 min
**INDICATIONS** | - Hemodynamically significant hypotension in the absence of hypovolemia.
- Bradycardia if Atropine has been ineffective.
**CONTRAINDICATIONS** | - Tachydysrhythmias
- Ventricular fibrillation
**ADVERSE REACTIONS** | - Dose-related tachydysrhythmias
- Hypertension
- Increased myocardial oxygen demand (e.g., ischemia)
- Renal failure
**DOSE AND ROUTE** | **Adult:**
Rx: Hypotension, Bradycardia: 5-20 µg/kg/min, titrate to effect.
Use premix or mix 400 mg in 250 ml D5W (1600 µg/ml) use 60 gtt set.

**Pediatric**
Rx: Hypotension:
2-20 µg/kg/min. Use premix or mix 400 mg in 250 ml D5W (1600 µg/ml) use 60 gtt set.

**Extravasation causes tissue necrosis**

**NOTES**

<table>
<thead>
<tr>
<th>Patient Weight in Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>5µg</td>
</tr>
<tr>
<td>10µg</td>
</tr>
<tr>
<td>15µg</td>
</tr>
<tr>
<td>20µg</td>
</tr>
</tbody>
</table>

**Microdrops per minute (or ml/hr)**
### NAME
EPINEPHRINE (Adrenalin)

### CLASS
Sympathomimetic

### ACTION
Epinephrine is an endogenous catecholamine that directly stimulates alpha, beta 1 and beta 2 adrenergic receptors in dose-related fashion. It is the initial drug of choice for treating bronchoconstriction and hypotension resulting from anaphylaxis as well as all forms of cardiac arrest.

### ONSET/DURATION
- **Onset:**  
  - (IM) 1-5 min  
  - (IV) 1-2 min  
- **Duration:** 5-10 min

### INDICATIONS
- Bronchial asthma  
- Upper Airway Edema  
- Hypotension in Children  
- Acute allergic reaction (anaphylaxis)  
- Cardiac arrest  
- Asystole  
- Pulseless Electrical Activity (PEA)  
- Ventricular fibrillation and pulseless ventricular tachycardia unresponsive to initial defibrillation  
- Profound symptomatic bradycardia  

### CONTRAINDICATIONS
- Hypersensitivity (not an issue especially in emergencies- the dose should be lowered or given slowly in non-cardiac arrest patients with heart disease)  
- Hypovolemic shock (as with other catecholamines, correct hypovolemia prior to use)  
- Coronary insufficiency (use with caution)

### ADVERSE REACTIONS
- Headache  
- Nausea  
- Restlessness/Agitation  
- Weakness  
- Dysrhythmia, including ventricular tachycardia and ventricular fibrillation  
- Hypertension  
- Precipitation of angina pectoris  
- Tachycardia

### DOSE AND ROUTE

**Adult:**
- **Cardiac Arrest:** 1 mg IV/IO q 3-5 minutes. 1:10,000 IV or IO  
- **Upper Airway Edema/ Severe Asthma:** 0.3-0.5 mg IM or Nebulized  
  
  (0.3-0.5 ml 1:1000 in 3cc NS)  
- **Anaphylaxis with hypoperfusion:** 0.3-0.5 mg slow IV (3-5 ml 1:10,000)  
- **Brady-cardia:** 2 –10 µg/min IV infusion. (mix 1 mg in 250 ml of D5W) Run on pump or use micro drip tubing  

**Pediatric:**
- **Cardiac Arrest:** 0.01 mg/kg IV/IO q 3-5 minutes. 1:10,000 (0.1ml/kg)  
- **Allergic Reaction/ Severe Asthma/ upper airway edema:** 0.01mg/kg 1:1000 IM or Nebulized – mix with 3cc NS  
- **Anaphylaxis with hypoperfusion:** 0.01mg/kg slow IV (1:10,000)  
- **Brady-cardia/hypotension:** 0.01 -.0.03 mg/kg IV, IO (1:10,000) Q 3 – 5 minutes  
- **Child hypoperfusion-** 0.1mcg/kg/min drip up to 1 mcg/kg/min titrate to effect  
  
  Neonatal: 0.01 -0.03 mg/kg (0.1 –[ 0.3 ml/kg) (IV, IO, UV) All 1:10,000.  
- **Croup/Stridor –** 0.5 mL/kg of 1:1000 epi Nebulized. Max of 5 ml dilute in 3 ml NS

### NOTES
- Do not administer Epinephrine in the buttocks on Children, use the Vastus Lateralis area of leg. Do not administer more than once in any given injection site. ET Administration is permissible use 2 – 2.5 X normal amount.
<table>
<thead>
<tr>
<th>NAME</th>
<th>ETOMIDATE (Amidate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Sedative, hypnotic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Exact action is unknown. May have GABA like effects, depresses brain stem reticular formation activity and produces hypnosis. Creates an ultra-short acting sedative/hypnotic effect. It decreases Intracranial Pressure (ICP) and decreases cerebral blood flow thus resulting in decreased basal metabolic rate.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: 30 – 60 seconds  
Duration: 10 – 15 minutes |
| INDICATIONS | Sedative for Pharmacological Assisted Intubation (PAI)  
Sedation/hypnotic |
| CONTRAINDICATIONS | Patient < 8 year-old  
Marked Hypotension  
Pregnancy  
Immunosuppression  
Sepsis  
Transplant patient |
| ADVERSE REACTIONS | Apnea  
Bradycardia  
Hypotension  
Dysrhythmias  
N & V  
Laryngospasm |
| DOSE AND ROUTE | Adult  
Rx: PAI or Sedation: 0.3 mg/kg IV slowly  
Pediatric: not used |
<p>| NOTES       | Always use IV fluid flowing during administration to reduce pain at injection site. |</p>
<table>
<thead>
<tr>
<th>NAME</th>
<th><strong>FENTANYL CITRATE (SUBLIMAZE)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Narcotic Analgesic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Therapeutic values are analgesic and sedative. Fentanyl is 50 – 100 times more potent than morphine. It has a rapid onset but its duration of action is shorter than that of meperidine or morphine. Fentanyl has less emetic activity than other narcotics. The respiratory effect in slowing rate and alveolar ventilation may last longer than the analgesic effect.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset – IV or IO Immediate IN 2 – 10 Minutes Peak Effects: 3 -5 minutes (IV) Duration: 15 -30 minutes Half-Life: 6-8 hours</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Used for maintenance of analgesia, as an adjunct PAI • Pain /Analgesia</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Severe hemorrhage • Shock • known hypersensitivity</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>As seen with all narcotic analgesics: • Respiratory depression • Apnea • Chest wall muscle rigidity • Bradycardia • Hypotension</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td><strong>Adult:</strong> Rx: Analgesia: 1 – 2 mcg/kg IV slow over at least 1 minute – preferably over 2 – 3 minutes. May be given IV or IM IN -2 mcg/kg –½ in each nostril <strong>Pediatric:</strong> Rx: Analgesia: 0.5 – 3.0 mcg/kg IV or IM – may repeat one time Intra Nasal administration 1 -2 mcg/kg –½ in each nostril</td>
</tr>
<tr>
<td>NOTES</td>
<td>Because Fentanyl has less of a hemodynamic effect on the body, Morphine is the drug of choice for cardiac chest pain control and CHF patients.</td>
</tr>
<tr>
<td>NAME</td>
<td>FUROSEMIDE (Lasix)</td>
</tr>
<tr>
<td>-----------------------</td>
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</tr>
<tr>
<td>CLASS</td>
<td>Loop diuretic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Furosemide is a potent diuretic that inhibits the reabsorption of sodium and chloride in the proximal tubule and loop of Henle. Intravenous doses can also reduce cardiac preload by increasing venous capacitance.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: (IV) diuretic effects within 15-20 min; vascular effects within 5 min; Duration: 2 hours</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Pulmonary edema associated with CHF, hepatic or renal disease • Isolated closed head trauma with signs and symptoms of herniation • Severe Hyperkalemia</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Hypersensitivity • Hypovolemia/dehydration • Known hypersensitivity to sulfonamides • Severe electrolyte depletion (hypokalemia)</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Hypotension • ECG changes associated with electrolyte disturbances • Dry mouth • Hypochloremia • Hypokalemia • Hyponatremia • Hypercalcemia • Hyperglycemia • Hearing loss can rarely occur after too rapid infusion of large doses especially in patients with renal impairment.</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult: Rx: CHF with Pulmonary Edema, Hyperkalemia, Isolated Closed Head Trauma: 0.5-1.0 mg/kg Slow IV. Maximum dose: 2 mg/kg Pediatric: Rx: CHF with Pulmonary Edema 1 mg/kg IV, IO slowly</td>
</tr>
<tr>
<td>NOTES</td>
<td>Hypotension is a common side effect that often results when Lasix is given too rapidly. As the diuretic effect of Lasix usually does not begin for 15-20 minutes after the drug is given, the primary effect of this drug when given in the prehospital environment is to dilate the venous system and reduce preload in patients with bi-ventricular failure.</td>
</tr>
<tr>
<td>NAME</td>
<td>GEODON / ZIPRASIDONE</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Anti-psychotic and tranquilizing agent</td>
</tr>
<tr>
<td>ACTION</td>
<td>When introduced by intramuscular injection Geodon enters the body and acts as an antagonist at dopamine and serotonin receptors. It also moderately inhibits re-uptake of norepinephrine and serotonin. Geodon works as an anti-histamine.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: IM 15 – 20 Minutes</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>- Agitated Delirium</td>
</tr>
<tr>
<td></td>
<td>- Schizophrenia</td>
</tr>
<tr>
<td></td>
<td>- Bipolar Disorders</td>
</tr>
<tr>
<td></td>
<td>- Manic Disorders</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>- Not to be administered to patients with Dementia-related psychosis</td>
</tr>
<tr>
<td></td>
<td>- History of prolonged QT interval or medications that prolongs QT interval</td>
</tr>
<tr>
<td></td>
<td>- Hypersensitivity to Geodon</td>
</tr>
<tr>
<td></td>
<td>- Recent MI or uncontrolled CHF</td>
</tr>
<tr>
<td></td>
<td>- Current use of antibiotics</td>
</tr>
<tr>
<td></td>
<td>- Current use of antidepressants</td>
</tr>
<tr>
<td></td>
<td>- Use of cancer medications</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>- Dystonic reactions</td>
</tr>
<tr>
<td></td>
<td>- Somnolence (sleepiness)</td>
</tr>
<tr>
<td></td>
<td>- Dizziness</td>
</tr>
<tr>
<td></td>
<td>- Headache</td>
</tr>
<tr>
<td></td>
<td>- Orthostatic hypotension</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult:</td>
</tr>
<tr>
<td></td>
<td>Rx: Agitated Delirium, Schizophrenia, Bipolar disorder, Manic Disorders: 10 – 20 mg IM</td>
</tr>
<tr>
<td></td>
<td>Pediatric:</td>
</tr>
<tr>
<td></td>
<td>Rx: Not recommended</td>
</tr>
<tr>
<td>NOTES</td>
<td></td>
</tr>
<tr>
<td>NAME</td>
<td>GLUCAGON</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Pancreatic hormone, insulin antagonist</td>
</tr>
<tr>
<td>ACTION</td>
<td>Glucagon is a protein secreted by the alpha cells of the pancreas. When released, it results in blood glucose elevation by increasing the breakdown of glycogen to glucose (glycogenolysis) and stimulating glucose synthesis (gluconeogenesis). The drug is only effective in treating hypoglycemia if liver glycogen is available, and may therefore be ineffective in chronic states of hypoglycemia, starvation, and adrenal insufficiency.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: With in 1 minute Duration: 60 – 90 minutes</td>
</tr>
</tbody>
</table>
| INDICATIONS | • Hypoglycemia when IV access is not obtainable or D50 is contraindicated  
• Beta Blocker Overdose  
• Refractory Hypotension with Anaphylaxis |
| CONTRAINDICATIONS | • Hypersensitivity (allergy to proteins) |
| ADVERSE REACTIONS | • Tachycardia  
• Hypotension  
• Nausea, vomiting  
• Urticaria |
| DOSE AND ROUTE | Adult:  
Rx: Hypoglycemia: 0.5-1.0 mg (or unit) IM, SQ, IV (IN – use 2-3 mg)  
Rx: Beta Blocker OD:  3-10 mg IV (50-100 µg/kg), followed by drip: 1-5 mg/hour  
Rx: Anaphylaxis:: 1 – 2 mg IV  
Pediatric < 20 kg:  
Rx: Hypoglycemia  0.5 – 1.0 mg IV, IO, IM, SQ |
<p>| NOTES       | For hypoglycemia patient who has been given Glucagon, remain on scene until patient is given foods high in carbohydrates. |</p>
<table>
<thead>
<tr>
<th>NAME</th>
<th>HALOPERIDOL LACTATE (Haldol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Antipsychotic/Neuroleptic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Haloperidol has pharmacologic properties similar to those of phenothiazines. The drug is thought to block dopamine (type 2) receptors in the brain, altering mood and behavior. In emergency care, haloperidol usually is given IM, but may also be given IV.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: (IM) 30 – 60 minutes</td>
</tr>
<tr>
<td></td>
<td>Duration: 12 – 24 hours</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Acute psychotic episodes</td>
</tr>
<tr>
<td></td>
<td>• Emergency sedation of severely agitated or delirious patients</td>
</tr>
<tr>
<td></td>
<td>• Excited Delirium</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• CNS depression</td>
</tr>
<tr>
<td></td>
<td>• Coma</td>
</tr>
<tr>
<td></td>
<td>• Hypersensitivity</td>
</tr>
<tr>
<td></td>
<td>• Pregnancy</td>
</tr>
<tr>
<td></td>
<td>• Severe liver or cardiac disease</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Dose-related extrapyramidal reactions</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
</tr>
<tr>
<td></td>
<td>• Orthostatic hypotension</td>
</tr>
<tr>
<td></td>
<td>• Nausea, vomiting</td>
</tr>
<tr>
<td></td>
<td>• Allergic reactions</td>
</tr>
<tr>
<td></td>
<td>• Blurred vision</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult:</td>
</tr>
<tr>
<td></td>
<td>Rx: Severe Agitation/Excited Delirium : 2-5 mg IM, or IN</td>
</tr>
<tr>
<td></td>
<td>Pediatric:</td>
</tr>
<tr>
<td></td>
<td>Not Recommended</td>
</tr>
<tr>
<td>NOTES</td>
<td>• Some patients may have prolonged reaction to Haldol</td>
</tr>
<tr>
<td></td>
<td>• Consider Haloperidol 2-5 mg IV or IM for acute psychosis or severe agitation.</td>
</tr>
<tr>
<td></td>
<td>• May significantly suppress CNS in patients with alcohol ingestion (monitor vital signs and prepare to intervene if respiratory depression occur</td>
</tr>
<tr>
<td>NAME</td>
<td>HEPARIN SODIUM</td>
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<tr>
<td>---------------</td>
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</tr>
<tr>
<td>CLASS</td>
<td>Anticoagulant</td>
</tr>
<tr>
<td>ACTION</td>
<td>Heparin inhibits the clotting cascade by activating specific plasma proteins. The drug is used in the prevention and treatment of all types of thrombosis and emboli, DIC, arterial occlusion and thrombophlebitis, and prophylactically to prevent clotting before and after surgery. Heparin is also considered part of the “thrombolytic package” administered to patients with acute myocardial infarction (along with aspirin and thrombolytic agents) and acute coronary syndromes including unstable angina and non-Q wave myocardial infarction.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: (IV) Immediate (SQ) 20 – 60 min Duration: 4 –8 hours</td>
</tr>
</tbody>
</table>
| INDICATIONS   | • Acute myocardial infarction  
• Prophylaxis and treatment of thrombolytic disorders (e.g., pulmonary emboli, DVT) |
| CONTRAINDICATIONS | • Hypersensitivity  
• Active bleeding  
• Recent intracranial, intraspinal, or eye surgery  
• Severe hypertension  
• Bleeding tendencies  
• Severe thrombocytopenia |
| ADVERSE REACTIONS | • Allergic reaction (chills, fever, back pain)  
• Thrombocytopenia  
• Hemorrhage  
• Bruising |
| DOSE AND ROUTE | Adult  
Follow your Specific EMS service protocol for Heparin Administration Authorization from Medical Control is mandatory.  
5000 units followed by maintenance infusion of 100 units/hour. |
<p>| NOTES         | Protamine sulfate is a Heparin antagonist and 1 mg neutralizes approx. 100 IU heparin |</p>
<table>
<thead>
<tr>
<th>NAME</th>
<th>HYDROXYZINE (Vistaril, Atarax, Apresoline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Antihistamine</td>
</tr>
<tr>
<td>ACTION</td>
<td>Hydroxyzine is a histamine-1 receptor antagonist that is used to treat allergy-induced pruritus, and is used for its antiemetic and sedative properties. It is effective for treatment of anxiety and tension associated with neuroses and alcohol withdrawal. Concomitant use with analgesics may potentiate the effects.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: (IM) 15 – 30 min</td>
</tr>
<tr>
<td></td>
<td>Duration: 4 – 6 hr</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Nausea and vomiting</td>
</tr>
<tr>
<td></td>
<td>• Anxiety reactions</td>
</tr>
<tr>
<td></td>
<td>• Motion sickness</td>
</tr>
<tr>
<td></td>
<td>• Alcohol withdrawal symptoms</td>
</tr>
<tr>
<td></td>
<td>• Pruritus</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hypersensitivity</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dry mouth</td>
</tr>
<tr>
<td></td>
<td>• Drowsiness</td>
</tr>
<tr>
<td></td>
<td>• N &amp; V</td>
</tr>
<tr>
<td></td>
<td>• Tachycardia</td>
</tr>
<tr>
<td></td>
<td>• Diarrhea</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Adult:</strong></td>
</tr>
<tr>
<td></td>
<td>Rx: Nausea and vomiting: 25-100 mg deep IM</td>
</tr>
<tr>
<td></td>
<td><strong>Pediatric:</strong></td>
</tr>
<tr>
<td></td>
<td>Rx: Nausea and vomiting: 0.5 - 1.0 mg/kg deep IM</td>
</tr>
<tr>
<td>NOTES</td>
<td>Localized burning at injection site is common.</td>
</tr>
<tr>
<td>NAME</td>
<td>IPRATROPIUM (Atrovent)</td>
</tr>
<tr>
<td>------</td>
<td>------------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Anticholinergic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Ipratropium is an anticholinergic (parasympatholytic) bronchodilator that is chemically related to atropine.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: Varies</td>
</tr>
<tr>
<td></td>
<td>Duration: 4-6 hours</td>
</tr>
<tr>
<td>INDICATION</td>
<td>• Bronchial Asthma</td>
</tr>
<tr>
<td></td>
<td>• Chronic Bronchitis</td>
</tr>
<tr>
<td></td>
<td>• Emphysema</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Hypersensitivity to the drug</td>
</tr>
<tr>
<td></td>
<td>• Peanut Allergies</td>
</tr>
<tr>
<td></td>
<td>• Allergies to soy and Atropine</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Palpitations</td>
</tr>
<tr>
<td></td>
<td>• Anxiety</td>
</tr>
<tr>
<td></td>
<td>• Rash</td>
</tr>
<tr>
<td></td>
<td>• Nausea</td>
</tr>
<tr>
<td></td>
<td>• Vomiting</td>
</tr>
<tr>
<td></td>
<td>• Nervousness</td>
</tr>
<tr>
<td></td>
<td>• Dizziness</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult:</td>
</tr>
<tr>
<td></td>
<td>Rx: Bronchial Asthma, Chronic Bronchitis, Emphysema: 0.5mg nebulized – max 3 doses</td>
</tr>
<tr>
<td></td>
<td>Can be administered with a B&lt;sub&gt;2&lt;/sub&gt; agonist in a nebulized treatment</td>
</tr>
<tr>
<td>Pediatric:</td>
<td>Rx: Bronchial Asthma, Chronic Bronchitis: 0.5mg nebulized – max 3 doses</td>
</tr>
<tr>
<td></td>
<td>Can be administered with a B&lt;sub&gt;2&lt;/sub&gt; agonist in a nebulized treatment</td>
</tr>
<tr>
<td>NOTES</td>
<td></td>
</tr>
<tr>
<td>NAME</td>
<td>KETAMINE (Ketalar)</td>
</tr>
<tr>
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<td>-------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Anesthetic Analgesic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Causes disassociation. Ketamine acts on the limbic system and cortex to block afferent transmission of impulses associated with pain perception. It produces short-acting amnesia without muscular relaxation.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: 30 seconds IV  
Duration: IV 5-10 minutes  
IM up to 30 minutes IM |
| INDICATIONS | • PAI (Pharmacological assisted intubation)  
• Pain  
• Agitated Delirium  
• Chemical Sedation of Violent Patient  
• Post resuscitation when Versed is contraindicated |
| CONTRAINDICATIONS | • Hypertensive Patients  
• Patients with increased intracranial pressure  
• Glaucoma  
• Hypersensitivity to drug |
| ADVERSE REACTIONS | • Increased salivation  
• Elevated blood pressure  
• Elevated heart rate  
• Altered mental status |
| DOSE AND ROUTE | Adult:  
Rx: Pain Control: 0.5 – 1.0 mg/kg IV over 1 minute – may repeat 1 time or 2 to 4 mg/kg IM, IN (no more than 1cc per nostril)  
Rx:: PAI, Post Resuscitation, Violent Patient: 1 – 2 mg/kg IV over 1 minute or 2-4 mg/kg IM/IN  
Pediatric > 2years old:  
Rx: Pain: 0.5 – 1.0 mg/kg IV over 1 minute may repeat one time, or 2 – 4 mg/kg IM, IN |
| NOTES | Consider Atropine in Children at 0.1mg/kg  
Consider lower doses for sedation (0.5mg/kg) if patient is under the influence of opiates. |
<table>
<thead>
<tr>
<th><strong>CLASS</strong></th>
<th>Non-steroidal anti-inflammatory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIONS</strong></td>
<td>Ketorolac Tromethamine is an anti-inflammatory drug that also exhibits peripherally acting non-narcotic analgesic activity by inhibiting prostaglandin synthesis.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: Within 10 min  
Duration: 6-8 hours |
| **INDICATION** | Short-term management of moderate to severe pain |
| **CONTRAINDICATIONS** |  
- Hypersensitivity to the drug  
- Pain associated with significant trauma/bleeding  
- Patients with allergies to aspirin or other nonsteroidal anti-inflammatory drugs  
- Bleeding disorders  
- Renal failure  
- Active peptic ulcer disease  
- Use of blood thinners: Coumadin, Plavix, etc. |
| **ADVERSE REACTIONS** |  
- Anaphylaxis from hypersensitivity  
- Edema  
- Sedation  
- Bleeding disorders  
- Rash  
- Nausea  
- Headache |
| **DOSE AND ROUTE** |  
**Adult:**  
Rx: Analgesia: 15-30 mg IV or 30-60 mg IM  
**Pediatric:** Typically Not Recommended |
| **NOTES** | Toradol (30mg) usually provides analgesia comparable to 12 mg Morphine or 100 mg Demerol. |
**NAME** | **LABETALOL** *(Normodyne, Trandate)*
---|---
**CLASS** | Alpha and beta adrenergic blocker
**ACTION** | Labetalol is a competitive alpha, receptor blocker as well as a nonselective beta receptor blocker that is used for lowering blood pressure in hypertensive crisis.
**ONSET/DURATION** | Onset: Within 5 min  
Duration: 3-6 hours
**INDICATION** | Hypertensive emergencies:  
Systolic B/P of greater than 230  
Diastolic B/P of greater than 120
**CONTRAINDICATIONS** | - Signs and Symptoms of CVA  
- Bronchial asthma (relative)  
- Uncompensated CHF  
- Second and third degree heart block  
- Bradycardia  
- Cardiogenic shock  
- Pulmonary edema
**ADVERSE REACTIONS** | - Headache  
- Dizziness  
- Dose related orthostatic hypotension  
- Fatigue  
- Vertigo  
- Ventricular dysrhythmias  
- Dyspnea  
- Allergic reaction  
- Facial flushing  
- Diaphoresis
**DOSE AND ROUTE** | **Adult:**  
Rx: Hypertensive Crisis: 10-20 mg IV over 1-2 minutes. May repeat or double dose q 10 minutes until a total dose of 150 mg OR start infusion at 2 mg/min.  
Drip: Mix 200 mg (40 ml) in 160 ml of D$_5$W for a concentration of 1 mg/ml. Start at 2 mg/min.  
| Labetalol Drip (1 mg/ml) |  
| --- | --- | --- | --- | --- | --- | --- | --- | ---  
| mg/min | 2 mg | 4 mg | 6 mg | 8 mg |  
| Micro drops/min (ml/hr) | 120 | 240 | 360 | 480 |  
| Microdrops per minute (or ml/hr) |  
**NOTES** | Bronchodilator effects of Albuterol may be blunted by Labetalol  
With infusion: Usually do not want to drop BP by more than 10 mmHg over 2 minutes
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>LEVALBUTEROL (XOPENEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Sympathetic agonist</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Levalbuterol is a selective $B_2$-adrenergic agonist that causes relaxation of bronchial smooth muscle, thus decreasing airway resistance and increasing vital capacity. Levalbuterol is a chemical variant of albuterol with greater affinity for the $B_2$-adrenergic receptors.</td>
</tr>
<tr>
<td><strong>ONSET/DURATION</strong></td>
<td>Onset: 5 -15 minutes Duration: 3 - 6 hours</td>
</tr>
<tr>
<td><strong>INDICATIONS</strong></td>
<td>• Asthma • Chronic bronchitis • Emphysema • Reversible obstructive airway disease</td>
</tr>
<tr>
<td><strong>CONTRAINDICATIONS</strong></td>
<td>• Known hypersensitivity to the drug</td>
</tr>
<tr>
<td><strong>ADVERSE REACTIONS</strong></td>
<td>• Tremors • Anxiety • Dizziness • Headache • Insomnia • Nausea • Palpitations • Tachycardia • Hypertension</td>
</tr>
<tr>
<td><strong>DOSE AND ROUTE</strong></td>
<td><strong>Adult:</strong> Rx: Asthma or Allergic Reaction: 0.63mg in 3.0 mL normal saline <strong>Pediatric:</strong> Rx: Asthma or Allergic Reaction: &lt; 12 year-of-age 0.31 mg nebulized / mix in 3.0 ml normal saline</td>
</tr>
</tbody>
</table>
**LIDOCAINE (Xylocaine)**

