# San Joaquin County
# Emergency Medical Services Agency

# Advanced Life Support Treatment Protocols
# EMS Policy No. 5700




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# Protocol Numbering

All protocols have a six-character alphanumeric identifier that is a combination of age, section abbreviation and number in sequence (Fig 10). The first letter of the identifier is either “A” or “P,” which signifies adult or pediatric. The next three (3) letters are abbreviations of the section followed by a two (2) digit number of the protocols in alphabetical order in that section. For example, ARSP-02, means Adult-Respiratory number two.

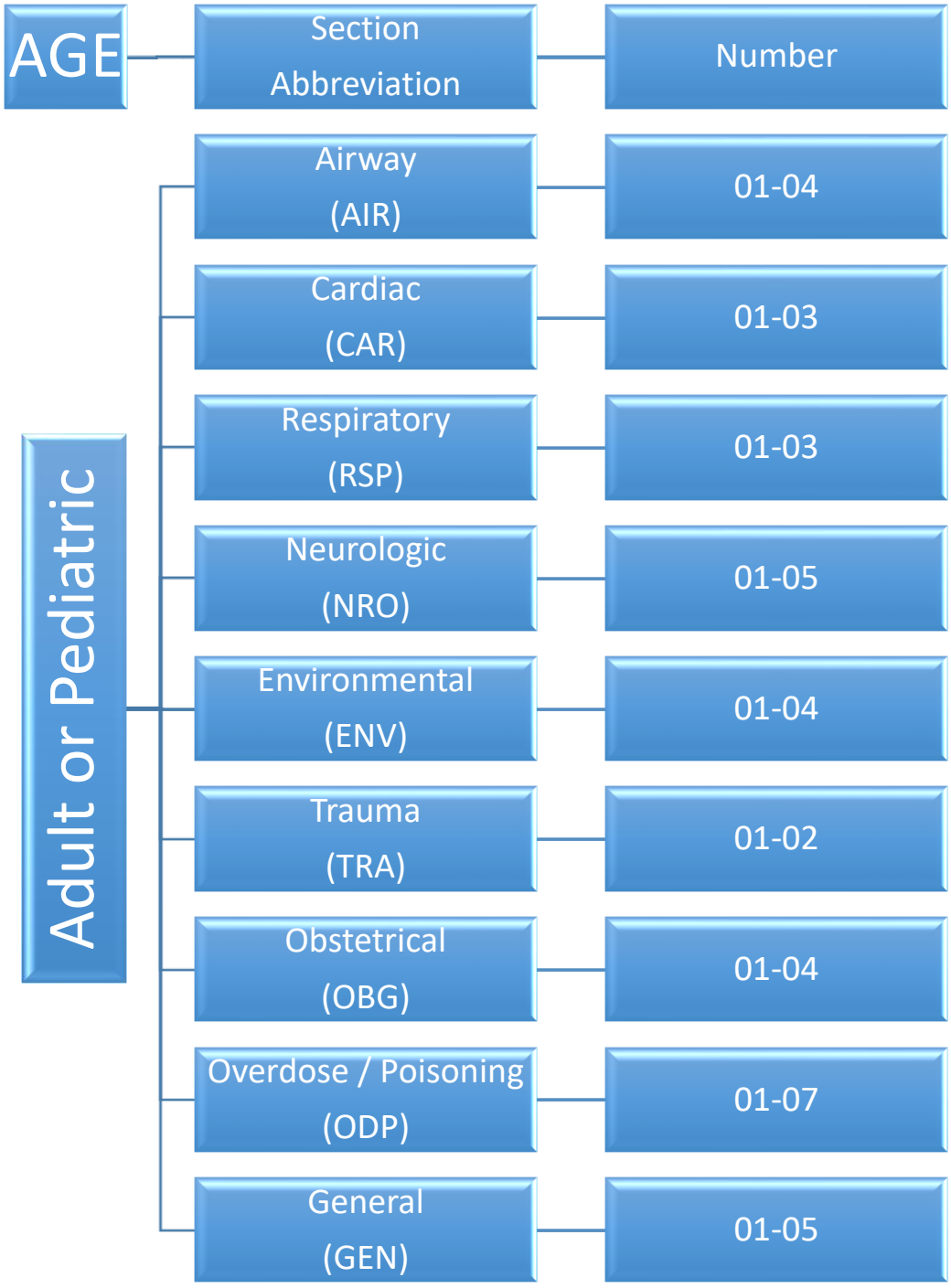



*Figure 1*

# Routine Patient Care

# Routine Patient Care

This protocol applies to all patients. The patient assessment primary survey is to identify and correct immediate life threats. The secondary survey is the systematic assessment and complaint focused, relevant physical examination of the patient. The secondary survey may be done concurrently with the patient history and should be performed after the Primary Survey and the initiation of Routine Medical Care. The purpose of the secondary survey is to identify problems, which though not immediately life or limb threatening, could increase patient morbidity and mortality. Exposure of the patient for examination may be reduced or modified as indicated due to environmental factors.

## Definitions:

1. **Standard Precautions**- means the application of body substance isolation precautions including the use of appropriate personal protective equipment (PPE) shall apply to all patients receiving care, regardless of their diagnosis or presumed infectious status. Body substance isolation precautions apply to 1) blood; 2) all bodily fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood; 3) non intact skin; and 4) mucous membranes. Standard precautions are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in the prehospital setting.
2. **Adult Patient**- means a patient 13 years of age or older, or taller than a weight-based assessment tape (146.5 cm).
3. **Weight-based assessment tape Pediatric Emergency Tape**- means a pediatric length-based resuscitation tape used to determine drug doses, fluid volumes, defibrillation settings, and equipment sizes. The tape is designed to estimate a child's weight based on length (head to heel). The tape should also include information about vital signs.
4. **Pediatric Patient**- means a patient that is twelve (12) years of age or younger and is not taller than a weight-based assessment tape (146.5 cm).

**Note:** If in doubt concerning whether to treat a patient as an adult or pediatric (i.e., obese child) treat as pediatric.

5. **Neonate/newborn**- means a pediatric patient from birth to one month of age.
6. **Infant** means a pediatric patient from one month to one year of age.
7. **Child**- means a pediatric patient from one year to twelve years of age.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients every 3 minutes for ROSC patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. Physical assessment.
3. All additional Documentation Standards outlined in each protocol.

# Routine Patient Care

## Treatment

1. Use Standard Precautions:
   A. Application of body substance isolation precautions including the use of appropriate personal protective equipment (PPE) shall apply to all patients receiving care.
   B. Body substance isolation precautions apply to:
      i. Blood.
      ii. All bodily fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood.
      iii. Non intact skin.
      iv. Mucous membranes.
2. Perform a complete patient assessment including:
   A. Primary Survey.
   B. Secondary Survey.
3. Initiate specific treatments in accordance with San Joaquin County Emergency Medical Services Agency Treatment protocols including, when appropriate:
   A. Monitor vital signs:
      i. Initial set.
      ii. Repeat every 5 minutes for unstable patients.
      iii. Repeat every 10 minutes for stable patients.
   B. Initiate spinal precautions, if indicated.
   C. Administer oxygen.
   D. Control hemorrhage.
   E. Cardiac monitor.
   F. Administer IV access as indicated (may use saline lock when appropriate).
   G. Obtain blood glucose level, as indicated
4. Transport.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Routine Patient Care

## Patient Assessment **Primary** Survey

Scene Size Up:

1. Recognize hazards, ensure safety of scene and secure a safe area for treatment.
2. Apply universal body substance isolation precautions.
3. Recognize hazards to patient and protect patient from further injury.
4. Identify the number of patients and initiate ICS/MCI operations if warranted:
   A. Ensure an ALS ambulance response and order additional resources.
   B. Consider initiating S.T.A.R.T. triage.
5. Observe position of patient(s).
6. Determine mechanism of injury.
7. Plan strategy to protect evidence at potential crime scene.

General Impressions:

1. Check for life threatening conditions.
2. Introduce self to patient, and determine chief complaint or mechanism of injury

Circulation:

1. Check for pulse. If no pulse, start CPR, See protocol ACAR-04.
2. Defibrillate as necessary.
3. Control life-threatening hemorrhage with direct pressure and use a tourniquet as appropriate.
4. Palpate radial pulse.
   A. Determine absence or presence.
   B. Assess general quality (strong/weak).
   C. Identify rate (slow, normal, or fast).
   D. Assess regularity (regular/irregular).
5. Assess skin for signs (capillary refill, cyanosis, mottling, etc.).
6. Reassess mental status for signs of hypo-perfusion/SHOCK.
7. Treat hypo-perfusion
8. Obtain ECG and continually monitor cardiac rhythm as appropriate.

Airway:

1. Ensure open airway; if airway is obstructed refer to protocol AAIR-02 or PAIR-02.
2. Ensuring an adequate airway supersedes spinal immobilization.
3. Protect spine from unnecessary movement in patients at risk for spinal injury.
4. Look and listen for evidence of upper airway problems and potential obstructions:
   A. Vomit.
   B. Bleeding.
   C. Loose, missing teeth or dentures.
   D. Facial trauma.
5. Utilize any appropriate adjuncts OPA/NPA as indicated to maintain airway.

Breathing:

1. Look, listen, and feel in order to assess ventilation and oxygenation.
2. Expose chest, if necessary, and observe for chest wall movement.
3. Determine approximate rate and depth and assess character and quality.
4. Reassess mental status.
5. Intervene for inadequate ventilation with:
   A. BVM device, airway adjunct and supplemental oxygen.
6. Assess for other life threatening respiratory problems and treat as needed.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Routine Patient Care

## Patient Assessment **Primary** Survey

Level of consciousness:

1. Information Needed:
   A. Surroundings: for example syringes, blood glucose monitoring supplies, insulin.
   B. Changes in mental status: Baseline status, onset and progression of altered state, symptoms prior to altered state such as headache, seizures, confusion, trauma and last time known well.
   C. Medical History: Diabetes, epilepsy, substance abuse, mental health, medications, allergies.
   D. Identify and document neurological deficits and consider possible stroke, overdose/ intoxication.
2. Considerations:
   A. Potential treatable causes (hypoglycemia, stroke, neurological injury, syncope, overdose, and sepsis) and refer to appropriate protocol.
   B. Consider indications for spinal motion restriction.
3. Objective Findings:
   A. Level of consciousness (AVPU) and neurological assessment.
   B. Signs of trauma.
   C. Breath odor.
   D. Pupil size and reactivity.
   E. Needle track marks.
   F. Medical information tags, bracelets, or medallions.
4. Determine Glasgow Coma Scale (GCS) Score.

Expose, Examine & Evaluate:

1. In situations with suspected life-threatening mechanism of injury, complete a Rapid Trauma Assessment.
2. Expose head, trunk and extremities.
3. Examine Head to Toe for DCAP-BTLS:
   A. Deformity.
   B. Contusion/Crepitus.
   C. Abrasion.
   D. Puncture.
   E. Bruising/Bleeding.
   F. Tenderness.
   G. Laceration.
   H. Swelling.

Obtain base line vital signs:

1. Pulse.
2. Respirations.
3. BP.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Routine Patient Care

Patient Assessment **Secondary** Survey

History:

1. A patient's history should optimally be obtained from the patient directly. If language, culture, age, disability barriers or patient condition interferes with obtaining the history, consult with family members, significant others or scene bystanders. Check for advanced directives such as a DNR order, Medic-Alert bracelet and prescription bottles as appropriate. Be aware of the patient's environment and issues such as domestic violence, possible human trafficking victim, child or elder abuse or neglect and report concerns. The following information should be obtained during the history:
   A. Allergies.
   B. Medications.
   C. Past medical history relevant to the chief complaint.
   D. Have patient prioritize his or her chief complaint if complaining of multiple problems.
   E. Last time known well (clock time).
   F. Ascertain recent medical history such as hospital admissions, surgeries, etc.
   G. Mechanism of injury if appropriate.
   H. In addition, obtain history relevant to specific patient complaints.

Head and Face:

1. Observe and palpate skull (anterior and posterior) and face for DCAP-BTLS.
2. Check eyes for equality, responsiveness of pupils, movement and size of pupils, foreign bodies, discoloration, contact lenses or prosthetic eyes.
3. Check nose and ears for foreign bodies, fluid or blood.
4. Recheck mouth for potential airway obstructions (swelling, dentures, bleeding, loose or avulsed teeth, vomit, absent or present gag reflex) and odors, altered voice or speech patterns and evidence of dehydration.

Neck:

1. Observe and palpate for DCAP-BTLS, jugular vein distension, use of neck muscles for breathing, tracheal tugging, tracheal shift, stoma and medical information medallions.

Chest:

1. Observe and palpate for DCAP-BTLS, scars, implanted devices such as pacemakers and indwelling IV/arterial catheters, medication patches, chest wall movement, asymmetry and accessory muscle use in breathing.
2. Have patient take a deep breath if possible and observe and palpate for signs of discomfort, asymmetry and air leak from any wound.
3. Assess lung sounds and heart tones as appropriate.

Abdomen:

1. Observe and palpate for DCAP-BTLS, scars and distention.
2. Palpation should occur in all four quadrants taking special note of tenderness, masses and rigidity.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

## Routine Patient Care

Patient Assessment **Secondary** Survey Continued

Pelvis/Genital-Urinary:

1. Generally, a patient's genital area should not be exposed and examined unless the assessment of this body region is required due to the patient's condition, such as trauma to the region, active labor or suspected/known bleeding. When possible have an EMT or paramedic of the same gender as the patient, perform evaluations of the pelvis/genital area.
2. Observe and palpate for DCAP-BTLS, asymmetry, sacral edema and as indicated for other abnormalities.
3. Palpate and gently compress lateral pelvic rims and symphysis pubis for tenderness, crepitus or instability.
4. Palpate for bilateral femoral masses, if warranted.

Shoulder and Upper Extremities:

1. Observe and palpate for DCAP-BTLS, asymmetry, skin color, capillary refill, edema, medical information bracelet, and equality of distal pulses.
2. Assess sensory and motor function as indicated.

Lower Extremities:

1. Observe and palpate for DCAP-BTLS, asymmetry, skin color, capillary refill, edema and equality of distal pulses.
2. Assess sensory and motor function as indicated.

Back:

1. Observe and palpate for DCAP-BTLS, asymmetry and sacral edema.

Precautions and Comments:

1. Observation and palpation can be done while gathering a patient's history.
2. A systematic approach will enable the rescuer to be rapid and thorough and not miss subtle findings that may become life threatening.
3. Minimize scene times, especially with trauma patients and pediatrics, by packaging/preparing the patient for immediate transport upon ambulance or air ambulance arrival (spinal stabilization, pediatric immobilization device, ensuring rapid ingress/egress for BLS personnel and equipment.)
4. The secondary survey should **ONLY** be interrupted if the patient experiences airway, breathing or circulation deterioration requiring immediate intervention. Complete the examination before treating other identified non-life threatening problems.
5. Reassessment of vital signs and other observations are necessary, particularly in critical or rapidly changing patients. Vital signs should be taken approximately every 5 minutes. Changes and trends observed in the field are essential data to be documented and communicated to the transport personnel or receiving facility.
6. As stated in the Primary Survey DCAP-BTLS is a mnemonic that stands for:
   A. Deformity.
   B. Contusion/Crepitus.
   C. Abrasion.
   D. Puncture.
   E. Bruising/Bleeding.
   F. Tenderness.
   G. Laceration.
   H. Swelling.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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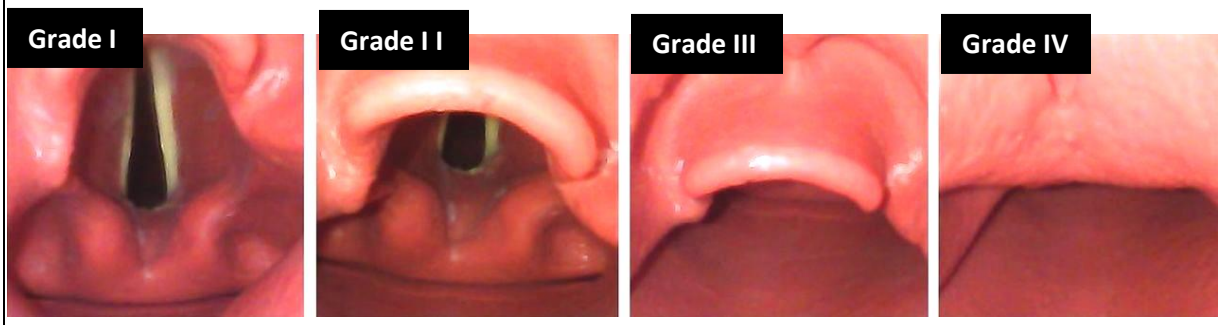
# Adult Airway Management

# Advanced Airway Management

## Definitions:

1. **Oral Tracheal Intubation (OTI) Attempt -** Means the introduction of an Endotracheal Tube Inducer (ETTI) or endotracheal tube past the patient's teeth.
2. **Difficult Airway -** Means an airway that has been predicted to be difficult based on assessment of the patient or upon an attempt to visualize the cords and the patient has a Cormack-Lehane (CL) grade of three (3) or four (4).

| Cormack and Lehane Classification Grades of Difficult Laryngoscopy | |
|---|---|
| Grade I | Most of glottis is seen |
| Grade II | Only posterior portion of glottis can be seen |
| Grade III | Only epiglottis may be seen (none of glottis seen) |
| Grade IV | Neither epiglottis nor glottis can be seen |




3. **"Successful OTI Attempt"** - Means a verified placement and securing of the endotracheal tube into the patient's trachea.

## Documentation Standards:

Oral tracheal intubation confirmation:
1. Visualization of tube through cords.
2. Condensation in ETT.
3. Capnography value and waveform.
4. Bilateral lung sounds.
5. Negative epigastric sounds.
6. Positive chest rise.

Every 5 minutes and on gross patient movement:
1. Capnography value and waveform.
2. Bilateral lung sounds.
3. Negative epigastric sounds.
4. Positive chest rise.

At transfer of care:
1. Capnography value and waveform.
2. Bilateral lung sounds.
3. Negative epigastric sounds.
4. Positive chest rise.
5. Name of receiving paramedic or ED physician.

Supraglottic airway confirmation:
1. Capnography value and waveform.
2. Bilateral lung sounds.
3. Minimal epigastric sounds.
4. Positive chest rise.

Every 5 minutes and on gross patient movement:
1. Capnography value and waveform.
2. Bilateral lung sounds.
3. Minimal epigastric sounds.
4. Positive chest rise.

At transfer of care:
1. Capnography value and waveform.
2. Bilateral lung sounds.
3. Minimal epigastric sounds.
4. Positive chest rise.
5. Name of receiving paramedic or ED physician.

# Advanced Airway Management

## Indications and procedure for Oral Tracheal Intubation

1. Inability of the patient to protect their airway (coma, decreased level of consciousness with loss of gag reflex).
2. Inability to adequately ventilate or oxygenate the patient using an OPA and BVM device.
3. Cardiac arrest. Adhere to sequence as specified in EMS Protocol ACAR-04.
4. Respiratory arrest.

DO NOT perform if gag is present.

1. Initiate BLS airway as needed before attempting advanced airway.
~~1.~~2. If an i-Gel has been placed do not remove to intubate unless there is poor compliance with ventilation.
~~2.~~3. Prepare equipment and position patient with the intent to provide an airway via either an endotracheal tube or via a supraglottic airway.
~~3.~~4. Upon a determination that the patient has a Cormack-Lehane grade of one (1) or two (2), attempt to insert an endotracheal tube as described in EMS Policy No. 2545 – Endotracheal Intubation – Adult. If patient has a Cormack-Lehane grade of (3) reposition the head and revisualize. If still a Cormack-Lehane grade of (3) see below.
~~4.~~5. A stylet or endotracheal tube inducer (ETTI) **SHALL BE USED ON ALL ATTEMPTS**.
~~5.~~6. No more than two (2) attempts per patient with pre-oxygenation and continuous oximetry monitoring prior to each attempt.
~~6.~~7. After two (2) unsuccessful attempts at endotracheal intubation, insert a supraglottic airway.
~~7.~~8. Each attempt should last no longer than thirty (30) seconds. If during any attempt patient SpO2 falls below 90%, immediately cease and ventilate to increase saturation.
~~8.~~9. Ventilate with 100% oxygen for one (1) minute prior to attempting to intubate.
~~9.~~10. Monitor pulse oximetry continuously.

## Indications and procedure for Supraglottic Airway Device

1. Cormack-Lehane grade of 3 or 4 on oral tracheal visualization.
2. Physical or physiological impediments to the successful insertion of an endotracheal tube.
3. After two unsuccessful attempts to insert an endotracheal tube.
~~4.~~ Use a laryngoscope to facilitate placement.
~~5.~~4.

Note:

1. Remove and replace the I-Gel Airway if resistance is met upon initial insertion.
~~2.~~ After two (2) unsuccessful attempts, place a BLS airway and transport to the closest receiving hospital.
~~3.~~2.

INDICATIONS FOR NEEDLE CRICOTHYROTOMY

1. Complete airway obstruction not relieved by airway adjuncts, positioning and direct laryngoscopy to remove obstruction. See protocol AAIR-02.

Considerations

1. **DO NOT** delay transport to establish an advanced airway in patients except in the case of complete airway obstruction, as evidenced by a complete inability to ventilate the patient using an Oral Pharyngeal Airway (OPA) and BVM device.
2. If unable to establish an airway due to complete airway obstruction not relieved using an OPA and BVM maneuvers, use direct laryngoscopy to visualize airway if patient is unconscious and remove foreign body with Magill's forceps. See protocol AAIR-02, and transport to closest receiving hospital.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Airway Obstruction

## Definitions:

1. **Partial Airway Obstruction-** Difficulty breathing but still able to ventilate.
2. **Severe Airway Obstruction-** Poor air exchange increased breathing difficulty, silent cough, cyanosis, and/or inability to speak or breathe.
3. **Adult Patient**- Means a patient 13 years of age or older, or taller than a weight-based assessment tape (146.5 cm.)

## Documentation Standards:

1. Every 10 minutes for stable patients, every 5 minutes for unstable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. Complete physical assessment.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Holding neck (universal choking sign).<br>2. Silent cough.<br>3. Stridor.<br>4. Inability to speak.<br>5. Drooling. | 1. Nothing by mouth, (NPO orders).<br>2. CVA.<br>3. Brain injury.<br>4. Choking episode.<br>5. Coughing while eating.<br>6. Dementia. | 1. Epiglottitis.<br>2. Esophageal obstruction.<br>3. Subglottic stenosis.<br>4. Vocal cord dysfunction.<br>5. Retro pharyngeal abscess. |

# Airway Obstruction

## Treatment- Partial Obstruction

1. Cardiac monitor.
2. Monitor SpO2, if <94%, 1-15 LPM, O2, NC or NRB, titrate to 94%.
3. Suction as needed.
4. Encourage patient to cough.

## Treatment - Severe Obstruction

If awake and alert:

1. Perform abdominal thrusts.
2. Remove foreign body.
3. Cardiac monitor.
4. Monitor SpO2.

If unconscious:

1. Place patient on ground and initiate chest thrusts.
2. Remove foreign body with direct laryngoscopy and Magill forceps.
3. Assist ventilations with BVM.
4. Cardiac monitor.
5. Monitor SpO2.

If unable to remove foreign body:

1. Attempt endotracheal intubation.

If unable to intubate and unable to ventilate adequately with BVM:

1. Perform needle cricothyrotomy.

Considerations

1. Avoid sedating medication.
2. Make early receiving hospital notification for unresolved obstruction.
3. Keep patient calm.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Mechanical Ventilation for Patients with Pulses

## Definitions:

The purpose of this protocol is to authorize paramedics to use and monitor mechanical ventilators during prehospital transport for ROSC patients and respiratory arrest patients with a pulse that are greater than 50 kg.

## Documentation Standards:

1. Every 5 minutes for unstable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. Complete physical assessment.
3. Ventilator settings listed below every 5 minutes.

## Ventilator Settings

| Modes | Values |
|---|---|
| **SIMV-** (Synchronized Intermittent Mechanical Ventilation) is a type of volume control mode of ventilation. With this mode, the ventilator will deliver a mandatory (set) number of breaths with a set volume while at the same time allowing spontaneous breaths.<br><br>**AC-** (Assist Control) **Not currently approved for prehospital use.** A mode of mechanical respiration in which all breaths are mandatory and are machine triggered, and machine cycled; a minimum breathing rate is set but the patient can trigger breaths at a faster pace.<br><br>**PS-** (Pressure Support) Provides ventilation based on a preset pressure.<br><br>**VS-** (Volume Support) Provides Ventilation based on a preset volume.<br><br>**CPAP-** (Continuous Positive Airway Pressure) See AAIR-04.<br><br>**BL-** (Bilevel) **Not currently approved for pre hospital use.** Non-invasive ventilation used to support breathing administered through a face mask, nasal mask, or a helmet. | Ventilator Settings:<br>**VT-** (Tidal Volume)<br>400-450ml<br>**FiO2-** (Fraction of Inspired Oxygen)<br>70-100%<br>**RR-** (Ventilation Rate) “BPM” on Zoll Z Vent.<br>16/m<br>**PEEP-** (Positive End Expiratory Pressure)<br>5-8 cm of H2O<br>**PIP-** **(Peak Inspiratory Pressure)<br>40 cm of H2O<br>**I:E-** ** (Inspiratory to Expiratory Ratio)<br>1:3<br>**PS**- (Pressure Support)<br>10cm of H2O<br><br>Alarms:<br>**PIP-** **Peak Inspiratory Pressure<br>High:30 cm of H2O<br>Low:10 cm of H2O<br>**VT-** **Tidal Volume<br>High:625ml<br>Low:225ml<br>**RR-** **(Ventilation Rate) “BPM” on Zoll Z Vent.<br>High:26<br>Low:8<br><br>****Not currently approved for adjustment in this protocol.** |

# Mechanical Ventilation for Patients with Pulses

## Procedure

1. Turn on ventilator and complete system self-check.
2. Connect patient to mechanical ventilator using appropriate ventilator circuit.
3. SpO2 must be used to continuously monitor the patient's oxygen saturation.
4. Treat the patient according to appropriate treatment policy (i.e. pulmonary edema).

## Initial Ventilator Settings

| **50 to 75Kg** | **>75kg** |
|---|---|
| 5. Mode: SIMV (V);<br>6. RR: 16 for medical 24 for trauma;<br>7. Tidal Volume: 400ml<br>8. PEEP: 5cm of H20;<br>9. FiO2: 100%;<br>10. Pressure Support: 10;<br>11. Trigger Level -2.0;<br>12. I:E Ratio: 1:3.0. | 5. Mode: SIMV (V);<br>6. RR: 16 for medical 24 for trauma;<br>7. Tidal Volume: 450ml<br>8. PEEP: 5cm of H20;<br>9. FiO2: 100%;<br>10. Pressure Support: 10;<br>11. Trigger Level -2.0;<br>12. I:E Ratio: 1:3.0. |

13. Patient must be placed on continuous capnography and capnography monitoring during mechanical ventilation.
14. **High or Low EtCO2**- During transport, adjust BPM to keep EtCO2 between 35-45.
    a. To decrease EtCO2: increase RR by 2 every 2 min to a max of 24 RR.
    b. To increase EtCO2: decrease RR by 2 every 2 min to a min of 8 RR.

**IF transport time is greater than 20 min:**

1. If arrest is secondary to CHF and lung sounds have rales or pink sputum is in the ETT and SpO2 remains below 90%:
    c. **Increase PEEP to 8 cm of H2O.**
2. FiO2- Titrate Oxygen with the objective to use as little O2 as possible to maintain SpO2 92-98%,
    d. **Decreased by 10% every 5 minutes to no less than 70%** If patient is unable to maintain SpO2 above 94%: **Immediately increase FiO2 to 100%.**

## Troubleshooting

**DOPE- When in doubt return to BVM Ventilations!!!**

1. Dislodgment;
2. Obstruction;
3. Pulmonary embolism / tension pneumothorax;
4. Equipment;

****If unable to clear any alarm with 4 or less actions or button pushes, return to BVM ventilations!!**

## Sedation of Intubated Patients

1. If below Inclusion and Exclusion criteria are met: midazolam 2-5mg IV/IO, may repeat once in 10 min.

| Inclusion Criteria | Exclusion Criteria |
|---|---|
| 1. EtCO2 greater than 30mmHg;<br>2. SpO2 greater than 88%;<br>3. Pt showing purposeful movement, or signs of agitation such as over breathing the ventilator, or increased HR. | 1. Pulse <50 or >160bmp;<br>2. SBP <100 or >200; |

## Base hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# CPAP via Ventilator

## Definitions:

The goal of CPAP is to improve ventilation and oxygenation in an effort to avoid intubation in patients who present with severe respiratory distress.