### CLASS
Antidysrhythmic (Class I-B) Local anesthetic

### ACTION
Lidocaine decreases phase 4 diastolic depolarization (which decreases automaticity), and has been shown to be effective in suppressing premature ventricular complexes. In addition it is used to treat ventricular tachycardia. Lidocaine also raises the ventricular fibrillation threshold.

### ONSET/DURATION
- **Onset:** 30-90 sec
- **Duration:** 10-20 min

### INDICATIONS
- Pain from Intraosseous Infusion Pressure
- Used if Amiodarone is not available for:
  - Ventricular tachycardia
  - Ventricular fibrillation
  - Wide-complex tachycardia of uncertain origin
  - Significant ventricular ectopy in the setting of myocardial ischemia/infarction

### CONTRAINDICATIONS
- Hypersensitivity
- Second or third degree heart block
- Relative Contraindication: Bradycardic rhythms with escape ectopy

### ADVERSE REACTIONS
- Lightheadedness
- Confusion
- Blurred vision
- Slurred speech
- Hypotension
- Bradycardia
- Altered level of consciousness, irritability, muscle twitching, seizures with high doses

### DOSE AND ROUTE
**Adult:**
- **Rx:** Cardiac Arrest VT/VF: 1-1.5 mg/kg IVP. (ET dose 2-4 mg/kg) May repeat with 0.5-0.75 mg/kg IVP q 5-10 minutes. Maximum: 3 mg/kg. If effective conversion start drip ASAP (2-4 mg/min)
- **Rx:** VT with Pulse: 1 – 1.5 mg/kg IVP; then 0.5 – 0.75 mg/kg q 5 – 10 minutes up to 3 mg/kg. Start Drip ASAP (2 – 4 mg/min)
- **Rx:** AICD firing, and/or Frequent PVC’s with cardiac symptomology: 0.5 – 1.5 mg/kg IV. May repeat as above up to 3 mg/kg. Start Drip ASAP (2 – 4 mg/min)
- **Rx:** Intraosseous Infusion Pain control: 40mg and then wait at least 1-2 minutes prior to flushing with 10cc NS. May use a subsequent dose of 10 – 20mg if pain returns or is persistent.

**Pediatric:**
- **Rx:** VF/VT: 1 mg/kg IV, IO. Followed by drip of 20 – 50 µg/kg/min (See Length Based Tape, Pedi-Wheel, or EMS Field Guide for Pediatric Infusions of Lidocaine)
- **Rx- IO Pain:** 0.5mg/kg up to max of 40 mg

| Drip: 1-4 mg/min. Use premix of mix 1 Gm in 250 ml D5W & run at: |
|---|---|---|---|---|
| **Lidocaine Drip (4 mg/ml)** | 1 mg | 2 mg | 3 mg | 4 mg |
| Micro drops/min (ml/hr) | 15gtts | 30gtts | 45gtts | 60gtts |
| If using Premix (8 mg/ml) run at | 7gtts | 15gtts | 30gtts | 45gtts |

**Microdrops per minute (or ml/hr)**
Reduce maintenance infusion by 50% if patient is >70 YO, has liver disease, or is in CHF or Shock
<table>
<thead>
<tr>
<th><strong>CLASS</strong></th>
<th><strong>LORAZEPAM (Ativan)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antianxiety, Sedative</td>
<td></td>
</tr>
</tbody>
</table>

| **ACTION** | Anxiolytic effect with skeletal muscle relaxation. |

| **ONSET/DURATION** | Onset:  
(IV) 1-5 minutes  
IM 15 – 30 minutes  
Duration: 12-24 hours |

| **INDICATIONS** | • Anxiety Disorder  
• Status Epilepticus  
• Skeletal muscle spasms  
• Sedation Prior to cardioversion or RSI  
• Post PAI sedation |

| **CONTRAINDICATIONS** | • Acute narrow angle Glaucoma  
• Acute Alcohol Intoxication  
• Shock |

| **ADVERSE REACTIONS** | • Nausea/Vomiting  
• Hypotension  
• Respiratory/CNS depression |

| **DOSE AND ROUTE** | **Adult:**  
Rx: Seizure, Anxiety Disorder: 2-4 mg slow IV (no faster than 2 mg/min) or IM  
May repeat every 15 – 20 minutes  
**Pediatric:**  
Rx: Seizure: 0.1 mg/kg slow IV or IO (Over 2-5 min) up to a maximum of 4 mg. May repeat at 0.5 mg/kg in 10-15 min. |

| **NOTES** | • Lorazepam can be administered rectally in the pediatric patient at double the recommended IV dose.  
• Attempt to use large secure veins as venous irritation is a common side effect |
### NAME
MAGNESIUM SULFATE

### CLASS
Electrolyte, Anticonvulsant

### ACTION
Magnesium sulfate reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction. In emergency care, magnesium sulfate is used in the management of seizures associated with toxemia of pregnancy. Other uses of magnesium sulfate include uterine relaxation (to inhibit contractions of premature labor), as a bronchodilator after beta agonist and anticholinergic agents have been used, replacement therapy for magnesium deficiency. Magnesium sulfate is gaining popularity as an initial treatment in the management of various dysrhythmias, particularly torsades de pointes, and dysrhythmias secondary to TCA overdose or digitalis toxicity.

### ONSET/DURATION
Onset: (IV) Immediate
Duration: (IV) 30 min

### INDICATIONS
- Seizures of eclampsia (toxemia of pregnancy)
- Torsades de pointes
- Suspected hypomagnesemia
- Refractory ventricular fibrillation
- Asthma (must contact med control)

### CONTRAINDICATIONS
- Heart block or myocardial damage
- Hypermagnesia

### ADVERSE REACTIONS
- Diaphoresis
- Facial flushing
- Hypotension
- Depressed reflexes
- Hypothermia
- Reduced Heart rate
- Respiratory depression
- Diarrhea

### DOSE AND ROUTE
**Adult:**
Rx: Cardiac Arrest (Torsades, Hypomagnesemia, Refractory VF/VT): 1-2 gm IVP (5-10 gm may be needed)
Rx: Torsades with a pulse: 1-2 gm IV over 5-60 min (mix in 50 ml of D₅W)
Rx: Seizures secondary to Eclampsia: 1-4 gm IV slowly
Rx: Asthma – 2 gm nebulized (after Med Control approval)

**Pediatric:**
Rx: Asthma, Cardiac Arrest (Torsades, Hypomagnesemia, Refractory VF/VT): 25—50 mg/kg IV, IO, Nebulized over 15-30 minutes. Maximum: 2 gm

### NOTES
IV calcium chloride or calcium gluconate is an antagonist to magnesium if needed.
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>METHYLprednisolone (Solu-Medrol)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Corticosteroid and anti-inflammatory</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Corticosteroids have multiple actions in the body. They have potent anti-inflammatory properties and inhibit many of the substances that cause inflammation.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION**     | Onset – Varies  
Duration – 1 – 5 weeks  
Half-life – 3.5 hours |
| **INDICATIONS**        | • Moderate to Severe Anaphylaxis  
• Asthma |
| **CONTRAINDICATIONS**  | • Known hypersensitivity  
• Systemic Fungal Infections |
| **ADVERSE REACTIONS**  | • Fluid Retention  
• CHF  
• Hypertension  
• ABD distention  
• Vertigo  
• Head Ache  
• Nausea  
• Malaise  
• Hiccup |
| **DOSE AND ROUTE**     | **Adult:**  
Rx: Anaphylaxis and Asthma: 125 mg IV or IO, IM  
**Pediatric:**  
Rx: Anaphylaxis and Asthma: 2 mg/kg IV, IO or IM |
| **NOTES**              | **Regional Protocol** |

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<table>
<thead>
<tr>
<th>NAME</th>
<th>MIDAZOLAM HYDROCHLORIDE (Versed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Short-acting benzodiazepine</td>
</tr>
<tr>
<td>ACTION</td>
<td>Midazolam HCl is a water-soluble benzodiazepine that may be administered for sedation to relieve apprehension or impair memory prior to tracheal intubation or cardioversion. It may also be used in the setting of status seizure activity.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: (IV) 1-3 min; dose dependent</td>
</tr>
<tr>
<td></td>
<td>Duration: 2-6 hours; dose dependent</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Premedication for tracheal intubation or cardioversion</td>
</tr>
<tr>
<td></td>
<td>• Seizures</td>
</tr>
<tr>
<td></td>
<td>• Sedation for Pharmacological Assisted Intubation (PAI)</td>
</tr>
<tr>
<td></td>
<td>• Traumatic Injury</td>
</tr>
<tr>
<td></td>
<td>• Agitated Delirium</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Hypersensitivity to midazolam</td>
</tr>
<tr>
<td></td>
<td>• Glaucoma (relative)</td>
</tr>
<tr>
<td></td>
<td>• Shock</td>
</tr>
<tr>
<td></td>
<td>• Depressed vital signs</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Respiratory depression</td>
</tr>
<tr>
<td></td>
<td>• Hiccough</td>
</tr>
<tr>
<td></td>
<td>• Cough</td>
</tr>
<tr>
<td></td>
<td>• Over sedation</td>
</tr>
<tr>
<td></td>
<td>• Nausea and vomiting</td>
</tr>
<tr>
<td></td>
<td>• Fluctuations in vital signs</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult:</td>
</tr>
<tr>
<td></td>
<td>Rx: Sedation &amp; Traumatic Injury: 0.1 mg/kg slow IV, or IN. Maximum single dose 5 mg – May repeat 1 time.</td>
</tr>
<tr>
<td></td>
<td>Rx: Seizures &amp; Agitated Delirium: 2.5 mg slow IV or IN. If unable to start IV, may give 5 mg IM, or IN</td>
</tr>
<tr>
<td></td>
<td>Rx: PAI: 2.5mg Q 2 minutes up to max dose of 20 mg until sedated or B/P falls below 90 systolic</td>
</tr>
<tr>
<td>Pediatric:</td>
<td>Rx: Seizures: 0.1 mg/kg IV. Maximum 2.5 mg. If unable to start IV may give 0.2 mg/kg IM. Or 0.1mg/kg IN ½ of dose in each nostril (Maximum IM dose: 5 mg)</td>
</tr>
<tr>
<td>NOTES</td>
<td>• Sedative effects of Versed may be enhanced by patient use of barbiturates, alcohol or narcotics.</td>
</tr>
<tr>
<td></td>
<td>• ECG monitor, blood pressure, and pulse oximetry should be monitored throughout administration of Versed and during transport.</td>
</tr>
<tr>
<td></td>
<td>• Resuscitation equipment should be readily available.</td>
</tr>
<tr>
<td>NAME</td>
<td>MORPHINE SULFATE</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Opioid analgesic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Morphine sulfate is a natural opium alkaloid that has a primary effect of analgesia. It also increases peripheral venous capacitance and decreases venous return (&quot;chemical phlebotomy&quot;). In addition, because morphine decreases both preload and afterload, it may decrease myocardial oxygen demand.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: 1-2 min after administration</td>
</tr>
<tr>
<td></td>
<td>Duration: 2-7 hours</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Chest pain associated with myocardial infarction.</td>
</tr>
<tr>
<td></td>
<td>• Pulmonary edema, with or without associated pain.</td>
</tr>
<tr>
<td></td>
<td>• Moderate to severe acute and chronic pain.</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Hypersensitivity to narcotics</td>
</tr>
<tr>
<td></td>
<td>• Hypovolemia</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
</tr>
<tr>
<td></td>
<td>• Head injury</td>
</tr>
<tr>
<td></td>
<td>• Increased ICP</td>
</tr>
<tr>
<td></td>
<td>• Severe respiratory depression, exacerbated COPD</td>
</tr>
<tr>
<td></td>
<td>• Decreased LOC</td>
</tr>
<tr>
<td></td>
<td>• Acute/severe bronchial asthma</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Hypotension</td>
</tr>
<tr>
<td></td>
<td>• Tachycardia</td>
</tr>
<tr>
<td></td>
<td>• Bradycardia</td>
</tr>
<tr>
<td></td>
<td>• Palpitations</td>
</tr>
<tr>
<td></td>
<td>• Syncope</td>
</tr>
<tr>
<td></td>
<td>• Respiratory Depression</td>
</tr>
<tr>
<td></td>
<td>• Euphoria</td>
</tr>
<tr>
<td></td>
<td>• Bronchospasm</td>
</tr>
<tr>
<td></td>
<td>• Dry mouth</td>
</tr>
<tr>
<td></td>
<td>• Allergic reaction</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult: Analgesia, pulmonary edema: 2-5 mg IV, IM, SQ. May repeat q 5 minutes up to 20 mg</td>
</tr>
<tr>
<td></td>
<td>Pediatric: Analgesia, pulmonary edema 0.1-0.2 mg/kg IV, SQ, IO, IM</td>
</tr>
<tr>
<td>NOTES</td>
<td>• Narcan should be readily available</td>
</tr>
<tr>
<td></td>
<td>• Anticipate respiratory depression and prepare to intervene</td>
</tr>
<tr>
<td></td>
<td>• May worsen bradycardia or heart block in inferior M.I. (vagotonic effect)</td>
</tr>
<tr>
<td></td>
<td>• Use with caution in patients under the influence of Alcohol or narcotics</td>
</tr>
<tr>
<td><strong>NAME</strong></td>
<td><strong>NALOXONE (Narcan)</strong></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>CLASS</strong></td>
<td>Narcotic Antagonist</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Naloxone is a competitive narcotic antagonist that is used in the management of known or overdose caused by narcotics. Naloxone antagonizes all actions of morphine.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: Within 2 min  
Duration: 30-60 min |
| **INDICATIONS** | For the complete or partial reversal of CNS and respiratory depression induced by opioids including but not limited to the following:  
- Narcotic agonist  
- Morphine sulfate  
- Heroin  
- Hydromorphone  
- Methadone  
- Meperidine  
- Paregoric  
- Fentanyl citrate  
- Oxycodone  
- Codeine  
- Propoxyphene  
- Narcotic agonist/antagonist  
- Butorphanol tartrate  
- Pentazocine  
- Nalbuphine  
- Decreased level of consciousness  
- Coma of unknown origin. |
| **CONTRAINDICATIONS** | • Hypersensitivity |
| **ADVERSE REACTIONS** | • Tachycardia  
• Hypertension  
• Dysrhythmias  
• Nausea and vomiting  
• Diaphoresis  
• Blurred vision  
• Withdrawal (opiate) |
| **DOSE AND ROUTE** | **Adult:**  
Rx: Narcotic OD, Coma, Decreased LOC: 0.4-2 mg IV, IM, SQ, SL, IN (or ET diluted) May repeat in 5 minute intervals up to 10 mg  
**Pediatric:**  
Rx: Narcotic OD, Coma, Decreased LOC: 0.1 mg/kg IV, IO, ET, IM, SQ, IN (see Broselow Tape®, Pedi-wheel®, or EMS field Guide) |
| **NOTES** | • Use with caution in narcotic dependent patients who may experience withdrawal syndrome (including neonates of narcotic-dependent mothers)  
• May precipitate narcotic withdrawal with hypertension, tachycardia, and violent behavior.  
• May not reverse hypotension  
• May precipitate seizures.  
• **Vomiting may occur if administered too rapidly** |
<table>
<thead>
<tr>
<th>NAME</th>
<th>NITROGLYCERIN (Nitrostat and others)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Vasodilator</td>
</tr>
<tr>
<td>ACTION</td>
<td>Nitrates and nitrites dilate arterioles and veins in the periphery (and coronary arteries in high doses). The resultant reduction in preload, and to a lesser extent in afterload, decreases the workload of the heart and lowers myocardial oxygen demand.</td>
</tr>
<tr>
<td>ONSET/DURATION</td>
<td>Onset: 1-3 min Duration: 30-60 min</td>
</tr>
<tr>
<td>INDICATIONS</td>
<td>• Ischemic chest pain • Pulmonary hypertension • CHF • Hypertensive emergencies</td>
</tr>
<tr>
<td>CONTRAINDICATIONS</td>
<td>• Hypersensitivity • Hypotension • Head injury • Cerebral hemorrhage (CVA) • Use with caution in setting of inferior AMI.</td>
</tr>
<tr>
<td>ADVERSE REACTIONS</td>
<td>• Transient headache • Reflex tachycardia • Hypotension • Nausea and vomiting • Postural syncope • Diaphoresis</td>
</tr>
<tr>
<td>DOSE AND ROUTE</td>
<td>Adult: Angina, Hypertensive Crisis, Pulmonary Edema: 0.4 mg SL spray or tablet. May repeat in 3-5 minutes (maximum 3 doses) prn pain without hypotension Rx: Unstable Angina (IV Drip) 5 – 200 mcg/min titrated to blood pressure and symptoms Pediatric: Not recommended</td>
</tr>
<tr>
<td>NOTES</td>
<td>• Assure IV access prior to administration of NTG in setting of inferior AMI. • Have IV fluid hanging in anticipation of syncope and/or hypotension. • NTG can also be administered in CHF patients with altered LOC when presenting with hypertension and pulmonary edema.</td>
</tr>
<tr>
<td>NAME</td>
<td>ONDANSETRON HYDROCHLORIDE - ZOFRAN</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>CLASS</td>
<td>Antiemetic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Selectively antagonizes serotonin 5-HT3 receptors.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION        | Onset: Rapid. Peaks in 15-30 minutes  
Duration: 4-8 hours |
| INDICATIONS           | • Nausea  
• Vomiting |
| CONTRAINDICATIONS     | • Hypersensitivity |
| ADVERSE REACTIONS     | • Bronchospasm  
• Anaphylaxis  
• Transient Blindness  
• Dizziness  
• Abdominal Pain  
• Fatigue  
• Drowsiness  
• ECG changes including prolonged Q-T interval |
| DOSE AND ROUTE        | Adult:  
Rx: Nausea: 4-8mg IV Slow (over 1 minute) or IM. May repeat once up to max dose of 8mg  
Pediatric:  
Rx: Nausea: 0.15mg/kg up to 4mg per dose IV Slow (over 1 minute). May repeat once up to max of 8mg |
| NOTES                 | • Not known to be harmful to pregnant patients.  
• Side effects are rare  
• May be used for patients with known head trauma |
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>OXYMETAZOLINE HYDROCHLORIDE (Afrin)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Nasal decongestant; sympathomimetic-alpha agonist.</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>It acts directly on alpha receptors of the sympathetic nervous system to constrict smaller arterioles in nasal passages and prolong decongestant effect. It has no effect on beta receptors.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: 5-10 minutes  
Duration: 6-10 hours |
| **INDICATION** | Vasoconstriction of surface vessels in nasal passage to decrease bleeding during nasal intubation. |
| **CONTRAINDICATIONS** | • Children under 6 years old  
• Pregnancy |
| **ADVERSE REACTIONS** | Burning, stinging, dryness of nasal mucosa |
| **DOSE AND ROUTE** | Intranasal Spray  
**Adult:**  
Rx: Nasal Intubation: 0.05% Solution; 2-3 sprays of drops in each nostril  
**Pediatric:**  
Rx: Nasal Intubation: > 6 years old: 0.025% solution; 2-3 sprays in each nostril |
| **NOTES** | • May reduce the incidence of epistaxis with nasal tracheal intubation.  
• Reassure the patient and inform them about the procedure for nasal intubation. |
<table>
<thead>
<tr>
<th>NAME</th>
<th>OXYTOCIN (Pitocin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Pituitary hormone</td>
</tr>
<tr>
<td>ACTION</td>
<td>It stimulates uterine smooth muscle contractions, and helps expedite the normal contractions of a spontaneous labor. The drug is administered in the prehospital setting to control postpartum bleeding.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION| **Onset:** (IV) Immediate (IM) within 3-5 min  
|               | **Duration:** (IV) 20 minutes after the infusion is stopped (IM) 30-60 min |
| INDICATIONS   | • Postpartum hemorrhage after infant and placental delivery |
| CONTRAINDICATIONS | • Hypertonic or hyperactive uterus  
|               | • Presence of a second fetus  
|               | • Fetal distress |
| ADVERSE REACTIONS | • Hypotension  
|               | • Tachycardia  
|               | • Hypertension  
|               | • Dysrhythmias  
|               | • Angina pectoris  
|               | • Anxiety  
|               | • Seizure  
|               | • Nausea and vomiting  
|               | • Allergic reaction  
|               | • Uterine rupture (from excessive administration) |
| DOSE AND ROUTE | Adult:  
|               | Rx: Postpartum Hemorrhage after infant and placental delivery: IV, mix 10 units in 1000 ml of NS or LR and infuse at 20 – 30 drops per minute via microdrop tubing, titrated to severity of bleeding and uterine response or 3 – 10 units IM following delivery of placenta |
| NOTES         | Fundal massage along with allowing neonate to nurse can also aid in controlling postpartum hemorrhage |
# NAME
**PROCAINAMIDE** *(Pronestyl)*

# CLASS
Antidysrhythmic (Class 1-A)

# ACTION
Procainamide suppresses phase 4 depolarization in normal ventricular muscle and Perkin's fibers, reducing the automaticity of ectopic pacemakers. It also suppresses reentry dysrhythmias by slowing intraventricular conduction. Procainamide may be effective in treating PVC’s and recurrent ventricular tachycardia that cannot be controlled with lidocaine.

# ONSET/DURATION
Onset: 10-30 min  
Duration: 3-6 hours

# INDICATIONS
- Suppressing PVCs refractory to lidocaine or Amioderone  
- Suppressing VT (with a pulse) refractory to Amioderone or lidocaine  
- Suppressing VF refractory to Amioderone or lidocaine  
- PSVTs with wide complex tachycardia of unknown origin

# CONTRAINDICATIONS
- Second and third-degree AV block  
- Digitalis toxicity  
- Torsades de pointes  
- Complete heart block  
- Tricyclic antidepressant toxicity

# ADVERSE REACTIONS
- Hypotension  
- Bradycardia  
- Reflex tachycardia  
- AV block  
- Widened QRS  
- Prolonged P-R or Q-T  
- Confusion  
- Seizure

# DOSE AND ROUTE
**Adult:**  
Rx: Cardiac Arrest VF/VT: 100 mg IVP q 5 minutes, or: 20 mg/min IV drip (maximum dose 17 mg/kg) Start Drip ASAP if successful conversion  
Rx: A-fib, VT; PSVT with WPW: 20 mg/min IV until dysrhythmia is converted, hypotension or QRS/QT widening develops, or 17 mg/kg has been given

**Pediatric:** Not recommended in prehospital setting

# NOTES
Procainamide Drip: 1-4 mg/min: Mix 1 gm in 250 of D5W & 60 gtt set  
run at:  
15 gtt/min 30 gtt/min 45 gtt/min 60 gtt/min  
1 mg/min 2 mg/min 3 mg/min 4 mg/min
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th><strong>PROMETHAZINE (Phenergan)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Phenothiazine, Antihistamine</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Promethazine is an H&lt;sub&gt;1&lt;/sub&gt; receptor antagonist that blocks the actions of histamine by competitive antagonism at the H&lt;sub&gt;1&lt;/sub&gt; level. In addition to antihistaminic effects, promethazine also possesses sedative, antiemetic, and considerable anticholinergic activity.</td>
</tr>
<tr>
<td><strong>ONSET/DURATION</strong></td>
<td>Onset: (IM) (rapid)</td>
</tr>
<tr>
<td></td>
<td>Duration: 4-6 hours</td>
</tr>
</tbody>
</table>
| **INDICATIONS** | • Nausea and vomiting  
• Motion sickness  
• To potentiate the effects of analgesics  
• Allergic reactions |
| **CONTRAINDICATIONS** | • Hypersensitivity  
• Comatose states  
• CNS depression from alcohol, barbiturates, or narcotics.  
• Vomiting of unknown etiology in children.  
• Acutely ill dehydrated children. |
| **ADVERSE REACTIONS** | • Sedation  
• Dizziness  
• Allergic reactions  
• Dysrhythmias  
• Hyperexcitability  
• Dystonias  
• Burning at administration site  
• Use with caution in head injured patient’s |
| **DOSE AND ROUTE** | **Adult:**  
Rx: Nausea/Vomiting, Potentiate effects of analgesics: (25 mg or deep IM) (This drug has not been FDA approved for IV administration and is not recommended by the drug manufacturer to be administered IV)  
**Pediatric:**  
Because of potential adverse reactions consider consulting medical control prior to administration in children (if administered: 0.5mg/kg IM) |
| **NOTES** | • Generally considered safe for use in pregnancy and during labor  
• Anticipate sedative effect and monitor airway and respiratory status |
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th><strong>RACEMIC EPINEPHRINE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Sympathomimetic</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Stimulate alpha and beta adrenergic receptors, reducing mucosal secretions and relaxing bronchial smooth muscles.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: Immediate 1-5 min  
Duration: 1-3 hours |
| **INDICATIONS** | • Bronchospasm (upper Airway)  
• Croup |
| **CONTRAINDICATIONS** | • Hypersensitivity to drug  
• Hypersensitivity to sulfites  
• Cardiac disease  
• Hypertension  
• Diabetes  
• Glaucoma angle-closure  
• BPH |
| **ADVERSE REACTIONS** | • Arrhythmias  
• Bronchospasm- paradoxical  
• Dizziness  
• Headache  
• Nervousness  
• Tremor  
• Insomnia  
• Nausea  
• Tachycardia |
| **DOSE AND ROUTE** | **Adult:**  
Rx: Bronchospasm/Croup - 0.5 mL NEB q3-4h of 2.25% solution  
**Pediatric:**  
Rx: Bronchospasm/Croup - < 4 years old - 0.25 mL of 2.25% Solution NEB q2-4h; Max 0.5 mL/dose q 1-2h  
Bronchospasm- > 4 Year old - 0.5 mL of 2.25% solution NEB Q 3- 4h |
<p>| <strong>NOTES</strong> |  |</p>
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>ROCURONIUM BROMIDE (Zemuron)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Neuromuscular blocker</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Antagonizes motor endplate acetylcholine receptors (non-depolarizing neuromuscular blocker)</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: < 2 minutes  
Duration: 25% recovery in 31 minutes (short – intermediate-acting) |
| **INDICATIONS** | - PAI (Pharmacological Assisted Intubation) |
| **CONTRAINDICATIONS** | - Allergy or hypersensitivity to drug or drug class |
| **ADVERSE REACTIONS** | - Prolonged paralysis  
- Respiratory depression  
- Apnea  
- Anaphylactic reaction  
- Bronchospasm  
- Arrhythmias |
| **DOSE AND ROUTE** | Adult  
Rx: PAI: 1 mg/kg IV may not repeat |
<p>| <strong>NOTES</strong> | |</p>
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>SODIUM BICARBONATE 8.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Buffer, Alkalinizing agent, Electrolyte supplement</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Sodium bicarbonate reacts with hydrogen ions (H+) to form water and carbon dioxide and thereby can act to buffer metabolic acidosis.</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: 2-10 min  
Duration: 30-60 min |
| **INDICATIONS** | • Known pre-existing bicarbonate responsive acidosis  
• Intubated patient with continued long arrest interval. PEA  
• Upon return of spontaneous circulation after long arrest interval  
• Tricyclic antidepressant overdose  
• Alkalinization for treatment of specific intoxications  
• Management of metabolic acidosis  
• DKA |
| **CONTRAINDICATIONS** | • In patients with chloride loss from vomiting and GI suction  
• Metabolic and respiratory alkalosis  
• Severe pulmonary edema  
• Abdominal pain of unknown origin  
• Hypocalcemia  
• Hypokalemia  
• Hypernatremia  
• When administration of sodium could be detrimental. |
| **ADVERSE REACTIONS** | • Metabolic alkalosis  
• Hypoxia  
• Rise in intracellular PCO₂ and increased tissue acidosis  
• Electrolyte imbalance (Hypernatremia)  
• Seizures  
• Tissue sloughing at injection site |
| **DOSE AND ROUTE** | **Adult:**  
Rx: Prolonged Cardiac Arrest with good ventilation: 1 mEq/kg IV (1 ml/kg) followed by 0.5 mEq/kg q 10 minutes  
Rx: Hyperkalemia, OD from Tricyclics, ASA, Phenobarbital, Cocaine, Benadryl: 1 mEq/kg IV  
**Pediatric:**  
Rx: Prolonged Cardiac Arrest with good ventilation: (1 mEq/kg) infuse slowly through good vein and only if ventilations are adequate (See Broselow Tape, Pedi wheel, or EMS Field Guide)  
Use 4.2% solution in neonates |
| **NOTES** | • Must flush IV lines before and after administration.  
• Must ventilate patient after administration.  
• Do not administer down ET.  
• When possible, arterial blood gas analysis should guide bicarbonate administration. |
<table>
<thead>
<tr>
<th>NAME</th>
<th>SUCCINYLCHOLINE (Anectine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Neuromuscular blocker (depolarizing)</td>
</tr>
<tr>
<td>ACTION</td>
<td>Succinylcholine has the quickest onset and briefest duration of action of all neuromuscular blocking drugs, making it a drug of choice for such procedures as endotracheal intubation, electroconvulsive shock therapy, and terminating laryngospasm.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: Less than 1 min  
Duration: 5-10 min after single IV dose |
| INDICATIONS | • PAI (Pharmacological Assisted Intubation)  
• Terminating laryngospasm  
• Muscle relaxation |
| CONTRAINDICATIONS | • Acute injuries  
• Hypersensitivity  
• Skeletal muscle myopathies  
• Inability to control airway and or support ventilation with oxygen and positive pressure.  
• History of malignant hyperthermia  
• Acute rhabdomyolysis  
• Burns > 8 hours  
• Massive crush injury |
| ADVERSE REACTIONS | • Hypotension  
• Respiratory depression/apnea  
• Bradycardias  
• Dysrhythmias  
• Initial muscle fasciculation  
• Excessive salivation  
• Malignant hyperthermia  
• Allergic reaction |
| DOSE AND ROUTE | Adult:  
Rx: PAI: 2 mg/kg IV (onset 1 minute, recovery 4-6 minutes)  
IM dose: 3-4 mg/kg: onset 2-3 minutes with Max dose of 150 mg  
Pediatric: (Age 9 to puberty)  
Rx: PAI: 2 mg/kg IV |
| NOTES     | • All patients undergoing PAI should be appropriately sedated prior to receiving a paralytic agent as paralytic agents do not alter the patients LOC, hearing, memory, or feeling.  
• Neuromuscular agents produce respiratory paralysis: thus intubation, alternative airway adjuncts and resuscitative equipment should be readily available prior to administration. |
<table>
<thead>
<tr>
<th>NAME</th>
<th>TETRACAINE (Pontacaine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Topical ophthalmic anesthetic</td>
</tr>
<tr>
<td>ACTION</td>
<td>Tetracaine is used for rapid, brief, superficial anesthesia. The agent inhibits conduction of nerve impulses from sensory nerves.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: Within 30 seconds  
Duration: 10-15 min |
| INDICATIONS | • Short-term relief from eye pain or irritation  
• Patient comfort before eye irrigation |
| CONTRAINDICATIONS | • Hypersensitivity to Tetracaine  
• Open injury to the eye |
| ADVERSE REACTIONS | • Burning or stinging sensation  
• Irritation |
| DOSE AND ROUTE | Adult:  
Rx: Eye pain: 1-2 gtt in affected eye  
Pediatric: Same as adult |
| NOTES | |