A. Assessment/Treatment Indicators: CPAP is authorized for use in patients who are age eight (8) or older with one of the following:
   1. Congestive Heart Failure (CHF) with acute pulmonary edema;
   2. Near drowning/submersion;
   3. Other causes of severe respiratory distress, excluding trauma.

B. Contraindications:
   1. Respiratory or cardiac arrest;
   2. Failing respirations;
   3. Inability to maintain airway;
   4. Severely depressed level of consciousness (LOC);
   5. Systolic blood pressure < 90mmHg;
   6. Signs and symptoms of pneumothorax;
   7. Major trauma, especially head injury or suspected chest injury;
   8. Facial anomalies or inability to obtain a mask seal.

C. Relative Contraindications:
   1. Decreased LOC;
   2. Claustrophobia;
   3. Unable to tolerate mask.

## Documentation Standards:

4. Every 5 minutes for unstable patients:
   A. BP;
   B. Respirations;
   C. Pulse;
   D. SpO2.
5. Complete physical assessment.

## Objective Findings:

| Signs & Symptoms | Equipment Needed | Differentials |
|---|---|---|
| 1. Peripheral pitting edema.<br>2. Dyspnea that worsens with activity or when lying down.<br>3. Wheezing or gasping for breath.<br>4. Cold, clammy skin.<br>5. Anxiety, restlessness.<br>6. A cough that produces frothy sputum that may be tinged with blood.<br>7. Blue-tinged lips.<br>8. A rapid, irregular heartbeat (palpitations).<br>9. Difficulty breathing with exertion.<br>10. Swelling in lower extremities. | 1. CPAP (pressure generator and circuit set with ability to deliver 7.5 cm to 10 cm of H20 pressure with appropriate sized facemask and straps).<br>2. Nebulizer, if required for bronchodilator administration.<br>3. Oxygen source.<br>4. Cardiac monitor. | 1. Congestive Heart Failure (CHF) with acute pulmonary edema.<br>2. Near drowning/submersion.<br>3. Other causes of severe respiratory distress, excluding trauma. |

# CPAP via Ventilator

1. Position the patient in a seated position with legs dependent.
2. Apply cardiac monitor and assess vital signs.
3. SpO2 must be used to continuously monitor the patient's oxygen saturation.
4. Treat the patient according to appropriate treatment policy (i.e. pulmonary edema).
5. Set up the CPAP system following manufacturer directions.
6. Explain the procedure to the patient.
7. **It is important to reassure the patient throughout the procedure.**
8. Verify that oxygen is flowing to the mask and then apply mask.
9. **Initial Ventilator Settings:**
    a. Mode: CPAP
    b. BPM: 12 or *default*;
    c. PEEP: 5cm of H20;
    d. FiO2: 100%;
    e. Pressure Support: 0;
    f. Trigger Level -2.0;
    g. I:E Ratio: 1:3.0.
10. Continuously monitor patient for improvement or failure to improve.
11. The patient should improve in the first five minutes with CPAP, evidenced by decreased heart rate and blood pressure, decreased respiratory rate and an increased SpO2.
12. If the patient does not improve or becomes worse with CPAP, remove the CPAP device and assist ventilations with BVM as needed.
13. Notify the receiving hospital of the type of CPAP device that is being used.

## Troubleshooting

If time constraints allow

1. **Trouble Triggering Breath:** If patient is A/Ox4 and able to breath on their own and appears to be struggling to trigger a breath: **Decrease trigger level to -1.0, and increase pressure support to 5cm of H2O.**
2. **Condition Not Improving:**
    a. If after 5 min condition is not improving PEEP may be: **increased in increments of 2cm of H2O every 5 minutes to max of 10cm of H2O**.
    b. If after 3 min condition is not improving or patient expresses a need for more air pressure or shows signs of air hunger: **increase pressure support (PS) by 5 every 3 minutes to a max of 10.**
3. **Extended Transport Time:** If transport is greater than 20 minutes and patient is tolerating CPAP and shortness of breath is improving and SpO2 is above 94%: **FiO2 can be decreased by 10% every 5 minutes to no less than 70%.** If patient is unable to maintain SpO2 above 94%: **Immediately increase FiO2 to 100%.**

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Adult Cardiac

# Atrial Fibrillation / Atrial Flutter

Atrial Fib: The rhythm is irregularly irregular. Atrial rate can be 350 to 600 but as a rule cannot be counted. Ventricular rate can be between 160 and 180. QRS complex is usually normal. Some patients may alternate between atrial fibrillation and atrial flutter.
Atrial Flutter: Atrial rhythm should be regular and can appear to have a "saw tooth" pattern. Ventricular rhythm may be regular or irregular if variable block is present. Ventricular rate 140 to 160, but may be slower. QRS complex usually normal and may follow every second, third or fourth flutter wave. Some patients may alternate between atrial fibrillation and atrial flutter.

Definitions:

1. **Asymptomatic-** Patient has no complaints related to heart rate.
2. **Mildly symptomatic-** Patient is symptomatic and hemodynamically stable. May have palpitations, fatigue or near syncope.
3. **Grossly symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. Must have ALOC, chest pain, **or** hypotension.

Documentation standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2
2. Obtain
   A. 12 Lead ECG.
   B. Pain scale PRN
3. Physical assessment.
4. Skin signs.
5. Duration of symptoms.
6. Frequency of symptoms.
7. Precipitating factors (e.g., exertion, sleep, caffeine, alcohol use).

Objective Findings**:**

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Elevated pulse.<br>2. JVD.<br>3. Cyanosis to lips or fingers.<br>4. Pulmonary or peripheral edema.<br>5. Thready pulse. | 1. A-Fib or A-Flutter.<br>2. Myocardial infarction.<br>3. Hypertension.<br>4. Coronary artery bypass grafting (CABG).<br>5. Recent heavy drinking.<br>6. Weight loss.<br><br>Home Meds:<br>1. Blood thinners.<br>2. Rate-controlling agents:<br>A. Antiarrhythmic.<br>B. Beta blockers<br>C. Calcium channel blockers. | 1. SVT.<br>2. AMI.<br>3. Sepsis.<br>4. Electrical abnormality.<br>5. Holiday heart syndrome.<br>6. Thyroid storm.<br>7. Wolf Parkinson White. |

# Atrial Fibrillation / Atrial Flutter

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 lead ECG.

Treatment #1- Asymptomatic:
**DO NOT** start IV/IO solely for presence of A-Fib/A-Flutter if patient is asymptomatic.

Treatment #2- Mildly Symptomatic:
1. IV, NS, TKO.
2. May consider IVF bolus If no fluid restrictions and lung sounds are without crackles and/or rales:
   500ml, NS Fluid, may repeat max 1L.

Treatment #3- Grossly Symptomatic:
1. IV/IO.
2. NS 500ml rapid IVF bolus to MAP > 60, may repeat, max 1L.
3. If remains hypotensive with rapid ventricular response, BHO for synchronized cardioversion.

Considerations:
1. Patients are rarely hemodynamically unstable from A-Fib or A-Flutter unless rapid HR with RVR.
2. Field synchronized cardioversion should be avoided if patient is stable enough to make it to ED.
3. It is imperative to rule out other causes, such as sepsis, ALOC or low BP.

**Base Hospital Orders**

1. Synchronized cardioversion 100J.
2. Additional NS beyond 1L.
3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Bradycardia

Bradycardia is characterized by a decrease in the in heart rate. This can be caused by a multitude of problems ranging from a decrease in atrial depolarization due to slowing of the sinus node or AV blocks. It may be secondary to sinus node disease, increased parasympathetic tone **or** drug effects (e.g., digitalis, propranolol or verapamil.) The rhythm is regular **or** slightly irregular with the heart rate below 60 beats per minute.

Definitions:

1. **Asymptomatic-** Patient has no complaints related to heart rate.
2. **Mildly symptomatic-** Patient is symptomatic and hemodynamically stable.
3. **Grossly symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, chest pain or hypotension related to a slow heart rate).

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2
2. Obtain:
   A. 12 lead ECG.
   B. Blood glucose level, if diabetic.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Skin signs, including capillary refill time.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Syncope.<br>2. Dizziness or lightheadedness.<br>3. Fatigue.<br>4. Shortness of breath.<br>5. Chest pains.<br>6. Confusion or memory problems.<br>7. Easily tiring during physical activity. | 1. Damage to heart tissues from heart disease or heart attack.<br>2. Congenital heart defect.<br>3. Infection of heart tissue (myocarditis).<br>4. A complication of heart surgery.<br>5. Imbalance of chemicals in the blood, such as potassium or calcium.<br>6. Medications, including some drugs for other heart rhythm disorders, high BP and psychosis.<br><br>Home Meds:<br>1. Beta blockers. | 1. High degree heart block.<br>2. Decompensated shock.<br>3. Right side MI.<br>4. Digoxin toxicity.<br>5. Beta blocker overdose.<br>6. Increased vagal tone.<br>7. Intracranial hemorrhage.<br>8. Athletic with normally low heart rate.<br>9. Lyme disease.<br>10. Calcium channel blocker OD/Toxicity.<br>11. Hyperkalemia. |

# Bradycardia

1. Cardiac monitor.
2. 12 Lead ECG.
3. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.

Treatment #1- Asymptomatic:
**DO NOT** start IV/IO solely for HR <60 if patient is asymptomatic.

Treatment #2- Mildly Symptomatic:
1. IV, NS, TKO.

Treatment #3- Grossly Symptomatic:
1. IV/IO.
2. Fluid bolus for hypotension, if no fluid restrictions and lung sounds are without crackles and/or rales.
   NS 500ml IV bolus, may repeat bolus, max 1L.
3. Atropine 0.5 mg IV/IO, every 5 minutes, max of 3 mg.

If no response to first 1.5mg atropine or complete heart block:
1. Midazolam 1-2mg IV/IO.
2. Transcutaneous pacing.

If no response to atropine or pacing:
1. Epinephrine 10mcg **1:100,000** IV/IO, every 2 minutes, titrate to MAP > 60.

Considerations:
1. Patients are rarely symptomatic from heart rates of 50 to 60 BPM. Other causes should be ruled out prior to pacing or atropine.

To make epinephrine **1:100,000**:
1. Mix 9ml NS with 1ml of epinephrine **1:10,000.**

## Base Hospital Orders

1. For renal failure and history suggestive of hyperkalemia:
   A. Calcium chloride 500mg 10%, IV/IO.
   B. Sodium bicarbonate 1 mEq/kg, IV/IO.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Chest Pain of Suspected Cardiac Origin

Characterized by: substernal chest pain; chest or epigastric discomfort; heaviness; squeezing; burning or tightness; pain radiating or isolated to jaw, shoulders, arms or back; nausea; diaphoresis; dizziness; dyspnea; anxiety; or back pain. Patient may have history of coronary artery disease.

Definitions:

1. **STEMI-** ST segment elevation myocardial infarction.
2. **SRC**- STEMI Receiving Center

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2
2. Obtain:
   A. 12 lead ECG.
   B. Blood glucose level, if diabetic.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Lung sounds.
3. If aspirin withheld, why?

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Description of pain (OPQRST):<br>A. Onset: acute or progressive.<br>B. Provocation: better with rest or NTG.<br>C. Quality: dull or pressure.<br>D. Radiation: shoulder or back.<br>E. Severity variable on a scale of 1-10.<br>F. Time: last known well time.<br>2. Nausea.<br>3. Vomiting.<br>4. Diaphoresis.<br>5. Dyspnea.<br>6. Dizziness.<br>7. Palpations.<br>8. Indigestion. | 1. Other cardiac problems.<br>2. Hypertension.<br>3. Diabetes.<br>4. Stroke.<br>5. Family history of MI/CAD.<br>6. Drug use (e.g. Cocaine, Meth).<br><br><u>Home Meds:</u><br>1. Aspirin: Has the patient taken an aspirin today? Does the patient usually take aspirin? Has the patient been advised by their private medical doctor to take one (1) aspirin per day?<br>2. Nitroglycerin: Have they taken it? | 1. Muscular skeletal chest pain.<br>2. Pericarditis.<br>3. Stable angina.<br>4. Pulmonary embolism.<br>5. Pericardial effusion.<br>6. Gastroenteritis.<br>7. GERD.<br>8. Pancreatitis.<br>9. Aortic Dissection. |

# Chest Pain of Suspected Cardiac Origin

Treatment:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, 1-15 LPM, O2, NC or NRB, titrate to 94%.
3. 12 Lead ECG.
4. Blood glucose level, if diabetic.
5. IV, NS, TKO.
6. NTG 0.4mg, SL if SBP >100 every 5 minutes x3 doses.
7. ASA 324mg PO, if patient is able to swallow.

If chest pain persists after 3 NTG, and SBP >100:
8. Morphine 2mg IV/IO, every 5 minutes. Max of 10 mg.

If chest pain persists after 3 NTG, and SBP <100:

~~9.~~ Fentanyl 1 mcg/kg slow IV/IO, every 5 minutes, max single dose 100 mcg, max total dose 2 mcg/kg.

~~10.~~

~~11.~~9. STEMI Alert Process if 12 lead reads:

~~-**LP12 (***ACUTE MI SUSPECTED***)**~~

**LP 15** - (***MEETS ST ELEVATION MI CRITERIA***).

-**LP 35** - (***ACUTE STEMI***), (***POSSIBLE ACUTE STEMI***), (**ACUTE MI/ISCHEMIA***).

-**Phillips Tempus** - (***MEETS ST ELEVATION MI CRITERIA***), (***Consider Acute STEMI***), (***Acute MI/ Ischemia***).

~~-**Zoll E Series (** ** ** ** * ACUTE MI * ** ** ** **)**~~

**Zoll X ~~Series~~** - (*** STEMI ***), (*** Acute ST Elevation Infarct***), (***Probable Acute ST Elevation Infarct***), (***Acute Infarct***).

1. Contact SRC as early as possible and Transmit 12 Lead to SRC.

~~2. Transport as to SRC.~~

~~3.~~2. Scene time should be less than ten (10) minutes.

Nitroglycerin:
1. **No NTG** if computerized interpretation of 12 lead states Inferior MI or elevation of greater than 2 mm in 2 or more contiguous inferior leads (II, III, or aVF).
2. **No NTG** if patient has had Viagra in past 24 hours or Cialis in past 36 hours.

Morphine:
1. **No MS** if computerized interpretation of 12 lead states Inferior MI or elevation of greater than 2 mm in 2 or more contiguous inferior leads (II, III, or aVF). Administer fentanyl 1 mcg/kg slow IV/IO, every 5 minutes, max single dose 100 mcg, max total dose 2 mcg/kg.

Aspirin:
1. **HOLD ASPIRIN IF DISSECTION IS SUSPECTED**.

~~2.~~ May give Aspirin 324mg PO if patient reports taking “baby”/daily 81mg Aspirin.

~~3.~~2.

Considerations:
1. It is no longer recommended to place patient on oxygen unless SpO2 is less than 94% or patient appears short of breath.
2. **DO NOT** initiate an IO if patient is conscious and stable.
3. If MAP below 60 ~~at any point~~ infuse NS 500ml IV/IO bolus, may repeat x3, to max of 1500mL if no crackles and/or rales present.
4. If 12 lead ECG does not indicate “Acute MI Suspected” and patient is showing signs and symptoms of STEMI to including:
   - ~~a.~~ 2 mm ST elevation in two or more contiguous leads.

   a.

b. ~~5.~~ Notify approved STEMI center and transmit 12 Lead ECG to receiving ED for physician interpretation.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.
2. If patient remains hypotensive after fluid bolus - discuss additional fluid .

# Medical Cardiac Arrest

The goal of cardiac resuscitation is to preserve cerebral and coronary function through meticulous attention to procedure and achieving return of spontaneous circulation (ROSC).

## Definitions:

1. **POI**- Passive oxygen insufflation.
2. **High quality CPR**- use TEAM approach:
   A. 100 to 120 compressions per minute.
   B. Compress at least 2 inches.
   C. Allow complete recoil.
   D. Minimize interruptions.
   E. Rotate compressors every 2 minutes.
   F. Pre-charge monitor for defibrillation while CPR is in progress.
3. **Contraindications for this protocol:**
   A. Traumatic arrest - see protocol ATRA-02.
   B. VAD- see protocol ACAR-08.
4. **Transport notes on this protocol:**
   A. Follow instructions on Page 40 for adult patients in medical cardiac arrest secondary to drowning.
   B. Complete airway obstruction or known prior respiratory arrest- Follow treatments in protocol, but transport immediately.

## Documentation Standards:

1. Every 5 minutes:
   A. Respirations.
   B. Pulse.
2. Obtain:
   A. Cardiac rhythm strip.
   B. SpO2.
   C. Capnography.
   D. Blood glucose level.
   E. Physical assessment.
   F. Pupils.
   G. Lung sounds.
3. Circumstances surrounding the arrest:
   A. Estimated down time.
   B. Onset (witnessed or unwitnessed).
   C. Preceding symptoms.
   D. Bystander CPR.
   E. Medications.
   F. Environmental factors (hypothermia, inhalation, and asphyxiation).

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Quickly assess for obvious signs of death:<br>A. Decapitation.<br>B. Decomposition.<br>C. Burnt beyond recognition.<br>D. Lividity.<br>E. Rigor mortis.<br>2. No pulse.<br>3. No respiration. | 1. Angina.<br>2. Myocardial infarction.<br>3. COPD.<br>4. Emphysema.<br>5. Hypertension. | 1. Respiratory arrest leading cardiac arrest.<br>2. Drowning.<br>3. Hypothermia. |

# Medical Cardiac Arrest

Reversible causes should be addressed for all medical cardiac arrest patients.

Treatments- treat reversible causes upon identification.

**Reversible Causes:**

1. **Hypovolemia-** (history suggesting volume depletion)
   Start 2nd, IV/IO, 2L, bolus, IV/IO.
2. **Hypoxia-** (SpO2 <94%)
   Maintain ventilations at 8-10 minutes, with 100% O2, BVM & OPA. Intubate if CL of 1 OR 2, Supraglottic airway if CL 3 and greater.
3. **Hydrogen ion-** (acidosis, long down time, dialysis pt.) 1mEq/kg, sodium bicarbonate, IV/IO.
4. **Hypoglycemia-** (<70 mg/dL)
   10ml/kg, dextrose 10%, IV/IO **OR** 25Gms, dextrose 50%, IV/IO.
5. **Hypocalcemia-** (down time >60 min, dialysis pt.) 500mg, calcium chloride 10%, IV/IO.
6. **Hyperkalemia-** (down time >60 min, dialysis pt.) 1mEq/kg sodium bicarbonate, IV/IO.
7. **Hypothermia-** (body temp below 34°C) Active rewarming with warm IV/IO fluids, start 2nd, IV if possible, hot packs to neck and groin.
8. **Tension Pneumothorax-** (absent lung sounds on affected side) Needle decompression.
9. **Tamponade, Cardiac**
   Start 2nd, IV, 2L, bolus, IV/IO, NS, bolus.
10. **Toxins**
    See protocol AODP-01 to 07.
11. **Torsade's de Pointes**
    Magnesium Sulfate 2 g, IV/IO over 5 min.

**Termination of Resuscitative (TOR) Efforts**

1. Must have:
   A. No shocks delivered.
   B. Been unwitnessed.
   C. Asystole.
   D. 2030 minutes of treatment.

If patient meets above criteria, a TOR can be done with an MICN. If any of the above is not met, base hospital physician approval is required.

**Base Hospital Orders**

1. Termination of resuscitative efforts after 30 minutes if any shocks were delivered.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Medical Cardiac Arrest

## Ventricular Fibrillation (VF) / Pulseless Ventricular Tachycardia (pVT)

**2 MIN**

If ROSC at rhythm check go to protocol ACAR-05.

1. 200 compressions.
2. 15LPM O2 NRB & OPA.
3. IV/IO, NS, WO.

**2 MIN**

Rhythm Check # 1

VF/pVT

1. Shock 200 joules.
2. 200 compressions.

**2 MIN**

Rhythm Check #2

Always consider reversible causes and treat when identified

VF/pVT

1. Shock 200 joules.
2. 200 compressions.
3. 1mg/kg lidocaine, IV/IO, every 5min, max of 3mg/kg.

**2 MIN**

Rhythm Check #3

VF/pVT

1. Shock 200 joules.
2. 200 compressions.
3. 1mg epi, IV/IO, every 4 min.

1. Ventilate with BVM at 30:2 compressions to ventilations.
2. Intubate, CL 1 & 2.
3. Supraglottic airway, CL 3 & 4.
4. After advance airway is placed, ventilate every 5-6 seconds, with continuous compressions.
5. Return to rhythm Check #2.

**All joules-** are in biphasic, use of monophasic equivalent dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

# Medical Cardiac Arrest

## Asystole / Pulseless Electrical Activity

1. 200 compressions.
2. 15LPM O2 NRB & OPA.
3. IV/IO, NS, WO.

If ROSC at rhythm check go to protocol ACAR-05.

**2 MIN**

### Rhythm Check #1

**Asystole/ PEA**

1. 200 compressions.
2. 1mg epi, IV/IO, every 4 min.

**2 MIN**

### Rhythm Check #2

**Asystole/ PEA**

1. 200 compressions.

Always consider reversible causes and treat when identified.

**2 MIN**

### Rhythm Check #3

**Asystole/ PEA**

1. 200 compressions.
2. 1mg epi, IV/IO, every 4 min.

**2 MIN**

1. Ventilate with BVM at 30:2 compressions to ventilations.
2. Intubate, CL 1 & 2.
3. Supraglottic airway, CL 3 & 4.
4. After advance airway is placed, ventilate every 5-6 seconds, with continuous compressions.
5. Return to rhythm Check #2.

**All joules-** are in biphasic, use of monophasic equivalent dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

# Pulseless Ventricular Tachycardia/Ventricular Fibrillation

1. Start CPR at 100-120 compressions per minute with cycles of 200 compressions.
2. OPA/NPA and initiate passive oxygen insufflation with O2 @ 15LPM via NRB if no contraindications for 8 minutes before assisting ventilations with BVM.
3. Place on cardiac monitor – SpO2 and ETCO2.
4. Defibrillate as soon as possible @ 200 joules (or manufacturer's recommendation), repeat at pulse check every 2 minutes if in VF/VT.
5. Establish IV/IO.
6. Initiate NS 500ml IVF bolus, max of 2L.
7. If VT/VF after 2 defibrillations, lidocaine 1mg/kg via IV/IO. May repeat every 5 minutes if VF/VT persists, max total dose of 3mg/kg.
8. Epinephrine 1mg **1:10,000** IV/IO, every 4 minutes. To be initiated after 3 cycles of CPR.
9. Establish advanced airway (ETT or SGA) after 8 minutes of passive oxygen insufflation
10. Continue cycles of 2 minutes of CPR, followed by shock of VF/VT, and epinephrine 1mg every 4 minutes, for 15 minutes then transport.
11. If ROSC is achieved, initiate transport and continue transport even if ROSC is lost.
12. Patients in persistent/refractory VT/VF at 15 minutes should be transported. If within 15 minutes of SRC, transport to SRC, otherwise transport to closest facility.
13. Patients in refractory VT/VF administer magnesium sulfate 2 g IV/IO over 5 minutes.

Exceptions:

If cardiac arrest is due to suspected drowning or respiratory arrest (i.e. airway obstruction, status asthmaticus), immediately initiate positive pressure ventilation with BVM and 100% oxygen at 30:2 ration of compressions to ventilations. After advanced airway is placed, ventilate once every 5-6 seconds with continuous compressions. Do not perform passive oxygen insufflation.

Considerations:

1. The goal is high quality compressions with early defibrillation.
2. If IV is not established after first attempt, **DO NOT** delay vascular access with IV attempts. Go directly to IO.
3. Monitor capnography with BVM & OPA.
4. Always consider reversible causes and treat when identified.
5. Oral tracheal intubation should be used as the definitive airway for CL scores of 1&2.
6. VAD see protocol ACAR-08.
7. **DO NOT** initiate therapeutic hypothermia.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Asystole/PEA

1. Start CPR at 100 – 120 compressions per minute with cycles of 200 compressions
2. OPA/NPA and initiate passive oxygen insufflation with O2 @ 15LPM via NRB if no contraindications for 8 minutes before assisting ventilations with BVM at 30:2 compressions to ventilations.
3. Place on cardiac monitor, SpO2 and ETCO2.
4. Establish IV/IO.
5. Early epinephrine 1mg IV/IO, every 4 minutes.
6. Initiate fluid bolus NS 500ml, max of 2L.
7. If ROSC is achieved, initiate transport and continue transport even if ROSC is lost.
8. If cardiac arrest witnessed by EMS providers or if patient is in a public place, initiate transport to closest facility at 15 minutes.
9. Establish advanced airway (ETT or SGA) after 8 minutes of passive oxygen insufflation.
10. **AT ~~30~~ 20 MINUTES** proceed to determination of death protocol with base hospital contact.

Exceptions:

If cardiac arrest is due to suspected drowning or respiratory arrest (i.e. airway obstruction, status asthmaticus), immediately initiate supported respirations with BVM. Do not perform passive oxygen insufflation.

Considerations:

1. The goal is high quality compressions and EARLY epinephrine.
2. If IV is not established after first attempt, **DO NOT** delay vascular access with IV attempts. Go directly to IO.
3. Monitor capnography with BVM & OPA.
4. Always consider reversible causes and treat when identified.
5. Oral tracheal intubation should be used as the definitive airway for CL scores of 1 & 2.
6. VAD see protocol ACAR-08.
7. **DO NOT** initiate therapeutic hypothermia.

## Base Hospital Orders

1. Termination of resuscitative efforts after 30 minutes if any shocks were delivered.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Medical Return of Spontaneous Circulation

The presence of a palpable pulse **and/or** BP for at least 30 seconds after cardiac arrest.

Definitions:

1. **Medical Cardiac Arrest-** Cardiac arrest not caused by trauma.
2. **Traumatic Arrest-** Cardiac arrest secondary to trauma.
3. **STEMI Receiving Facility (SRC)-** Facility approved by SJCEMSA to receive patients with ST elevation myocardial infarctions.

Documentation Standards:

1. Every **TWO MINUTES (2)** minutes:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
   E. EtCO2.
2. Obtain:
   A. 12 Lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Lung sounds.
   F. Capillary Refill.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Breathing.<br>2. Coughing.<br>3. Movement.<br>4. Palpable pulse.<br>5. Measurable BP. | 1. Chest pain.<br>2. Shortness of breath.<br>3. Recent travel with complaint of leg pain prior to arrest. | 1. Myocardial infarction.<br>2. Pulmonary embolism.<br>3. Aortic dissection.<br>4. Hypovolemia.<br>5. Septic shock.<br>6. Acute blood loss.<br>7. Hyperkalemia.<br>8. Intracranial hemorrhage.<br>9. H's & T's.<br>a. **H**ypovolemia.<br>b. **H**ypoxia.<br>c. **H**ydrogen ion acidosis.<br>d. **H**yper/**H**ypoglycemia.<br>e. **H**yper/**H**ypokalemia.<br>f. **H**yper/**H**ypothermia.<br>g. **T**ension pneumothorax.<br>h. **T**amponade cardiac.<br>i. **T**oxins.<br>j. **T**hrombosis, pulmonary or cardiac.<br>k. **T**orsade's De Pointes. |

# Medical Return of Spontaneous Circulation

1. Cardiac monitor.
2. Monitor SpO2, if <94%, 1-15 LPM O2 via NC/NRB/BVM, titrate to 94%.
3. Monitor EtCO2 with BVM and OPA or advanced airway.
4. 12 Lead ECG. Transmit to receiving emergency department.
5. If not performed during arrest, IV/IO, NS, TKO.
6. NS 500ml IVF bolus, repeat PRN to maintain MAP >70, max 2L.
7. If not given during arrest, lidocaine 1mg/kg IV/IO ONLY if VF/VT present during arrest.
8. If low HR, see bradycardia protocol ACAR-02.
9. **Avoid hypotension**, initiate early vasopressors:
   A. Epinephrine 20mcg, **1:100,000**, IV/IO, every 2 minutes, titrate to MAP >70.

To make **1:100,000** epinephrine:

1. Mix 9ml NS with 1ml of epinephrine **1:10,000.**

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.
2. If V-Tach persists lidocaine 0.5mg/kg IV/IO, every 5 minutes, max cumulative dose of 3mg/kg.

# Non Traumatic Shock

Shock is a syndrome which is characterized by inadequate tissue perfusion. Shock can have a variety of underlying causes including hypovolemia, sepsis, cardiogenic, and anaphylaxis.

Definitions:

1. **Asymptomatic-** Patient has no complaints.
2. **Mildly Symptomatic-** Patient has tachycardia with low blood pressure and no change in level of consciousness.
3. **Grossly Symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, significant chest pain or hypotension or delayed capillary refill).