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<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>THIAMINE (Betaxin)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Vitamin (B1)</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Thiamine combines with adenosine triphosphate (ATP) to form thiamine pyrophosphate coenzyme, a necessary component for carbohydrate metabolism. Most vitamins required by the body are obtained through the diet. However, certain states such as alcoholism, malnourishment, and chemotherapy may affect the intake, absorption, and utilization of thiamine. The brain is extremely sensitive to thiamine deficiency.</td>
</tr>
<tr>
<td><strong>ONSET/DURATION</strong></td>
<td>Onset: Rapid&lt;br&gt;Duration: Depends on degree of deficiency</td>
</tr>
<tr>
<td><strong>INDICATIONS</strong></td>
<td>• Coma of unknown origin (prior to or along with administration of D50 or naloxone)&lt;br&gt;• Delirium tremens&lt;br&gt;• Wernicke’s encephalopathy</td>
</tr>
<tr>
<td><strong>CONTRAINDICATIONS</strong></td>
<td>None significant</td>
</tr>
<tr>
<td><strong>ADVERSE REACTIONS</strong></td>
<td>• Hypotension (from rapid injection)&lt;br&gt;• Anxiety&lt;br&gt;• Diaphoresis&lt;br&gt;• Nausea/vomiting&lt;br&gt;• Allergic reaction</td>
</tr>
<tr>
<td><strong>DOSE AND ROUTE</strong></td>
<td>Adult:&lt;br&gt;Rx: 100 mg slow IV or deep IM&lt;br&gt;Pediatric:&lt;br&gt;Not recommended in the prehospital setting</td>
</tr>
<tr>
<td><strong>NOTES</strong></td>
<td>Anaphylactic reactions are possible</td>
</tr>
<tr>
<td><strong>NAME</strong></td>
<td><strong>TRANEXAMIC ACID (TXA)</strong></td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>CLASS</strong></td>
<td>Antifibrinolytic</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Competitively binds with Plasminogen to prevent clot breakdown thus preventing or stabilizing coagulopathy</td>
</tr>
<tr>
<td><strong>ONSET/DURATION</strong></td>
<td>Onset : Almost immediate when administered IV Duration : 2 – 4 hours</td>
</tr>
</tbody>
</table>
| **INDICATIONS** | All three of below indications must be met:  
  - Blunt or Penetrating trauma suggesting potential major hemorrhage (examples: multiple long bone fractures, flail chest, major abdominal injury, pelvic fracture, amputation)  
  - Objective signs of hemorrhagic shock associated with trauma (B/P < 90 or HR> 115)  
  - Known time of injury < 3 hours |
| **CONTRAINDICATIONS** |  
  - Age less than 16  
  - Renal failure  
  - Allergy to TXA  
  - History of Thromboembolism  
  - Known aneurismal Sub arachnoid hemorrhage  
  - Injury greater than 3 hours old |
| **ADVERSE REACTIONS** |  
  - Possible risk of thrombosis |
| **DOSE AND ROUTE** |  
  **Adult:**  
  Rx: Hemorrhage: 1 gram mixed in 100cc bag of NS and infuse IV or IO over 10 minutes. If possible – follow initial bolus with maintenance drip by reconstituting 1 gram in 250cc NS and infuse over the next 8 hours (31ml/hr.)  
  **Pediatric:** Not indicated |
| **NOTES** |  
  Hypotension may ensue if administered too quickly.  
  Procedure:  
  Reconstitute 1 (one) gram in 100ml NS and infuse over 10 minute. If possible, follow initial bolus with maintenance drip by reconstituting 1 gram in 250 ml NS and infuse over the next 8 hours (31 ml/hr). Should not be given in same line as blood products  
  Administration of TXA should not alter any other treatments (fluids, medications, etc)> |
<table>
<thead>
<tr>
<th><strong>NAME</strong></th>
<th>VECURONIUM (Norcuron)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td>Neuromuscular-blocking agent (non-depolarizing)</td>
</tr>
<tr>
<td><strong>ACTION</strong></td>
<td>Antagonizes motor endplate acetylcholine receptors (non-depolarizing neuromuscular blocker) resulting in paralysis</td>
</tr>
</tbody>
</table>
| **ONSET/DURATION** | Onset: 75 – 90 seconds  
Duration: 25 – 40 min |
| **INDICATIONS** | • PAI (Pharmacological Assisted Intubation) when Rocuronium is not available |
| **CONTRAINDICATIONS** | • Hypersensitivity |
| **ADVERSE REACTIONS** | • Prolonged paralysis |
| **DOSE AND ROUTE** | Adult:  
PAI Rx: 0.1 mg/kg IV  
Pediatric: (greater than 9 or puberty)  
PAI Rx: 0.08 – 0.1 mg/kg IV |
<p>| <strong>NOTES</strong> | • Should not be administered unless persons skilled in endotracheal intubation are present. Endotracheal intubation equipment must be available. Oxygen equipment and emergency resuscitative drugs must be available. Paralysis occurs after 1 minute and lasts for approximately 30 minutes. |</p>
<table>
<thead>
<tr>
<th>NAME</th>
<th>VERAPAMIL (Isoptin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS</td>
<td>Calcium channel blocker (Class IV antiarrhythmic)</td>
</tr>
<tr>
<td>ACTION</td>
<td>Verapamil is used as an antidysrhythmic, antianginal, and antihypertensive agent. It works by inhibiting the movement of calcium ions across cell membranes. Verapamil decreases atrial automaticity, reduces AV conduction velocity, and prolongs the AV nodal refractory period. In addition, verapamil depresses myocardial contractility, reduces vascular smooth muscle tone, and dilates coronary arteries and arterioles in normal and ischemic tissues.</td>
</tr>
</tbody>
</table>
| ONSET/DURATION | Onset: 2-5 min  
Duration: 30-60 min (up to 4 hr is possible) |
| INDICATIONS | • Only consider verapamil if Cardizem is unavailable  
• SVT  
• Atrial flutter with a rapid ventricular response  
• Atrial fibrillation with a rapid ventricular response |
| CONTRAINDICATIONS | • Hypersensitivity  
• Second-or-third degree heart block  
• Sinus bradycardia  
• Hypotension  
• Cardiogenic shock  
• Severe CHF  
• WPW with atrial fibrillation or flutter  
• Patients receiving intravenous beta blockers  
• Wide complex tachycardias (ventricular tachycardia can deteriorate into ventricular fibrillation when calcium channel blockers are given) |
| ADVERSE REACTIONS | • Dizziness  
• Headache  
• Nausea and vomiting  
• Hypotension  
• Bradycardia  
• Complete AV block |
| DOSE AND ROUTE | Adult:  
Rx: SVT, Accelerated A-Fib, A-Flutter: 2.5-5.0 mg IV SLOW over 3 minutes. May repeat 5 mg in 15 minutes. Maximum total dose: 20 mg.  
Pediatric:  
Not recommended in prehospital setting |
| NOTES | • Anticipate hypotension after administration.  
• Anticipate bradycardia.  
• Have resuscitation equipment readily available.  
• Some physicians recommend slow IV administration of 500 mg Calcium Chloride before Verapamil to minimize hypotension and bradycardia. |
The Guideline Section is included in the NW Protocol to Function as a supplement to the protocols.

Guidelines are not meant to serve as protocols and are to be used only when specifically indicated in the Protocol Section of this manual.

Guidelines will assist in performing specific procedures. They are not meant to be restrictive. Other techniques in performing a procedure may be acceptable.
12 LEAD EKG

INDICATIONS

- (See specific Protocols: Provider may use discretion to perform 12 lead on any patient)

PROCEDURE

1. Assess patient and monitor cardiac status.
2. If patient is unstable, definitive treatment is the priority. If patient is stable or stabilized after treatment, perform a 12 lead EKG.
3. Prepare EKG monitor and connect patient cable with electrodes.
4. If time permits, enter the patient’s last name into the monitor for identification if transmitted to ER or for download.
5. Expose chest and prep as necessary. Modesty of the patient should be respected.
6. Apply monitor (limb) leads and diagnostic (Chest) Leads using the following landmarks:
   - RA - Right Arm
   - LA - Left ARM
   - RL - Right Leg
   - LL - Left Leg
   - V1 - 4th intercostal space at right sternal border
   - V2 - 4th intercostal space at left sternal border
   - V3 - Directly between V2 and V4
   - V4 - 5th intercostal space at midclavicular line
   - V5 - Level with V4 at left anterior axillary line
   - V6 - Level with V5 at left midaxillary line
7. Instruct patient to remain still.
8. Press 12 Lead to acquire the EKG.
9. If the monitor detects signal noise (such as patient motion or a disconnected electrode) the 12 Lead acquisition will be interrupted until the noise is removed.
10. Once acquired, transmit the 12 Lead EKG data to the appropriate hospital.
11. Contact the receiving hospital to notify them a 12 Lead EKG has been sent.
12. Monitor the patient while continuing with the treatment protocol.

CERTIFICATION REQUIREMENTS

- EMT (apply)
- ADVANCED EMT (apply)
- PARAMEDIC (apply and interpret)
Indications
- Suspected Right Ventricle Infarct
- Suspected Posterior Infarct
- Patients who have clinical findings highly suggestive of acute coronary ischemia but have ECG findings that are either normal or nondiagnostic.
- Patients with inferior lead changes or the reciprocal changes of ST-segment depression for a posterior infarction.
- ST-segment elevation suggestive of an inferior wall MI (II, III, AVF)
- Isolated ST-segment elevation in V1 or ST-segment elevation greater in V1 than in V2
- Borderline ST-segment elevation in V5 and V6 or in V1 to V3
- ST-segment depression or suspicious isoelectric ST segments in V1 to V3.
- Because ST-segment elevation in V4R to V6R may resolve within 12 to 18 hours, the benefit of a 15- or 18-lead ECG is primarily soon after the patient's presentation. In addition, the presence of anterior wall infarction obscures the changes in the right precordial leads.
- 15- or 18-lead ECGs should be used soon after presentation in patients with chest pain suggestive of acute coronary ischemia that do not have clear evidence of anterior ischemia or infarction.

Procedure
1. Perform initial 12 Lead EKG procedures
2. Right Sided (Right view)
   a. Using new electrodes, position as follows and relocate leads V1, V2, and V3 as follows
      - V4R: right midclavicular line, fifth intercostal space (use V3 lead)
3. Posterior (Posterior view)
   a. Using new electrodes, position as follows and relocate leads V4, V5, and V6 as follows
      - V7: left posterior axillary line, straight line from V6 (use V4 lead)
      - V8: left midscapular line, straight line from V7 (use V5 lead)
      - V9: left paraspinal line, straight line from V8 (use V6 lead).
4. Label modified leads appropriately on all printouts
5. Notify receiving hospital of modifications when transmitted wirelessly

CERTIFICATION REQUIREMENTS
- EMT (apply)
- ADVANCED EMT (apply)
- PARAMEDIC (apply and interpret)
### Apgar Scoring System

<table>
<thead>
<tr>
<th>Indicator</th>
<th>0 Points</th>
<th>1 Point</th>
<th>2 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Activity, muscle tone)</td>
<td>Absent</td>
<td>Flexed arms and legs</td>
<td>Active</td>
</tr>
<tr>
<td>P (Pulse)</td>
<td>Absent</td>
<td>Below 100 bpm</td>
<td>Over 100 bpm</td>
</tr>
<tr>
<td>G (Grimace, reflex irritability)</td>
<td>Floppy</td>
<td>Minimal response to stimulation</td>
<td>Prompt response to stimulation</td>
</tr>
<tr>
<td>A (Appearance, skin color)</td>
<td>Blue; pale</td>
<td>Pink body, blue extremities</td>
<td>Pink</td>
</tr>
<tr>
<td>R (Respiration)</td>
<td>Absent</td>
<td>Slow and irregular</td>
<td>Vigorous cry</td>
</tr>
</tbody>
</table>

- Document at 1 and 5 minutes.
- Infants with a score of 7-10 usually require supportive care only.
- A score of 4-6 indicates moderate depression.
- Infants with a score of 3 or less require aggressive resuscitation.
BLOOD DRAW

INDICATION

Per your department protocol.

PROCEDURE

1. Use universal precautions.
2. Discuss this procedure with the patient as per guidelines and answer all of the patient’s questions.
3. Obtain consent.
4. Select vein and prep as usual.
5. Select appropriate blood-drawing devices.
6. Draw appropriate tubes of blood for lab test Purple, Green, Blue and Red
7. Place blood into blood tubes immediately.
8. Label all blood with a minimum of Patient’s name, Date, Time of Draw & Initial
9. Assure that the blood samples are labeled with the correct information.
10. Deliver the labeled blood tubes to the appropriate individual at the hospital.

CONSIDERATIONS

1. Size of IV you are drawing from effects the blood as it is drawn. Smaller catheters (smaller than 20 – 22 gauge) should be avoided
2. If drawing blood with a syringe – do not pull back firmly because it will cause turbulence in the blood flow into the syringe and rupture the cell membrane – thus destroying your blood sample
3. If you are unable to reach the hospital in a timely manner – less than an hour – your blood sample will not be useable by the lab.
4. Never shake the tubes. This will rupture the cell membrane and destroy your sample. All tubes except the red top should be immediately - gently agitated a few times to mix the chemicals in the tube with the blood to preserve it for testing.
5. The blood tubes are vacuum sealed to draw in the proper amount of blood to mix with the chemical agent. A minimum of 2cc per tube is required. – Red top tubes do not have chemicals and should be filled last with whatever blood is remaining – no minimum.

CERTIFICATION REQUIREMENTS

- Advanced EMT
- PARAMEDIC
BLOOD GLUCOSE ANALYSIS

INDICATION

Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

PROCEDURE

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained simultaneously with intravenous access or finger stick.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer’s instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.

NOTES: Clinical Industry Improvements Amendments (CLIA) indicates daily calibration of equipment. Follow your department policies regarding calibration of your glucometer. Therefore use your glucometer for reading and do not rely on outside sources/equipment.