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. Obtain:
   A. 12 Lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Capillary refill.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Compensated shock: this often missed stage of shock is characterized by normal to slightly decreased BP and tachycardia.<br>2. Decompensated shock: hypotension and tachycardia.<br>3. Irreversible shock: hypotension and bradycardia. | 1. GI bleeding.<br>2. Vomiting.<br>3. Diarrhea.<br>4. Allergic reaction.<br>5. Sepsis.<br>6. Anti-hypertensive O.D.<br>7. Fever.<br>8. Recent surgery. | 1. Myocardial infarction.<br>2. Sepsis.<br>3. Pulmonary embolism.<br>4. Acute blood loss.<br>5. GI bleed.<br>6. Intracranial hemorrhage.<br>7. Aortic dissection. |

# Non Traumatic Shock

1. Cardiac monitor.
2. Monitor SpO2, if < 94%, 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 Lead ECG.

Treatment #1- Mildly Symptomatic
4. IV, NS, TKO.
5. NS 500ml IVF bolus, to BP of 90 systolic, max of 2L.

If patient has fluid restrictions (CHF, ESRD, HD) or lung sounds with crackles and/or rales.
6. NS 250ml IVF bolus, to MAP > 60, max of 1L. Reassess lung sounds and SpO2 between boluses.

Treatment #2- Grossly Symptomatic without fluid restrictions:
1. IV/IO, NS, TKO.
2. NS 500ml rapid IVF bolus, to MAP > 60, max of 2L.

If after rapid bolus 2L NS, MAP remains <60, proceed to addition of vasopressors.

Treatment #3 – Grossly symptomatic with fluid restrictions
If patient has fluid restrictions (CHF, ESRD, HD) or lung sounds with crackles and/or rales **AND** SpO2 >94%:
1. Rapid IVF bolus of NS 250ml, to MAP > 60, max of 1L. Reassess lung sounds and SpO2 between boluses.
2. If patient develops crackles and/or rales, SpO2 drops or does not respond to fluid bolus, proceed to additional of vasopressors.
3. Epinephrine 10mcg of **1:100,000**, IV/IO, every 2 minutes, titrate to MAP > 60.

Considerations:
1. Patients that appear to be mildly symptomatic can be in the compensatory stage of shock, **ANTICIPATE DETERIORATION.**
2. Consider CPAP if lung sounds are not clear and patient has signs of respiratory distress in addition to vasopressors.

To make epinephrine **1:100,000**:
1. Mix 9ml NS with 1ml of epinephrine **1:10,000.**

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Supraventricular Tachycardia

Supraventricular tachycardia (SVT), also called paroxysmal supraventricular tachycardia, is defined as an abnormally fast heartbeat.

Definitions:

1. **Asymptomatic-** Patient has no complaints related to heart rate.
2. **Mildly symptomatic-** Patient is symptomatic but hemodynamically stable.
3. **Grossly Symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, chest pain or hypotension related to a SVT).
4. **All Joules-** are in biphasic, use of equivalent monophasic dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse and quality.
   D. SpO2.
2. Obtain:
   A. 12 lead ECG.
   B. Blood glucose level if diabetic.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Skin signs, including capillary refill time.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. A fluttering in chest.<br>2. Rapid heartbeat (palpitations).<br>3. Shortness of breath.<br>4. Lightheadedness or dizziness.<br>5. Sweating.<br>6. A pounding sensation in the neck.<br>7. Fainting (syncope) or near fainting. | 1. SVT.<br>2. Stimulant drug use.<br>3. Illicit drug use.<br>4. Cardiac ablation.<br>Home Meds:<br>1. Beta blockers.<br>2. Calcium channel blockers. | 1. Atrial fibrillation.<br>2. Atrial flutter.<br>3. Dehydration.<br>4. Sepsis.<br>5. Beta blocker withdrawal.<br>6. Wolf Parkinson White Syndrome. |

# Supraventricular Tachycardia

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 lead ECG.

Treatment #1 Asymptomatic:
**DO NOT** start IV solely for HR >150, if patient is asymptomatic.

Treatment #2- Mildly Symptomatic:
1. IV, AC or higher if possible, NS, TKO.
2. Perform Valsalva's maneuver.
3. NS 500ml IVF bolus, to MAP > 60.

If no response to fluid bolus:
4. Adenosine 6 mg rapid IVP. If no response after 2 minutes give adenosine 12mg rapid IVP, If no response after 2 min may repeat adenosine 12mg rapid IVP once.
5. If no response after 3 doses of adenosine, if not already, begin transport.

Treatment #3- Grossly Symptomatic:
1. NS 500ml rapid IVF bolus.
2. If IV readily obtained, give adenosine 12 mg rapid IVP.

If no response **or** unable to readily establish IV:
1. Synchronized cardioversion 100J.
2. If no response, synchronized cardioversion 200J.
3. If IV/IO established, may give midazolam 2mg IV/IO immediately prior to synchronized cardioversion. Do not delay synchronized cardioversion in unstable patient.
4. If no response to synchronized cardioversion, begin transport and make base hospital contact.

Considerations:
1. Patients are rarely symptomatic from heart rates of 150 to 160 BPM. Other causes should be ruled out prior to adenosine or synchronized cardioversion.

**Base Hospital Orders**

1. Additional synchronized cardioversions.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Ventricular Assist Device (VAD) Failure

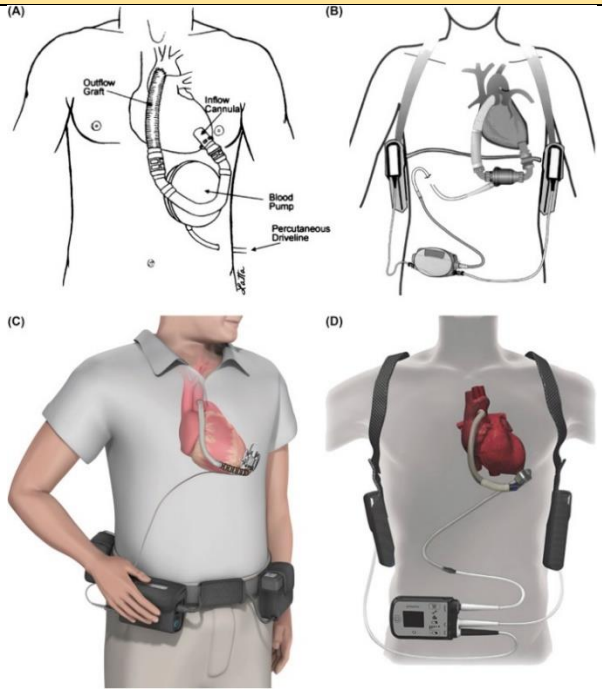
The following are key points to remember from this American Heart Association Scientific Statement about cardiopulmonary resuscitation (CPR) in adults and children with mechanical circulatory support (MCS).

Definitions:

1. **LVAD-** Left Ventricular Assist Device.
2. **RVAD-** Right Ventricular Assist device.
3. **BiVAD-** Biventricular Assist Device.
4. **Pulsatile-** Will have pulsing or rhythmic sound, possible palpable radial pulse and CO2 will read accurately.
5. **Continuous Flow-** Most commonly located in patient's thorax and will have no peripheral pulses. Utilize monitor generated Mean Arterial Pressure (MAP) to assess perfusion, CO2 will read accurately.
6. **HeartMate II-** The most commonly implanted device. This device is a continuous flow device and patients will not have a palpable pulse.
7. **HeartWare-** Older version but still common. This device is a continuous flow device and patients will not have a palpable pulse.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. MAP (BP is not accurate in these patients).
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. Obtain:
   A. 12 lead ECG.
   B. EtCO2 if using and advanced airway or BVM and OPA.
   C. Blood glucose if diabetic.
   D. Pain scale PRN.
   E. Physical assessment.
   F. Capillary refill.



# Ventricular Assist Device (VAD) Failure

Treatment

1. Cardiac monitor.
2. Monitor SpO2, if < 94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Monitor MAP.
4. Monitor EtCO2 if using and advanced airway or BVM.
5. 12 lead ECG.
6. Assess the device to see if it is working:
   A. Gather information regarding the type of device, the implantation hospital, and/or the VAD Coordinator contact telephone number.
   B. Telephone number may be available by a tag on the device, on the refrigerator, or on a medical alert bracelet.
   C. If a caregiver is present, utilize his/her knowledge.
   D. Listen to their directions regarding VAD device management until you are able to contact the VAD Coordinator. The VAD Coordinator can help you decide the best course of action regarding assessment of the equipment. **NOTE: Only the base hospital is legally allowed to give orders regarding patient care.**
7. If the patient has a **continuous flow VAD** (non-pulsatile / pulseless), auscultate the left upper quadrant of the patient's abdomen for the "hum" of the VAD, which can help direct the appropriate actions.
8. A **pulsatile VAD** will make an audible sound without auscultation. Pulsatile VADs are usually older devices which pump blood via pulsatile mechanism, generating a peripheral pulse.
9. Determine if the device has power:
   A. If the device has power, you will see a green light on the HeartMate II, the most commonly implanted device.
   B. On the HeartWare device, the display will tell you the Liters per Minute (LPM) of blood flow.
10. Check the VAD for secure connections and that the batteries are charged and functional.

If VAD is definitively confirmed by a trained person and there are no signs of life, no MAP and no pulse:

11. Start CPR see protocol ACAR-04.

Considerations

1. While pulse oximetry can be used in patients with a VAD, the results may not be accurate because of the lack of pulsatile flow.
2. A CO2 value of <20mmHg in an unresponsive, correctly intubated, pulseless patient with a VAD would seem to be a reasonable indicator of poor systemic perfusion and should prompt rescuers to initiate chest compressions.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Sustained Ventricular Tachycardia with a Pulse

A regular or slightly irregular rhythm, heart rate 100 to 200 and wide >0.12 seconds QRS complex.

Definitions:

1. **Sustained Ventricular Tachycardia-** Wide complex QRS rhythm **>100BPM** lasting longer than **30** seconds.
2. **Asymptomatic-** Patient has no complaints related to heart rate.
3. **Mildly Symptomatic-** Patient is symptomatic (CP, SOB, weakness, lightheadedness) and hemodynamically stable.
4. **Grossly Symptomatic-** Patient is symptomatic and hemodynamically unstable (ALOC, significant chest pain, delayed capillary refill or hypotension).
5. **All Joules-** Are in biphasic, use of equivalent monophasic dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. Obtain:
   A. 12 lead ECG.
   B. Pain scale PRN.
   C. Physical assessment.
   D. Skin signs, including capillary refill time.
   E. Blood glucose level, if diabetic.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Dizziness.<br>2. Shortness of breath.<br>3. Lightheadedness.<br>4. Feeling as if your heart is racing (palpitations).<br>5. Chest pain (angina).<br>6. Loss of consciousness or fainting. | 1. Cardiac arrest.<br>2. Syncope.<br>3. Palpitations.<br>4. Heart disease.<br>5. Prior synchronized cardioversion.<br>6. Implanted defibrillator.<br>7. Family history of early sudden death.<br><br>Home Meds:<br>1. NTG.<br>2. ASA.<br>3. Beta blockers.<br>4. Calcium channel blockers. | 1. Atrial fibrillation.<br>2. Aberrant conduction. |

# Sustained Ventricular Tachycardia with a Pulse

1. Cardiac monitor.
2. Monitor SpO2, if < 94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 lead ECG.
4. IV, NS, TKO.

Treatment #1- Asymptomatic:
1. NS 500mL IVF bolus.

Treatment #2- Mildly Symptomatic:
1. Lidocaine 1mg/kg IVP.
2. Give lidocaine 0.5mg/kg IV if persists after 5 minutes. May repeat 0.5 mg/kg x2, every 5 minutes.

Treatment #3- Grossly Symptomatic:
1. Transport to SRC.
2. NS 500ml rapid IVF bolus, titrate to MAP > 60, max of 2L. To be done in conjunction with synchronized cardioversion.
3. Synchronized cardioversion 100J. If no response, repeat, increasing by 50J, max of 3 shocks.
4. Give lidocaine 1mg/kg IV/IO bolus after synchronized cardioversion.
5. If no response to synchronized cardioversion, give lidocaine 1mg/kg IV/IO, may repeat 0.5mg/kg x 2, every 5 minutes.
6. If IV/IO established, may give midazolam 2mg IV immediately prior to synchronized cardioversion. Do not delay synchronized cardioversion in an unstable patient.

Considerations:
1. If ECG appears polymorphic (Torsades De Pointes) magnesium sulfate 2g, IV/IO, infusion in 250ml NS, over 20 minutes.
2. For suspected TCA overdose see protocol AODP-05.

**Base Hospital Orders**

1. Additional synchronized cardioversions.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Adult Respiratory

# Acute Pulmonary Edema

Pulmonary edema is a condition caused by excess fluid in the lungs. Fluid collection in the numerous air sacs within the lungs cause difficulty breathing.

## Definitions:

1. **Acute Pulmonary Edema-** Means an acute onset of respiratory difficulty with SBP >120 and rales or occasional wheezes. May have a history of cardiac disease.
2. **Mild SOB with Pulmonary Edema-** Patient complains of SOB with mild work of breathing (speaking full sentences with difficulty) auscultated rales and no complaints of chest pain.
3. **Moderate SOB with Pulmonary Edema-** Patient has moderate work of breathing (speaking 3-5 word sentences) possible complaints of chest pain and has rales on auscultation.
4. **Severe SOB with Pulmonary Edema-** Patient has severe work of breathing (speaking 1-3 word sentences) ALOC or chest pain, with rales on auscultation and or pink frothy sputum production.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
   E. ETCO2
2. Obtain:
   A. 12 lead ECG.
   B. Blood glucose level on diabetic patients.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Lung sounds.
   F. Skin signs including capillary refill.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Peripheral pitting edema.<br>2. Dyspnea that worsens with activity or when lying down.<br>3. Wheezing or gasping for breath.<br>4. Cold, clammy skin.<br>5. Anxiety, restlessness.<br>6. A cough that produces frothy sputum that may be tinged with blood.<br>7. Blue-tinged lips.<br>8. A rapid, irregular heartbeat (palpitations).<br>9. Difficulty breathing with exertion.<br>10. Swelling in lower extremities. | 1. Congestive heart failure.<br>2. Atrial fibrillation.<br>3. Myocardial infarction.<br>4. Coronary artery disease.<br>5. COPD.<br>6. Emphysema.<br>7. Previous intubations secondary to CHF.<br>8. Conditions related to valve failure.<br>9. End stage renal diseases. (ESRD)<br>10. Hemodialysis.<br><br>Home Meds:<br>1. Lasix.<br>2. ASA.<br>3. Beta blockers. | 1. Pneumonia.<br>2. Smoke inhalation.<br>3. Altitude sickness.<br>4. Pulmonary embolism.<br>5. Flash pulmonary edema.<br>6. Mitral valve regurgitation.<br>7. Sepsis.<br>8. ARDS.<br>9. Anaphylaxis.<br>10. Acute bronchospasms. |

# Acute Pulmonary Edema

1. Cardiac monitor.
2. Monitor SpO2, if < 94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 Lead ECG.

Treatment #1- Mild SOB with pulmonary edema:
1. Transport in position of comfort.

Treatment #2- Moderate SOB with pulmonary edema:
1. Establish IV, NS, TKO.
2. If suspected cardiac origin and SBP >100, NTG 0.4mg, every 3 minutes PRN.

Treatment #3- Severe SOB with pulmonary edema:
1. Establish IV/IO, NS, TKO.
2. CPAP or PPV ventilation if ALOC.
3. If suspected cardiac origin and SBP >100, NTG 0.4mg SL, every 3 minutes PRN.
4. If pulmonary edema present and MAP < 60, make base hospital contact during transport for possible vasopressor use.

Considerations
1. With severe SOB, **DO NOT** delay CPAP or PPV ventilation if ALOC.
2. Consider withholding bronchodilators if patient has wheezing breath sounds and no history of reactive airway disease, consider acute CHF.
3. May treat nausea according to protocol AGEN-04.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

For MAP < 60,

2. Epinephrine 10mcg, **1:100,000**, IV/IO, every 2 minutes, titrate to MAP > 60.

To make **1:100,000** epinephrine:

1. Mix 9ml NS with 1ml of epinephrine **1:10,000.**

# Bronchospasms

Bronchospasm occurs when the airways (bronchial tubes) go into spasm and contract. This makes it hard to breathe and causes wheezing (a high-pitched whistling sound). Bronchospasm can also cause frequent coughing without wheezing. Bronchospasm is often due to irritation, inflammation, or allergic reaction of the airways. People with asthma get bronchospasm. However, not everyone with bronchospasm has asthma.

## Definitions:

1. **Mild Respiratory Distress-** Means mild wheezing, shortness of breath and/or cough, and ability to speak full sentences.
2. **Moderate Respiratory Distress-** Means spontaneous adequate breathing with significant wheezing/SOB accompanied by any of the following signs: accessory muscle use, nasal flaring, grunting, and/or inability to speak full sentences.
3. **Severe Respiratory Distress-** Means ineffective respirations and/or inadequate tidal volume, which may be accompanied by any of the following signs: accessory muscle use, cyanosis, inability to speak, gasping respirations, and/or decreased level of consciousness.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG for severe distress or chest pain.
   B. Blood glucose level, if diabetic.
   C. Pain scale PRN.
   D. Physical assessment including skin signs.
   E. Lung sounds. (if giving treatment, lung sounds before and after intervention should be noted)

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Respirations <10 or >30 per minute.<br>2. Rhythm (abnormal pattern, shallow).<br>3. Effort (labored).<br>4. Lung sounds (wheezing, stridor).<br>5. Cough.<br>6. Fever.<br>7. Sputum production.<br>8. Rash.<br>9. Urticaria.<br>10. Restlessness. | 1. Asthma.<br>2. COPD.<br>3. Emphysema.<br>4. Chemical exposure.<br>5. Smoking.<br>6. Previous intubation.<br><br>Home Meds:<br>1. Albuterol.<br>2. Atrovent.<br>3. Steroids.<br>4. Home Neb.<br>5. Home O2.<br>6. Antihistamines. | 1. Smoke inhalation.<br>2. Allergic reaction.<br>3. Anaphylaxis.<br>4. Congestive heart failure.<br>5. Spontaneous pneumothorax.<br>6. Pulmonary embolism.<br>7. Vocal cord dysfunction.<br>8. Pneumonia.<br>9. Plural effusion. |

# Bronchospasms

1. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.

Treatment #1- Mild Bronchospasm:
1. Albuterol 2.5 mg/3ml NS & atrovent 0.5mg/2.5ml via nebulizer with 4-6 LPM O2 x1.

Treatment #2- Moderate Bronchospasm:
1. Albuterol 2.5 mg/3ml NS & atrovent 0.5mg/2.5ml via nebulizer with 4-6 LPM O2 x1.
2. Cardiac monitor.
3. Repeat albuterol 2.5 mg/3 ml NS every 5 minutes as needed.
4. IV, NS, TKO.

Treatment #3- Severe Bronchospasm:
1. Consider CPAP.
2. Albuterol 2.5 mg/3ml NS & atrovent 0.5mg/2.5ml via mask nebulizer or in-line with CPAP x1.
3. Cardiac monitor.
4. Repeat albuterol 2.5mg/3ml NS as needed.
5. 12 lead ECG.
6. IV, NS, TKO.

If no response after initial albuterol or worsening respiratory status.
7. Magnesium sulfate 2g IV/IO in 250 NS, infusion over 20 minutes. DO NOT administer if patient has known kidney disease or on dialysis.

If not responding to magnesium sulfate
8. Administer epinephrine **1:1,000** 0.3mg IM.

Treatment #4- Respiratory Failure from severe bronchospasm
1. Assist ventilations with BVM 100% oxygen and initiate an inline nebulizer treatment with albuterol 2.5mg/3ml NS & atrovent 0.5mg/2.5ml NS.
2. Begin continuous inline albuterol nebulizer therapy until patient status has improved and wheezing has resolved.
3. Cardiac monitor.
4. Administer epinephrine **1:1,000** 0.3mg IM, repeat every 5 minutes as needed.
5. Consider magnesium sulfate 2g IV/IO, in 250ml NS, infusion over 20 minutes.
6. Obtain 12 lead ECG.
7. Only place advanced airway when patient is without gag reflex or unable to ventilate.

Considerations
1. Suction as needed.
2. Titrate oxygen to SpO2 of 92% for patients with a history of COPD.
3. Upper airway obstruction; Relieve obstruction by positioning, suction, abdominal thrusts, or direct removal with Magill forceps.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Smoke Inhalation

Smoke inhalation is the leading cause of death due to fires. It produces injury through several mechanisms, including thermal injury to the upper airway, irritation or chemical injury to the airways from soot, asphyxiation, and toxicity from carbon monoxide (CO) and other gases such as cyanide.

Definitions:

1. **Asymptomatic-** Known significant exposure to smoke with no complaints or asymptomatic.
2. **Mildly Symptomatic-** Known significant exposure to smoke, with signs and symptoms, such as weakness or mild shortness of breath.
3. **Grossly Symptomatic-** Known significant exposure to smoke, with serious signs and symptoms, such as ALOC, severe shortness of breath, unconscious.
4. **Carbon Monoxide-** Is a colorless, odorless, and tasteless poisonous gas that can be fatal when inhaled. CO inhibits the blood's capacity to carry oxygen. CO can be produced when burning any fuel. CO is a byproduct of incomplete combustion.
5. **Smoke Inhalation-** Should be suspected in patients rescued from closed-space fires or exposed to significant amounts of smoke.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level, if diabetic.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Similar to flu with no fever.<br>2. Dizziness.<br>3. Severe headaches.<br>4. Nausea.<br>5. Sleepiness.<br>6. Fatigue/weakness.<br>7. Disorientation/confusion. | 1. Exposure to smoke from fire.<br>2. Exposure to gas and/ chemicals. | 1. Anaphylaxis.<br>2. ARDS.<br>3. Chemical exposure.<br>4. Pulmonary edema. |

# Smoke Inhalation

1. Monitor SpO2.

Treatment #1- Mildly symptomatic:
1. If SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Cardiac monitor.
3. IV, NS, TKO.
4. Consider nebulized saline.
5. If CO poisoning suspected, administer 15 LPM O2 via NRB regardless of SpO2.
6. Treat wheezes according to protocol ARSP-02.

Treatment #2- Grossly symptomatic:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Cardiac monitor.
3. IV, NS, TKO.
4. Consider nebulized saline.
5. If CO poisoning suspected, administer 15 LPM O2 via NRB regardless of SpO2.
6. Treat wheezes according to protocol ARSP-02.
7. Consider CPAP if patient develops pulmonary edema.
8. For MAP < 60 without evidence of fluid overload, NS 500ml IVF bolus, titrate MAP > 60, max 2L.
9. Treat seizure according to protocol ANRO-05.
10. Treat dysrhythmias according to protocol ACAR-01 to 09.
11. If unmanageable airway involvement, transport to closest hospital.

Considerations:
1. Completely remove victim's clothing prior to transport.
2. Evaluate patient for facial burns, hoarseness, black sputum, and soot in the nose or mouth.
3. Pulse oximetry values may be unreliable in smoke inhalation patients.
4. Anticipate deterioration.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Adult Neurological

# CVA/TIA

To identify and treat patients suffering from stokes and TIA's, and provide early notification to Primary Stroke Center (PSC).

## Definitions:

1. **CVA**- Cerebral Vascular Accident.
2. **TIA**- Transient Ischemic Attack. Patient with stroke-like symptoms that are improving since onset.
3. **RACE**- Rapid Arterial Occlusion Evaluation.
4. **CPSS**- Cincinnati Prehospital Stroke Scale.
5. **LKWT**- Last Known Well Time (Clock time).
6. **AC**- Antecubital Fossa.
7. **EJ**- External Jugular.
8. **PSC**- Primary Stroke Center.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. Cardiac monitor.
   B. 12 lead ECG.
   C. Blood glucose level.
   D. Pain scale PRN.
   **E. LAST KNOWN WELL TIME (LKWT)** written as time of day (clock time), not as hours or minutes prior to arrival.
   F. Physical assessment.
   G. Pupils.
   H. Stroke scale (Cincinnati Prehospital Stroke Scale & RACE stroke score if indicated).

## Objective Findings:

| Signs & Symptoms | History | Differentials & Stroke Mimics |
|---|---|---|
| 1. ALOC.<br>2. Weakness/Paralysis.<br>3. Balance/Vertigo/Dizziness.<br>4. Vision changes.<br>5. Aphasia/Dysarthria.<br>6. Syncope.<br>7. Headache.<br>8. Nausea and vomiting.<br>9. Hyper /Hypotension.<br>10. Seizures. | 1. Previous CVA/TIA.<br>2. Previous trauma.<br>3. Previous cardiac surgery.<br>4. HTN.<br>5. Diabetes.<br>6. Coronary artery disease.<br>7. Atrial fibrillation.<br>8. Medication (i.e. blood thinners).<br>9. DNR orders / code status. | 1. ALOC.<br>2. ETOH / Drug use.<br>3. Hypo / Hyperglycemia.<br>4. Hypoxia.<br>5. Hypercarbia.<br>6. Trauma.<br>7. Metabolic disorders.<br>8. Inter cranial hemorrhage.<br>9. Dizziness<br>10. Syncope.<br>11. Blurred vision. |

## PSC Alert Process

Upon recognition of RACE score greater than 5:

1. Initiate transport as soon as feasible.
2. Notify PSC via radio **or** phone of findings:
   A. CPSS.
   B. RACE score.
   C. Blood glucose level.
   D. LKWT (Clock time).
   E. Pertinent history.

# CVA/TIA

1. Cardiac monitor
2. Monitor SpO2, if <94% 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 lead ECG.
4. Blood glucose level, if <70 mg/dL, see Protocol ANRO-03.
5. If MAP < 60, NS 500ml IVF bolus, titrate to MAP > 60, max of 2L.
6. Perform CPSS.
7. Perform RACE scale on all patients with **POSITIVE CPSS**.
8. **PROVIDE STROKE ALERT** and transport to stroke center, if patient has a positive CPSS exam with symptoms <24 hours.
9. If patient has a positive CPSS exam with symptoms >24 hours, transport to PSC **WITHOUT** stroke alert.
10. RACE score less than 5; IV, NS, TKO where available.
11. RACE score greater than 5; IV, AC or higher, (EJ after two failed attempts) NS, TKO.

Considerations

1. Accurate LKWT is vital to treatment in the hospital.
2. Limit IV attempts.
3. Look out for atypical presentations and stroke mimics.
4. Provide stroke alert to receiving hospital center as soon as possible.
5. Scene time should be kept to **LESS THAN 15 MINUTES**.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

**Cincinnati Prehospital Stoke Screen**

| | Normal | Abnormal |
|---|---|---|
| **Facial Droop** | Both sides of face move equally | One side of face does not move as well |
| **Arm Drift** | Can hold arms out equally | One arms moves down |
| **Speech** | Uses correct words, no slurring | Uses incorrect words or slurred speech |

**RACE Stroke Scale**

| ITEM | INSTRUCTION | | Score |
|---|---|---|---|
| FACIAL PALSY | Ask the patient to show their teeth | ABSENT= (Symmetrical movement) | 0 |
| | | MILD= (Slightly asymmetrical) | 1 |
| | | MODERATE/SEVERE= (Completely asymmetrical) | 2 |
| ARM MOTOR FUNCTION | Extending the arm of the patient 90 degrees if sitting or 45 degrees if supine. | NORMAL/MILD= (Limb held up for more than 10 seconds) | 0 |
| | | MODERATE= (Limb held up for less than 10 seconds) | 1 |
| | | SEVERE= (Patient unable to raise arm against gravity) | 2 |
| LEG MOTOR FUNCTION | extending the leg of the patient 30 degrees if supine | NORMAL/MILD= (Limb upheld more than 10 seconds) | 0 |
| | | MODERATE= (Limb upheld less than 10 seconds) | 1 |
| | | SEVERE= (Patient unable to raise leg against gravity) | 2 |
| HEAD AND GAZE DEVIATION | observe eyes and cephalic deviation to one side | ABSENT= (Eye movements to both side are possible) | 0 |
| | | PRESENT= (Eyes deviation to one side observed) | 1 |
| APHASIA (EVALUATE IN RIGHT SIDED WEAKNESS) | Ask the patient to "close your eyes" and "make a fist" | NORMAL= (Performs bot tasks correctly) | 0 |
| | | MODERATE= (Performs one task correctly) | 1 |
| | | SEVERE= (Unable to perform either task) | 2 |
| AGNOSIA (EVALUATE IN LEFT SIDED WEAKNESS) | Assess for recognition deficit: Does patient recognize effected side? "Whose arm is this?" Can the patient lift both arms and clap? | NORMAL= (Recognizes arm and impairment) | 0 |
| | | MODERATE= (Unable to recognize arm or impairment) | 1 |
| | | SEVERE= (Unable to recognize arm and impairment) | 2 |

# Hyperglycemia

An excess of glucose in the bloodstream, often associated with diabetes mellitus.

Definitions:

1. **Asymptomatic-** No symptoms or complaints related to blood glucose level.
2. **Mildly Symptomatic-** Showing symptoms of hyperglycemia such as polyuria, polydipsia, tachypnea.
3. **Grossly Symptomatic-** ALOC, confusion, tachypnea.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. Cardiac monitor.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Frequent urination.<br>2. Increased thirst.<br>3. Blurred vision.<br>4. Fatigue.<br>5. Headache.<br>6. Fruity-smelling breath.<br>7. Nausea and vomiting.<br>8. Shortness of breath.<br>9. Tachypnea (especially in the absence of a SOB complaint).<br>10. Dry mouth.<br>11. Weakness.<br>12. Confusion.<br>13. Coma.<br>14. Abdominal pain. | 1. Insulin dependent diabetes.<br>2. Non-insulin dependent diabetes.<br>3. Excessive thirst.<br><br>Home Meds:<br>1. Insulin.<br>2. Glucophage.<br>3. Metformin.<br>4. Januvia. | 1. CVA.<br>2. ETOH intoxication.<br>3. Overdose.<br>4. Shock.<br>5. Sepsis.<br>6. DKA.<br>7. HHNK. |

# Hyperglycemia

1. Monitor SpO2.
2. Blood glucose level.

Treatment #1- Asymptomatic:
1. If blood glucose level >300 mg/dL, **DO NOT** initiate IV solely for high blood glucose.
2. Notify receiving nurse.

Treatment #2- Mildly Symptomatic:
1. If SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. If blood glucose level >300 mg/dL, consider IV, NS, TKO.
3. Notify receiving nurse.

Treatment #3- Grossly Symptomatic:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. If blood glucose level >300 mg/dL, establish IV/IO.
3. Cardiac monitor.
4. NS 500ml IVF bolus if no evidence of fluid overload (CHF, ESRD, HD). May repeat x 1, max of 1L.
5. Obtain repeat blood glucose after fluid bolus.
6. Notify receiving nurse.

Considerations
1. If ALOC, perform stroke screen. Go to protocol ANRO-01, if positive.
2. If having any chest discomfort perform a 12 ECG lead. If STEMI go to protocol ACAR-03.
3. It is imperative to rule out other causes of ALOC.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed **or** patient has atypical presentation.

# Hypoglycemia

Hypoglycemia is a condition caused by a very low level of blood glucose, your body's main energy source.

Definitions:

1. **Asymptomatic -** No symptoms or complaints related to blood glucose level. A/Ox4, GCS 15.
2. **Mildly Symptomatic -** Showing symptoms of hypoglycemia such as confusion, abnormal behavior or poor skin signs.
3. **Grossly Symptomatic -** Loss of consciousness or unconscious, seizure activity.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. An irregular heart rhythm.<br>2. Fatigue.<br>3. Pale skin.<br>4. Shakiness.<br>5. Anxiety.<br>6. Sweating.<br>7. Hunger.<br>8. Irritability.<br>9. Confusion.<br>10. Abnormal behavior.<br>11. Visual disturbances.<br>12. Blurred vision.<br>13. Seizures.<br>14. Loss of consciousness. | 1. Insulin dependent diabetes.<br>2. Non-insulin dependent diabetes.<br>3. Malnutrition.<br>4. Chronic renal disease.<br>5. Vomiting.<br><br>Home Meds:<br>1. Insulin.<br>2. Glucophage.<br>3. Metformin.<br>4. Januvia. | 1. CVA.<br>2. ETOH intoxication.<br>3. Overdose.<br>4. Shock.<br>5. Sepsis.<br>6. Adrenal Insufficiency.<br>7. Insulin OD.<br>8. Malfunction Insulin pump. |

# Hypoglycemia

1. Monitor SpO2.
2. Blood glucose level.

Treatment #1- Asymptomatic:
1. If blood glucose level <70 mg/dl with diabetes history, administer oral glucose.
2. If blood glucose level <70 mg/dl with **NO** diabetes history and **NO** symptoms **DO NOT** initiate IV or give dextrose solely for blood glucose level <70 mg/dL.
3. Notify receiving nurse.

Treatment #2- Mildly symptomatic with blood glucose level <70 mg/dL:
1. If SpO2 <94%, 1-6 LPM O2 via NC, titrate to 94%.
2. IV, NS, TKO.
3. Administer 25g of dextrose 50% IV, titrate to blood glucose above 70 mg/dL or 100ml of dextrose 10% IV, titrate to blood glucose >70 mg/dL.
4. Recheck blood glucose.
5. Notify receiving nurse.

Treatment #3- Grossly symptomatic with blood glucose level <70 mg/dL:
1. Cardiac monitor.
2. If SpO2 <94%, 1-15 LPM O2 via NC or NRB, titrate to 94%.
3. IV/IO, NS, TKO.
4. Administer 25g of dextrose 50%, IV/IO, titrate to blood glucose level >70 mg/dL or 100ml of dextrose 10% IV/IO, titrate to blood glucose level >70 mg/dl.
5. Recheck blood glucose level.
6. If dextrose 10% administered and blood glucose level remains <70 mg/dL and patient is still grossly symptomatic, administer 25g of D50%.
7. Notify receiving nurse.

Considerations
1. If ALOC continues after dextrose is given, perform stroke screen. Go to protocol ANRO-01, if positive.
2. If having any chest discomfort, consider a 12 ECG. If STEMI go to protocol ACAR-03.
3. Always assess for the presence of an insulin pump, and have patient turn off pump if hypoglycemic.

**IF PATIENT IS OBTUNDED WITH POOR IV ACCESS:**
1. Place semi-prone position.
2. Place glucose gel onto the end of a tongue depressor.
3. Spread glucose gel on the inside of the lower cheek (buccal area).
4. Promote maximal absorption of glucose product by massaging the outer lower cheek.
5. Continue this practice until the patient becomes able to control their airway.
6. Suction as necessary.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders as needed or patient has atypical presentation.

# New Onset Altered Level of Consciousness Unknown Etiology

A mildly depressed level of consciousness or alertness is described as listless. Someone in this state can be aroused with little difficulty. People who are obtunded have a more depressed level of consciousness and cannot be fully aroused. Those who are not able to be aroused from a sleep-like state are said to be stuporous.

Definitions:

1. **Stroke Screen-** Cincinnati Prehospital Stroke Scale.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment including skin signs and capillary refill.
   E. Stroke screen.
   F. GCS.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Evidence of trauma.<br>2. Fever.<br>3. Cough.<br>4. Fatigue.<br>5. Shakiness.<br>6. Skin color changes.<br>7. Snoring respirations. | 1. Recent fall.<br>2. Recent infections.<br>3. Change in medications.<br>4. Stopped medications.<br>5. Accidental overdose.<br>6. ETOH abuse.<br>7. Liver disease.<br><br>Home Meds<br>1. Blood thinners.<br>2. Lactulose.<br>3. Narcotics.<br>4. Parkinson medications. | 1. Alcohol intoxication.<br>2. Epilepsy.<br>3. Hypo/Hyperglycemia.<br>4. Over/Underdose of medications.<br>5. Trauma.<br>6. Sepsis.<br>7. Shock.<br>8. Behavioral.<br>9. CVA/TIA.<br>10. Hypoxia.<br>11. Meningitis/encephalitis.<br>12. Encephalopathy.<br>13. Hyponatremia.<br>14. Alzheimer's.<br>15. Parkinson's. |

# New Onset Altered Level of Consciousness Unknown Etiology

Treatment:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Monitor CO2 if history of asthma/COPD or using an advanced airway or BVM.
4. Check blood glucose level, if <70 mg/dL, see protocol ANRO-03.
5. Obtain 12 lead ECG. If STEMI see protocol ACAR-03.
6. Perform stroke screen, if positive, see protocol ANRO-01.

If presenting with serious signs and symptoms that do not fit into any other protocol:
7. IV, NS, TKO.
8. If no evidence of fluid overload, treat hypotension or tachycardia with NS 500ml IVF bolus. May repeat PRN, max 2L. Reassess lung sounds and SpO2 before each additional bolus.

Considerations
**DO NOT** initiate an IV for the presence ALOC alone, consider other causes:
1. **A**lcohol- Maintain airway as needed. If MAP < 60, see protocol ACAR-06.
2. **E**pilepsy- If postictal, maintain airway as needed. If seizing, see protocol ANRO-05.
3. **I**nsulin- If blood glucose level >70 mg/dL, see protocol ANRO-02. If blood glucose level <70 mg/dL, see protocol ANRO-03.
4. **O**verdose/ Underdose - See overdose protocols AODP-01 to 07. If no reversible causes and serious signs and symptoms, consider IV/IO.
5. **T**rauma- See protocol ATRA-01.
6. **I**nfection- See protocol AGEN-01.
7. **P**sychosis- This should be considered only after all other potential causes are ruled out.
8. **S**hock- See protocol ACAR-06.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

| EYE | | Verbal | | Motor | |
|---|---|---|---|---|---|
| 4 | Alert | 5 | Oriented | 6 | Spontaneous |
| 3 | Verbal | 4 | Confused | 5 | Follows Commands |
| 2 | Tactile | 3 | Inappropriate words | 4 | Localizes |
| 1 | None | 2 | Incomprehensible speech | 3 | Decorticate Posturing |
| | | 1 | None | 2 | Decerebrate Posturing |
| | | | | 1 | None |

# Seizures

A seizure is a sudden, uncontrolled electrical disturbance in the brain. It can cause changes in your behavior, movements, feelings, and in levels of consciousness. In the prehospital setting, our goal is the management of generalized seizure activity that may affect respiratory drive or airway patency.

Definitions:

1. **Tonic Seizures-** Tonic seizures cause stiffening of your muscles. These seizures usually affect muscles in your back, arms, and legs and may cause you to fall to the ground.
2. **Clonic Seizures-** Clonic seizures are associated with repeated or rhythmic, jerking muscle movements. These seizures usually affect the neck, face, and arms.
3. **Tonic-Clonic Seizures-** Tonic-Clonic seizures, previously known as grand mal seizures, are the most dramatic type of epileptic seizure and can cause an abrupt loss of consciousness, body stiffening, and shaking, and sometimes loss of bladder control or biting of the patient's tongue.
4. **Recurrent Seizure-** Witnessed by prehospital personnel to be seizing for >2 minutes **or** patient has two (2) seizures without regaining consciousness.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment including skin signs and capillary refill.
   E. Pupils.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Evidence of trauma.<br>2. Febrile state.<br>3. Current seizure activity.<br>4. Medical information tags, bracelets, or medallions. | 1. Recent infection.<br>2. Fever.<br>3. Trauma.<br>4. Environment (heat/cold).<br>5. Epilepsy.<br>6. Drug use / ETOH Abuse.<br><br>Home Meds:<br>1. Acetazolamide(Acetazolam).<br>2. Carbamazepine (Tegretol).<br>3. Clobazam (Frisium).<br>4. Clonazepam (Rivotril).<br>5. Diazepam (Valium).<br>6. Ethosuximide (Zarontin).<br>7. Gabapentin (Neurontin).<br>8. Lamotrigine (Lamictal).<br>9. INH (Kuniazid). | 1. CVA.<br>2. Meningitis / Encephalitis.<br>3. Intracranial hemorrhage.<br>4. Electrolyte imbalance.<br>5. Alcohol withdrawal.<br>6. VT/VF.<br>7. Overdose.<br>8. Metabolic acidosis.<br>9. Hyperthermia.<br>10. Hypoxia. |

# Seizures

1. Cardiac monitor.
2. O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Check blood glucose.
4. IV, NS, TKO.
5. For suspected hyperthermia, See protocol AENV-03.
6. If patient actively seizing, administer midazolam 5mg IV/IM/IO. May repeat in 5 minutes if seizure activity continues. Max dose 10mg.
7. Intranasal route is not preferred; however, if IV/IM/IO is not possible, may give midazolam 5mg IN (2.5mg each nares.) May repeat in 10 minutes if seizure activity continues. Max dose 10mg.

Considerations:

1. Protect patient from further injury e.g. move furniture and ensure safe area for treatment.
2. Spinal stabilization as indicated.
3. **DO NOT** forcibly restrain patient during seizure activity.
4. If narcotic overdose is suspected, refer to protocol AODP-06.
5. If eclampsia suspected, refer to protocol AOBG-02.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.
2. Make base contact for additional medication if seizures continue after maximum dose of midazolam.

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# Adult Environmental

# Allergic Reaction/Anaphylaxis

Allergic reactions occur when your immune system reacts to a foreign substance ranging from mild to severe.
Anaphylaxis is a severe, potentially life-threatening allergic reaction occurring within seconds or minutes of exposure.

Definitions:

1. **Mild-** Hives, rash to arms or legs, itching, anxiety.
2. **Moderate-** Hives, rash to torso, bronchospasm, nausea.
3. **Severe-** Respiratory distress, wheezing, chest tightness, difficulty swallowing, altered mental status.
4. **Anaphylactic shock-** Signs of hemodynamic instability, tachycardia, ALOC, hypotension, syncope.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment.
   E. Skin assessment.
   F. Lung sounds before and after treatment.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Sneezing.<br>2. Itching of the nose, eyes or roof of the mouth.<br>3. Runny, stuffy nose.<br>4. Swelling of the lips, tongue, face or throat.<br>5. Hives.<br>6. Edema at the sting site.<br>7. Cough, chest tightness, wheezing or shortness of breath.<br>8. Loss of consciousness.<br>9. A drop in BP.<br>10. Urticaria.<br>11. Lightheadedness.<br>12. A rapid, weak pulse.<br>13. Nausea and vomiting.<br>14. Abdominal pain. | 1. Known allergy.<br>2. Asthma.<br>3. Eczema.<br><br>Home Meds:<br>1. Epi-pen.<br>2. Diphenhydramine. | 1. Bronchospasms.<br>2. Gastroenteritis. |

# Allergic Reaction/Anaphylaxis

1. Monitor SpO2, if <94%, O2, 1-15 LPM, NC or NRB, titrate to 94%.
2. If wheezing albuterol 5mg/6ml NS nebulized, PRN.

Treatment #1- Mild reaction:
1. Diphenhydramine 50mg PO.

Treatment #2- Moderate reaction:
1. IV, NS, TKO.
2. Diphenhydramine 50mg PO/IV/IM.

Treatment #3- Severe reaction:
1. Cardiac monitor.
2. IV/IO, NS, TKO.
3. Epinephrine 0.3mg **1:1,000** IM in lateral thigh.
4. Diphenhydramine 50mg IM/IV/IO.
5. Consider CPAP for respiratory distress.

Treatment #4- Anaphylactic shock:
1. Cardiac monitor.
2. Establish large bore IV/IO, NS.
3. Epinephrine 0.3mg **1:1,000** IM, lateral thigh. Repeat x1 in 5 minutes, if symptoms not significantly improved.
4. Diphenhydramine 50mg IM/IV/IO.
5. Consider CPAP for respiratory distress.
6. If MAP < 60, without fluid overload (CHF, ESRD, HD), NS 500ml rapid IVF bolus, titrate to MAP > 60, max 2L.

If after 2L NS, MAP < 60
7. Epinephrine 10mcg **1:100,000** IV/IO, every 2 minutes, titrate to MAP > 60.

If patient becomes:
8. Unresponsive with pulses:
   A. Epinephrine drip infusion of 5mcg/min IV/IO.
9. Unresponsive with no pulses:
   B. Adult cardiac arrest protocol ACAR-04.

Considerations:
1. Attempt to identify allergen if it can be done **SAFELY**.
2. Remove allergen, if possible.
3. If patient has received an EpiPen prior to arrival and is asymptomatic administer diphenhydramine 50mg PO. If patient is mildly symptomatic, administer diphenhydramine 50mg IM/IV.
4. Consider 12 Lead ECG for any patient with possible cardiac history.

To make epinephrine **1:100,000**:
1. Mix 9ml NS with, 1ml of epinephrine **1:10,000.**

To make **epinephrine Infusion** with concentration of epinephrine 4mcg/ml:
1. Add 1mg of epinephrine **1:1,000** to 250ml NS.

Dosage = mcg/min, 60gtts/1ml drip set 5 mcg= **75 drops/min**

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Bites & Envenomation

Common poisonous spiders to the Central Valley are the Brown Widow (brown with orange hourglass on belly), Black Widow (black with red hourglass on body) spiders, and the Brown Recluse spider. The only known, indigenous poisonous snake in the Central Valley is the Rattlesnake.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Pain scale PRN.
   C. Physical assessment.
   D. Lung sounds.
   E. Skin signs and capillary refill.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Abrasions.<br>2. Punctures.<br>3. Swelling and edema.<br>4. Pain to site. | 1. Working on or around woodpiles or agriculture storage.<br>2. Hiking. | 1. Abscess.<br>2. Cellulitis.<br>3. Necrosis.<br>4. Necrotizing fasciitis.<br>5. Allergic reaction.<br>6. Anaphylaxis. |

# Bites & Envenomation

1. Ensure personal safety.
2. Clean and dress wound as appropriate.
3. Remove rings, watches, or other constricting items.

Treatment #1- Animal bite / Human bite:
1. For possible fracture, see protocol ATRA-01.
2. For complaint of pain, apply ice packs. If pain continues, provide pain management per protocol AGEN-03.

Treatment #2- Insect bite or sting:
1. Scrape away stinger if appropriate.
2. **DO NOT** squeeze venom sac.
3. If allergic reaction or anaphylaxis, see protocol AENV-01.
4. For complaint of pain, apply ice packs. If pain continues, provide pain management per protocol AGEN-03.
5. Consider cardiac monitor.
6. Consider monitoring SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.

Treatment #3- Snake bite:
1. AVOID excessive movement of extremity.
2. Circle erythema at puncture site with ink pen and note time.
3. Monitor distal pulses.
4. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
5. For complaint of pain, **DO NOT** apply ice packs. Provide pain management per protocol AGEN-03.
6. Consider cardiac monitor.

Considerations:
1. Do not apply constricting band or tourniquet.
2. Do not incise snakebites.
3. If dead or captured, have animal control transport snake for identification.
4. If safe, package insect or spider for transport and positive identification.
5. All bites (dog, cat, human, etc.) need to be transported for further evaluation at a hospital for further cleansing and potential antibiotic therapy.
6. Time since envenomation is important as anaphylaxis rarely occurs more than 60 minutes after inoculation.
7. Chemical ice packs should never be in direct contact with patient's skin. Chemical ice pack should be wrapped in towel or other fabric material.

## Base Hospital Orders

1. For known and confirmed black widow bite: calcium chloride 8mg/kg, IV/IO, MAX 500mg.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Hyperthermia

Hyperthermia is a condition caused by your body overheating, usually as a result of prolonged exposure to or physical exertion in high temperatures. This most serious form of heat injury, heatstroke, can occur if your body temperature rises to 104° F (40° C) or higher. The condition is most common in the summer months.

Definitions:

1. **Mildly Symptomatic-** Signs or heat cramps and heat exhaustion.
2. **Grossly Symptomatic-** Signs of heatstroke including ALOC or unconsciousness.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment with skin signs.
   E. Lung sounds.
   F. Temperature.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Headache.<br>2. Chest pain.<br>3. Cramps.<br>4. Nausea.<br>5. Weakness.<br>6. Abnormal temperature.<br><u>Heat cramps and heat exhaustion:</u><br>1. Temperature normal to slightly elevated.<br>2. Mental status alert to slightly confused.<br>3. Skin signs diaphoresis, warm or hot to touch.<br>4. Muscle cramps and weakness.<br><u>Heat stroke:</u><br>1. High core temperature usually above 104 F.<br>2. Altered mental status.<br>3. Skin hot to touch and flushed.<br>4. Possible seizure activity.<br>5. Low BP.<br>6. Tachycardia. | Note: Persons at greatest risk of hyperthermia are:<br>1. The elderly.<br>2. Athletes.<br>3. Persons on medications, which impair the body's ability to regulate heat. | 1. Always rule out other causes of ALOC.<br>2. Drug Induced hyperthermia.<br>3. Malignant hyperthermia.<br>4. Rhabdomyolysis.<br>5. Sepsis.<br>6. Serotonin syndrome. |

# Hyperthermia

1. Move patient to cool environment.
2. Remove excess clothing.

Treatment #1- Mildly symptomatic:

1. Spray or sprinkle patient's face with cool (not cold) water and use fan to evaporate.
2. Apply ice packs to palms of hands and soles of feet.
3. If able to swallow safely, cool water PO.
4. Consider IV, NS, TKO.
5. NS 500ml IVF bolus, IV. Hold fluids if evidence of fluid overload.

Treatment #2- Grossly symptomatic:

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Obtain blood glucose level.
4. Ice packs to palms of hands and soles of feet.
5. IV/IO, NS, TKO.
6. NS 500ml IVF bolus, IV, max 2L.
7. If seizing, see seizure protocol ANRO-05.

Considerations:

1. Chemical ice packs should never be in direct contact with patient's skin. Ice pack should be wrapped in towel or other fabric material.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Hypothermia

Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing dangerously low body temperatures. Normal body temperature is around 98.6° F (37° C). Hypothermia occurs as your body temperature falls below 95° F (35° C).

Definitions:

1. **Mildly symptomatic-** Signs and symptoms of hypothermia.
2. **Grossly symptomatic-** Signs and symptoms of hypothermia with ALOC, loss of consciousness or hypotension.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 10 minutes for stable patients
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 Lead ECG.
   B. Blood glucose level.
   C. Pain scale.
   D. Physical assessment.
3. Patient's body temperature.
4. Length of exposure.
5. Air temperature, water temperature.
6. Was patient wet or dry.
7. Time of mental status changes.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Shivering.<br>2. Slurred speech or mumbling.<br>3. Slow, shallow breathing.<br>4. Weak pulse.<br>5. Lack of coordination.<br>6. Drowsiness.<br>7. Confusion or memory loss.<br>8. Loss of consciousness.<br>9. Altered mental status.<br>10. Evidence of local cold injury-blanching, red or wax looking skin especially ears, nose and fingers, burning or numbness in affected areas.<br>11. Stuporous or comatose.<br>12. Dilated pupils.<br>13. Hypotensive or pulseless.<br>14. Slowed or absent respirations. | 1. Trauma.<br>2. Alcohol consumption.<br>3. Pre-existing medical problems. | 1. Rule out other causes for ALOC.<br>2. Myxedema (severe hypothyroid).<br>3. Sepsis.<br>4. Environmental exposure.<br>5. Adrenal Insufficiency. |

# Hypothermia

1. Move patient to warm environment.
2. Remove clothing if wet and cover with warm blankets.
3. Apply heat packs to groin and axilla.

Treatment #1- Mildly symptomatic:
1. Consider IV, NS, TKO.
2. Consider WARM NS 500ml IVF bolus. May repeat x1, max 1L.

Treatment #2- Grossly symptomatic:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Obtain blood glucose level, if <70 mg/dL, see protocol ANRO-03.
4. Consider 12 lead ECG.
5. IV/IO, NS, TKO.
6. WARM NS 500ml IVF bolus IV/IO, if not fluid overloaded. May repeat as needed, max 2L.

Considerations:
1. Do not attempt to thaw out frost bitten areas or apply heat packs to frostbite sites.
2. Chemical heat packs should never be in direct contact with patient's skin. Heat pack should be wrapped in towel or other fabric material.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Adult Trauma

# Trauma

Trauma can either be blunt or penetrating, open or closed, or any combination of all.

Definitions:

1. **Blunt Trauma-** Traumatic injury caused by a blunt object or surface.
2. **Penetrating-** Traumatic injury caused when an object enters the body.
3. **Open-** Traumatic injury with a break in the skin.
4. **Closed-** Traumatic injury without a break in the skin.
5. **TBSA-** Total Burn Surface Area.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level, if diabetic.
   C. Pain scale PRN.
   D. Medications such as blood thinners.
   E. Baseline GCS and GCS after treatment.
   F. Physical assessment including skin signs and capillary refill
   G. Lung sounds.
   H. Complete/Head to toe exam.

Objective Findings:

1. Mechanism of injury.
2. Medical history e.g. cardiovascular problems, diabetes, or seizure disorder
3. Check for DCAP-BTLS (Deformity, Contusion/Crepitus, Abrasion, Puncture, Bleeding, Tenderness, Laceration, Swelling).
4. Glasgow coma score.
5. Neurological impairment or focal deficit e.g. paralysis, weakness.
6. Eyes/vision e.g. pupil inequality and reactivity, eye tracking, impaired vision/double vision, stars.
7. Check for paradoxical chest wall movement (flail chest), rib cage, and sternal instability.
8. Check for pelvic instability, abdominal rigidity and guarding. Check for range of motion, distal pulses, sensation, skin color, and associated injuries.

## Trauma

1. Place in spinal motion restriction if indicated.
2. See injury specific guidelines.
3. If bleeding, see injury specific guidelines.

Treatment #1- Symptomatic:
1. Monitor SpO2, if <94%, 1-15 LPM via NC or NRB, titrate to 94%.
2. Consider treating for pain. See protocol AGEN-03.

If loss of consciousness:
3. Obtain blood glucose level. If <70 mg/dL, see protocol ANRO-03.
4. Consider stroke screen. If positive, see protocol ANRO-01.

If chest pain:
5. Cardiac monitor.
6. Consider 12 lead ECG. Obtain if concern for medical emergency caused traumatic event or blunt trauma to chest.

Treatment #2- Grossly symptomatic or signs of shock:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Consider treating for pain. See protocol AGEN-03.

If loss of consciousness or ALOC:
4. Obtain blood glucose level. If <70 mg/dL, see protocol ANRO-03.
5. Consider stroke screen. If positive, see protocol ANRO-01.

If chest injury:
6. Consider 12 lead ECG. Obtain if concern for medical emergency caused traumatic event or blunt trauma to chest.
7. Large bore IV x2, NS, TKO.
8. If SBP <90, NS 500ml rapid IVF bolus. Titrate to SBP >90, max of 1L.

For blunt or penetrating trauma to the torso:
9. 2 gm TXA IV/IO over 1 minute or infusion in 100ml NS over 10 min.