CERTIFICATION REQUIREMENTS

- EMT
- ADVANCED EMT
- PARAMEDIC
BLOOD PRODUCTS
MONITORING AND RE-INTIATING

Purpose
Blood products must be initiated prior to the transport of a patient and started by the hospital staff. If a patient requires administration of blood products during transport a paramedic can continue the administration. In the event the blood product requires replacing the paramedic can hang another bag of product. If infiltration occurs a paramedic can re-initiate an IV and restart the blood product.

Vital signs should be taken and recorded at least every 5 minutes. Time of transfusion should be documented. This is the time when the blood actually enters the vein.

Procedure
1. Continued monitoring of already established blood products requires the following:
   a. An order for the transfusion with the flow rate documented
   b. Verify IV access patency. Must be 20 gauge or larger.
   c. Blood tubing must be a dedicated line. It may not be piggybacked into existing lines. No medications or solutions other than 0.9% Normal Saline may be mixed with or run concurrently with blood.
   d. No more than 2 units may be infused through the same blood tubing. The Saline must be changed when the tubing is changed. If a leukocyte reduction filter is used, only one unit of blood may be infused through the tubing and filter.

2. Replacing blood products:
   a. Review the orders from the facility.
   b. Be sure you do not need to replace the blood-Y tubing. Do not use a 6” or 7” extension set.
   c. Turn blood slowly end-over-end to mix blood (do not shake) and observe contents for change in color, consistency or presence of unusual particulate matter.
   d. Spike the blood and hang with the ordered flow rate.

3. Reinitializing infiltrated IV:
   a. Monitor IV insertion site as usual. If signs of infiltration reinitiate as per IV access protocol.
   b. Remember a 20 gauge or larger must be used.

Precautions:
Several types of blood transfusion reactions can occur during or up to 96 hours after infusion. Symptoms range from mild fever up to life-threatening anaphylactic shock. If a reaction is suspected stop the transfusion immediately and contact medical control.

Transfusion Reactions

Hemolytic Reactions

Hemolytic reactions occur when the recipient's serum contains antibodies directed against the corresponding antigen found on donor red blood cells. This can be an ABO incompatibility or an incompatibility related to a different blood group antigen.

Disseminated intravascular coagulation (DIC), renal failure, and death are not uncommon following this type of reaction.

The most common cause for a major hemolytic transfusion reaction is a clerical error, such as a mislabeled specimen sent to the blood bank, or not properly identifying the patient to whom you are giving the blood. DO NOT ASSUME IT IS SOMEONE ELSE'S RESPONSIBILITY TO CHECK!

Continued on next page
BLOOD PRODUCTS
MONITORING AND RE-INTIATING

Continued

Allergic Reactions:

Allergic reactions to plasma proteins can range from complaints of hives and itching to anaphylaxis, febrile reactions.
White blood cell reactions (febrile reactions) are caused by patient antibodies directed against antigens present on transfused lymphocytes or granulocytes.
Symptoms usually consist of chills and a temperature rise > 1 degree C.

Transfusion related acute lung injury (TRALI):

TRALI is caused when plasma contains HLA or granulocyte specific antibodies which correspond to antigens found on donor WBC’s.
Granulocyte enzymes are released, increasing capillary permeability and resulting in sudden pulmonary edema.
Most often occurs with administration of blood products with plasma, such as FFP.

Bacterial Contamination:

Bacterial contamination of blood can occur during collection. Bacteria can grow during storage at room temperature and during refrigeration (psychrophilic organisms). Transfusing a contaminated unit can result in septic shock and death.

Circulatory Overload:

Circulatory overload can occur with administration of blood or any intravenous fluid, particularly in patients with diminished cardiac function.

Certification Requirements:
EMTP
INDICATIONS

- Any Intubated Person
- Altered LOC
- Respiratory Distress
- Congestive Heart Failure
- COPD
- Suspected Traumatic Brain Injury
- Allergic Reactions
- Burn Victims
- Persons Pharmacologically altered
- Sepsis

PROCEDURE- Electronic

Monitors equipped with this capability will have one disposable device for ET tube placement and a Nasal Cannula like device for monitoring naturally expired air. ET Versions should be used on all intubated patients to confirm placement. Normal ranges for CO2 are 35-45mmHg. A square wave form (see below) indicates no bronchospasms treatable with bronchodilator medications. Audible wheezing with a square wave form may be considered Cardiac Asthma. Care should be taken to ensure readings are accurate by checking placement and fouled or faulty sensors.

1. Apply device to Patient
2. Allow time for unit to calibrate and give readings
3. Change wave form to view on monitor
4. Note values and wave form in both Pre and Post airway management
5. Adjust ventilations to meet normal values when appropriate
6. ETCO2 should be continuously monitored throughout transport
7. Vomit or other bodily fluids may clog sensor and require you to change to another one.
8. Imperfect positioning of nasal cannula capnography devise may cause distorted readings. Unique nasal anatomy, obstructed nares and mouth breathers can also cause this problem. Oxygen by mask may lower the reading by 10%.
9. Document on PCR values and wave form after intubation and after each time you move patient.

![Waveform Diagram]

PROCEDURE- Colorimetric

Attach End-Tidal CO2 Detector between the supra glottic airway or endotracheal tube and ventilation bag.

Colorimetric:

1. The color will change according to the concentration of CO2 in the exhaled air:

<table>
<thead>
<tr>
<th>Color</th>
<th>To Color</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PURPLE</td>
<td>to</td>
<td>YELLOW</td>
</tr>
<tr>
<td>PURPLE</td>
<td>to</td>
<td>TAN</td>
</tr>
<tr>
<td>NO CHANGE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INDICATIONS

- Firefighters in rehab or other Patients in or around fire
- Persons found in a potentially high CO environment
- Patients with weakness, flushed skin, and/or “flu” like symptoms
- Any person working around any combustion-generated device
- May be considered for all patients

PROCEDURE

Outside of environmental sources individuals with hemolytic anemia, sepsis, and critical illness can have higher than normal CO levels. Patients with CO poisoning may have a wide range of varying signs and symptoms including: Seizures, lethargy, tachycardia, confusion, nausea, and unconsciousness.

1. Turn machine on. Some CO monitors can take longer to “warm-up”
2. Apply probe to patient’s finger. Most CO monitors are very light sensitive and do not work as well on ear lobes and feet. Cover finger probe with dark material (not a white towel – dark material)) for better results
3. Some monitors have a PI indicator bar used to indicate accuracy. This should be monitored for fullness and continuity with the heart rate
4. Allow time for machine to get an accurate reading. (up to 1 minute)
5. Note CO levels. Use chart below for reference.
6. The accuracy of a SpCO monitor can vary by 3%
7. Pregnant women should always be transported to hospital. Fetal CO is much higher than the mother’s.

<table>
<thead>
<tr>
<th>CO Level (%)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5%</td>
<td>Considered normal in non-smokers. When &gt;3% with symptoms, consider high-flow O2 and evaluate environment for possible CO sources. Consider transport if symptoms persist.</td>
</tr>
<tr>
<td>5-10%</td>
<td>Considered normal in smokers, abnormal in non-smokers. If symptoms are present, consider high flow O2 and inquire if others are ill. Consider transport if symptoms persist. Alert Fire Department to monitor air quality for high CO levels.</td>
</tr>
<tr>
<td>10-15%</td>
<td>Abnormal in any patient. Assess for symptoms, consider high-flow O2. Evaluate others for illness. These patients should be transported to local ED. Alert Fire Department and monitor air quality for high CO levels. Consider Placing Patient on CPAP/BIPAP</td>
</tr>
<tr>
<td>&gt;15%</td>
<td>Significantly abnormal in any patient. Administer high-flow O2, assess for symptoms, and evaluate others for illness. These patients should be transported to local ED. Alert Fire Department to evaluate air quality for high CO levels. Place patient on CPAP/BIPAP</td>
</tr>
<tr>
<td>&gt;20%</td>
<td>Consider transport to a hyperbaric facility capable of treating patients with high CO levels. Alert Fire Department to evaluate air quality for high CO levels. Place Pt on CPAP/BIPAP</td>
</tr>
</tbody>
</table>

NOTE: Consider transport to hyperbaric facility for any patient with altered mental status or any female that is pregnant. Not all facilities with a hyperbaric facility are able to treat these patients. Consider air transport if no local facilities available.

CERTIFICATION REQUIREMENTS

- EMR
- EMT
- Advanced EMT
- Paramedic
CHEST DECOMPRESSION

INDICATIONS

- Tension Pneumothorax:
  - Diminished, unequal and/or absent lung sounds on affected side
  - Restlessness, anxiety, and air hunger
  - Progressive cyanosis, despite patent airway and oxygen therapy
  - Jugular vein distension
  - Hypotension not responding to fluid replacement
  - Tracheal deviation away from affected side (late sign)

PROCEDURE  (If using a commercial device – follow their instructions)

1. Identify the 2nd intercostal space, mid-clavicular line on the affected side.
2. Prepare area with commercial antiseptic.
3. Insert a 14 gauge or larger (at least 3 inch) over-the-needle catheter through the chest wall. The needle should be directed over the superior border of the rib. (A commercial device is preferred if used – follow the commercial device instructions)
4. Feel for “popping” sensation and listen for the hiss of escaping air.
5. Advance the needle several millimeters and withdraw the needle, leaving the catheter in the pleural space.
6. Secure the catheter in place.
7. Apply a one-way/flutter valve if necessary. (This step may need to be part of equipment assembly prior to the procedure.)
8. Reassess lung sounds frequently to confirm improved tidal volume, and ensure tension does not recur.
9. If an additional decompression is needed- the next puncture site will be lateral from the first puncture site.
10. If anterior decompressions is not possible due ot trauma or land marks, contact medical control for possible lateral chest decompression.
11. For children under 14, contact medical control for instruction
12. Notify ER if you have performed a pleural decompression.

CERTIFICATION REQUIREMENTS:

- PARAMEDIC
CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

INDICATIONS

- Patients with moderate to severe respiratory distress secondary to pulmonary edema (wet lung sounds), COPD, asthma, or submersion incidents.
- Indications of moderate to severe respiratory distress can include:
  - Retractions
  - Accessory muscle use
  - Tachypnea (respiratory rate >25/min)
  - Pulse oximetry reading <90%
  - Tripod position
  - 1 to 2 word sentences

CONTRAINDICATIONS

- Respiratory or cardiac arrest
- Systolic blood pressure <90mmHg
- Severely depressed level of consciousness
- Inability to maintain airway patency
- Major trauma, especially head injury with increased ICP or significant chest trauma
- Facial trauma affecting mask seal
- Signs and symptoms of pneumothorax
- Vomiting
- Gastric distention or active GI bleed
- Inability to tolerate mask on face
- CPAP is contraindicated during inferior wall STEMI with right ventricular involvement or with unknown right ventricular involvement.

PROCEDURE

1. Advise the patient of the need for and efficacy of CPAP therapy
2. Continuously monitor the patient’s vitals including ECG, pulse oximetry, and waveform capnography
3. Place patient in a seated position with legs dependent or position of comfort
4. Set the CPAP pressure at 5 cmH₂O
5. Use appropriate sized and fitted mask (note patient may tolerate better if they hold the mask as opposed to strapping to their face)
6. Allow the patient to adjust to the procedure
7. Titrater pressure up to patient response or comfort
8. Do not delay other EMS treatment guidelines (Nitro, Morphine, Bronchodilators…)
9. Continuously monitor patient for improvement or decline

NOTES

- Monitor O2 usage as some units will consume oxygen rapidly
- COPD and Asthma patient will typically require lower pressures around 5 cmH₂O
- Pulmonary edema may require pressures of 10 cmH₂O
- If patient fails to show improvement, endotracheal intubation should be considered.
- Monitor EtCO₂ closely for patients who are known CO₂ retainers
- Document all use of CPAP with thorough assessments including a full set of vitals before and after treatment.
CERTIFICATION REQUIREMENTS:

- ADVANCED EMT
- PARAMEDIC

CRICOTHYROTOMY--NEEDLE

INDICATION

Pediatric patients, 0 to 8 yrs old, with complete airway obstruction where all other efforts at airway management have failed.

PROCEDURE

1. Continue attempts at ventilation while assembling equipment.
2. The cricothyroid membrane is best identified by palpating the laryngeal prominence at the anterior, superior aspect of the larynx. Approximately one of the patient’s fingerbreadths inferior to the laryngeal prominence is a small depression bounded on its inferior aspect by a rigid, horizontal structure, the cricoid cartilage. This small depression is the cricothyroid membrane and the rigid structure below is the cricoid cartilage. Prep the site with Betadine.
3. Attach a syringe to an over-the-needle catheter.
4. Insert the needle downward through the midline of the cricothyroid membrane at a 45 - 60° angle toward the patient’s carina. Take caution not to pass through the back of the trachea.
5. During insertion, apply negative pressure to the syringe. The entrance of air into the syringe indicates that the needle is in the trachea.
6. Remove the needle and syringe, leaving the catheter in the trachea.
7. Stabilize the catheter and connect a 3.0 ETT adapter to the hub of the catheter and ventilate with a bag-valve device and 100 % oxygen.
8. Remove the bag-valve to allow for exhalation.
9. Observe for chest rise, increased pulse ox and other clinical signs of oxygenation.
CERTIFICATION REQUIREMENTS

- PARAMEDIC

CRICOTHYROTOMY--SURGICAL

INDICATIONS

- Complete airway obstruction not responding to all other attempts to ventilate
- Destructive facial injuries
- This procedure shall be used only after all other attempts of establishing an airway and ventilating a patient have failed. Limited to patients over 8 years old.

PROCEDURE (if using a commercial device – follow their instructions on use)

1. Continue attempts at ventilation while assembling equipment.
2. The cricothyroid membrane is best identified by palpating the laryngeal prominence at the anterior, superior aspect of the larynx. Approximately one of the patient’s fingerbreadths inferior to the laryngeal prominence is a small depression bounded on its inferior aspect by a rigid, horizontal structure, the cricoid cartilage. This small depression is the cricothyroid membrane and the rigid structure below is the cricoid cartilage. Prep the site with Betadine.
3. With the thumb and long finger immobilizing the larynx, a vertical, midline 2 cm incision is made, down to the depth of the laryngeal structures.
4. Carefully make a second incision horizontally near the inferior edge of the membrane, transversely through the cricothyroid membrane with the scalpel. A low cricothyroid incision avoids the superior cricothyroid vessels, which run transversely near the top of the membrane.
5. Insert a gloved finger or tracheal hook into the opening.
6. Insert 7.0 mm cuffed ET tube into the opening and inflate cuff with enough air to seal.
7. Ventilate with a bag-valve device and 100 % oxygen. Confirm ventilation with chest rise, increased pulse ox and other clinical findings.
8. Secure ET tube with a folded Vaseline gauze pad around incision and tape in place.
9. Continually monitor for development of complications including dislodged ETT or soft tissue bleeding.
CRIME SCENE

Policy:

The primary responsibility of EMS is patient care; however, EMS should take all possible precautions to preserve evidence while at a crime scene.

Purpose:

To establish guidelines by which EMS personnel may provide patient care in a potential or known crime scene.

Procedure:

1. The primary EMS responsibility is to provide medical help to a patient or patients. The secondary responsibility is to preserve evidence.
2. The entire scene (including roadway, driveway, parking lot, outside areas) may contain evidence, which may be contaminated or destroyed by EMS.
3. Limit the number of EMS and fire responders entering the crime scene. All personnel should enter and exit by one route, taking care not to touch or move anything not directly related to the care of the patient.
4. Weapons should not be touched or moved by EMS or fire personnel. If a weapon presents a real threat or hindrance to patient care, have law enforcement secure it.
5. The clothing and personnel effects of the patient are evidence. If clothing must be removed from the patient to provide care, EMS or Fire should use care to cut around holes or tears in the clothing and not cut through them.
6. EMS and fire personnel are not detectives. Searches of the premises should be left up to law enforcement.
7. There should be no cleanup of the scene prior to an “ok” from law enforcement. Used dressings, packaging, and other EMS trash should be left in place until after other evidence has been processed by law enforcement.
8. The PCR (patient care report) should reflect the name(s) of all EMS personnel who have physical contact with the scene, including students and riders.
9. The PCR should contain only factual information obtained by EMS about the patient and the patient’s relationship to the scene. The PCR should describe the injuries to a patient and not the apparent cause of those injuries.
10. The PCR will become part of the legal record of the incident.

CERTIFICATION REQUIREMENTS:

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC

2017 Revision
DECONTAMINATION - EMERGENCY

INDICATIONS

- If hazardous materials are suspected, immediately activate the Hazmat Team
- Emergency decontamination shall be performed whenever a patient has been contaminated with a chemical that may present a risk to the patient, caregiver or hospital staff.
- Activate the Hazmat Team for large-scale or multiple-patient contamination, or hazardous environment situations.

PROCEDURE- FOLLOW HAZAMT TEAM RECOMMENDATIONS – SOME RECOMMENDATIONS MAY INCLUDE:

1. Remove the patient from the Hazard Area (Hot Zone).
2. If patient is capable have the patient follow the procedure without assistance.
3. If the patient is stable take actions to preserve the patient’s dignity.
4. Remove contaminated clothing. This may be accomplished simultaneously with rinsing especially if the patient is critical or chemical burns are occurring.
5. Triple bag contaminated clothing (valuables may be bagged separately)
6. Rinse the patient with copious amounts of water at low pressure. If patient is stable and/or staffing and equipment allows take actions to protect the environment (plastic sheeting, impoundment, etc.)
7. Wash the patient with mild soap, if available, and rinse.
8. Re-dress patient in hospital gown and/or cover with sheet and blanket(s)
9. Procedure need not take too much time—balance amount of decontamination with the need to reduce the risk to all involved.

CERTIFICATION REQUIREMENTS

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC
ELECTRICAL THERAPY

INDICATIONS

- Defibrillation—ventricular fibrillation or pulseless ventricular tachycardia
- Cardioversion—unstable tachycardia
- Transcutaneous Pacing—symptomatic bradycardia

PROCEDURE (FOLLOW CURRENT AHA STANDARDS AND GUIDELINES)

Defibrillation:

1. Initial treatment for ventricular fibrillation and pulseless ventricular tachycardia is immediate defibrillation.
2. Every minute that passes reduces the chances of successful cardioversion.
3. Apply defibrillation pads to patient’s chest.
4. Perform quick look and assess for shockable rhythm.
5. Charge to 360 J for monophasic or equivalent biphasic energy levels Usually 200 Joules if unknown what setting.
6. **Physio Control Recommendations** | **ZOLL Recommendations** | **Phillips Recommendations**
7. Deliver shock and begin CPR immediately for 5 cycles.

Cardioversion:

1. Initial treatment for unstable tachycardia and the subsequent treatment of tachycardia not responding to antiarrhythmic medications.
2. Do not delay the delivery of cardioversion for IV attempts, medication administration, or failure of the EKG monitor to “synch”.
3. Apply three or four lead EKG monitor cables.
4. Assess rhythm and determine if patient is unstable.
5. Apply pads to patient’s chest.
6. Depress the “synch” button. If there is difficulty synchronizing increase QRS size.
   **Physio Control Recommendations** | **ZOLL Recommendations** | **Phillips Recommendations**
7. Deliver shock and assess for rhythm change.

Transcutaneous Pacing:

1. TCP is a Class 1 intervention for all symptomatic bradycardias, and should be the initial treatment for Mobitz type II second-degree, or third-degree heart block.
2. If patient is symptomatic, do not delay TCP while awaiting IV access.
3. Apply three or four lead EKG monitor cables.
4. Apply pads to patient’s chest. Anterior-Posterior or Anterior-Lateral position may be used.
5. Set rate. Increase output until capture is achieved. Access pulse on right side of the body for mechanical capture.
6. Continue pacing at an output level slightly (10%) higher than threshold of initial capture.

CERTIFICATION REQUIREMENTS

- EMR (defibrillation only with AED)
- EMT (defibrillation only with AED)
- ADVANCED EMT (defibrillation only)
- PARAMEDIC
**GLASGOW COMA SCORE**

**ADULT**

<table>
<thead>
<tr>
<th>MOTOR RESPONSE</th>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obeys commands</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Localizes</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Flexion</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Extension</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**PEDIATRIC**—Recommended from 4 years of age to adult

<table>
<thead>
<tr>
<th>MOTOR RESPONSE</th>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
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<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Localizes</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Flexion-withdrawal</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Flexion-abnormal</td>
<td>2</td>
<td>None</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**INFANT**—Recommended from birth to 4 years of age

<table>
<thead>
<tr>
<th>MOTOR RESPONSE</th>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous</td>
<td>6</td>
<td>4 Smiles, oriented to sound, interacts appropriate</td>
</tr>
<tr>
<td>Localizes pain</td>
<td>5</td>
<td>3 Crying - consolable Interacts - inappropriate</td>
</tr>
<tr>
<td>Withdraws in response</td>
<td>4</td>
<td>2 Crying - inconsistently consolable; interacts - restless</td>
</tr>
<tr>
<td>Abnormal flexion</td>
<td>3</td>
<td>1 Crying - inconsolable Interacts - restless</td>
</tr>
<tr>
<td>Abnormal extension</td>
<td>2</td>
<td>No response</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
INTRAOSSEOUS ACCESS HUMERAL HEAD

INDICATIONS
- Adult or Pediatric (if appropriate device is available) patient with life threatening illness or injury and urgent need for IV but veins are not readily available after effective ventilation is established. Humeral Head IO is preferred route for decreased pain and increased flow rates.

CONTRAINDICATIONS
- Fracture (target bone)
- Previous orthopedic procedure of target bone (IO within 24 hours, prosthetic limb or joint)
- Infection at insertion site
- Inability to locate landmarks or excessive tissue

PROCEDURE
- Place the patient in a supine position
- Expose shoulder and adduct humerus (place the patient’s arm against the patient’s body) resting the elbow on the stretcher or ground
- Palpate and identify the mid-shaft humerus and continue palpating toward the proximal aspect or humeral head. As you near the shoulder you will note a protrusion. This is the base of the greater tubercle insertion site.
- With the opposite hand you may consider “pinching” the anterior and inferior aspects of the humeral head while confirming the identification of the greater tubercle. This will ensure that you have identified the midline of the humerus itself.

CONSIDERATIONS
- Flow rates: Due to the anatomy of the intraosseous space, flow rates will be slower than those achieved with IV catheters. Use a pressure bag or infusion pump to ensure continuous infusion.
- Pain: Insertion of the IO needle in conscious patients causes mild to moderate discomfort but is usually no more painful than a large bore IV. IO infusion can cause severe discomfort for conscious patients. Administer 30 - 40mg (or 1-2mLs) 2% IV Lidocaine Prior to IO flush

CERTIFICATION REQUIREMENTS
- Paramedic
INDICATION

Adult or Pediatric (if appropriate device is available) patient with life threatening illness or injury and urgent need for IV but veins are not readily available after effective ventilation is established. Humeral Head IO is preferred route for decreased pain and increased flow rates.

CONTRAINDICATIONS (consider alternate tibia)

Fracture of the tibia or femur on side of procedure
Previous orthopedic procedures (IO within 24 hours, knee replacement)
Pre-existing medical condition or infection near insertion site
Inability to locate landmarks (significant edema or excessive tissue at insertion site)

PROCEDURE

Expose the lower leg
Locate insertion site one finger breath medial of the tibial tuberosity
Prep the site as per peripheral IV site
Prepare the IO driver and needle set
Using aseptic technique, stabilize the leg and insert IO needle
Remove IO driver from needle set while stabilizing catheter hub.
Remove stylet from needle set and dispose in sharps container and connect the extension tubing.
Confirm placement – do not insert needle if it is too short and the 5mm line is not visible after placing through tissue.
Proper placement?: consider these: IO Needle stands firm, can flush without infiltration..
Pain control and Flushing:
Flush the IO space with 10 ml of fluid (If the patient is conscious, SLOWLY administer 30 - 40mg (1-2mLs) 2% Lidocaine IO and wait up to 2 minutes prior to initial bolus). If pain persists after the bolus of fluids 15 – 20 mg of Lidocaine may be administered.
Connect IV tubing, monitor, and document as per IV access procedure.

CONSIDERATIONS

Flow rates:
Due to the anatomy of the intraosseous space, flow rates will be slower than those achieved with IV catheters. Use a pressure bag or infusion pump to ensure continuous infusion.
Pain:
Insertion of the IO needle in conscious patients causes mild to moderate discomfort but is usually no more painful than a large bore IV. IO infusion can cause severe discomfort for conscious patients. Administer 30 - 40mg (or 1-2mLs) 2% IV Lidocaine Prior to IO flush

CERTIFICATION REQUIREMENTS

- Advanced EMT
- PARAMEDIC
INTUBATION--NASOTRACHEAL (BLIND)

INDICATION

A spontaneously breathing patient in need of intubation—inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection. Patient must be 12 years of age or older.

CONTRAINDICATIONS

- Apneic patients, midfacial fractures, suspected basilar skull fractures, bleeding disorders, taking Coumadin, likely to receive Heparin or thrombolytics, severe nasal trauma, pharyngeal hemorrhage, acute epiglottitis, suspected laryngeal fracture, and suspected increased intracranial pressure.

PROCEDURE

1. Hyperoxygenate patient while preparing equipment.
2. Select the nostril that appears larger and the ET tube at least 1 mm size smaller than that which would be used for orotracheal approach. Pre-flex the ET tube, and lubricate with water soluble gel.
3. Apply topical vasoconstrictor and/or topical anesthetic. If time permits insert a lubricated nasal pharyngeal airway to help dilate the nostril.
4. Place the patient in the “sniffing position” with elevation of the head on a pillow and the jaw forward.
5. Attach the BAAM whistle (if available) on the ET tube. The patient’s breathing will activate the BAAM and whistling will be observed with inhalation and exhalation.
6. Insert the ET tube with tip directed along the floor of the nostril and then in a plane across the midline toward the opposite shoulder so that the tip of the tube will be near the midline at the level of the larynx.
7. Gently advance the ET tube on early inspiration.
8. If using the BAAM whistle the intensity of the whistling will increase as the ET tube is properly placed. Deviation out of the airflow tract will result in immediate decrease and loss of whistle sound. Withdraw the ET tube a short distance and redirect it laterally by twisting the tube, anteriorly by extending the head, or posteriorly by elevating the jaw and/or slight flexion of the neck until the whistle sound is again maximal.
9. Inflate ET tube cuff with appropriate amount of air. Note measurement.
10. All ET tube placements shall be confirmed using the following steps:

<table>
<thead>
<tr>
<th>Primary Confirmation</th>
<th>Secondary Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Continued increase in whistle through BAAM as ET tube passes through the vocal cords.</td>
<td>• Esophageal Intubation Detector</td>
</tr>
<tr>
<td>• 5 point auscultations anterior L/R, mid-axillary, over epigastrium.</td>
<td>• With a perfusing patient – ETCO₂</td>
</tr>
<tr>
<td>• Chest rise and fall with each ventilation.</td>
<td>• Monitor oxygen saturation and CO₂ levels</td>
</tr>
<tr>
<td>• ETCO₂</td>
<td></td>
</tr>
</tbody>
</table>

11. If still in doubt, remove the ET tube and ventilate the patient with bag-valve mask and follow the oxygen titration protocol.
12. Upon confirmation of correct ET tube placement, secure with appropriate device and note the tube depth measurement.
13. Reassess placement frequently–each time patient is moved, change in patient condition, transfer of care, etc.
14. Continuous ETCO₂ via capnography should be applied.

CERTIFICATION REQUIREMENTS

- PARAMEDIC
INTUBATION--OROTRACHEAL

INDICATIONS

- Cardiac arrest with ongoing chest compressions.
- Inability of patient in respiratory compromise to breathe adequately.
- Inability of the patient to protect their airway—coma, areflexia, or cardiac arrest.
- Inability of the rescuer to ventilate the unresponsive patient with bag-valve device.

Endotracheal intubation is the gold standard of airway management. However, failure to intubate does not mean failure to ventilate.

PROCEDURE

1. Hyperoxygenate while preparing intubation equipment. Remember suction.
2. For patients with suspected spinal injuries, maintain neutral position of the cervical spine during intubation. In all other patients use the position that best accommodates visualization of the vocal cords.
3. Insert the laryngoscope blade into the oropharynx to visualize the vocal cords. Avoid pressure on the patient’s lips and teeth.
4. Apply downward pressure on the larynx or use the BURP (Backward, Upward, Right, Pressure) to assist in visualization of the cords.
5. While visualizing the cords, insert the proper size ET tube with stylette through the vocal cords, advance one-half to one inch farther.
6. While holding the ET tube in place, inflate the cuff with the appropriate amount of air (check cuff to determine if high or low volume).
7. All ET tube placement shall be confirmed using the following steps:

<table>
<thead>
<tr>
<th>Primary Confirmation</th>
<th>Secondary Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Direct visualization of ET tube passing through the vocal cords.</td>
<td>• Esophageal Intubation Detector</td>
</tr>
<tr>
<td>• 5 point auscultations anterior L/R, midaxillary, over epigasstrum.</td>
<td>• With a perfusing patient – ETCO₂</td>
</tr>
<tr>
<td>• Chest rise and fall with each ventilation.</td>
<td>• Monitor oxygen saturation and CO₂ levels</td>
</tr>
</tbody>
</table>

8. If at any time placement of the ET tube is in doubt, insert the laryngoscope into the oropharynx and note if the ET tube passes through the vocal cords.
9. If still in doubt, remove the ET tube and ventilate the patient with bag-valve mask and follow the oxygen protocol.
10. Upon confirmation of correct ET tube placement, secure with appropriate device and note the tube depth measurement.
11. Reassess placement frequently—each time patient is moved, change in patient condition, transfer of care, etc.
12. Continuous ETCO₂ via capnography should be applied.

CERTIFICATION REQUIREMENTS

- PARAMEDIC
INDICATION

In cases of severe illness or injury requiring immediate fluid or drug administration when peripheral IV access has been unobtainable or is unlikely

PRECAUTIONS

It is important to remember that many patients with central venous lines in place are immunosuppressed or severely debilitated. Thus, they are very susceptible to routine pathogens. Special care should be taken to avoid contamination.

- Access of a port used for dialysis is discouraged. If you are unclear or have doubts you should consider other means of vascular access. Use patient history to help make this decision.

Introduction of air can be extremely hazardous. DO NOT remove injection cap from catheter or allow IV fluids to run dry.

PROCEDURE

BROVIAC / HICKMAN / GROSHONG AND OTHER DOUBLE/TRIPLE LUMEN CATHETERS:

1. Select appropriate port for access. If more than one port is seen then access the venous side. Although blue generally indicates the venous side, many different colors are available. You cannot use color only as a guide. Aspirate blood and examine. Do not use a line with gauze wrapped around the port or with a medication sticker.

2. Lay patient supine.

3. Thoroughly cleanse injectable port cap prior to use.

4. Aspirate 10cc of blood from catheter (this prevents an inadvertent anticoagulant bolus from occurring). If you are unable to draw blood, reposition patient and try again. If problem persists do not use line.

5. Confirm venous access by examination of aspirated blood and then discard blood. If in doubt use other port or consider use of other vascular access methods.

6. Attach IV line to injection port. Begin IV fluid flow and adjust according to patient presentation. Make sure clamps are closed except when aspirating, flushing or infusing.

7. Inject all necessary medications and fluids. Always aspirate before flushing or infusing. This prevents embolization of any clots that may have formed since last administration.

NOTE: If at any time you are unable to aspirate blood or infuse fluids, do not use line as clotting may have accord. Consider alternative vascular access.

Continued on next page
EXISTING CENTRAL VENOUS LINES

1. Select desired port, when two sizes are available select the larger of the two.
2. Thoroughly cleanse injectable port prior to use.
3. Aspirate 6-10cc of blood and discard. Attempt to inject 5cc of NS into port. If resistance is met, withdraw needle and attempt same procedure on different port. Do this until you find a catheter that does not present with resistance to administration of NS. If resistance continues, do not use PICC line.
4. If you are unable to draw blood or suspect arterial placement do not use PICC line.
5. Attach IV tubing, open line, and ensure patency. You should aspirate 5cc of blood before each flush or medication administration. Begin IV fluid flow and adjust according to patient presentation.

1. Use only if access to a Huber needle is available.
2. Position patient supine.
3. Locate the site by visualization and palpation, these ports are generally found in the upper right chest and present as a dome shaped protrusion.
4. Thoroughly cleanse site prior to use. The preferred method is to use Iodine and vigorous rubbing in a circular pattern starting at the center and working your way out. Allow time to dry completely.
5. Using a non-coring Huber Needle attached to a syringe, insert into the site at a 90-degree angle until resistance is met. This means you have reached the back plate of the hub.
6. Aspirate 10cc of blood and discard. Then draw additional blood for lab work and inject 5-10cc of NS. If resistance is met or blood cannot be aspirated change the patient’s position and try again. If problem persists withdraw needle and consider alternative vascular access.
7. Remove syringe, attach IV tubing, open line, and ensure patency.
8. Secure the site with large occlusive dressing.

PICC LINE (Peripherally Inserted Central Catheter):

INTERNAL SUBCUTANEOUS INFUSION PORTS:

CERTIFICATION REQUIREMENTS:

- Paramedic
INDICATION

Inability to obtain an IV or IO on a critically ill or injured patient ≥ 12 years of age who requires intravenous access for fluid or medication administration, where no obvious peripheral site or Intraosseous is accessible.

PROCEDURE

1. Place the patient in a supine, head-down position. This helps distend the vein and prevents air embolism.
2. Turn the patient’s head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim downward toward the same side shoulder.
5. “Tourniquet” the vein lightly with one finger above the clavicle and cannulate the vein in the usual method.
6. Remember that air can easily enter the blood stream from a large Vein such as this so quickly attach ext. set to prevent air from entering the blood stream.
7. Attach the IV and secure the catheter avoiding circumferential dressing or taping.

CERTIFICATION REQUIREMENTS

- PARAMEDIC
- Successfully complete an annual skill evaluation inclusive of the indications, contraindications, technique, and possible complications of the procedure.
KING AIRWAY

INDICATION
- An alternative to endotracheal intubation for airway management in patients greater than 35 inches tall to secure a patent airway and deliver ventilations.

CONTRAINDICATIONS
- Responsive patients with an intact gag reflex.
- Patients with known esophageal disease.
- Any patients that have ingested caustic substances.
- Patients who are less than 35 inches tall.

PROCEDURE
Use BSI including gloves, mask, and eye protection. Assemble the equipment while continuing ventilations.
1. Choose the correct tube size based on the patient’s height.
   
<table>
<thead>
<tr>
<th>Pt. height</th>
<th>Size</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>35”-45”</td>
<td>2</td>
<td>Green</td>
</tr>
<tr>
<td>41”-51”</td>
<td>2.5</td>
<td>Orange</td>
</tr>
<tr>
<td>4’-5’</td>
<td>3</td>
<td>Yellow</td>
</tr>
<tr>
<td>5’-6’</td>
<td>4</td>
<td>Red</td>
</tr>
<tr>
<td>&gt; 6’</td>
<td>5</td>
<td>Purple</td>
</tr>
</tbody>
</table>

2. Check inflatable cuffs for leaks.
3. Apply water soluble lubrication to the tip.
4. Prepare and turn on suction.
5. Apply chin lift and introduce the King airway into the corner of the mouth.
6. Advance tip under the base of the tongue while rotating the tube back to midline.
7. Without excessive force, advance the tube until the base of the connector is aligned with the patient’s teeth or gums.
8. Inflate cuff based on tube size. Typical inflation volume is as follows:
   
<table>
<thead>
<tr>
<th>Size</th>
<th>KLTD/ml</th>
<th>KLTSD/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>25-35</td>
<td>n/a</td>
</tr>
<tr>
<td>2.5</td>
<td>25-35</td>
<td>n/a</td>
</tr>
<tr>
<td>3</td>
<td>45-60</td>
<td>40-55</td>
</tr>
<tr>
<td>4</td>
<td>60-80</td>
<td>50-70</td>
</tr>
<tr>
<td>5</td>
<td>70-90</td>
<td>60-80</td>
</tr>
</tbody>
</table>

9. Attach the BVM. While gently bagging slowly withdraw the tube until ventilation is easy to administer a large tidal volume with minimal airway pressure.
10. Adjust cuff inflation, if necessary, to obtain an airway seal at peak ventilation pressure.
11. Assess for proper tube placement.
   a. Assess breath sounds; Assure chest rise and fall; Attach patient to continuous end tidal CO₂ monitoring; Continue to reassess that tube is properly placed and that patient ventilation is easy and free flowing with chest rise and adequate breath sounds.
   b. If at any time the provider is unsure of proper placement – deflate cuff, remove and use BVM for ventilation.