Considerations:
1. If brain injury is suspected, elevate the head of the patient as long as no signs of shock are present.
2. Head injured patients that require intubation (No gag reflex and cannot protect own airway AAIR-01) if time allows, pre-medicate head injured patients with fentanyl 2 mcg/kg IVP/IO prior to intubation.
3. Traumatic brain patients are especially sensitive to hypotension and hypoxia.
4. Transport patient in position of comfort if not in spinal precautions. Place pregnant patients in left lateral recumbent position.
5. If concern for spinal cord injury, patient should be laid flat. If patient is without thoracic or lumbar tenderness, may be placed in semi-fowler position no greater than 30 degrees.
6. All patients with a period of unconsciousness should be transported to an emergency department for evaluation.
7. If patient meets Trauma Triage Criteria, transport to approved trauma center.
8. Scene time should be **LESS THAN 10 MINUTES.**

### Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Injury Specific Guidelines

## Trauma: Injury Specific Treatments

| Treatment for Bleeding Control | Treatment Considerations |
|---|---|
| 1. Direct pressure.<br>2. If unable to control with direct pressure alone, use hemostatic dressing on wound and pack wound if applicable.<br>3. Elevate extremity.<br>4. If bleeding is still not controlled, apply tourniquet. | 1. Secure tourniquets as high on arm or leg as possible.<br>2. Note time of placement.<br>3. Do not apply bulky dressing to wounds as they can hide bleeding. |
| **Treatment for Eye Injury** | **Treatment Considerations** |
| 1. Apply dressing as appropriate.<br>2. Loosely cover affected and unaffected eye. | 1. **DO NOT** attempt to re-insert eye. |
| **Treatment for Tooth Injury** | **Treatment Considerations** |
| 1. Keep avulsed teeth in saline soaked gauze.<br>**OR**<br>2. Commercial tooth saver kit.<br>3. Transport tooth with patient. | 1. **DO NOT** attempt to re-insert teeth.<br>2. **DO NOT** attempt to remove partially avulsed teeth. |
| **Treatment for Mandible Fracture** | **Treatment Considerations** |
| 1. Splint with cravat or bandage. | 1. Monitor airway for compromise or difficulty breathing. |
| **Treatment for Impaled Object** | **Treatment Considerations** |
| 1. Stabilize with large bulky dressings.<br>2. Leave in place. | 1. Removal of impaled objects should only be considered if object interferes with CPR or airway cannot be managed.<br>2. Consider base contact for consult. |
| **Treatment for Flail Chest** | **Treatment Considerations** |
| 1. Stabilize chest with large bulky dressing. | 1. Observe for tension pneumothorax. |
| **Treatment for Open Chest Wound** | **Treatment Considerations** |
| 1. Cover wound with loose dressing, **DO NOT** seal.<br><br>Sucking chest wounds:<br>2. Immediately cover with gloved hand.<br>3. Cover with occlusive dressing taped on three sides<br>**OR**<br>4. Use commercially available chest seal. | 1. Continuously monitor patient for tension pneumothorax.<br>2. Attempt to “burp” the wound by removing occlusive dressing, allowing air to escape and then recovering the wound, prior to needle decompression. |
| **Treatment for Tension Pneumothorax** | **Treatment Considerations** |
| 1. Perform needle decompression:<br>A. 2nd or 3rd Intercostal space at midclavicular line. | 1. Tension pneumothorax occurs when a patient has:<br>A. Absent or decreased lung sounds.<br>B. Difficulty breathing.<br>C. Hypotension. |

| Trauma: Injury Specific Treatments | |
|---|---|
| Treatment for Cardiac Tamponade | Treatment Considerations |
| 1. Cardiac monitor.<br>2. 12 Lead ECG.<br>3. If SBP <90, NS 500ml rapid IVF bolus. Titrate to SBP >90, max of 1L. | |
| Treatment for Cardiac Contusion | Treatment Considerations |
| 1. Cardiac monitor for dysrhythmias.<br>A. V-Tach- see protocol ACAR-09.<br>2. Obtain 12 lead ECG. | 1. Consider 12 lead with blunt chest trauma. |
| Treatment for Evisceration of Organs | Treatment Considerations |
| 1. Cover eviscerated organs with saline soaked gauze. | 1. Frequently assess gauze for dryness and add additional saline if needed.<br>2. **DO NOT** attempt to reinsert organs. |
| Treatment for Genital Injuries | Treatment Considerations |
| 1. Cover genitalia with saline soaked gauze. | 1. If necessary, apply direct pressure to control bleeding.<br>2. Treat amputation as extremity amputation. |
| Treatment for extremity Injuries | Treatment Considerations |
| 1. Check for range of motion, distal pulses, sensation, skin color, and associated injuries.<br>2. Elevate extremity.<br>3. Apply cold packs to reduce pain and decrease soft tissue swelling.<br>4. Splint injured extremity in position found unless precluded by extrication consideration, no palpable pulses, or patient discomfort. | 1. Pad all splinted extremities and recheck distal pulses and neurological function every 5 minutes.<br>2. Do not apply traction or attempt to reduce an open extremity fracture. |
| Treatment for Mid Shaft Femur Fracture | Treatment Considerations |
| 1. Apply traction splint. | 1. Closed mid shaft only. |
| Treatment for Extremity Amputation | Treatment Considerations |
| 1. Place or cover amputated part with dry sterile dressing.<br>2. Place in sealed plastic bag or wrap with plastic.<br>3. Place dressed and wrapped part on top of ice or cold pack. | 1. If patient condition allows transport amputated part with patient. |
| Treatment for Soft Tissue Injuries without serious bleeding | Treatment Considerations |
| 1. Cover open wounds with sterile dressings. | |

# Trauma: Injury Specific Treatments

| Treatment for Burns | Treatment Considerations |
|---|---|

1. Remove clothing from burned area if possible without removing skin.
2. Calculate TBSA using rule of nines.
3. Patients with respiratory distress see protocol ARSP-01 to 03.
4. Consider treating for pain. See protocol AGEN-03.

If <20% TBSA:

5. Estimate depth of burn (full thickness, partial thickness, surface burn).
6. Cover with sterile dressing soaked with sterile water.

If >20% TBSA:

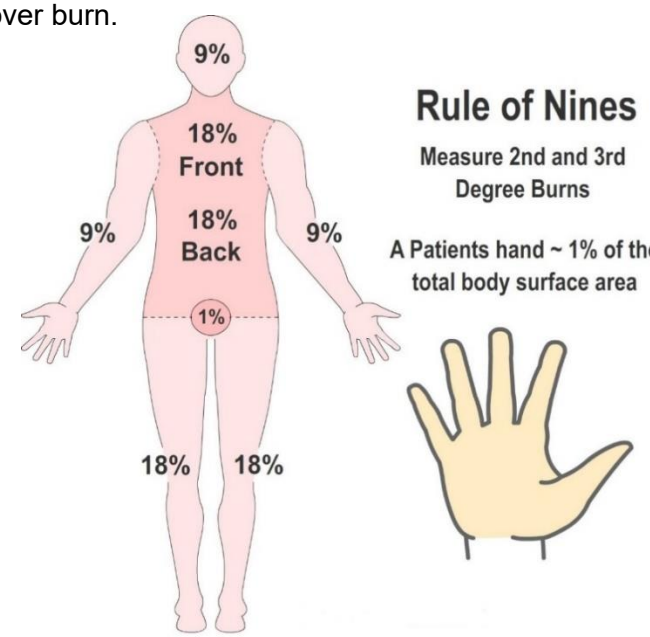
7. Cover with dry sterile burn sheet or cleanest dry sheet.
8. Place patient on dry sterile burn sheet for transport.
9. IV x2, NS, WO, titrate to Parkland Formula.

**Chemical:**

1. Follow appropriate decontamination or hazmat procedures.
2. Brush off dry powders.
3. Remove contaminated clothing.
4. Irrigate with copious amounts of water.

**Thermal and electrical:**

1. Stop the burning process.
2. Cool with water for up to thirty (30) minutes, **DO NOT DELAY** transport to approved trauma center.
3. Remove jewelry and non-adhered clothing.
4. Cover burn.




1. Always attempt to identify type and source of burn:
   A. Chemical.
   B. Electrical.
   C. Steam.
   D. Smoke.
   E. Open flame.

**Parkland Formula**

4 ml x %TBSA x body weight (kg) = Total for 24 hours.
50% given in first eight hours;
50% given in next 16 hours.

**Chemical:**

1. **DO NOT** attempt to remove tar or other adhered material.
2. If possible, bring chemical Safety Data Sheet (S DS) with patient to hospital.

**Thermal and electrical:**

1. Avoid prolonged cool water usage due to risk for hypothermia and local cold injury.
2. **DO NOT** use ice water or apply ice or ice packs to patient.
3. **DO NOT** break blisters.

# Traumatic Arrest

Loss of cardiac and pulmonary function due to traumatic event.

Definitions:

1. High quality CPR - Use TEAM approach:
   A. 100 to 120 compressions per minute.
   B. **30:2** ratio compression to ventilation ratio.
   C. Compress at least 2 inches.
   D. Allow complete recoil.
   E. Minimize interruptions.
   F. Rotate compressors every 2 minutes.
   G. Pre-charge monitor for defibrillation while CPR is in progress.

Documentation Standards:

1. Every 5 minutes:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   1. Capnography.
   2. Blood glucose.
   3. Physical assessment.

Objective Findings:

Obtain patient history and document the following:

1. Estimated down time.
2. Quickly assess for obvious signs of death:
   A. Decapitation.
   B. Decomposition.
   C. Burnt beyond recognition.
   D. Lividity.
   E. Rigor mortis.
3. Circumstances surrounding the arrest:
   A. Onset (witnessed or unwitnessed).
   B. Preceding symptoms.
   C. Bystander CPR.
   D. Medications.
   E. Environmental factors (hypothermia, inhalation, and asphyxiation).

# Traumatic Arrest

- Is there obvious signs of death per EMS Policy No. 5103, or,
- Unwitnessed arrest by First Responder with estimated transport time of more than 20 minutes to the approved trauma center,
  **AND**
  ECG rhythm is PEA less than 40 bpm or asystole.

NO → **INITIATE IMMEDIATE TRANSPORT** to approved trauma center.

YES → **CEASE EFFORTS**

Treatment- Treat reversible causes upon identification

**Reversible Causes:**

1. **Hypovolemia-** (History suggesting volume depletion) NS 2L IVF bolus, start 2nd IV.
2. **Hypoxia-** (SpO2 <94%) Maintain ventilations at 24/min, with 100% O2, BVM & OPA. Intubate if CL of 1 or 2, supraglottic airway if CL >3.
3. **Hydrogen Ion-** (Acidosis, crush patient, long down time, dialysis patient) Sodium Bicarbonate 1mEq/kg IV/IO.
4. **Hypoglycemia**- (Blood glucose level <70 mg/dL) Dextrose 10% 10ml/kg IV/IO or Dextrose 50% 25g IV/IO.
5. **Hypocalcemia-** (Long down time, crush injury, dialysis patient) Calcium Chloride 500mg 10% IV/IO.
6. **Hyperkalemia-** (Long down time, crush injury, dialysis patient) Sodium Bicarbonate 1mEq/kg IV/IO.
7. **Hypothermia-** (Body temp below 34°C) Active rewarming with warm IV/IO fluids, start IV if possible, hot packs to neck and groin.
8. **Tension Pneumothorax-** (Absent lung sounds on affected side) Needle decompression.
9. **Tamponade, Cardiac-** If SBP <90, lung sounds are clear and no fluid restrictions exist: NS 2L IVF Bolus, start 2nd IV.
10. **Toxins-** See protocol AODP-01 to 07.
11. **Thrombosis, Pulmonary & Coronary-**
12. **Torsade's De Pointes-** Magnesium Sulfate 2g IV/IO.

Considerations:

1. The goal is high quality CPR.
2. **DO NOT** delay vascular access with IV attempts. Go directly to IO if IV is not established after first attempt.
3. Monitor capnography with BVM & OPA.
4. Oral tracheal intubation should be used as the definitive airway for CL scores of 1 & 2.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed **or** patient has atypical presentation.

# Traumatic Arrest

## Algorithm - Immediate Transport

**Transport**

**To approved Trauma Center.**
**Perform ALL treatment enroute.**

1. 200 compressions.
2. OPA & BVM at 24/min.
3. Bilateral needle decompression unless isolated head injury.
4. IO/IV
5. NS, Max 2L & 2G TXA IV/IO over 1 min or infusion in 100ml NS over 10 min.
6. Consider advanced airway.

2 Min

Rhythm check #1

V-Fib/V-Tach | Asystole/PEA | ROSC

Shock 200Joules.

1. 200 compressions.

See ROSC protocol ATRA-01.

2 Min

Rhythm check #2

V-Fib/V-Tach | Asystole/PEA | ROSC

Shock 200Joules.

1. 200 compressions.

See ROSC protocol ATRA-01.

1. 200 compressions.
2. Lidocaine 1mg/kg IV/IO, No Repeat.

2 Min

Return to Rhythm check #1

**All Joules-** are in Biphasic, Use of equivalent Monophasic dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single

Always consider reversible causes and treat when identified.

2 Min

# Traumatic Arrest

## Treatment - Immediate Transport

If patient meets criteria for Immediate Transport, begin transport to approved Trauma Center. Perform ALL treatment enroute. (0 min of CPR):

1. Start CPR at 100-120 compressions per minute.
2. Insert OPA.
3. Ventilate with BVM at 24 per minute.
4. Perform bilateral needle decompression unless isolated head injury.
5. IV/IO, X2
6. NS, Max 2 L & 2G TXA, IV/IO over 1 min or infusion in 100ml NS over 10 min.
7. Consider advanced airways.

If after 200 compressions, (2 min of CPR):

1. **ROSC-** Initiate transport if not already transporting, see ROSC protocol ATRA-01.
2. **Asystole/PEA-**
   A. Continue CPR.
3. **VFib/VTach-**
   A. Continue CPR.
   B. Shock at 200 joules (or manufacturer's recommendation).

If after additional 200 compressions, (4 min of CPR):

1. **ROSC-** Initiate transport if not already transporting, see ROSC protocol ATRA-01.
2. **Asystole/PEA-**
   A. Continue CPR
3. **VFib/VTach-**
   A. Shock at 200 joules (or manufacturer's recommendation).
   B. Continue CPR.
   C. Lidocaine 1mg/kg IV/IO, once. No repeat.

Always consider reversible causes and treat when identified.

Considerations:
When mechanism of injury does not correlate with clinical condition, suggesting a non-traumatic cause of cardiac arrest, standard resuscitation measures should be followed. See ACAR-04, p. 36.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Obstetrical

# Childbirth

Childbirth, the process of delivering a baby and the placenta, membranes, and umbilical cord. During the first stage of labor, the cervix dilates fully. The first stage of labor is divided into two phases: the latent phase and the active phase. In the latent phase, contractions become progressively more coordinated and the cervix dilates. The latent phase averages about 8 hours for a nullipara (a woman having her first baby) and 5 hours for a multipara (a woman having a subsequent baby). In the active phase, the presenting part of the baby descends into the mid pelvis. The active phase averages about 5 hours for a nullipara and 2 hours for a multipara. In the second stage (which is called expulsion), the baby moves out through the cervix and vagina to be born. Expulsion generally lasts 2 hours for a nullipara and 1 hour for a multipara. The third stage of labor begins with the delivery of the baby and ends when the placenta and membranes are expelled.

Definitions:

1. **Imminent delivery-** Means regular contractions, bloody show, low back pain, feels like bearing down, crowning.
2. **Breech presentation-** Means presentation of buttocks or both feet.
3. **Limb presentation-** Means presentation of a single extremity.
4. **Nuchal cord-** Condition where the umbilical cord is around the baby's neck during delivery.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. SpO2.
   B. Blood glucose level PRN.
   C. Pain scale PRN.
   D. Physical assessment.
3. Last menstrual period and possibility of pregnancy.
4. Weeks of pregnancy, estimated due date, any anticipated problems (e.g. pre-eclampsia, lack of prenatal care, expected multiple births).
5. Presence of contractions, cramps, or discomfort.
6. Pertinent past medical history.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Crowning.<br>2. Bleeding.<br>3. Abdominal pain.<br>4. Contractions. | 1. Pregnant.<br>2. Eclampsia.<br>3. Pre-eclampsia.<br>4. Multiple birth.<br>Home Meds<br>1. Pre-natal vitamins.<br>2. Magnesium Sulfate. | 1. Spontaneous abortion.<br>2. Complicated breech delivery.<br>3. Braxton's Hicks contractions.<br>4. Premature ruptured membranes. |

**APGAR Scale**

| | 0 Points | 1 Point | 2 Points |
|---|---|---|---|
| **Appearance** | Cyanotic/pale all over | Peripheral cyanosis only | Pink |
| **Pulse** | 0 | <100 | >100 |
| **Grimace** | No response to stimulus | Weak cry or movement when stimulated | Cry when stimulated |
| **Activity** | Floppy | Some flexion | Well flexed and resisting extension |
| **Respirations** | Apneic | Slow or irregular respirations | Strong cry |

## Childbirth

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. IV, NS, TKO when possible.

Treatment #1- Normal Delivery:

1. For imminent delivery, assist mother with delivery, using clean preferably sterile technique:
   A. Control and guide delivery of head and shoulders.
   B. Once delivered, wipe face with clean dry cloth, suction only if needed.
   C. Assess APGAR.
   D. Clamp and cut cord.
   E. Dry and warm neonate.
2. If neonatal resuscitation is needed, see protocol PCAR-01.
3. Perform fundal massage and delivery placenta.
4. Continue to protocol AOBG-04, for further post-partum care.

Treatment #2- Nuchal Cord:

1. Attempt to gently slide cord over baby's head.
2. If cord is tight, clamp and cut cord.

Treatment #3- Breech Delivery:

1. If breech is two feet or buttocks, attempt to deliver as normal delivery.
2. If unable to delivery or other breech types:
   A. Place a gloved hand into the birthing canal to relive pressure on umbilical cord.
   B. Transport.
   C. Place mother in left lateral recumbent.

Treatment #4- Prolapsed Cord:

1. Place in Trendelenburg position.
2. Elevate hips with pillow.
3. If cord has a pulse, cover cord with saline soaked gauze.
4. If cord has no pulse, place a gloved hand into the birthing canal to relive pressure on cord.

Considerations:

1. If undeliverable breech, transport immediately.
2. If prolapsed cord has no pulse, transport immediately.
3. Always assess mother for signs of shock and treat accordingly to protocol AOBG-04.
4. First priority in childbirth is assisting mother with delivery of child.
5. The primary complication of the newborn is hypothermia which can occur in minutes.
6. Ensure newborn is warm and dry.
7. Ensure newborn has a clear airway. Suction with bulb syringe as needed.
8. Keep baby at or below the level of the mother's heart until cord is clamped.
9. Do not pull on the umbilical cord.
10. Consider transport while waiting for placenta to deliver.

### Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Eclampsia & Preeclampsia

Preeclampsia and Eclampsia are diseases of pregnancy that involve the development or worsening of high blood pressure during the second half of pregnancy. Pre-eclampsia may develop into the more severe condition eclampsia. Eclampsia includes symptoms of preeclampsia, along with seizures. These conditions typically occur after 20 weeks of pregnancy. They also may develop shortly after delivery. In very rare situations, they occur before 20 weeks of pregnancy.

## Definitions:

1. **Severe Preeclampsia-** means pregnancy 20 weeks or greater with hypertension (SBP >140, diastolic >90), **WITHOUT** change in mental status, visual disturbances, and/or peripheral edema.
2. **Eclampsia-** means pregnancy 20 weeks or greater with seizures, change in mental status, and/or coma, and typically but not always hypertension (SBP >140, diastolic >90).
3. **Post-partum eclampsia-** means within 6 weeks post-partum hypertension (SBP >140, diastolic >90), **WITH** change in mental status, visual disturbances, peripheral edema, seizures, and/or coma.
4. **Gravid fundus-** Is a pregnant uterus with obvious signs of anatomical changes related to pregnancy.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale PRN.
   D. Physical assessment.
3. Last menstrual period and possibility of pregnancy.
4. Duration and amount of any bleeding.
5. Weeks of pregnancy, estimated due date, any anticipated problems (e.g. pre-eclampsia, lack of prenatal care, expected multiple births).
6. Presence of contractions, cramps, or discomfort.
7. Pertinent past medical history
8. Estimated blood loss.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Spontaneous abortion or passage of products of conception.<br>2. Headaches, blurred vision.<br>3. Severe abdominal cramps or sharp abdominal pain.<br>4. Crowning.<br>5. Painful vaginal bleeding.<br>6. Painless vaginal bleeding. | 1. Eclampsia.<br>2. Preeclampsia.<br>3. Multiple Birth.<br>4. Eclampsia or Preeclampsia with previous pregnancies.<br>5. Gestational hypertension.<br><br>Home Meds<br>1. Prenatal Vitamins.<br>2. Magnesium Sulfate. | 1. Eclampsia.<br>2. Preeclampsia.<br>3. Placenta previa.<br>4. Placenta abruption.<br>5. Intra cranial hemorrhage. |

# Eclampsia & Pre-eclampsia

1. Cardiac monitor.
2. Monitor SpO2, if <94%, 1-15 LPM O2 via NC or NRB, titrate to 94%.
3. IV, NS, TKO.

Treatment #1- Eclampsia:
1. Obtain blood glucose level, if <70 mg/dL, see protocol ANRO-03.
2. If seizing (regardless of BP), Magnesium Sulfate 2g IV in 250 ml NS, infusion over 10 minutes.
3. Initiate transport during infusion.
4. If seizure continues after Magnesium Sulfate, see base hospital order below.
5. If seizures continue after 10 minutes, see seizure protocol ANRO-05.
6. For ALOC or visual disturbances, make base hospital contact for Magnesium Sulfate.

Treatment #2- Preeclampsia:
1. Obtain blood glucose level, if <70 mg/dL, see protocol ANRO-03.

Considerations:
1. Transport pregnant patients with Eclampsia or Preeclampsia to closest OB receiving facility.
2. If patient presents in the third trimester or is obviously pregnant, place in left lateral recumbent position.
3. Do not visualize genital region except for known or suspected active bleeding, severe trauma to region or active labor.
4. When possible, have a care giver of same gender as the patient perform evaluations of the pelvis/genital area.

## Base Hospital Orders

If ALOC and SBP >140:
1. Magnesium Sulfate 2-4g IV over 10 minutes.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

If seizure continues after initial 2 G
1. Additional 2 G IV over 10 minutes

# Obstetrical Emergencies

The first principles of dealing with obstetric emergencies are the same as for any emergency (see to the airway, breathing, and circulation), but remember that in obstetrics there are two patients; the fetus is very vulnerable to maternal hypoxia.

## Definitions:

1. **High risk obstetrical-** means a pregnancy in which some condition puts the mother, the developing fetus, or both at higher than normal risk for complications during or after the pregnancy and birth.
2. **Placenta Previa-** Bright red vaginal bleeding without pain during the second half of pregnancy is the main sign of placenta previa. Some women also have contractions.
3. **Placenta Abruptio-** Bright red vaginal bleeding with complaints of back or abdominal pain. Patient may also experience contractions or firmness and rigidity to abdomen.
4. **Spontaneous abortion-** Loss of a fetus before the 20th week of pregnancy. May have vaginal bleeding or passage of fetal tissue, severe cramps, abdominal pain or bleeding that progress from light to heavy.
5. **Ectopic pregnancy-** Implantation of a fertilized egg outside the uterus. May have severe abdominal pain, abnormal vaginal bleeding, nausea and or vomiting.
6. **Gravid fundus-** Is a pregnant uterus with obvious signs of anatomical changes related to pregnancy.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. SpO2.
   C. Blood glucose level PRN.
   D. Pain scale PRN.
   E. Physical assessment.
3. Last menstrual period and possibility of pregnancy.
4. Duration and amount of any bleeding.
5. Weeks of pregnancy, estimated due date, any anticipated problems (e.g. pre-eclampsia, lack of prenatal care, expected multiple births).
6. Presence of contractions, cramps, or discomfort.
7. Pertinent past medical history.
8. Estimated blood loss.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Spontaneous abortion has passage of products of conception.<br>2. Headaches, blurred vision.<br>3. Severe abdominal cramps or sharp abdominal pain.<br>4. Crowning.<br>5. Painful vaginal bleeding.<br>6. Painless vaginal bleeding. | 1. Eclampsia.<br>2. Preeclampsia.<br>3. Multiple Birth.<br><br>Home Meds<br>1. Prenatal Vitamins.<br>2. Magnesium Sulfate. | 1. Eclampsia.<br>2. Preeclampsia.<br>3. Placenta Previa.<br>4. Placenta abruptio. |

# Obstetrical Emergencies

1. Cardiac monitor.
2. Monitor SpO2

Treatment #1- Pregnant without shock:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. If in 3rd trimester and bleeding, establish IV.

IV, NS, TKO.

Treatment #2- Pregnant with shock:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. IV, NS, TKO.
3. If MAP < 60 without evidence of fluid overload, give NS 500ml rapid IVF bolus, may repeat to a max 2L.
4. If MAP < 60with fluid overload, give NS 250ml rapid IVF bolus, may repeat to a max 1L.
5. Consider 2nd IV for refractory hypotension.

Considerations:
1. If patient presents with gravid fundus, place in left lateral recumbent position.
2. Do not visualize genital region except for known or suspected active bleeding, severe trauma to region or active labor.
3. For active bleeding, place bulky dressing externally to absorb blood flow.
4. Do not pack vagina with any material, use external dressings only.
5. When possible, have a care giver of same gender as the patient perform evaluations of the pelvis/genital area.

**Base Hospital Orders**

Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Postpartum Care

Postpartum emergencies can include headache, eclampsia, infection, heart failure, and hypertension. Failure to recognize and treat these conditions can lead to disastrous consequences for the patient, including stroke, permanent brain damage, or death.

## Definitions:

1. **Postpartum bleeding-** Causes of postpartum bleeding include loss of tone in the uterine muscles, a bleeding disorder, or the placenta failing to come out completely, or tearing. Symptoms include vaginal bleeding that doesn't slow or stop.
2. **Perineal trauma-** Vaginal tears during childbirth, also called perineal lacerations or tears, occur when the baby's head is coming through the vaginal opening and is either too large for the vagina to stretch around or the head is a normal size but the vagina doesn't stretch easily. These kinds of tears are relatively common and may or may not have significant bleeding.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. SpO2.
   C. Blood glucose level.
   D. Pain scale.
   E. Physical assessment.
3. Last menstrual period and possibility of pregnancy.
4. Duration and amount of any bleeding.
5. Weeks of pregnancy, estimated due date, any anticipated problems (e.g. pre-eclampsia, lack of prenatal care, expected multiple births).
6. Presence of contractions, cramps, or discomfort.
7. Pertinent past medical history.
8. Estimated blood loss.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Spontaneous abortion has passage of products of conception.<br>2. Headaches, blurred vision.<br>3. Severe abdominal cramps or sharp abdominal pain.<br>4. Crowning.<br>5. Painful vaginal bleeding.<br>6. Painless vaginal bleeding. | 1. Eclampsia.<br>2. Preeclampsia.<br>3. Multiple Birth.<br><br>Home Meds<br>1. Prenatal Vitamins.<br>2. Magnesium Sulfate. | 1. Eclampsia.<br>2. Preeclampsia.<br>3. Placenta previa.<br>4. Placenta abruptio. |

# Post-partum Care

1. Cardiac monitor.
2. Monitor SpO2.

Treatment #1- Postpartum without shock:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Perform fundal massage if bleeding or cramping.
3. Control external bleeding with large bulky dressing.
4. Put infant to breast (as appropriate).
5. For seizure activity see Eclampsia protocol AOBG-02.

Treatment #2- Postpartum with shock:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Perform fundal massage If bleeding or cramping.
3. Put infant to breast (as appropriate).
4. Control external bleeding with large bulky dressing.
5. IV, NS, TKO.
6. If MAP < 60 without fluid overload, NS 500ml rapid IVF bolus. May repeat to max 2L.
7. If MAP < 60 with signs of fluid overload, NS 250ml rapid IVF bolus. May repeat to max 1L.
8. Consider 2nd IV.
9. For persistent hypotension, **AVOID** push dose epinephrine. Contact base hospital.
10. For seizure activity see protocol ANRO-05.

Considerations:
1. Do not visualize genital region except for known or suspected active bleeding, or severe trauma to region.
2. For active bleeding, place bulky dressing externally to absorb blood flow.
3. Do not pack vagina with any material, use external dressings only.
4. When possible, have a caregiver of same gender as the patient perform evaluations of the pelvis/genital area.

## Base Hospital Orders

1. If after 1L, NS if MAP < 60, consult base hospital to discuss push dose epinephrine.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Adult Overdose

# Acute Dystonic Reactions

Acute dystonic reactions are an extrapyramidal side effect of antipsychotic and certain other medications such as Phenothiazines. Dystonia refers to sustained muscle contractions, frequently causing twisting, repetitive movements, or abnormal postures. They may affect any part of the body. Patients experiencing acute dystonic reactions are often frightened and fearful, and may be in considerable pain.

Definitions:

1. **Symptomatic/Mild Reaction-** Intermittent spasms or sustained involuntary contractions isolated to extremities, tongue or jaw.
2. **Grossly Symptomatic/Severe Reaction-** Intermittent spasms or sustained involuntary contractions affecting back or entire body.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose level.
   D. Pain scale.
   E. Physical assessment.
3. Name of medication.
4. Estimated number of pills or dose.
5. Route of administration.
6. Time of administration.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Inability to move eyes.<br>2. Muscle spasms of face, neck, body, arms, or legs causing unusual postures or unusual expressions on face.<br>3. Rapid or worm-like movements of tongue.<br>4. Sticking out of tongue.<br>5. Tic-like or twitching movements.<br>6. Trouble in breathing, speaking, or swallowing.<br>7. Uncontrolled chewing movements.<br>8. Uncontrolled movements of arms or legs.<br>9. Uncontrolled twisting movements of neck, trunk, arms, or leg. | 1. Abdominal pain.<br>2. Nausea and vomiting.<br>3. Bipolar disorder.<br>4. Schizophrenia.<br><br><u>Common Med Names</u><br>1. Prochlorperazine (Compazine, Compro, Procomp).<br>2. Chlorpromazine (Promapar, Thorazine).<br>3. Fluphenazine (Permitil, Prolixin).<br>4. Perphenazine.<br>5. Trifluoperazine (Stelazine).<br>6. Thioridazine (Mellaril). | 1. Seizure. |

# Acute Dystonic Reactions

Treatment #1- Symptomatic/Mild Reaction:
1. Consider IV, NS, TKO.
2. If able to swallow safely, diphenhydramine 50 mg PO.
3. If **UNABLE** to swallow safely, diphenhydramine 1mg/kg IM/IV, max of 50mg.

Treatment #2- Grossly Symptomatic/Severe Reaction:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. IV, NS, TKO.
4. Diphenhydramine 1mg/kg IV/IO, max of 50mg.

Considerations:
1. If benzodiazepines have already been administered to treat seizures, **DO NOT** withhold Diphenhydramine.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Beta Blockers Overdose

Beta blockers, also known as beta-adrenergic blocking agents, are medications that are commonly used to reduce BP. Beta blockers work by blocking the effects of the adrenaline.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibility of beta blocker overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals beta blocker overdose and patient is showing signs and symptoms including bradycardia, hypotension, hypothermia, hypoglycemia, seizures.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale.
   D. Physical assessment.
   E. Pupils.
3. Name of medication.
4. Estimated number of pills or liquid.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Hypotension.<br>2. Bradycardia.<br>3. AV block.<br>4. Heart failure.<br>5. Bronchospasm.<br>6. Hypoglycaemia.<br>7. Hyperkalaemia.<br>8. Stupor.<br>9. Coma.<br>10. Seizures. | 1. High BP.<br>2. Irregular heart rhythm (arrhythmia).<br>3. Heart failure.<br>4. Chest pain (angina).<br>5. Heart attacks.<br>6. Migraine.<br>7. Certain types of tremors.<br><br>Home Meds:<br>1. Acebutolol (Sectral).<br>2. Atenolol (Tenormin).<br>3. Bisoprolol (Zebeta).<br>4. Metoprolol (Lopressor, Toprol-XL).<br>5. Nadolol (Corgard).<br>6. Nebivolol (Bystolic).<br>7. Propranolol (Inderal LA, InnoPran XL). | 1. Co-ingestion.<br>2. Calcium channel blocker OD.<br>3. Digoxin toxicity.<br>4. Complete heart block.<br>5. Renal failure. |

# Beta Blockers Overdose

1. Cardiac monitor.
2. 12 lead ECG.
3. Monitor SpO2.

Treatment #1- Asymptomatic:
1. If SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Consider, IV, NS, TKO.
3. Blood glucose level every 30 minutes.
4. If blood glucose level <70 mg/dL, see Hypoglycemia protocol ANRO-03.
5. If MAP < 60, NS 500ml IVF bolus, max 1L. Notify receiving hospital of hypotension.

Treatment #2- Symptomatic:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. IV, NS, TKO.
3. Blood glucose level every 15 minutes.
4. If blood glucose level <70 mg/dL, see hypoglycemia protocol ANRO-03.
5. MAP < 60without fluid overload or history of CHF/Dialysis, NS 500ml IVF bolus. May repeat, max 2L.
6. MAP < 60and HR <50 with fluid overload or history of CHF/Dialysis, NS 250ml IVF bolus. May repeat if no worsening fluid overload, max 1L.
7. For refractory hypotension with HR <50, epinephrine 10 mcg, **1:100,000**, IV/IO, every 2 minutes, titrate to MAP > 60.
8. If no response epinephrine & HR <50, initiate transcutaneous pacing.
9. For seizure activity, see protocol ANRO-05.

Considerations
1. Monitor QRS duration closely even in asymptomatic patients.
2. If patient is physically combative, consider involving law enforcement to assist in putting patient in 4-point restraints.

To make epinephrine **1:100,000**:
1. Mix 9ml NS with, 1ml of epinephrine **1:10,000.**

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Calcium Channel Blocker Overdose

Calcium channel blockers are used in the treatment of hypertension, angina pectoris, cardiac arrhythmias, and other disorders. These medications are available in both immediate-release and extended-release preparations. The potential toxicity of these agents is substantial, and is often under appreciated by the public.

## Definitions:

1. **Asymptomatic**- Patient has admitted or history reveals possibility of calcium channel blocker overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic**- Patient has admitted or history reveals calcium channel overdose and patient is showing signs and symptoms including hypotension, bradycardia, or sudden cardiac collapse.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Pain scale.
   D. Physical assessment.
3. Name of medication.
4. Estimated number of pills or liquid.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Constipation.<br>2. Headache.<br>3. Palpitations.<br>4. Dizziness.<br>5. Rash.<br>6. Drowsiness.<br>7. Flushing.<br>8. Nausea.<br>9. Swelling in the feet and lower legs.<br>10. Bradycardia.<br>11. Hypotension.<br>12. Shortness of breath. | 1. Hypertension.<br>2. Angina pectoris.<br>3. Cardiac arrhythmias.<br><br>Home meds<br>1. Amlodipine (Norvasc).<br>2. Diltiazem (Cardizem, Tiazac, others).<br>3. Felodipine.<br>4. Isradipine.<br>5. Nicardipine.<br>6. Nifedipine (Adalat CC, Afeditab CR, Procardia).<br>7. Nisoldipine (Sular).<br>8. Verapamil (Calan, Verelan). | 1. Co-ingestion.<br>2. Beta blocker OD.<br>3. Digoxin toxicity.<br>4. Complete heart block.<br>5. Renal failure. |

# Calcium Channel Blocker Overdose

1. Cardiac monitor.
2. 12 lead ECG.
3. Monitor SpO2.

Treatment #1- Asymptomatic:
1. If SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Consider IV, NS, TKO.

Treatment #2- Symptomatic:
1. if SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. IV/IO, NS, TKO.
3. If MAP < 60& HR <50, calcium chloride 20 mg/kg 10% IV/IO, max 2g .
4. If MAP remains <60 without fluid overload or history of CHF/Dialysis, NS 500ml IVF bolus. May repeat, max 2L.
5. If MAP remains <60 and HR <50 with fluid overload or history of CHF/Dialysis, NS 250ml bolus. May repeat if no worsening fluid overload, max 1L
6. After bolus if MAP < 60and HR <50, epinephrine 10 mcg **1:100,000** IV/IO, every 2 minutes, titrate to MAP > 60.
7. If no response to epinephrine, initiate transcutaneous pacing.

Considerations:
1. Monitor QRS duration closely even in asymptomatic patients.
2. Cardiac monitor for presence of AV nodal blocks.
3. If patient is physically combative, consider involving law enforcement to assist in putting patient in 4 point restraints.

To make epinephrine **1:100,000**:
1. Mix 9ml NS, with 1ml of epinephrine **1:10,000.**

**Base Hospital Orders**

1. Additional normal saline for hypotension.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Acute Drug Intoxication

Acute drug intoxication refers to the immediate and deleterious effects of drugs such as cocaine, amphetamines, PCP or bath salts, on the body. Although acute drug intoxication and drug dependence can be present in the same individual, these syndromes present with different symptoms.

Definitions:

1. **Intoxication**- History reveals or patient is showing signs and symptoms of acute drug intoxication however patient is cooperative.
2. **Intoxication with serious agitation**- History reveals or patient is showing signs and symptoms of acute drug intoxication however, patient is not cooperative, is a safety risk to crews or a safety risk to themselves. Safety risks include physically combative or erratic dangerous behavior.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. 12 lead ECG.
   B. Blood glucose level.
   C. Physical assessment.
   D. Pupils.
   E. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Tachycardia.<br>2. Hypertension.<br>3. Dilated pupils.<br>4. Hyperthermia.<br>5. Restlessness.<br>6. Anxiety, panic, paranoia.<br>7. Erratic behavior.<br>8. Tremors.<br>9. Psychosis.<br>10. Nausea.<br>11. Agitation. | 1. Drug use.<br>2. Previous OD.<br><br>Home Meds<br>1. Methadone. | 1. Co-ingestion.<br>2. Stimulant induced MI.<br>3. Encephalopathy.<br>4. Drug induced psychosis. |

# Acute Drug Intoxication

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-6 LPM via NC, titrate to 94%.

Treatment #1- Intoxication:
1. If chest pain, obtain 12 lead ECG. If STEMI see chest pain protocol ACAR-03.

Treatment #2- Intoxication with serious agitation:
1. If chest pain, obtain 12 lead ECG, if STEMI see chest pain protocol ACAR-03.
2. If ALOC, obtain blood glucose level. If blood glucose level <70 mg/dL, see protocol ANRO-03.
3. Consider IV, NS, TKO, **ONLY IF SAFE TO DO SO**.
4. IF age is between 18 and 55, and patient is **PHYSICALLY COMBATIVE**, midazolam 4mg IM/IN. If outside these ages, make base hospital contact.

Considerations:
1. Safety is the highest priority. Consider law enforcement assistance if patient is agitated.
2. If patient is physically combative consider involving law enforcement to assist in putting patient in 4 point restraints.

**Base Hospital Orders**

1. Midazolam 2-4mg IM, for patients older than 55 and younger than 18.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Cyclic Antidepressants Overdose

The clinical presentation of cyclic antidepressant overdose is extremely variable. Patients can present alert with normal vital signs or comatose and hypotensive. In any case, rapid onset of symptoms and rapid deterioration are characteristic of cyclic antidepressant overdose.

Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibly of cyclic antidepressants overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals cyclic antidepressants overdose and patient is showing signs and symptoms related to cyclic antidepressants or is having dysrhythmias, VF/VT, widening QRS, prolonged QT, wide complex tachycardia that's is not VF/VT.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
2. BP.
3. Respirations.
4. Pulse.
5. SpO2.
6. If performed, before and after intervention or if condition changes:
   a. ECG.
   b. Blood glucose level.
   c. Pain scale.
   d. Physical assessment.
   e. Pupils.
7. Name of medication.
8. Estimated number of pills or liquid.
9. Route of administration.
10. Time of administration.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Blurred vision.<br>2. Dry mouth.<br>3. Constipation.<br>4. Weight gain or loss.<br>5. Rash.<br>6. Hives.<br>7. Increased heart rate.<br>8. Cardiac conduction delays.<br>9. Dysrhythmias.<br>10. Hypotension.<br>11. Respiratory depression.<br>12. Seizures.<br>13. Coma. | 1. Depression.<br>2. Previous OD.<br>3. Panic disorder.<br>4. Bulimia.<br>5. Chronic pain.<br>6. Migraine.<br>7. Tension headaches.<br>8. Diabetic neuropathy.<br>9. Phantom limb pain.<br>10. Chronic itching.<br><br>Home meds<br>1. Amitriptyline.<br>2. Amoxapine.<br>3. Desipramine (Norpramin).<br>4. Doxepin.<br>5. Imipramine (Tofranil).<br>6. Nortriptyline (Pamelor).<br>7. Protriptyline (Vivactil).<br>8. Trimipramine (Surmontil). | 1. Co-ingestion. |

# Cyclic Antidepressants Overdose

1. Cardiac monitor.
2. Monitor SpO2.
3. Obtain 12 lead ECG.

Treatment #1- Asymptomatic:
1. If SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Consider IV, NS, TKO.

Treatment #2- Symptomatic or dysrhythmias:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. IV/IO, NS, TKO.
3. Sodium bicarbonate 50 mEq IV/IO every 3 min to resolution of ECG changes, max 150 mEq. May make base hospital contact for additional doses.
4. For seizure activity see protocol ANRO-05.
5. If MAP < 60 without fluid overload or history of CHF/Dialysis, NS 500ml IVF bolus. May repeat, max 2L.
6. If MAP < 60 with fluid overload or history of CHF/Dialysis, NS 250ml IVF bolus. May repeat if no worsening fluid overload, max 1L

7. If MAP < 60 after bolus, see protocol ACAR-06.
8. If patient requires assistance with ventilations, hyperventilate, to EtCO2 30-35.

Considerations:
1. Cardiac monitor closely even in asymptomatic patients as tricyclic antidepressant overdose patients deteriorate suddenly and quickly.
2. If patient is on a hold or there is potential for intentional OD, consider 4-point restraints.
3. If patient is physically combative consider involving law enforcement to assist in putting patient in 4 point restraints.

**Base Hospital Orders**

1. Additional sodium bicarbonate beyond 150mEq.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Opiate Overdose

Physical and mental symptoms that occur after taking too many opioids, a substance found in certain prescription pain medications and illegal drugs like heroin.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibility of opiate overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals opiate overdose and patient is showing signs and symptoms related to opiate overdose, including respiratory depression or apnea.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
   E. EtCO2
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Blood glucose level, if diabetic history or continues to have ALOC.
   C. Physical assessment.
   D. Pupils.
3. Name of medication or substance.
4. Estimated number of pills or liquid.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Lethargy.<br>2. ALOC.<br>3. Shortness of breath.<br>4. Pinpoint pupils.<br>5. Slow or absent respirations.<br>6. Hypotension. | 1. Short-term pain management.<br>2. Chronic pain management.<br>3. Heroin use.<br><br>Home Meds<br>1. Hydrocodone (Vicodin®).<br>2. Oxycodone (OxyContin®, Percocet®).<br>3. Oxymorphone (Opana®).<br>4. Morphine (Kadian®, Avinza®).<br>5. Codeine.<br>6. Fentanyl. | 1. Pontine bleed. |

# Opiate Overdose

1. Monitor SpO2.
2. Monitor EtCO2.

Treatment #1- Asymptomatic:
1. Consider cardiac monitor.
2. If EtCO2 is elevated, evaluate efficacy of respirations.

Treatment #2- Symptomatic with inadequate respiration:
1. Cardiac monitor.
2. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Support ventilations with BVM and O2 15-20 LPM as needed.
4. IV, NS, TKO or saline lock.
5. Naloxone 0.4mg IV/IO or 2mg IM/IN. Repeat for ineffective respirations or RR <10. Max 4mg. Contact base hospital for additional doses
   **DO NOT** titrate to level of consciousness or pupil size.

Considerations:
1. Ventilate patient prior to administration of naloxone.
2. Preferred route is IV. However, if unable to start IV, IM/IO/IN are acceptable.
3. In patients with chronic opioid use, naloxone can induce **SEVERE** withdrawals including:
   A. Pulmonary edema.
   B. Seizures.
   C. Arrhythmias.
   D. Hypertension.
4. Always use the lowest dose possible to obtain an improvement in respirations.

**Base Hospital Orders**

1. Additional naloxone 2mg.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Organophosphates Exposure

Organophosphates are a group of chemicals that poison insects and mammals. Organophosphates are the most widely used insecticides today. They are used in agriculture, the home, gardens, and veterinary practice. Organophosphate work by damaging an enzyme acetylcholinesterase.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibility of organophosphates exposure but patient is showing no signs or symptoms.
2. **Symptomatic-** Patient has admitted or history reveals organophosphates exposure and patient is showing signs and symptoms related to organophosphates exposure, but is still hemodynamically stable.
3. **Grossly Symptomatic-** Patient has admitted or history reveals organophosphates exposure and patient is showing signs and symptoms related to organophosphates exposure, but is **NOT** hemodynamically stable.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Blood glucose level.
   C. Pain scale.
   D. Physical assessment.
3. If safe to identify:
   A. Chemical labels.
   B. Safety data sheet (SDS).
   C. Placards.
   D. Chemical type.
   E. Chemical amount.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Salivation.<br>2. Lacrimation.<br>3. Urination.<br>4. Defecation.<br>5. Gastrointestinal distress.<br>6. Emesis. | 1. Agricultural setting.<br>2. Industrial setting.<br><br>Common Names<br>1. Parathion.<br>2. Malathion.<br>3. Methyl parathion.<br>4. Chlorpyrifos<br>5. Diazinon.<br>6. Dichlorvos.<br>7. Phosmet.<br>8. Fenitrothion.<br>9. Tetrachlorvinphos.<br>10. Azamethiphos.<br>11. Azinphos-methyl.<br>12. Terbufos. | 1. Nerve agent exposure. |

# Organophosphates Exposure or Ingestion

1. Avoid contamination.
2. Cardiac monitor.
3. Monitor SpO2.
4. Consider IV, NS, TKO.

Treatment #1- Mildly symptomatic:
1. if SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. IV/IO NS, TKO.
3. If HR <100, atropine 2mg IV/IO every 10 minutes. Max 4mg.

Treatment #2- Grossly symptomatic:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. IV/IO, NS, TKO.
3. Atropine 2mg IV/IO every 5 minutes. Max of 4mg.
4. For seizure activity see protocol ANRO-05.

Considerations
1. Safety is top PRIORITY.
2. Patient must be grossly decontaminated prior to transport.
3. Patient must be fully decontaminated prior to entering ED.

## Base Hospital Orders

1. Additional atropine beyond 4 mg.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

## Nerve Agent Exposure and EMS *Chempack* use

If *EMS Chempack* is deployed and atropine auto injectors, pralidoxime (2-Pam) auto injectors, and diazepam are available they may be used as follows:
1. Cardiac monitor.
2. Monitor SpO2.
3. Consider IV/IO, NS, TKO.
4. If MAP < 60without fluid overload or history of CHF/Dialysis, NS 500ml IVF bolus. May repeat, max 2L.
5. If MAP < 60with fluid overload or history of CHF/Dialysis, NS 250ml IVF bolus. May repeat if no worsening fluid overload, max 1L.
6. If seizing, diazepam 2.5-10mg slow IVP or 10mg IM. May repeat once, max of 20mg.
7. Atropine and 2-pam Auto injectors according to below chart.

| Exposure level | Atropine (2mg Auto Injector) | 2-Pam (600mg Auto Injector) |
|---|---|---|
| Mild Liquid or Vapor – (Dyspnea Rhinorrhea, Wheezing) | One (1) Auto injector IM (2Mg) every 3-5 min. | If symptomatic after atropine: One (1) Auto Injector IM (600Mg) No repeat. |
| Moderate – (SLUDGE ) | Two (2) Auto injector IM (4Mg) every 3-5 min. | One (1) Auto injector IM (600Mg) may repeat once in 5-10 min. |
| Severe – (SLUDGE and Seizure activity) | Three (3) Auto injector IM (6Mg) every 3-5 min. | Three (3) Auto injector IM (1.8Gms) No repeat. |

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# Adult General

# Sepsis

Sepsis is the body's overwhelming and life-threatening response to infection. In sepsis, when an infection occurs at any potential site in the body, the immune system's inflammatory response can be overwhelmed leading to SIRS (Systemic Inflammatory Response Syndrome) which causes tissue damage that can lead to organ dysfunction, failure and death.

## Definitions:

1. **SIRS Criteria-** possible infection (Abnormal WBC), fever, tachypnea, tachycardia or hypotension.
2. **Asymptomatic- DOES NOT** meet TWO or MORE SIRS Criteria.
3. **Symptomatic Sepsis-** Meets TWO or MORE SIRS criteria, **PLUS** has source of infection and is hemodynamically stable.
4. **Septic Shock-** Meets two or more SIRS criteria and is hemodynamically **UNSTABLE**.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Blood glucose level, if diabetic.
   C. Pain scale.
   D. Physical assessment.
   E. Temp.
   F. Lung Sounds.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. SIRS Criteria<br>A. Temp: >38°C or <36°C.<br>B. HR >90.<br>C. RR >20.<br>2. Significantly decreased urine output.<br>3. Abrupt change in mental status.<br>4. Difficulty breathing.<br>5. Abdominal pain.<br>6. Identifiable infection. | 1. Evidence of infection.<br>2. Clotting problems.<br>3. Abnormal liver or kidney function.<br>4. Impaired oxygen availability.<br>5. Electrolyte imbalances.<br>6. Transplant patient.<br>7. On active chemotherapy.<br>8. HIV/AIDs.<br>9. Chronic steroid use.<br>10. Indwelling Foley catheter.<br>11. Indwelling PIC line.<br><br>Home Meds:<br>1. Antibiotics.<br>2. Immunosuppressant medications.<br>3. Immunomodulatory medications. | 1. Pneumonia.<br>2. Abdominal infection.<br>3. Kidney infection / failure.<br>4. Bloodstream infection (bacteremia).<br>5. Meningitis.<br>6. Encephalitis.<br>7. Myocarditis. |

# Sepsis

1. Cardiac monitor.
2. Monitor SpO2.

Treatment #1- Asymptomatic:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Consider 12 lead ECG.
3. Blood glucose level, if <70 mg/dL, see protocol ANRO-03.
4. If ALOC, perform stroke screen. If positive, see protocol ANRO-01.

Treatment #2- Symptomatic meeting **TWO** or **MORE** SIRS Criteria with identifiable infection:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Obtain 12 lead ECG.
3. Blood glucose level, if <70 mg/dL, see protocol ANRO-03.
4. If ALOC, perform stroke screen. If positive, see protocol ANRO-01.
5. IV, NS, TKO.
6. NS 500ml IVF bolus may repeat x1.

Treatment #3- Shock with **TWO** or **MORE** SIRS Criteria:
1. If SpO2 <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Monitor EtCO2 if using an advanced airway or BVM.
3. Obtain 12 lead ECG.
4. Blood glucose level, if <70 mg/dL, see protocol ANRO-03.
5. If ALOC, stroke screen. If positive, see protocol ANRO-01.
6. IV/IO, NS, TKO.
7. If MAP < 60 without fluid overload or history of CHF/Dialysis, NS 500ml IVF bolus. May repeat, max 2L.
8. If MAP <60 with fluid overload or history of CHF/Dialysis, NS 250ml IVF bolus. May repeat if no worsening fluid overload, max 1L.
9. Epinephrine 10mcg **1:100,000** IV/IO, every 2 minutes, titrate to MAP > 60.

Considerations:
1. If patient is in shock and does not meet TWO or more SIRS Criteria see protocol ACAR-06.
2. **SIRS Criteria:**
   A. Temp: >100.4°F or <96°F.
   B. HR >90.
   C. RR >20.
3. Always have a high index of suspicion of infection in patients on chronic steroids, immunomodulatory medications and immunosuppression medications.

To make epinephrine **1:100,000**:
1. Mix 9ml NS with 1ml epinephrine **1:10,000**

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Patients From Out Patient Offices

This protocol is in place to allow paramedics on a 911 / pre hospital call (Not to include IFT) to transport patients that may be currently under anesthesia or having an adverse reaction to out of hospital anesthesia, such as at dental offices or outpatient care facilities.

## Definitions:

1. **Local anesthesia**- a type of pain prevention used during minor procedures to numb a small site where the pain is likely to occur without changing the patient's awareness.
2. **General anesthesia**- a medically induced coma with loss of protective reflexes, resulting from the administration of one or more general anesthetic agents.
3. **Nerve and regional blocks**- deliberate interruption of signals traveling along a nerve, often for the purpose of pain relief.
4. **Conscious sedation-** is a combination of medicines to help you relax (a sedative) and to block pain (an anesthetic) during a medical or dental procedure.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.
   G. EtCO2.
3. Type of anesthetic used.
4. Procedure being performed:
   A. Surgical.
   B. Medical.
   C. Dental.
5. Reaction to anesthetic.
6. Treatments administered prior to arrival:
   A. Defibrillations.
   B. Airway management.
   C. Medication administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. ALOC.<br>2. Unconscious.<br>3. Apneic.<br>4. Uncontrolled airway.<br>5. History of:<br>A. Procedural sedation.<br>B. Local anesthesia.<br>C. General anesthesia.<br>D. Conscious sedation. | 1. Outpatient procedure.<br>2. Dental procedure.<br><br>Possible Anesthetic drugs:<br>1. Nitrous oxide.<br>2. Ativan.<br>3. Barbiturates:<br>A. Amobarbital.<br>B. Methohexital.<br>C. Thiamylal.<br>4. Benzodiazepines:<br>A. Diazepam.<br>B. Lorazepam.<br>C. Midazolam.<br>5. Etomidate.<br>6. Ketamine.<br>7. Propofol. | 1. CVA/TIA.<br>2. Hypoglycemia.<br>3. Seizure. |

# Patients From Out Patient Offices

Treatment

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC, NRB or BVM, titrate to 94%.
3. Monitor EtCO2 if patient received any sedation or analgesic medications or if using an advanced airway or BVM.
4. Consider IV/IO, NS, TKO.
5. Consider 12 lead, if STEMI see protocol ACAR-03.
6. Blood glucose level, if <70 mg/dL, see protocol ANRO-03.
7. If patient administered narcotics and RR <10, naloxone 0.4mg IV/IO or 2mg IM/IN, Max 4mg.

Titrate to respirations. **DO NOT** titrate to level of consciousness or pupil size.

8. If MAP < 60 without fluid overload or history of CHF/Dialysis, NS 500ml IVF bolus. May repeat, max 2L.
9. If MAP < 60 with fluid overload or history of CHF/Dialysis, NS 250ml IVF bolus. May repeat if no worsening fluid overload, max 1L
10. Epinephrine 10 mcg **1:100,000** IV/IO, every 2 minutes, titrate to MAP > 60.

Considerations:

1. Secure airway as appropriate.
2. Advise doctor on scene they may maintain care if they ride with you to ED and they do not delay transport.
3. Only the base hospital physician can give field personnel orders.
4. Contact the base hospital for any questions or concerns.

To make epinephrine **1:100,000**:

1. Mix 9ml NS with 1ml epinephrine **1:10,000.**

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pain Management

This protocol is intended for the treatment of pain associated with traumatic injuries, burns, or medical conditions that cause significant **ACUTE** pain or **SEVERE Exacerbation** of chronic pain.

Definitions:

1. **Pain-** is a significantly unpleasant sensation, occurring in varying degrees of severity, which results because of injury, disease, or emotional disorder.
2. **Max Single Dose (Max SD)-** is maximum medication given in one administration.
3. **Max Total Dose (Max TD)-** is the most the patient can have overall without a base order.
4. **Mild to moderate pain-** Pain on movement, chronic pain, or pain that is managed with, positioning, ice, stabilization, or immobilization.
5. **Moderate to Severe Pain-** patient pain is unable to be managed with, positioning, ice, stabilization, or immobilization **AND** patient is showing outward signs of being symptomatic secondary to pain. Symptoms may include guarding, grimacing at rest, tachycardia, tachypnea, hypertension, and diaphoresis, etc.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   A. Pulse.
   B. SpO2.
2. If performed, before and after intervention or if condition changes:
   C. ECG.
   D. Blood glucose.
   E. Pain scale.
   F. Physical assessment.
   G. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Guarding.<br>2. Grimacing.<br>3. Deformity.<br>4. Swelling.<br>5. Diaphoresis.<br>6. Splinting. | 1. Recent traumatic event.<br>2. Chronic pain. | 1. Chronic pain exacerbation.<br>2. Complex Regional pain.<br>3. Compartment syndrome.<br>4. Nerve injury. |

Pain management medication guidelines:

| Medication | Best use | Contraindications |
|---|---|---|
| **Ketorolac** | Mild to moderate pain | >65Y/O, GI bleed, pregnancy, asthma, Acute coronary syndrome, coagulation disorders, meets trauma triage criteria, anticoagulation medications. |
| **Acetaminophen** | | Allergy, Liver failure, ETOH Intoxication. |
| **Ibuprofen** | | Currently taking ASA, or NSAID, GI bleed, Blood thinner, Pregnant. |
| **Morphine** | Visceral pain | Hypotension. |
| **Fentanyl** | Somatic pain, or patients with hypotension | GI obstruction. |

# Pain Management

Treatment #1- Mild to Moderate:
1. Elevate as appropriate.
2. Ice as appropriate.
3. Position as appropriate.
4. Stabilize as appropriate.
5. 650mg acetaminophen PO **OR** 400mg ibuprofen PO (withhold if pregnant).

Treatment #2- Moderate to Severe:
1. Consider Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. IV/IO, NS, TKO.
4. If pain scale >5 & symptomatic from pain see dose chart below.
5. Monitor EtCO2.

Considerations:
1. Treatment should not be based on pain scale alone. Use objective signs to support treatment.
2. If SBP<100 consider fentanyl for pain management.
3. IM fentanyl shall only be used for patients with difficult IV access (IN may be considered if patient refuses IM injection).
4. An IO should not be established solely for the purpose of pain management. An IO may be utilized for pain management where indicated, **ONLY** if IO was established for other treatments.

| Medication | Max SD | Max TD |
|---|---|---|
| **Acetaminophen IV** | | |
| A. 15mg/kg IV over 15 min, no repeat | 15mg/kg | 1,000mg |
| **Ketorolac** | | |
| A. 15mg IV No repeat **Or**<br>B. 30 mg IM no repeat | 15Mg | No repeat |
| **Morphine** | | |
| A. 2mg slow IV/IO, every 5 min, **Or**<br>B. 5-10 mg IM, every 30 min. | 2 mg IV<br><br>10 mg IM | 20 mg |
| **Fentanyl** | | |
| A. 1 mcg/kg slow, IV/IM/IN/IO, every 5 minutes. | 100 mcg | 2 mcg/kg, For burns max TD is 3mcg/kg |

**Base Hospital Orders**

1. Medication dose above listed maximums
2. In the presence of any finding listed below
   - A. Allergy or sensitivity to the medication being administered.
   - B. SBP <90.
   - C. RR <12.
   - D. History of loss of consciousness.
   - E. Decreased mental status from patient baseline.
   - F. Pregnancy greater than 20 weeks.
3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Nausea

Nausea may be due to a viral illness (e.g. gastroenteritis), motion sickness, or medication side effects. However, it is important to remember that serious medical conditions also produce nausea or vomiting such as stroke, head injuries, toxic ingestions, bowel obstruction, appendicitis, and acute coronary syndrome. Generally, benign causes of nausea or vomiting do not have any associated pain complaints, or alterations in level of consciousness (LOC).