NOTES
1. Preparation: Use only water soluble lubricant. Do not apply lubricant near ventilatory openings.
2. Induction: Patient should be “deep enough”, do NOT insert the KLTD/KLTSD if the patient is swallowing, retching, moving or gagging.
3. Insertion: Hold the KLTD/KLTSD with the dominant hand at the proximal end (connector) such that insertion will be accomplished in a single, continuous motion. Use the lateral approach with chin lift. Insert the KLTD/KLTSD until the base of the connector is aligned with teeth or gums.
   - The KLTD/KLTSD should not “bounce out” after release.
4. Inflation: Using a pressure gauge: 60 cm H₂O. Using a syringe: just seal (average volumes: KLTD: Size #2, 25-35 ml; Size #2.5, 30-40 ml; Size #3, 45-60 ml; Size #4, 60-80 ml; Size #5, 70-90 ml). KLTSD: Size #3, 40-55 ml; Size #4, 50-70 ml; Size #5, 60-80 ml.
   - Check that the blue (pharyngeal) cuff is not visible in the oropharynx.
5. Final Positioning: Withdraw the KLTD/KLTSD until ventilation is optimized. Readjust cuff inflation.
6. Taping: Disconnect the circuit and aggressively tape the KLTD/KLTSD in the midline to the maxilla.
   - For the KLTSD, avoid taping over the opening to the gastric access lumen.

CERTIFICATION
CERTIFICATION REQUIREMENTS:
- ADVANCED EMT
- PARAMEDIC
LOS ANGELES PREHOSPITAL STROKE SCREEN (LAPSS)

Patient Name: ____________________________
Rater Name: ____________________________
Date: ____________________________

STROKE SCREEN (LAPSS)

<table>
<thead>
<tr>
<th>Screening Criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age over 45 years</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>No prior history of seizure disorder</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>New onset of neurologic symptoms in last 24 hours</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Patient was ambulatory at baseline (prior to event)</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Blood glucose between 60 and 400</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>

Exam: *look for obvious asymmetry*

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial smile / grimace:</td>
<td>✔️</td>
<td>✔️ Droop</td>
<td>✔️ Droop</td>
</tr>
<tr>
<td>Grip:</td>
<td>✔️</td>
<td>✔️ Weak Grip</td>
<td>✔️ Weak Grip</td>
</tr>
<tr>
<td>Arm weakness:</td>
<td>✔️</td>
<td>✔️ Drifts Down</td>
<td>✔️ Drifts Down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✔️ Falls Rapidly</td>
<td>✔️ Falls Rapidly</td>
</tr>
</tbody>
</table>

Based on exam, patient has only unilateral (and not bilateral) weakness: Yes    No
If Yes (or unknown) to all items above LAPSS screening criteria met:    Yes    No

If LAPSS criteria for stroke met, call receiving hospital with “STROKE ALERT”, if not then return to the appropriate treatment protocol. (Note: the patient may still be experiencing a stroke if even if LAPSS criteria are not met.)

CERTIFICATION REQUIREMENTS:

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC

2017 Revision
Regional Protocol  Guideline Section – To be used only as indicated in Protocol Section
LVAD (Left Ventricular Assist Device)

Patient Calls 911

LVAD Functioning?
Auscultate left upper abdominal quadrant. Continuous humming sound = pump IS working
Attention: Non pulsatile pump function. Patient may not have palpable pulse or measurable BP or pulse oximeter readings, even if pump is working properly.

YES  NO

Patient Stable  Patient Unstable  Pump connected to controller? Controller connected to power?

Other general medical problem  EKG  Controller Alarming (red heart)

Treat per medical protocol  Treat per standard protocol  Treat per ACLS protocol

Treat for cardiogenic shock  Change controller

Transport urgently to ER If possible, transport to implant center.
MEDICATION ADMINISTRATION

Five “Rights” of Drug Administration:

1. Right Patient
2. Right Drug
3. Right Time
4. Right Dose
5. Right Route

Paramedics should carefully read the drug package and/or label prior to administering any drug to help assure the correct preparation is being administered.

Sublingual Administration:

Sublingual medications are placed or sprayed under the tongue and allowed to dissolve. Absorption occurs via the rich supply of superficial vessels under the tongue. Examples include Nitroglycerin and Narcan.

Inhalation Administration:

Because the respiratory tract offers an enormous absorption surface with a rich blood supply, drugs administered via this route can have both local and systemic effects. Examples include drugs administered via nebulizer and metered-dose inhaler.

Endotracheal Administration:

Instillation of a drug into the trachea via the endotracheal tube. Patient is then ventilated with a bag valve mask to disperse the drug across the alveoli where it is absorbed into the circulation. Drugs that can be given endotracheal include Lidocaine, epinephrine, atropine and Narcan (LEAN is the mnemonic to help remember this). Endotracheal use of diazepam (Valium) is controversial because it is not water soluble and can be damaging to lung tissue. Diluting drugs given endotracheal with 5—10 ml of normal saline can help absorption. Establish IV access ASAP as repeated dosing down ETT can add excess fluid volume to the lungs. In general, endotracheal doses are increased by 2 to 2.5 times the recommended IV dose.

Procedure:

1. Dilute drug in 5—10 ml of normal saline (Many drugs are diluted as packaged.)
2. Remove the needle from the syringe if possible before instilling medication down the tube. The American Heart Association recommends passing a suction catheter beyond the tip of the endotracheal tube and administering the medication through the catheter. Some preloaded syringes do not have removable needles and, in the interest of time, are used as is. With such syringes, care should be taken to prevent damaging the endotracheal tube with the needle.
3. If CPR is being done, briefly interrupt chest compressions while the drug is instilled into the endotracheal tube.
4. Follow instillation of drug with two to three ventilations via bag-valve mask to disperse drug.
5. Assess the patient’s response.

Subcutaneous Injection:

In SC or SQ injection medication is injected into the loose connective tissue between the dermis and muscle layer. This route allows for slow absorption of drugs and is used when a sustained effect is desired.

(CONTINUED ON NEXT PAGE)
MEDICATION ADMINISTRATION – CONTINUED

**SQ Injection Procedure:**

1. Review 5 Rights
2. Explain procedure to patient
3. Take BSI precautions
4. Select and cleanse site with alcohol and allow it to dry or wipe it dry with sterile gauze before proceeding
5. Pinch the skin up slightly between the thumb and other fingers.

6. Insert the needle using a quick, dart-like motion, using the appropriate angle:
   - When using a 5/8-inch needle, a 45-degree angle should be used with most adults
   - In very obese patients, increase the angle to 60 degrees
   - In very thin patients, reduce the angle to 30 degrees
7. Aspirate to check for blood (if blood is drawn, withdraw needle and discard medication and then prepare another dose)
8. Gently inject medication
9. Discard needle in sharps container
10. Massage injection site to reduce discomfort and disperse medication
11. Consider applying band aid if time permits

**Intramuscular Injection:**

This route has several advantages over the subcutaneous route: larger amounts of fluid can be injected (up to 5 ml in adults), absorption is faster, and drugs that are irritating to SC tissues are better tolerated when given IM. For volumes greater than 3—5 ml, more than one injection site should be used. Because of the depth of IM injections, special care must be taken to avoid damaging nerves. Common sites used for IM injections include the arm (deltoid), the thigh (rectus femoris or vastus lateralis), and the hip (dorsogluteal or ventrogluteal).

Note: While the deltoid (upper arm) is an easily accessible site and well perfused, it has several disadvantages. It can only accommodate small amounts of fluid (i.e., 1 ml in women and children and up to 2 ml in males with well-developed deltoids). The vastus lateralis and rectus femoris (thigh) are the preferred sites for IM injections in infants.

**IM injection procedure:**

1. Review 5 rights
2. Explain procedure to patient
3. Take BSI precautions
4. Select appropriate size needle syringe and injection site. Consider:
   - Ability of patient to cooperate
   - Amount of drug to be given
   - Type of drug to be given (very irritating drugs should be given in large gluteal muscles, i.e., Promethazine, Hydroxyzine, Diazepam.
5. Cleanse and prep site.
6. Using Z-track technique, Insert needle at 90 degree angle to skin using a quick dart-like motion.
7. Aspirate before injecting to check for blood return. (if blood is drawn, withdraw needle and discard medication and then prepare another dose)
8. Discard needle and syringe appropriately
9. Do not massage needle site if Z-track technique utilized.
10. Consider applying Band-Aid if time permits

(CONTINUED ON NEXT PAGE)
Intravenous Administration:

Administering a drug intravenously places the medication directly into the patient’s bloodstream. Therefore, the onset of action is more rapid than with other parenteral routes. The general rule to follow when selecting a catheter is to choose the smallest bore that will accomplish the purpose of the IV. However, large-bore catheters (18-14) should be selected for adult patients with life threatening emergencies in which rapid fluid replacement is required. It is also important to note that damage to veins and other complications of IV therapy are often result of utilizing large catheters.

If at all possible, IV catheters should be placed in the hands or forearm with the antecubital space reserved for patients in cardiac arrest or patients with life threatening emergencies requiring rapid fluid administration. The external jugular vein along with veins in the feet or ankle can also be used in emergent patients with limited accessible upper extremity IV sites.

Troubleshooting IV Lines:

In the event that an IV will not infuse, the following steps should be taken:
1. Ensure that the tourniquet has been removed.
2. Check the line for kinks or obstruction caused by the patient or nearby equipment
3. Check to see that the roller clamp and line clamps are open.
4. Raise the height of the IV infusion bag.
5. Gently manipulate the position of the IV line and the patient’s extremity.

Do not forcefully irrigate an apparently occluded line.

Procedure for administering IV medication:

1. Review 5 rights.
2. Take BSI precautions.
3. Typically select and cleanse the most distal medication port (closest to IV site).
4. Check patency of the primary line by aspirating gently and checking for blood return.
5. Occlude the tubing above the injection port by using the roller clamp or crimping the tube with the other hand
6. Administer the medication at the specified flow rate.
7. Release the occlusion on the tubing.
8. Readjust the flow rate
9. Document the date, time, and amount of drug administered.
10. Assess the patient’s response to the drug.

Procedure for administering IV piggyback (IVPB) medication:

1. Review 5 rights
2. Take BSI precautions
3. Prepare the medication
4. If not using premix, cleanse injection port on bag used for IVPB and inject medication into bag.
5. Invert the bag several times to mix the solution.
6. Attach a medication label to the bag indicating the name and amount of drug injected along with the date and time.
7. Connect an appropriate drip set to IVPB bag and flush tubing.
8. Connect to port on main line (distal main line roller clamp) with either a needle or needle-less adapter.
9. If not using infusion pump, hang IVPB bag higher than main bag and adjust flow rate.
10. Main line can be clamped off at this time or infused along with IVPB.

(CONTINUED ON NEXT PAGE)
Intraosseous Administration:

The IO route is intended for short-term use until other venous access can be obtained. It is recommended that an IO line be placed after 90 seconds or two unsuccessful attempts to start a peripheral line. The distribution of fluid and drugs given the IO route is similar to that of IV administration. Fluids or medications are injected into the bone marrow cavity and pass into the venous sinusoids to the central venous channels and then to the systemic circulation via the emissary and nutrient veins.

The insertion sites for IO infusion commonly used are the humoral head, proximal tibia, distal tibia, and distal femur. Placement can be found under the guideline for IO placement.

Rectal Administration:

The only drug commonly administered via the rectal route in the prehospital setting is valium for status seizure activity in the pediatric patient when IV access is not possible. It is also sometimes used for adult patients who are seizing. Ativan can also be administered rectally.

Procedure for rectal administration of valium (Diazepam):

1. Review 5 rights.
2. Take BSI precautions.
3. Draw up appropriate dose in TB or 1cc syringe.
4. Remove needle.
5. Lubricate tip of syringe.
6. Insert in rectum approximately 3 cm.
7. Inject solution.
8. Facilitate drug retention by elevating and squeezing buttocks together with manual pressure.

Using existing central venous lines and implantable ports for fluid and drug administration:

Central lines may be used for fluid and drug administration in emergency situations. It is important to remember that many patients with central venous lines in place are immunosuppressed or severely debilitated. Thus, they are very susceptible to routine pathogens. Special care should be taken by the paramedic to avoid contamination.

Procedure for using peripheral or central lines for drug or fluid administration:

1. Review 5 rights.
2. Take BSI precautions.
3. Draw up 3 ml of normal saline.
4. Wipe connection port with Betadine and allow it to dry.
5. Connect 5-10ml syringe, release clamp and withdraw 5 ml of blood (do not use this for specimen as it is typically heparinized)
6. Secure clamp
7. Attach syringe with 3ml of normal saline to port, release clamp and flush with saline. Take precautions to insure that you do not flush air from the syringe into the line.
8. Remove syringe and secure clamp
9. You may now connect IV tubing to port (be sure tubing is flushed)
11. If injecting medication directly into port, be sure to follow with heparin flush and then re-secure the clamp.

(CONTINUED ON NEXT PAGE)
Procedure for using Implantable Ports (Port-a-Cath):

Implantable ports are venous access devices that are surgically implanted under the skin with the distal end of the catheter inserted into a large central vein. The injection end of the catheter is implanted subcutaneously, often on the chest wall, and has a self-sealing septum over a small chamber or reservoir. (Most require Huber needles)

1. Consider 5 rights
2. Take BSI precautions
3. Swab site with Betadine or alcohol
4. Locate the device and stabilize it with one hand.
5. Puncture the skin and septum with a Huber needle attached to a 3 ml syringe containing normal saline. (Huber needles are special stainless-steel needles: they may be straight or angled 90 degrees) Do not use regular needles or IV catheters with Port-a-Caths
6. Aspirate blood to determine patency and then inject the saline to flush the system.
7. Connect air-free IV tubing to reservoir and begin infusion.
8. Tape connection site to prevent displacement.
9. After use, flush the device with a heparinized solution.

Intranasal Drug Administration

NAD (Nasal Administration Device) or MAD (Mucosal Administration Device).

Some medications can be administered intranasal. If injection or IV is not possible or undesired, this route is an option for the following drugs: Fentanyl, Glucagon, Versed, Narcan and Ketamine. Other drugs may be approved for intranasal administration and will be listed in the drug section.

To administer medication intranasal:

1. Place medication in syringe, add 0.1ml more than the dose needed for dead space.
2. Place the NAD device to syringe to atomize the medication in the nasal mucosa.
3. Have patient sitting up if possible (45 degrees is best)
4. Place the NAD into the nostril aim toward the superior part of the ear) and pinch the other nostril
5. Have patient inhale while spraying
6. Spray ½ of the medication in each nostril. Should not exceed 1 cc per nostril.

CERTIFICATION REQUIREMENTS

- PARAMEDIC
MIST REPORT

Emergency Department physicians and nursing staff expect concise, precise and *pertinent* information. The following is the standard format they are most accustomed to. This report, if given in person, should last no more than 30 seconds or so:

- M - Mechanism of Injury / Chief Complaint
- I – Injuries
- S – Signs and Symptoms
- T - Treatments

Arkansas Trauma Team Activation Time out – allows 30 seconds for a brief and concise verbal report on trauma patients to the receiving physician and staff. Using MIST will assist in keeping this information brief while still allowing for pertinent information to be given.

Incoming radio report may also follow this format for brevity and consistency.

CERTIFICATION REQUIREMENTS:

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC
ORTHOSTATIC VITAL SIGNS

INDICATION

Patient with suspected blood or fluid loss, dehydration or syncope, as a diagnostic aid.

PROCEDURE

1. Assess the need for orthostatic vital signs.
2. Obtain patient’s pulse and blood pressure while supine.
3. Have patient stand for one minute.
4. Obtain patient’s pulse and blood pressure while standing.
5. If pulse has increased by 20 BPM and systolic BP decreases by 20 mmHG, the orthostatic vital signs are considered positive.
6. If patient is unable to stand, orthostatic vital signs may be taken with patient sitting with feet dangling.
7. Document the vital signs for supine and standing positions.
8. Determine the appropriate treatment based on protocol.

CERTIFICATION REQUIREMENTS:

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC
Regional Protocol  Guideline Section – To be used only as indicated in Protocol Section

Arkansas Department of Health EMS Field Patient Care Report – Short Form
All Pertinent Sections Should Be Completed for all Patients at Time of Care Transfer to ED Staff
Please print legibly. Complete this form and leave with the RN receiving the patient.
THIS FORM DOES NOT REPLACE THE OFFICIAL EMS PATIENT CARE REPORT

<table>
<thead>
<tr>
<th>Agency Name</th>
<th>Phone</th>
<th>Receiving Hospital</th>
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</thead>
<tbody>
<tr>
<td>Patient Name</td>
<td>DOB</td>
<td>Age</td>
</tr>
<tr>
<td>Date / /</td>
<td>Time:</td>
<td>Level of Consciousness: Alert</td>
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</table>

<table>
<thead>
<tr>
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<td></td>
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<table>
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<tr>
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<th>Rate</th>
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<td></td>
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</table>

PMHx: Meds: Allergies:

Primary Impression:

Findings/Notes (If more room needed, check box at bottom-right and write additional):

<table>
<thead>
<tr>
<th>Stroke</th>
<th>Prehospital Stroke Screen Performed: Yes No</th>
<th>Stroke Alert called to hospital by EMS: Yes No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose 60–400</td>
<td>Yes No</td>
<td>Last Known Well Time: Date:</td>
</tr>
<tr>
<td>Balance - Sudden loss of balance?</td>
<td>Yes No</td>
<td>Name providing well time:</td>
</tr>
<tr>
<td>Eyes - Sudden change in vision or trouble seeing?</td>
<td>Yes No</td>
<td>Phone number: - -</td>
</tr>
<tr>
<td>Face - Facial drooping?</td>
<td>Yes No</td>
<td>Times (approximation - in whole minutes)</td>
</tr>
<tr>
<td>Arms - Does one arm drift downward??</td>
<td>Yes No</td>
<td>Dispatch to patient contact (goal&lt;8): Minutes</td>
</tr>
<tr>
<td>Speech - Is their speech slurred or strange?</td>
<td>Yes No</td>
<td>Arrival to first vital set (goal&lt;5): Minutes</td>
</tr>
<tr>
<td>Time - Did you document last knows well time?</td>
<td>Yes No</td>
<td>Arrival to glucose check (goal&lt;5): Minutes</td>
</tr>
<tr>
<td>Potential Stroke Patient?</td>
<td>Yes No</td>
<td>Total time on scene (goal&lt;15): Minutes</td>
</tr>
<tr>
<td>Stroke Band #: starts with “S”</td>
<td>5</td>
<td>Total transport time: Minutes</td>
</tr>
</tbody>
</table>

STEMI
12, 15, or 18 Lead Obtained: Yes No | STEMI Alert called to hospital by EMS: Yes No |
| STEMI Indicated: Yes No | Elevation in leads: |
| Initial Rhythm: Depression in leads: |
| Was ECG transmitted to the receiving facility: Yes No |

Trauma Band #: (starts with “A” or “B”)

<table>
<thead>
<tr>
<th>Trauma Band #: ATCC Contacted: Yes No</th>
<th>Trauma Alert by EMS: Yes No</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCS</td>
<td>Eye Opening</td>
</tr>
<tr>
<td>Initial: Spontaneous To Speech To Pain None</td>
<td>4 Best Verbal Response</td>
</tr>
<tr>
<td>Post: Oriented Disoriented Mono-syllabic Incomprehensible None</td>
<td>5 Best Motor Response</td>
</tr>
<tr>
<td></td>
<td>6 Obey Commands</td>
</tr>
<tr>
<td></td>
<td>4 Localizes Pain</td>
</tr>
<tr>
<td></td>
<td>3 Withdraws From Pain</td>
</tr>
<tr>
<td></td>
<td>2 Abnormal Respiration</td>
</tr>
</tbody>
</table>

EMS Field HCP: Name & Title: | Transfer of Care Time: : |
Receiving HCP: Name & Title: | If checked, see back side: |
PHYSICIAN ON SCENE

Primary Physician
A paramedic is permitted to take orders by telephone or other means of communication from the patient’s primary/attending physician under any of the following conditions:

- The paramedic knows the physician by voice.
- The physician identifies him or herself and repeats orders to at least two members of the on-scene EMS crew.
- Written, signed orders are presented.

The medical control physician should be notified and this notification documented on the patient care report.

Non-Primary Physician
This pertains only to those situations in which a non-primary physician (i.e. not the patient’s physician) is physically present on scene of an emergency. In the event that the physician on scene wishes to direct the care of the patient(s) and therefore, accepts responsibility for the patient(s), the physician on scene must be informed of and agree to the following conditions prior to assuming the care of the patient:

- The physician must show proper identification and a current Arkansas physician’s license.
- The physician must agree to sign a written statement attesting to physician’s assumption of responsibility for patient care.
- The physician must remain with the patient(s) on scene and during transport to the receiving hospital. Patient care may be transferred at the receiving hospital, with report by the physician, to the medical staff.
- The physician on scene must be informed that the medical control at the receiving hospital will be contacted and medical control will make the final decision regarding assumption of patient care by the physician on scene.

If the above conditions are agreed to, the physician on scene may assume the responsibility for patient care.

Paramedic’s Responsibility
1. Remain tactful, calm and courteous.
2. Follow the procedure conditions.
3. Offer assistance to the physician on scene. The paramedic may perform any procedures that are within the scope of practice of that individual as defined by these protocols.
4. Maintain control of medications and equipment.
5. Inform the physician on scene of equipment available.
6. Maintain active communication with medical control.
7. Complete the necessary patient care form and obtain appropriate signatures.

Physician’s Responsibility Form

Physicians, please read carefully.

The emergency personnel are trained extensively and function under protocols developed to address situations that occur in the pre-hospital emergency and non-emergency setting.

If you wish to take charge of the injury/illness scene, you must:

1. Show your current Arkansas medical license to the Paramedic or EMT on scene.
2. Agree to take full responsibility for care and treatment of the patient(s) involved in this incident.
3. Accompany the patient(s) in the ambulance to the most appropriate receiving hospital.

__________________________  __________________________  ________________
Physician’s signature        License #, Type              Date

Witness

__________________________  __________________________
__________________________  __________________________
CERTIFICATION REQUIREMENTS:  Date
- ADVANCED EMT
- PARAMEDIC

2017 Revision
PULSE OXIMETRY

INDICATIONS

- Patients with suspected hypoxemia.
- Patients being administered oxygen by EMS crew.
- A trending tool to monitor O\(_2\) saturation as one indication of perfusion to be used in conjunction with other clinical findings.

PROCEDURE

Pulse oximetry measures the percentage of hemoglobin saturated with oxygen and is denoted as SaO\(_2\). Several factors may have an impact on the reading: PCO\(_2\), pH, temperature, CO, and whether hemoglobin is normal or altered. Pulse oximetry changes may be delayed and not a direct reflection of patient’s oxygenation. Therefore, clinical findings should determine care of patient. Pulse oximetry should be used as one of those findings along with others to make treatment decisions.

1. Turn the machine on and allow for self-tests.
2. Apply probe to the patient’s finger, ear lobe, forehead, or foot.
3. Allow machine to register saturation level. This may take up to 45 seconds.
4. Record saturation percent (SaO\(_2\)), pulse rate and time.
5. Verify pulse rate on machine with actual pulse of patient.
6. Monitor critical patients continuously until arrival at the destination.
7. Document percent of oxygen saturation every time vital signs are recorded and in response to efforts to correct hypoxemia.
8. In general, normal saturation is 97—99%. Below 94%, suspect a respiratory compromise.
9. Use the pulse oximetry reading as an added tool for patient evaluation, another clinical finding. Remember to treat the patient, not the machine.
10. The pulse oximetry reading should not be used to withhold oxygen from a patient in respiratory distress, or when it is the standard of care to apply oxygen despite a good SaO\(_2\), such as chest pain.
11. Factors which may reduce or otherwise alter reliability of pulse oximetry readings:
    - Poor peripheral circulation—blood volume, hypotension, hypothermia.
    - Low blood hemoglobin concentration.
    - Excessive pulse ox sensor movement.
    - Fingernail polish—should be removed with nail polish remover.
    - Carbon monoxide bound to hemoglobin—250 times greater than oxygen to hemoglobin.
    - Irregular or rapid heart rhythms—atrial fibrillation, SVT, etc.
    - Jaundice.

CERTIFICATION REQUIREMENTS

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC
RERAINTS

INDICATION

Patients with actual or potential threat to self or others.

PROCEDURE

1. Evaluate the need for restraints. Restraints should be considered only as a last resort after verbal techniques have failed.
2. If threat to self or others is due to behavioral problems (including drugs or alcohol) or criminal behavior (including resisting arrest), request law enforcement assistance.
3. Consult Medical Control.
4. The least amount of restraint necessary to accomplish the desired purpose should be used.
5. The restraints should not be limiting to the patients peripheral or central circulation or respiratory status.
6. Soft restraints such as cravats or roller bandage can be used for extremity restraints. Sheets may be used to limit upper body or lower extremity movement. This does not restrict the use of equipment specifically designed for patient restraint.
7. Restraints should be frequently monitored during transport. Neurovascular status of restrained parts should be assessed.
8. Documentation should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed.

CERTIFICATION REQUIREMENTS

- EMT
- ADVANCED EMT
- PARAMEDIC
CERTIFICATION REQUIREMENTS:

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC
SAFETY EQUIPMENT REMOVAL

INDICATION

Mechanism of injury or signs and symptoms that suggest potential spinal injury.

PROCEDURE

1. There are many different athletic events where the potential for spinal injury is high. Some athletes wear protective equipment which may vary from sport to sport, level to level, or school to school. Individuals may also wear helmets or padding for non-sport related activity such as riding a motorcycle.
2. In sports situations, the paramedic must coordinate activities with the team’s athletic trainer or physician when possible.
3. Removal of helmets and padding is recommended for assessment as well as for maintaining the spine in a neutral in-line position.
4. Removal of helmet and shoulder pads:
   - Helmet Removal:
     a. Manually immobilize the helmet.
     b. Remove any face mask or face shield as able.
     c. A second rescuer should provide anterior and posterior, or lateral, stabilization and support of the patient’s head and neck during removal of the helmet.
     d. Deflate any air bladders in the helmet.
     e. Remove any cheek/jaw pad if necessary.
     f. Gently slide the helmet off rotating the helmet slightly anterior so as not to lift the occiput. Do not pull apart from side to side unless absolutely necessary for removal.
     g. Be sure to maintain neutral alignment of the cervical spine once the helmet is removed as well as during removal of the shoulder pads.
   - Shoulder pad removal:
     a. Expose the anterior portion of pads and cut any center strings/straps.
     b. Cut any straps under the arms. (These straps can be disconnected if doing so does not cause excessive movement.)
     c. Maintain stabilization and support of the head and neck with hands underneath the shoulder pads from side of the patient’s torso.
     d. With the appropriate number of rescuers, lift the patient’s thorax, maintaining neutral alignment just enough to gently slide the shoulder pads off.
     OR
     e. Gently slide the shoulder pads off over the patient’s head if the surface the patient is on allows for smooth sliding.
5. Several sports require many different types of protective equipment. Approach each suspected spinal injury with the goal of maintaining neutral alignment.
6. Complete a thorough neurological assessment prior to, and after, spinal restriction.

CERTIFICATION REQUIREMENTS:
EMT
ADVANCED EMT
PARAMEDIC

2017 Revision
## TOXICOLOGICAL SYNDROMES

<table>
<thead>
<tr>
<th>COMMON SIGNS</th>
<th>CAUSATIVE AGENT</th>
<th>SPECIFIC TREATMENT RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cholinergic</strong>&lt;br&gt; (“Wet” patient presentation)&lt;br&gt; Confusion, CNS depression, weakness, SLUDGE (salivation, lacrimation, urination, defecation, emesis), bradycardia, wheezing, bronchoconstriction, miosis, coma, convulsion, diaphoresis, seizure</td>
<td>Organophosphate and Carbamate insecticides, nerve agents, some mushrooms</td>
<td>Atropine, pralidoxine (2-PAM Chloride), diazepam, activated charcoal</td>
</tr>
<tr>
<td><strong>Anticholinergic</strong>&lt;br&gt; (“Dry” Patient Presentation)&lt;br&gt; Delirium, tachycardia, dry flushed skin, dilated pupils, seizures and dysrhythmias (in severe cases)</td>
<td>Antihistamines, antiparkinson medications, atropine, antipsychotic agents, antidepressants, skeletal muscle relaxants, many plants (e.g., jimson weed, and Amanita muscaria)</td>
<td>Benzodiazepine, activated charcoal, rarely physostigmine (Antilirium)</td>
</tr>
<tr>
<td><strong>Hallucinogen</strong>&lt;br&gt; Visual illusions, delusions, bizarre behavior, flashbacks, respiratory and CNS depression</td>
<td>LSD, PCP, mescaline, some mushrooms, marijuana, jimson weed, nutmeg, mace, some amphetamines</td>
<td>Minimal sensory stimulation and calming measures, benzodiazepine if necessary</td>
</tr>
<tr>
<td><strong>Opioids</strong>&lt;br&gt; Euphoria, hypotension, respiratory depression/arrest, nausea, pinpoint pupils, seizures, coma</td>
<td>Heroin, morphine, codeine, meperidine (Demerol), propoxyphene (Darvon), fentanyl (Duragesic), OxyContin</td>
<td>Naloxone (Narcan), nalmefene (Revex)</td>
</tr>
<tr>
<td><strong>Sympathomimetic</strong>&lt;br&gt; Delusions, paranoia, tachycardia or bradycardia, hypertension, diaphoresis, seizures, hypotension and dysrhythmias in severe cases</td>
<td>Cocaine, amphetamine, methamphetamine, over-the-counter decongestants</td>
<td>Minimal sensory stimulation and calming measures, benzodiazepine if necessary</td>
</tr>
</tbody>
</table>
The following reflects the Pre-hospital Triage and Decision Scheme of the ADH Rules and Regulations for Trauma Systems, March 2000. All trauma patients shall be evaluated against the criteria to determine the need for rapid transport. If the trauma patient meets any of the items listed below consider the patient a "trauma alert" and notify dispatch and ATCC as soon as possible. The dispatch center shall notify the receiving facility immediately and document the trauma alert time. On-scene times for patients meeting the trauma alert criteria shall be 10 minutes or less, unless there are extrication delays. Transport of the "trauma alert" patient to the receiving facility shall be in the emergency mode, unless otherwise determined by Medical Control.

### VITAL SIGNS & LEVEL OF CONSCIOUSNESS

- **Shock**
  - Systolic Blood Pressure of **90** mmHg or less with other signs & symptoms of shock
- **Respiratory Distress**
  - Respiratory Rate of **10** or less; or **29** or higher.
  - Stridor or retractions.
- **Altered Mentation**
  - Glasgow Coma Scale of **13** or less
  - Pediatric Coma Scale of **9** or less
  - Trauma Score of **11** or less
  - Pediatric Trauma Score of **9** or less

### ASSESS ANATOMY OF INJURY

- Penetrating injury to the head/open or depressed skull fracture
- Penetrating injury of the neck, torso, or groin
- Amputation above the wrist or ankle
- Spinal cord injury with limb paralysis or alteration of SMC's
- Flail chest
- Pelvic fracture
- Two or more obvious long bone fractures above the elbows or knees
- Major burns: 15%BSA or greater and/or with respiratory involvement
- High voltage electrical burns

For trauma patients meeting any one of the above criteria, initiate Trauma Alert and Rapid Transport

For Trauma patients not meeting any one of the above criteria, consider the following to determine the need for TRAUMA ALERT and rapid transport. Consult Medical Control and ATCC for assistance if necessary.

### MECHANISM OF INJURY

- Speed 40 mph or greater
- Vehicle rollover
- Death of same vehicle occupant
- Pedestrian vs. vehicle 5mph or greater
- Vehicle deformity 20” or greater
- Ejection from moving vehicle
- Motorcycle, ATV or bicycle 20mph or greater
- Falls 20ft or greater (consider pediatric rules if applicable)

### CO-MORBID FACTORS

The following factors may compound the severity of injury and shall increase the index of suspicion:

- Extremes in age: 12 or less/55 or more
- Hostile environment (e.g. extremes of heat or cold)
- Medical illness (e.g. COPD, CHF, renal failure)
- Presence of intoxicants/substance abuse
- Pregnancy

### CERTIFICATION REQUIREMENTS:

- PARAMEDIC
### Regional Protocol

**Guideline Section** – To be used only as indicated in Protocol Section

**TRAUMA SCORE ADULT**

<table>
<thead>
<tr>
<th>Respiratory Rate</th>
<th>Respiratory Expansion</th>
<th>Systolic Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–24/ minute</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>25–35/ minute</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>36/ minute or greater</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1–9/ minute</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capillary Refill</th>
<th>Add points for Glasgow Coma Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>2</td>
</tr>
<tr>
<td>Delayed</td>
<td>1</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Trauma Score: ___ + Points for GCS: _____ = TOTAL Trauma Score (revised): ________

### CERTIFICATION REQUIREMENTS:

- EMR
- EMT
- ADVANCED EMT
- PARAMEDIC

2017 Revision
TRIAGE

INDICATION

Multiple-patient scenarios, to categorize patients based on the severity of their injuries, prioritize their need for treatment and transportation and stabilize life-threatening injuries before additional resources arrive on-scene.

PROCEDURE

This procedure is based on START triage system.

1. Determine the location, number and condition of patients.
2. Determine, in close coordination with Extrication sector, if triage will be performed in place or at the entrance to the treatment area.
3. Determine resources.
4. Assign triage teams.
5. Direct minor patients (walking wounded) to a gathering place and tag them later. *
6. Identify and treat as necessary, remaining patients.
   • Evaluate patient using START
   • Attach triage tag or ribbon to patient
7. When triage is complete, provide COMMAND with a “Triage Report.”
8. Once “Immediate” have been treated/transported, Reassess “Delayed” by Mechanism of Injury and upgrade as necessary. May be done continuously if resources allow *

*At smaller incidents (up to 10 patients) “MINOR” patients should not be relocated and reassessment should be continuous

The S.T.A.R.T. Algorithm

<table>
<thead>
<tr>
<th>ACTION</th>
<th>Tagged as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move the walking wounded</td>
<td>MINOR</td>
</tr>
<tr>
<td>No respirations (after head tilt or insertion of an OPA)</td>
<td>DEAD/DYING</td>
</tr>
<tr>
<td>Respiration over 30</td>
<td>IMMEDIATE</td>
</tr>
<tr>
<td>Pulse—No radial pulse</td>
<td>IMMEDIATE</td>
</tr>
<tr>
<td>Mental Status—Unable to follow simple commands</td>
<td>IMMEDIATE</td>
</tr>
<tr>
<td>All others</td>
<td>DELAYED</td>
</tr>
</tbody>
</table>

CERTIFICATION REQUIREMENTS:

- EMT
- ADVANCED EMT
- PARAMEDIC