Definitions:

1. **Contraindications-** Known sensitivity to ondansetron or other 5-HT-3 antagonists e.g.: Granisetron (Kytril), Dolasetron (Anzamet), Palonosetron (Aloxi).

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose if history of diabetes.
   D. Pain scale.
   E. Physical assessment.
   F. Abdominal exam.

Objective Findings:

| Possible Signs and Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Nausea.<br>2. Vomiting.<br>3. Abdominal pain.<br>4. Diarrhea. | 1. Gastritis.<br>2. Gastroenteritis. | 1. AMI.<br>2. Appendicitis.<br>3. Gall stones.<br>4. Kidney stones.<br>5. Bowel obstruction. |

# Nausea

Treatment #1- Persistent Mild Nausea:
1. Ondansetron 4mg Oral Disintegrating Tablet (ODT).
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.

Treatment #2- Persistent Moderate to Severe Nausea:
1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Consider 12 lead ECG if concerns for cardiac related complaint.
4. IV, NS, TKO.
5. Ondansetron 4mg IVP over 1 min. May repeat once in 15 minutes **OR** ondansetron 4mg ODT, no repeat.

Ondansetron 4mg, may be given via IO, **IF** IO is established for other treatments. An IO should not be established solely for the purpose of nausea treatment.

Considerations
1. For patients greater than 55 years of age, perform 12-lead ECG.
2. Rapid administration of ondansetron has been associated with syncope.
3. Rare side effects include headache, dizziness, tachycardia, sedation, or hypotension.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Agitation/Behavioral Emergency (AGEN-05)

Agitation or behavioral emergency is an acute, often severe disturbance in mood, thought, or behavior that poses an immediate risk of harm to the patient, others, or the environment, and requires urgent assessment and intervention.

Definitions:

1. Mild/moderate agitation: distressed or agitated but cooperative, able to engage, and willing to take oral medication.
2. Severe agitation: behavior creating an immediate or credible risk of physical harm to the patient, responders, or others.
3. Physical restraint is not required before medication when attempting restraint alone would create unnecessary risk.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   D. BP.
   E. Respirations.
   F. Pulse.
2. If performed, before and after intervention or if condition changes:
   G. ECG.
   H. SpO2.
   I. Blood glucose if history of diabetes.
   J. Pain scale.
   K. Physical assessment.
   L. Abdominal exam.

Objective Findings:

| Possible Signs and Symptoms | Comorbidities | Differentials |
|---|---|---|

| | | |
|---|---|---|
| 1. **Restlessness and motor agitation**: pacing, fidgeting, wringing hands, clenching fists, purposeless movements<br>2. **Emotional signs**: irritability, hostility, inner tension, difficulty focusing .<br>3. **Verbal behaviors**: excessive or pressured speech, rapid talking, difficulty following conversation<br>4. **Aggression**: verbal threats, physical assault, destruction of property, or violence toward others<br>5. **Self-harm risk**: self-injurious actions, suicidal gestures or statements<br>6. **Altered mental status**: confusion, disorientation, hallucinations, delusions, or psychotic features | 1. Cardiovascular disease,<br>2. Diabetes,<br>3. psychiatric illness<br>4. Withdrawal<br>5. Alzheimer's / Dementia | 1. Alcohol intoxication<br>2. Epilepsy, Postictal<br>3. Hypoglycemia / Hyperglycemia<br>4. Overdose / Underdose<br>5. Uremia<br>6. Trauma<br>7. Infection<br>8. Psychosis<br>9. Shock |
| **Agitation/Behavioral Emergency** | | |

Treatment #1 - Mild to Moderate Agitation

1. IF age is between 18 and 64 - Olanzapine ODT 5 mg PO.
2. May repeat 5 mg once after 20 minutes if agitation persists without adverse effects.
3. Obtain 12 Lead ECG if known long-QT, ventricular dysrhythmia, concerning syncope, QT-prolonging overdose, significant electrolyte-loss state, or evidence of dysrhythmia.

Contraindications for Olanzapine:

1. Violent behavior requiring immediate control.
2. Patient unwilling or unable to take oral medication.
3. Altered level of consciousness or suspected delirium.
4. Suspected medical, traumatic, or toxicologic cause.
5. Suspected alcohol, opioid, sedative-hypnotic, or other CNS-depressant intoxication.
6. Hypotension/shock or olanzapine hypersensitivity.

Considerations:

1. Goal is sufficient improvement for safe interaction and transport, not elimination of all psychiatric symptoms.
2. Olanzapine Medication should be offered **voluntarily**; it is not to be administered forcibly.

Treatment #2 - Severe Agitation

1. IF age is between 18 and 64, midazolam 2.5 mg IM, or IV/IO 2.5 mg SLOW push.
    a. If received olanzapine no repeat dose.
    b. If pt. did not receive olanzapine, may repeat in 10 min to a max total dose of 5 mg.
2. IF patient is >64 or is clinically frail, midazolam 2.5 mg IM, or 1 mg IV/IO.
    a. If pt did not receive olanzapine max total dose of 2.5 mg.

Considerations:

1. Do not administer midazolam IF respiratory depression, hypotension, or excessive sedation occur.
2. No mandatory waiting interval when an immediate safety threat develops.
3. Do not establish vascular access solely to administer midazolam when IM is safer and faster.
4. IN may be retained only as a secondary option when it can be administered safely and reliably.
5. Anticipate CNS/respiratory depression and hypotension.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.
2. Additional midazolam
3. Olanzapine for patients >64, Max dose 2.5 mg
4. Midazolam for post olanzapine Max 2.5 mg
5. Olanzapine after midazolam Max dose 2.5mg

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# Pediatric Airway Management

# Pediatric Advanced Airway Management

Definitions:

1. **Pediatric Patient**- twelve (12) years of age or younger and is not taller than a weight-based assessment tape (146.5 cm.).

Documentation Standards:

Supraglottic Airway Confirmation:

1. Capnography value and waveform.
2. Bilateral lung sounds.
3. Minimal epigastric sounds.
4. Positive chest rise.

Every 5 minutes and on Gross Patient Movement:

5. Capnography value and waveform.
6. Bilateral lung sounds.
7. Minimal epigastric sounds.
8. Positive chest rise.

At Transfer of Care:

6. Capnography value and waveform.
7. Bilateral lung sounds.
8. Minimal epigastric sounds.
9. Positive chest rise.
10. Name of receiving paramedic or ED physician.

# Pediatric Advanced Airway Management

Indications for Supraglottic Airway:

1. Inability of the patient to protect their airway (coma, decreased level of consciousness with non-intact gag reflex).
2. Inability to adequately ventilate or oxygenate the patient using an OPA and BVM device.
3. Cardiac arrest. Adhere to sequence as specified in EMS Protocol PCAR-03.
4. Failing respirations (irregular and shallow), respiratory arrest.

If patient meets any of above criteria, place supraglottic airway.

Oral Tracheal intubation is outside the paramedic scope of practice in **PEDIATRIC PATIENTS** - twelve (12) years of age or younger and is not taller than a weight-based assessment tape (146.5 cm.).

5. Remove and replace the I-Gel Airway if resistance is met upon initial insertion.
6. After two (2) unsuccessful attempts, place a BLS an airway and transport red lights and sirens to the closest receiving hospital.

**Only use pediatric supraglottic airway if unable to maintain airway with BVM and OPA**

Considerations:

1. The approved airway management procedure for the unconscious pediatric patient consists of the following: providing BLS airway management skills; correctly assessing the need for an advanced airway; and successfully inserting or an I-Gel Airway **ONLY IF** there is no compliance with BVM and OPA.
2. **DO NOT** delay transport to establish an advanced airway in trauma patients except in the case of complete airway obstruction, as evidenced by a complete inability to ventilate the patient using an OPA and BVM device.
3. If unable to establish an airway due to complete airway obstruction not relieved using an OPA and BVM maneuvers, begin red lights and siren (RLS) transport to closest receiving hospital. During transport, consider insertion of an I-Gel Airway.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Airway Obstruction

Definitions:

1. **Partial Airway Obstruction-** Difficulty breathing but still able to ventilate.
2. **Severe Airway Obstruction-** Poor air exchange increased breathing difficulty, silent cough, cyanosis, and/or inability to speak or breathe.
3. **Weight based assessment tape Pediatric Emergency Tape-** Means a pediatric length based resuscitation tape used to determine drug doses, fluid volumes, defibrillation settings, and equipment sizes. The tape is designed to estimate a child's weight based on length (head to heel). The tape also includes information about abnormal vital signs.
4. **Pediatric Patient-** Means a patient that is twelve (12) years of age or younger and is not taller than a weight-based assessment tape (146.5 cm.).

Documentation Standards:

1. Every 5 minutes for unstable patients, every 10 minutes for stable patients:
   A. BP.
   B. Respirations.
   A. Pulse.
   B. SpO2.
2. If performed, before and after intervention or if condition changes:
   C. ECG.
   D. Blood glucose.
   E. Pain scale.
   F. Physical assessment.
   G. Lung sounds.

Objective Findings

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Holding neck (universal choke sign).<br>2. Silent cough.<br>3. Stridor.<br>4. Inability to speak.<br>5. Drooling. | 1. Nothing by mouth (NPO orders).<br>2. CVA.<br>3. Brain injury.<br>4. Choking episode.<br>5. Coughing while eating. | 1. Epiglottitis.<br>2. Esophageal obstruction.<br>3. Supraglottic stenosis.<br>4. Vocal cord dysfunction.<br>5. Retropharyngeal abscess. |

# Pediatric Airway Obstruction

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM, NC or NRB, titrate to 94%.

Treatment- Partial Obstruction:
1. Encourage patient to cough.
2. Suction as needed.

Treatment- Complete Obstruction:
1. Initiate back blows and chest thrusts.
2. If conscious and foreign body can be seen when patient opens mouth, remove foreign body with Magill forceps.
3. If unconscious, remove foreign body with direct laryngoscopy and Magill forceps.
4. Assist ventilations with BVM.
5. If unable to remove, attempt to insert supraglottic airway. Go to closest ED with early notification to receiving facility.

Considerations
1. Needle Cricothyrotomy is contraindicated in pediatrics.

**Base Hospital Orders**

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Pediatric Cardiac

# Neonatal Resuscitation

The goal of neonatal resuscitation is to preserve cerebral and coronary function through meticulous attention to procedure and achieving return of spontaneous circulation (ROSC).

## Definitions:

1. High quality CPR - use TEAM approach:
   A. 100-120 compressions per minute.
   B. **3:1** ratio compression to ventilation ratio.
   C. Compress 1/3 depth of chest.
   D. Allow complete recoil.
   E. Minimize interruptions.
   F. Rotate compressors every 2 minutes.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   A. Pulse.
   B. ECG.
   C. SpO2.
2. If performed, before and after intervention or if condition changes:
   D. Blood glucose.
   E. Physical assessment.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. No pulse.<br>2. Weak pulse.<br>3. No muscle tone.<br>4. No cry.<br>5. Meconium staining. | 1. Expected complications.<br>2. Prolonged delivery.<br>3. Delivery complications.<br>4. Mother with significant medical history. | 1. Still born.<br>2. Meconium aspiration.<br>3. Fetal Hypoxia. |

# Neonatal Resuscitation

1. Cardiac monitor.
2. Monitor SpO2.
3. Wipe and dry nose and mouth.

Treatment #1- Heart Rate **>100** :
1. Monitor SpO2.
2. If peripheral cyanosis is present place in sniffing position O2 5-10 LPM via blow by.
3. Reassess heart rate every 30-60 seconds.

Treatment #2- Heart Rate **80-100 BPM:**
1. Oxygen 100% via mask or blow by.
2. Stimulate and suction mouth and nose.

If heart rate is <100 BPM, after 30 Seconds of stimulation:
3. Assist ventilations with BVM and 100% oxygen at 40-60 per min.
4. Reassess heart rate and respirations every 15-30 seconds.

Treatment #3- Heart Rate **60-80 BPM:**
1. Assist ventilations with BVM and 100% oxygen at 40-60 per min.

If no improvement after 30 seconds of assisted ventilations:
2. Start CPR, **3:1**, @120 compressions/min.

Treatment #4- Heart Rate **<60 BPM:**
1. Assist ventilations with BVM and 100% oxygen at 40-60 per min.
2. Start CPR, **3:1**, @120 compressions/min.

If no improvement after 60 seconds:
3. IV/IO, NS, TKO.
4. Epinephrine 0.01mg/kg IV/IO, every 6 minutes.

If no improvement after 60 seconds:
5. Consider supraglottic airway only if unable to ventilate with BVM.
6. If heart rate is >80 BPM, stop chest compressions and continue assisting ventilations.

Considerations
1. Note APGAR Scores at: 1, 3, and 5 minutes.
2. Meconium stain amniotic fluid: suction the mouth and nose of only those patients with a non-vigorous cry or inability to protect their own airway. If the patient has a strong cry wipe and dry the mouth and nose. There is no need to aggressively suction.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

| APGAR Score | 0 | 1 | 2 |
|---|---|---|---|
| Appearance | Cyanotic/ Pale | Peripheral cyanosis only | Pink |
| Heart Rate | 0 | <100 | 100-140 |
| Grimace | No response to stimulation | Grimace or weak cry | Strong cry |
| Activity | Absent | Flexed arms or legs | Active |
| Respirations | Absent | Slow or irregular | Loud cry |

# Pediatric Bradycardia

Bradycardia is characterized by a decrease in the rate of atrial depolarization due to slowing of the sinus node. It may be secondary to sinus node disease, increased parasympathetic tone **or** drug effects (e.g., digitalis, propranolol or verapamil.) The rhythm is regular **or** slightly irregular with the heart rate is below length based treatment tape low value.

Definitions:

1. **Asymptomatic**- Patient has no complaints related to heart rate.
2. **Mildly symptomatic**- Patient is symptomatic but hemodynamically stable.
3. **Grossly symptomatic**- Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, chest pain or hypotension related to a slow heart rate).

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. 12 lead.
   C. SpO2.
   D. Blood glucose.
   E. Pain scale.
   F. Physical assessment.
   G. Skin signs.
   H. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Near fainting or fainting (syncope).<br>2. Dizziness or lightheadedness.<br>3. Fatigue.<br>4. Shortness of breath.<br>5. Chest pains.<br>6. Confusion or memory problems.<br>7. Easily tiring during physical activity. | 1. Damage to heart tissues from heart disease **or** heart attack.<br>2. Heart disorder present at birth (congenital heart defect).<br>3. Infection of heart tissue (myocarditis).<br>4. A complication of heart surgery.<br>5. Imbalance of chemicals in the blood, such as potassium or calcium.<br>6. Medications, including some drugs for other heart rhythm disorders, high blood pressure and psychosis.<br>Home Meds:<br>1. Beta blockers. | 1. High degree heart block.<br>2. Decompensated shock.<br>3. Increased vagal tone.<br>4. Accidental OD.<br>5. Lyme disease.<br>6. Intracranial hemorrhage.<br>7. Increased ICP. |

# Pediatric Bradycardia

1. Cardiac monitor.
2. Monitor SpO2.

Treatment #1- Asymptomatic:
1. Consider 12 lead ECG.

**DO NOT** start IV/IO solely for low HR if patient is asymptomatic.

Treatment #2- Mildly Symptomatic:
1. If SpO2 <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Obtain 12 lead ECG.
3. IV, NS, TKO.
4. If SBP is below length based treatment tape low value, NS 20 ml/kg IVF bolus. Bolus may repeat twice at 20ml/kg.

Treatment #3- Grossly Symptomatic:
1. If SpO2 <94%, 1-15 LPM O2 via NC or NRB, titrate to 94%.
2. Obtain 12 lead ECG.
3. IV/IO, NS, TKO.
4. If SBP is below length based treatment tape low value, NS 20ml/kg IVF bolus. Bolus may repeat twice at 20ml/kg.
5. If history or assessment reveals bradycardia is due to increased vagal tone, atropine 0.02 mg/kg IV/IO, max single dose of 1 mg. Repeat once if needed.
6. ~~If SBP remains below length based treatment tape low value after fluids, **DILUTED** epinephrine 1ml IV/IO, every 3-5 minutes, titrate to normal age-based SBP.~~
7. ~~6.~~ ~~I~~If HR remains <60 BPM after treatment or patient is deteriorating quickly:
8. ~~7.~~ Start CPR

Considerations:
1. Used approved length based treatment tape to determine heart rate.

~~To make **DILUTED** epinephrine:~~
1. ~~Mix epinephrine 0.01 mg/kg **1:10,000** to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.
2. ~~1.~~ If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.

# Pediatric Medical Cardiac Arrest

The goal of cardiac resuscitation is to preserve cerebral and coronary function through meticulous attention to procedure and achieving return of spontaneous circulation (ROSC).

Definitions:

1. **Ventricular Fibrillation (VF)-** Bizarre, rapid, irregular, ineffective rhythm with electrical waveforms varying in size and shape. There is no P wave. QRS complexes are absent.
2. **Pulseless Ventricular Tachycardia (pVT)-** Regular or slightly irregular rhythm. Heart rate 100 to 200, A-V disassociation, QRS complex distorted, wide (> 0.12 seconds) and bizarre. No pulse.
3. **Asystole-** Asystole represents the absence of electrical activity in the heart. There is no rhythm, although an occasional P wave may be seen. Heart rate is less than five ectopic beats per minute.
4. **Pulseless Electrical Activity (PEA)-** The absence of a detectable pulse and the presence of some type of electrical activity other than VF or pVT.
5. **Contraindications for this protocol.**
   A. Traumatic arrest see protocol PTRA-02.
   B. VAD see protocol PCAR-07.

Documentation Standards:

1. Every 5 minutes:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Capnography.
   D. Blood glucose.
   E. Physical assessment.
   F. Pupils.
   G. Lung sounds.
3. Circumstances surrounding the arrest:
   A. Estimated down time.
   B. Onset (witnessed or unwitnessed).
   C. Preceding symptoms.
   D. Bystander CPR.
   E. Medications.
   F. Environmental factors (hypothermia, inhalation, and asphyxiation).

Objective Findings:

| Possible Signs and Symptoms | Possible Medical History | Differentials |
|---|---|---|
| 1. Quickly assess for obvious signs of death:<br>A. Decapitation.<br>B. Decomposition.<br>C. Burnt beyond recognition.<br>D. Lividity.<br>E. Rigor mortis.<br>2. No pulse.<br>3. No respiration. | 1. Congenital heart defects.<br>2. Asthma.<br>3. Food or insect allergies. | 1. Respiratory arrest leading cardiac arrest.<br>2. Drowning.<br>3. Hypothermia. |

# Pediatric Medical Cardiac Arrest

Treatments

1. Begin High Quality CPR:
   A. Compressions rate 100 to 120 per minute.
   B. Compress 1/3 depth of chest.
   C. Allow complete recoil.
   D. Minimize interruptions.
2. OPA & BVM with O2,10-15LPM, 15:2 compressions to ventilations.
3. IO
4. NS 20 ml/kg IVF bolus. May repeat x2
5. Initiate epinephrine 0.01 mg/kg 1:10,000 IO as soon as possible and repeat every 6 minutes.
6. Pulse and rhythm check every 2 minutes.
   A. Pre-charge defibrillator before every pulse check.
7. If ROSC achieved, initiate transport, see protocol PCAR-05.

**Treatment #1- VF/VT:**

1. Initial shock 2 Joules/kg, **ALL** subsequent shocks 4 J/kg. (or manufacturer's recommendation)
2. After 3 shocks, lidocaine 1mg/kg IO. Repeat once if after 5 minutes patient remains in VF/VT.
3. Consider reversible causes.
4. Transport after 15 minutes.

**Treatment #2- Asystole/PEA:**

1. Continue compressions.
2. Consider reversible causes.
3. Transport after 15 minutes.

Considerations:

1. **EARLY EPINEPHRINE.**
2. Administer medications beginning of compression cycle.
3. Use i-Gel only if unable to maintain airway with OPA/BVM or if patient has a history of drowning or respiratory arrest prior to cardiac arrest.

**REVERSIBLE CAUSES**

1. **Hypovolemia-** NS 20 ml/kg IVF bolus IO, max 1L.
2. **Hypoxia-** Maintain ventilations every 3-5 seconds at a ratio of 15:2 compressions to ventilations.
3. **Hydrogen Ion-** sodium bicarbonate 1mEq/kg IO.
4. **Hypoglycemia-** dextrose 10% 5ml/kg or dextrose 50% 1ml/kg.
5. **Hypocalcemia-** calcium chloride 20mg/kg IO.
6. **Hyperkalemia-** sodium bicarbonate 1mEq/kg.
7. **Hypothermia-** Active rewarming with warm IO fluids, start IV if possible, hot packs to neck and groin.
8. **Tension Pneumothorax-** Needle decompression.
9. **Tamponade, Cardiac-** NS 20ml/kg IVF bolus IO, max 1L.
10. **Toxins-** See protocol PODP-01 to 07.
11. **Torsade's de pointes-** magnesium sulfate 25mg/kg IO, max 2g.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Non Traumatic Shock

Shock is a syndrome, which is characterized by inadequate tissue perfusion. Shock can have a variety of underlying causes, including hypovolemia, sepsis, cardiogenic, and anaphylaxis.

Definitions:

1. **Asymptomatic-** Patient has no complaints.
2. **Mildly Symptomatic-** Patient has tachycardia, delayed capillary refill and may have low blood pressure with normal level of consciousness.
3. **Grossly Symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, mottled skin or hypotension delayed capillary refill).

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Compensated shock: Initial often missed stage of shock characterized by normal to slightly decreased BP and tachycardia.<br>2. Decompensated shock: hypotension and tachycardia.<br>3. Irreversible shock: hypotension and bradycardia. | 1. GI bleeding.<br>2. Vomiting.<br>3. Diarrhea.<br>4. Allergic reaction.<br>5. Septicemia.<br>6. Anti-hypertensive O.D. | 1. Myocardial infarction.<br>2. Septic shock.<br>3. DKA.<br>4. Dehydration.<br>5. Myocarditis.<br>6. Cardiomyopathy. |

# Pediatric Non Traumatic Shock

Treatment #1- Mildly Symptomatic:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-6 LPM, NC, titrate to 94%.
3. IV, NS, TKO.
4. If BP is below length based treatment tape low value, NS 20ml/kg IVF bolus. May repeat bolus twice.

Treatment #3- Grossly Symptomatic:
1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 Lead.
4. IV/IO, NS, TKO.
5. If SBP is below length based treatment tape low value, NS 20ml/kg IVF bolus. May repeat bolus twice
6. ~~If SBP remains below length based treatment tape low value, **DILUTED** epinephrine 1ml IV/IO, every 3-5 minutes, titrate to normal age-based SBP.~~

Considerations:
1. Patients that appear to be mildly symptomatic can be in the compensatory stage of shock.
2. Delayed capillary refill is one of the earliest signs of shock. Fluids should be administered for delayed capillary refill.
3. Strongly consider checking blood glucose level in these patients. If they are hyperglycemic, only initial bolus should be given to avoid cerebral edema

~~To make **DILUTED** epinephrine:~~
~~Mix epinephrine 0.01mg/kg **1:10,000** to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. Additional NS 10ml/kg IVF bolus.
2. ~~1.~~ If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.
3. ~~**DILUTED** epinephrine 1ml IV/IO, every 2 minutes,~~
4. ~~-~~Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Return of Spontaneous Circulation

The presence of a palpable pulse **AND/OR** BP for at least 30 seconds after cardiac arrest.

Definitions:

1. **Medical Cardiac Arrest-** Cardiac arrest with no trauma.
2. **Traumatic Arrest-** Cardiac arrest secondary to blunt or penetrating trauma.
3. **STEMI Receiving Facility-** Facility approved by SJCEMSA to receive patients with ST elevation myocardial infarctions.

Documentation Standards:

1. Every THREE 3 minutes:
   A. BP.
   B. Respirations.
   A. Pulse.
   B. SpO2.
   C. ECG.
2. If performed, before and after intervention or if condition changes:
   D. 12 Lead.
   E. Blood glucose.
   F. Pain scale.
   G. Physical assessment.
   H. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Breathing.<br>2. Coughing.<br>3. Movement.<br>4. Palpable pulse.<br>5. Measurable BP. | 1. Congenital heart defects.<br>2. Metabolic disorder. | 1. Sepsis.<br>2. Hypoxia.<br>3. Drowning.<br>4. Arrhythmia.<br>5. Hyperkalemia. |

# Pediatric Return of Spontaneous Circulation

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-20 LPM NC, NRB, or BVM, titrate to 94%.
3. Monitor EtCO2 if using a supraglottic airway or BVM.
4. 12 Lead ECG
5. IV/IO, NS, TKO.

Treatment #1- Arrest Rhythm VF/VT and SBP below length based treatment tape low value:
1. Lidocaine 1 mg/kg IV/IO if not already given during arrest.
2. NS 20 ml/kg IVF bolus. Do not repeat.
3. ~~If SBP is below length based treatment tape low value after bolus, **DILUTED** epinephrine 1ml of IV/IO every 2 minutes. Titrate to length based treatment tape SBP low value.~~
4. ~~3.~~ If V-Tach persists lidocaine 0.1 mg/kg IV/IO. Make base hospital contact for additional doses, max total dose of 1 mg/kg.

Treatment #2- Arrest Rhythm Asystole/PEA and SBP below length based treatment tape low value:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-20 LPM, NC, NRB, or BVM, titrate to 94%.
3. Monitor EtCO2 if using supraglottic airway or BVM.
4. 12 Lead.
5. IV/IO, NS, TKO.
6. NS 20 ml/kg IVF bolus.
7. If low HR, see Bradycardia protocol PCAR-02.

~~If SBP is below length based treatment tape low value after bolus~~
8. ~~**DILUTED** epinephrine 1ml IV/IO, every 2 minutes, titrate to length based treatment tape low value.~~

Considerations:
1. All movements should be done delicately.

~~To make **DILUTED** epinephrine:~~
~~1. Mix epinephrine 0.01mg/kg **1:10,000** to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.
2. ~~1.~~ Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Supraventricular Tachycardia

Supraventricular tachycardia (SVT), also called paroxysmal supraventricular tachycardia, is defined as an abnormally fast heartbeat.

Definitions:

1. **Asymptomatic-** Patient has no complaints related to heart rate.
2. **Mildly symptomatic-** Patient is symptomatic but hemodynamically stable.
3. **Grossly Symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, chest pain or hypotension related to a SVT).
4. **All Joules-** are in biphasic, use of equivalent monophasic dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. 12 lead.
   C. SpO2.
   D. Blood glucose.
   E. Pain scale.
   F. Physical assessment.
   G. Skin signs.
   H. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. A fluttering in chest.<br>2. Rapid heartbeat (palpitations).<br>3. Shortness of breath.<br>4. Lightheadedness or dizziness.<br>5. Sweating.<br>6. A pounding sensation in the neck.<br>7. Fainting (syncope) or near fainting. | 1. Congenital heart defect.<br>2. Hemodialysis.<br><br>Home Meds:<br>1. Beta blockers.<br>2. Calcium channel blockers.<br>3. Amiodarone.<br>4. Sotalol. | 1. Atrial fibrillation.<br>2. Atrial flutter.<br>3. Dehydration.<br>4. Sepsis.<br>5. Drug use. |

# Pediatric Supraventricular Tachycardia

1. Cardiac monitor.
2. Monitor SpO2, if < 94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 lead ECG.

Treatment #1- Asymptomatic:

1. **DO NOT** start IV solely for high HR if patient is asymptomatic.

Treatment #2- Mildly Symptomatic:

1. IV (AC or Higher), NS, TKO.
2. Perform Valsalva's Maneuver.
3. If SBP is below length based treatment tape low value, NS 20 ml/kg rapid IVF bolus.
4. If no response after 2 minutes, adenosine 0.1 mg/kg rapid IVP followed with 10ml NS IV. Max of 6mg. May repeat adenosine 0.2 mg/kg rapid IVP, followed with 10ml NS IV. Max of 12mg.

Treatment #3- Grossly Symptomatic:

1. IV (AC or Higher), NS, TKO.
2. If SBP is below length based treatment tape low value NS 20 ml/kg rapid IVF bolus.
3. If no response after 2 minutes, adenosine 0.2 mg/kg rapid IVP, followed with 10ml NS IV.
4. If no response after 2 minutes to adenosine, synchronized cardioversion 1 J/kg. May repeat at 2 J/kg.
5. Just prior to synchronized cardioversion, give midazolam 0.1 mg/kg IV/IM. Max **TOTAL** dose of 2mg,

**OR**

6. Midazolam 0.2 mg/kg IN (Half in each nostril). Max **TOTAL** dose of 2mg.

Considerations:

1. Consider pediatric normal values for heart rate. Infants may have heart rates as high as 220/minute and children may have heart rates as high as 180/minute in the presence of fever, anxiety, and/or pain.
2. Used approved length based treatment tape to determine heart rate.

## Base Hospital Orders

1. Additional synchronized cardioversions.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Ventricular Assist Device (VAD) Failure

The following are key points to remember from this American Heart Association Scientific Statement about cardiopulmonary resuscitation (CPR) in adults and children with mechanical circulatory support (MCS).

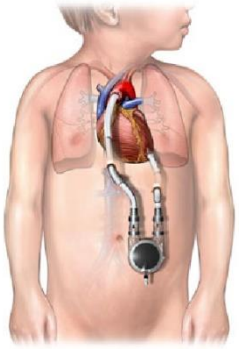
Definitions:

1. **LVAD-** Left Ventricular Assist Device.
2. **RVAD-** Right Ventricular Assist Device.
3. **BiVAD-** Biventricular Assist Device.
4. **Pulsatile-** Will have pulsing or rhythmic sound and possible radial pulse, EtCO2 will read accurately.
5. **Continuous flow-** Most common, located in patient's thorax, will have no peripheral pulses. Utilize monitor generated MAP to assess perfusion EtCO2 will read accurately.
6. **HeartMate II-** The most commonly implanted device.
7. **HeartWare-** Older version but still common.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP and MAP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. EtCO2 if using and supraglottic airway or BVM.
   D. Blood glucose level.
   E. Pain scale.
   F. Physical assessment.
   G. Lung sounds.
   H. Capillary refill







# Pediatric Ventricular Assist Device (VAD) Failure

Treatment:

1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Monitor MAP.
4. Assess capillary refill.
5. Monitor EtCO2 if using and advanced airway or BVM.
6. 12 lead.
7. Blood glucose level, If >70 mg/dL, see protocol PNRO-02.
8. Assess the device to see if it is working:
   A. Gather Information regarding the type of device, the implantation hospital, and/or the VAD Coordinator contact telephone number.
   B. Telephone number may be available by a tag on the device, on the refrigerator, or on a medical alert bracelet.
   C. If a caregiver is present, utilize his/her knowledge. Listen to their directions regarding VAD device management until you are able to contact the VAD Coordinator. The VAD Coordinator can help you decide the best course of action regarding assessment of the equipment. **NOTE: Only the base hospital is legally allowed to give orders regarding patient care.**
9. If the patient has a **continuous flow VAD** (non-pulsatile/pulseless), auscultate the left upper quadrant of the patient's abdomen for the "hum" of the VAD, which can help direct the appropriate actions.
10. A **pulsatile VAD** will make an audible sound without auscultation. Pulsatile VADs are usually older devices which pump blood via pulsatile mechanism, generating a peripheral pulse.
11. Determine if the device has power.
    A. If the device has power, you will see a green light on the HeartMate II, the most commonly implanted device
    B. On the HeartWare device, the display will clearly tell you the Liters per Minute (LPM) of blood flow.
12. Check the VAD for secure connections and that the batteries are charged and functional.

If a VAD is definitively confirmed by a trained person and there are no signs of life, no MAP and no pulse, and EtCO2 <20mmHg

13. Start CPR see protocol PCAR-03.

Considerations

1. While pulse oximetry can be used in patients with a VAD, the results may not be accurate because of the lack of pulsatile flow.
2. A EtCO2 <20mmHg in an unresponsive, correctly intubated, pulseless patient with a VAD would seem to be a reasonable indicator of poor systemic perfusion and should prompt rescuers to initiate chest compressions.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Sustained Ventricular Tachycardia with a Pulse

A regular or slightly irregular rhythm, heart rate 100 to 200 and wide >0.12 seconds QRS complex.

Definitions:

1. **Sustained Ventricular Tachycardia-** Runs of ventricular tachycardia lasting longer than 30 seconds.
2. **Asymptomatic-** Patient has no complaints related to heart rate.
3. **Mildly Symptomatic-** Patient is symptomatic but hemodynamically stable.
4. **Grossly Symptomatic-** Patient is symptomatic and **NOT** hemodynamically stable. (Must have ALOC, chest pain or hypotension related to a VT).
5. **All Joules-** Are in monophasic, use of equivalent Biphasic dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. 12 lead.
   C. SpO2.
   D. Blood glucose level.
   E. Pain scale.
   F. Physical assessment.
   G. Skin signs.
   H. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Dizziness.<br>2. Shortness of breath.<br>3. Lightheadedness.<br>4. Feeling as if your heart is racing (palpitations).<br>5. Chest pain (angina).<br>6. Loss of consciousness or fainting. | 1. Congenital heart defect.<br>2. Hemodialysis.<br><br>Home Meds:<br>1. Beta Blockers.<br>2. Calcium Channel blockers.<br>3. Amiodarone.<br>4. Sotalol. | 1. Aberrancy.<br>2. Hyperkalemia.<br>3. Tricyclic antidepressant overdose. |

# Pediatric Sustained Ventricular Tachycardia with a Pulse

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
3. 12 lead ECG.
4. IV, NS, TKO.

Treatment #1- Asymptomatic:
1. Lidocaine 0.5mg/kg IV.

If V-Tach persists:
2. Lidocaine 0.5mg/kg IV, No repeat.

Treatment #2- Mildly Symptomatic:
1. Lidocaine 1mg/kg IV.

If V-Tach persists:
2. Lidocaine 0.5mg/kg IV, every 5 minutes, max total dose of 3mg/kg.

Treatment #3- Grossly Symptomatic:
1. midazolam 0.1mg/kg IV/IM, max total dose of 2mg,

**OR**

2. Midazolam 0.2mg/kg IN, (Half in each nostril), max total dose of 2mg.
3. Synchronized cardioversion 1 J/kg.

If no cardioversion:
4. Synchronized cardioversion 2 J/kg.

Considerations:
1. Do not delay synchronized cardioversion for IV access and premedication with midazolam.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Pediatric Respiratory

# Pediatric Bronchospasms

Bronchospasm occurs when the airways (bronchial tubes) go into spasm and contract. This makes it hard to breathe and causes wheezing (a high-pitched whistling sound). Bronchospasm can also cause frequent coughing without wheezing. Bronchospasm is often due to irritation, inflammation, or allergic reaction of the airways. People with asthma get bronchospasm. However, not everyone with bronchospasm has asthma.

Definitions:

1. **Mild Respiratory Distress-** means mild wheezing, shortness of breath and/or cough, and ability to speak full sentences.
2. **Moderate Respiratory Distress-** means spontaneous breathing and adequate tidal volume with significant wheezing/SOB accompanied by any of the following signs: accessory muscle use, nasal flaring, grunting, and/or inability to speak full sentences.
3. **Severe Respiratory Distress-** means ineffective ventilations and/or inadequate tidal volume, which may be accompanied by any of the following signs: accessory muscle use, cyanosis, inability to speak, gasping respirations, and/or decreased level of consciousness.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   A. Pulse.
   B. SpO2.
2. If performed, before and after intervention or if condition changes:
   C. ECG.
   D. Blood glucose if history of diabetes.
   E. Pain scale.
   F. Physical assessment.
   G. Lung sounds before and after treatment.
   H. Capillary refill

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Respirations <10 or >30 per minute, rhythm (abnormal pattern, shallow), effort (labored).<br>2. Lung sounds (wheezing, stridor), cough, fever, spitting/coughing up blood or pink froth, barking.<br>3. Rash.<br>4. Urticaria.<br>5. Restlessness.<br>6. Fever.<br>7. Sputum production. | 1. Asthma.<br><br>Home Meds:<br>1. Albuterol.<br>2. Atrovent. | 1. Smoke inhalation.<br>2. Allergic reaction.<br>3. Anaphylaxis.<br>4. Respiratory distress syndrome.<br>5. Pulmonary hemorrhage.<br>6. Pneumonia. |

# Pediatric Bronchospasms

1. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Capillary refill.

Treatment #1- Mild Bronchospasm:
1. Albuterol 2.5mg/3ml NS, via nebulizer, repeat as needed.

Treatment #2- Moderate Bronchospasm:
1. Cardiac monitor.
2. Albuterol 2.5mg/3ml NS & atrovent 0.5mg/2.5ml NS via nebulizer, do not repeat atrovent administration without BHO.
3. Repeat albuterol 2.5mg/3ml NS every 5 minutes as needed.
4. Consider IV, NS, TKO.

Treatment #3- Severe Bronchospasm:
1. Cardiac monitor.
2. Albuterol 2.5 mg/3ml NS & atrovent 0.5mg/2.5ml NS via nebulizer, do not repeat atrovent.
3. Repeat albuterol 2.5mg/3ml NS every 5 minutes as needed
4. 12 Lead ECG.
5. IV, NS, TKO.

If significant wheezes and SOB after albuterol 10mg:
6. Magnesium Sulfate 75 mg/kg, max single dose 2g, IV/IO, in 250ml NS, infusion over 20 minutes.

If patient **DOES NOT** show signs of improvement or is deteriorating rapidly:
7. Epinephrine 0.01 mg/kg **1:1,000** IM, Max dose of 0.5mg.

If necessary, assist ventilations with BVM 100% oxygen and initiate an inline nebulizer treatment with albuterol 2.5mg/3ml.

Considerations:
1. Suction as needed.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.
2. Additional Dose of atrovent, 0.5mg/2.5ml NS, via nebulizer.
3. Additional dose epinephrine 0.01 mg/kg 1:1000 IM, max dose of 0.5mg IM

# Pediatric Croup

Croup refers to an infection of the upper airway, which obstructs breathing and causes a characteristic barking cough.

Definitions:

1. **Croup without stridor-** Is characterized by a brassy or "barking" cough and hoarseness. The focus of treatment should be on keeping the patient calm.
2. **Croup with stridor-** Stridor is a harsh, crowing, or vibratory sound of variable pitch that results from turbulent airflow caused by partial obstruction of the respiratory passages. Audible without a stethoscope, stridor always warrants immediate attention because it may be the first sign of a serious or life-threatening process.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   A. Pulse.
   B. SpO2.
2. If performed, before and after intervention or if condition changes:
   C. ECG.
   D. Blood glucose level.
   E. Pain scale.
   F. Physical assessment.
   G. Lung sounds.
3. Vaccine history.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Barking cough.<br>2. Raspy voice.<br>3. Fever.<br>4. Hoarse voice.<br>5. Tachypnea.<br>6. Lethargy. | 1. Recent illness.<br>2. Upper respiratory infection.<br><br>Home Meds:<br>1. Steroids (Dexamethasone, Prednisone). | 1. Epiglottitis.<br>2. Smoke inhalation.<br>3. Allergic reaction.<br>4. Anaphylaxis.<br>5. Foreign body airway obstruction. |

# Pediatric Croup

Treatment #1- Without Stridor:
1. Keep patient calm.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC, NRB or blow by, titrate to 94%.

Do not use humidified O2 or nebulized saline.

Treatment #2- With Stridor:
1. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB or blow by, titrate to 94%.
2. Consider cardiac monitor.

If HR <200 and no cardiac history:
3. 2.25% racemic epinephrine 0.5mL in 2.5 mL NS via nebulizer.

**OR**
4. Epinephrine 2.5 mg **1:1,000** via nebulizer.

Considerations:
1. Suction as needed.
2. Keep patient calm as symptoms can worsen with agitation.
3. If signs of allergic reaction, see protocol PENV-01.
4. If signs of foreign body airway obstruction, see protocol PAIR-02.
5. If wheezing, see protocol PRSP-01.

## Base Hospital Orders

1. Racemic epinephrine or nebulized epinephrine if patient has a cardiac history.
2. Additional dose of racemic epinephrine or nebulized epinephrine
3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Epiglottitis

Epiglottitis is a potentially life-threatening condition that occurs when the epiglottis swells, blocking the flow of air into your lungs. A number of factors can cause the epiglottis to swell such as burns from hot liquids, direct injury to your throat and various infections.

Definitions:

1. **Epiglottitis without stridor-** Potentially life-threatening condition that occurs when the epiglottis swells, blocking the flow of air into your lungs. The primary goal for presentation of epiglottis with no stridor is keeping patient calm and transporting smoothly. Patient may present with a history of infection and may be drooling or have difficulty swallowing.
2. **Epiglottitis with stridor -** Patients at this stage have audible high pitched respirations secondary swelling in the upper airway. Great care should be taken to avoid respiratory failure. Keep patient calm and transport smoothly.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose level.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds before.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Fever.<br>2. Severe sore throat.<br>3. Abnormal, high-pitched sound when breathing in (stridor).<br>4. Difficult and painful swallowing.<br>5. Drooling.<br>6. Anxious, restless behavior.<br>7. Position of comfort may be sitting up or leaning forward. | 1. Recent illness.<br>2. Recent upper airway infection.<br><br>Home Meds:<br>1. Antibiotics (Cipro, PCN). | 1. Smoke inhalation.<br>2. Allergic reaction.<br>3. Anaphylaxis. |

# Pediatric Epiglottitis

Treatment #1- Without Stridor:
1. Keep patient calm.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.

If can be done without increasing agitation or crying:
3. Consider nebulized NS or humidified O2.

Treatment #2- With Stridor:
1. Keep patient calm.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Consider cardiac monitor.
4. Epinephrine **1:1,000** 2.5mg nebulized

**OR**

5. 2.25% racemic epinephrine 0.5 mL mix in 2.5 mL NS via nebulizer.

If respiratory failure:
6. Ventilate with BVM and oral airway
7. Administer racemic epinephrine or epinephrine **1:1,000** via inline nebulizer.

Do not attempt to visualize airway:
8. Place supraglottic airway **ONLY IF UNABLE TO VENTILATE** with BVM and oral airway.

Considerations:
1. Suction as needed.
2. Keep patient calm as symptoms can worsen with agitation.
3. If signs of allergic reaction, see protocol PENV-01.
4. If signs of foreign body airway obstruction, see protocol PAIR-02.
5. If wheezing, see protocol PRSP-01.
6. Supraglottic airway can cause additional inflammation and must be used sparingly.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Smoke Inhalation

Smoke inhalation is the leading cause of death due to fires. It produces injury through several mechanisms, including thermal injury to the upper airway, irritation or chemical injury to the airways from soot, asphyxiation, and toxicity from carbon monoxide (CO) and other gases such as cyanide.

Definitions:

1. **Asymptomatic-** Known significant exposure to smoke with no complaints or symptoms.
2. **Mildly Symptomatic-** Known significant exposure to smoke, with signs and symptoms, such as weakness or mild shortness of breath.
3. **Grossly Symptomatic-** Known significant exposure to smoke, with serious signs and symptoms, such as ALOC, severe shortness of breath, unconscious.
4. **Carbon Monoxide-** Is a colorless, odorless, and tasteless poisonous gas that can be fatal when inhaled. CO inhibits the blood's capacity to carry oxygen. CO can be produced when burning any fuel. CO is a byproduct of incomplete combustion.
5. **Smoke Inhalation-** Suspected in patients rescued from fires or exposed to smoke.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Pain scale.
   C. Physical assessment.
   D. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Symptoms of CO poisoning:<br>A. Similar to flu with no fever.<br>B. Dizziness.<br>C. Severe headaches.<br>D. Nausea.<br>E. Sleepiness.<br>F. Fatigue/weakness.<br>G. Disorientation/confusion. | 1. Exposure closed space fires. | 1. Pulmonary edema.<br>2. CO poising. |

# Pediatric Smoke Inhalation

Treatment #1- Asymptomatic:
1. Monitor SpO2, if <94% 1-6 LPM O2 via NC, titrate to 94%.

Treatment #2- Mildly Symptomatic:
1. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Cardiac monitor.

If suspected CO poisoning and SpO2 >94%:
3. Administer O2 at 15LPM via NRB.
4. IV, NS, TKO.

If wheezing:
5. See protocol PRSP-01.

If SBP is below length based treatment tape low value, and lung sounds are clear:
6. NS 20ml/kg IVF bolus, may repeat x2.

Treatment #3- Grossly Symptomatic:
1. Monitor SpO2, if <94% 1-15 LPM O2 via NC or NRB, titrate to 94%.
2. Cardiac monitor.

If suspected CO poisoning and SpO2 >94%:
3. O2 at 15LPM via NRB.
4. IV, NS, TKO.

If wheezing:
5. See protocol PRSP-01.

If SBP is below length based treatment tape low value, and lung sounds are clear:
6. NS 20ml/kg IVF bolus, may repeat twice.

If seizing:
7. See protocol PNRO-04.

If dysthymias occur:
8. See protocols PCAR-01 to 08.

Considerations:
1. Completely remove victim's clothing prior to transport.
2. Evaluate patient for facial burns, hoarseness, black sputum, and soot in the nose or mouth.
3. Pulse oximetry values may be unreliable in smoke inhalation patients.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Pediatric Neurologic

# Pediatric Hyperglycemia

An excess of glucose in the bloodstream, often associated with diabetes mellitus.

Definitions:

1. **Asymptomatic-** No symptoms or complaints related to blood glucose level.
2. **Mildly Symptomatic** Showing symptoms of hyperglycemia such as polyuria, polydipsia and dehydration.
3. **Grossly Symptomatic-** ALOC, confusion.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Frequent urination.<br>2. Increased thirst.<br>3. Blurred vision.<br>4. Fatigue.<br>5. Headache.<br>6. Fruity-smelling breath.<br>7. Nausea and vomiting.<br>8. Shortness of breath.<br>9. Dry mouth.<br>10. Weakness.<br>11. Confusion.<br>12. Coma.<br>13. Abdominal pain. | 1. Insulin dependent diabetes.<br>2. Non-insulin dependent diabetes.<br><br>Home Meds:<br>1. Insulin.<br>2. Glucophage. | 1. CVA.<br>2. ETOH intoxication.<br>3. Overdose.<br>4. Sepsis.<br>5. Dehydration.<br>6. DKA.<br>7. Hyperosmolar hyperglycemic nonketotic state HHNK. |

# Pediatric Hyperglycemia

Treatment #1- Asymptomatic:
1. Obtain blood glucose level.

If blood glucose level >180 mg/dL:
2. **DO NOT** initiate IV solely for high blood glucose.
3. Notify receiving nurse/physician.

Treatment #2- Mildly Symptomatic:
1. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
2. Obtain blood glucose level.

If blood glucose level >300 mg/dL
3. IV, NS, TKO.

If no fluid restriction exists and lungs are clear:
4. NS 10 ml/kg IVF bolus. Do not repeat.

Treatment #2- Grossly Symptomatic:
1. Cardiac monitor.
2. Monitor SpO2, if <94% 1-15 LPM O2 via NC or NRB, titrate to 94%.
3. Obtain blood glucose level.

If Blood glucose level >300 mg/dL:
4. IV, NS, TKO

If no fluid restriction exists and lungs are clear:
5. NS 10ml/kg IVF bolus. May repeat 10 ml/kg IVF bolus x 1 if capillary refill is delayed.

Considerations:
1. It is imperative to rule out other causes of ALOC.
2. In pediatric patients with hyperglycemia, aggressive fluid resuscitation can cause cerebral edema.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Hypoglycemia

Hypoglycemia is a condition caused by a very low level of blood glucose, your body's main energy source.

Definitions:

1. **Asymptomatic-** No symptoms or complaints related to blood glucose level.
2. **Mildly Symptomatic-** Showing symptoms of hypoglycemia such as confusion abnormal behavior or poor skin signs.
3. **Grossly Symptomatic-** Loss of consciousness or unconscious, seizure activity.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. An irregular heart rhythm.<br>2. Fatigue.<br>3. Pale skin.<br>4. Shakiness.<br>5. Anxiety.<br>6. Sweating.<br>7. Hunger.<br>8. Irritability.<br>9. Confusion.<br>10. Abnormal behavior.<br>11. Visual disturbances.<br>12. Blurred vision.<br>13. Seizures.<br>14. Loss of consciousness. | 1. Insulin dependent diabetes<br>2. Non-insulin dependent diabetes.<br>3. Malnutrition.<br><br>Home Meds:<br>1. Insulin.<br>2. Glucophage. | 1. CVA.<br>2. ETOH intoxication.<br>3. Overdose.<br>4. Shock.<br>5. Sepsis. |

# Pediatric Hypoglycemia

1. Obtain blood glucose.

Treatment #1- Asymptomatic:
1. If blood glucose <70 mg/dL with diabetes history: Administer oral glucose.
2. If patient has **NO DIABETES HISTORY** administer oral glucose and notify receiving facility.

Treatment #2- Mildly Symptomatic:
1. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.

If less than 70 mg/dL: IV, NS, TKO.

**Child >2 years of age**
2. Consider oral glucose.
3. Dextrose 50% 1ml/kg IV/IO, titrate to blood glucose level >70 mg/dL,
   **OR**
4. Dextrose 10% 5ml/kg IV/IO, titrate to blood glucose level >70 mg/dL.

**Child <2 years of age**
5. Dextrose 10% 5ml/kg IV/IO, titrate to blood glucose level >70 mg/dL.

Treatment #3- Grossly Symptomatic:
1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Obtain blood glucose level.

If blood glucose level <70 mg/dL:
4. IV/IO, NS, TKO.

**Child >2 years of age**
5. Dextrose 50% 1ml/kg IV/IO, titrate to blood glucose level >70 mg/dl,
   **OR**
6. Dextrose 10% 5ml/kg IV/IO, titrate to blood glucose level >70 mg/dl.

**Child <2 years of age**
7. Dextrose 10% 5ml/kg IV/IO, titrate blood glucose level >70 mg/dl.

Considerations:
1. Dextrose 10% is the preferred concentration in pediatric patients.
2. If ALOC continues after Dextrose, go to protocol PNRO-03.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric New Onset A.L.O.C. Unknown Etiology

A mildly depressed level of consciousness or alertness may be classed as lethargy. Someone in this state can be aroused with little difficulty. People who are obtunded have a more depressed level of consciousness and cannot be fully aroused. Those who are not able to be aroused from a sleep-like state are said to be stuporous. Scales such as the Glasgow coma scale have been designed to measure the level of consciousness.

Definitions:

1. **New Onset-** No medical history that would cause a chronic altered level a of conscious or a decrease in patients normal level of consciousness.
2. **CPSS-** Cincinnati Prehospital Stroke Scale.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Stroke screen.
   G. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Evidence of trauma.<br>2. Fever.<br>3. Cough.<br>4. Fatigue.<br>5. Shakiness.<br>6. Skin color changes.<br>7. Snoring respirations. | 1. Recent fall.<br>2. Recent infections.<br>3. Chang in medications.<br>4. Stopped medications<br>5. Accidental overdose.<br>6. ETOH abuse.<br>7. Liver disease.<br><br>Home Meds<br>1. Lactulose.<br>2. Narcotics or pain meds. | 1. Alcohol intoxication.<br>2. Epilepsy.<br>3. Hypo/Hyperglycemia.<br>4. Over/Underdose.<br>5. Trauma.<br>6. Sepsis.<br>7. Shock.<br>8. Behavioral. |

# Pediatric New Onset A.L.O.C. Unknown Etiology

Treatment #1-

1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via BVM, NC or NRB, titrate to 94%.
3. Monitor EtCO2 if using an supraglottic airway or BVM.
4. Obtain blood glucose level, if <70 mg/dL, see protocol PNRO-02. If blood glucose level >200 mg/dL, see protocol PNRO-01.
5. 12 lead ECG.

If presenting with serious signs and symptoms that do not fit into any other protocol:

6. IV, NS, TKO.

Considerations

1. **A**lcohol - Maintain airway as needed. If SBP below length based treatment tape low value, see protocol PCAR-04.
2. **E**pilepsy - If postictal, maintain airway as needed. If seizing, see protocol PNRO-04.
3. **I**nsulin - If blood glucose level >70 mg/dL, see protocol PNRO-01. If blood glucose level <70 mg/dL, see protocol PNRO-02.
4. **O**verdose/ Underdose - See protocols PODP-01 to 07. If no reversible causes and serious signs and symptoms, consider IV/IO.
5. **T**rauma - See protocol PTRA-01.
6. **I**nfection - See protocol PGEN-05.
7. **P**sychosis - This should be considered only after all other potential causes are ruled out.
8. **S**hock - See protocol PCAR-04.
9. **S**troke/Intracranial hemorrhage - assess pupil equality, presence of headache, posturing, abnormal neuro exam – alert receiving hospital of abnormal findings.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

| Glasgow Coma Scale | | | | |
|---|---|---|---|---|
| Score | | Child 4-14 | Child 1-3 | Infant <1 Year |
| 4 | EYE | Spontaneous | Spontaneous | Spontaneous |
| 3 | | To Speech | To Speech | To Speech |
| 2 | | To Pain | To Pain | To Pain |
| 1 | | None | None | None |
| 5 | Verbal | Age appropriate orientation | Speaks and Social | Coos and babbles |
| 4 | | Confused or disoriented | Disoriented, Consolable | Irritable cry's |
| 3 | | Inappropriate Words | Inappropriate Words, Inconsolable | Cry's to pain |
| 2 | | Incompressible speech | Incompressible speech, agitated | Moans to pain |
| 1 | | None | None | None |
| 6 | Motor | Follows Commands | Moves Spontaneously | Moves Spontaneously |
| 5 | | Localizes | Moves purposefully | Moves purposefully |
| 4 | | Withdraws | Withdraws to Pain | Withdraws to Pain |
| 3 | | Decorticate Posture | Abnormal Flexion | Abnormal Flexion |
| 2 | | Decerebrate poster | Abnormal Extension | Abnormal Extension |
| 1 | | None | None | None |

# Pediatric Seizures

A seizure is a sudden, uncontrolled electrical disturbance in the brain. It can cause changes in your behavior, movements, or feelings, and in levels of consciousness. In the prehospital setting, our goal is the management of generalized seizure activity that may affect respiratory drive or airway patency.

Definitions:

1. **Tonic Seizures-** Tonic seizures cause stiffening of your muscles. These seizures usually affect muscles in your back, arms, and legs and may cause you to fall to the ground.
2. **Clonic Seizures-** Clonic seizures are associated with repeated or rhythmic, jerking muscle movements. These seizures usually affect the neck, face, and arms.
3. **Tonic-Clonic Seizures-** Tonic-Clonic seizures, previously known as grand mal seizures, are the most dramatic type of epileptic seizure and can cause an abrupt loss of consciousness, body stiffening, and shaking, and sometimes loss of bladder control or biting your tongue.
4. **Recurrent Seizure-** Seizure witnessed by prehospital personnel lasting >2 minutes **OR** patient having two (2) or more seizures without regaining consciousness.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Blood glucose.
   C. Pain scale.
   D. Physical assessment
   E. Pupils.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Evidence of trauma.<br>2. High temperature (febrile state).<br>3. Current seizure activity.<br>4. Medical information tags, bracelets, or medallions. | 1. Recent infection.<br>2. Fever.<br>3. Trauma.<br>4. Environment (heat/cold).<br>5. Epilepsy.<br><br>Home Meds:<br><br>1. Acetazolamide(Acetazolam).<br>2. Carbamazepine (Tegretol).<br>3. Clobazam (Frisium).<br>4. Clonazepam (Rivotril).<br>5. Diazepam (Valium).<br>6. Ethosuximide (Zarontin).<br>7. Gabapentin (Neurontin).<br>8. Lamotrigine (Lamictal). | 1. CVA.<br>2. Tetany.<br>3. Meningitis.<br>4. Encephalitis.<br>5. Hypertension.<br>6. Drug OD. |

# Pediatric Seizures

1. Cardiac monitor.
2. 2-15 LPM via NC or NRB, titrate to 94%.

Treatment #1- Recurrent Seizure Treatment:

3. Obtain blood glucose level, if <70 mg/dL, see protocol PNRO-02. If >200 mg/dL, **AVOID** fluids and notify receiving facility
4. If febrile, start active cooling measures, avoid midazolam unless seizure is >5 minutes. See protocol PGEN-05.
5. IV, NS, TKO.
6. Midazolam 0.1 mg/kg IV/IM/IO, max of 5 mg,

**OR**

7. Midazolam 0.2 mg/kg IN (half in each nostril), max of 5mg.

Treatment #2- Continued Seizure Activity:

If after **5** minutes, initial dose has **NOT** lessened or stopped seizure activity:

1. Midazolam 0.1 mg/kg IV/ IM/IO, max total dose of 10 mg,

**OR**

2. Midazolam 0.2 mg/kg IN (Half in each nostril), max total dose of 10 mg.

If patient is showing signs of respiratory compromise secondary to seizure activity:

3. Support ventilations with BVM and OPA.
4. Suction as needed.

Considerations:

1. Protect patient from further injury – move furniture and ensure safe area for treatment.
2. Spinal stabilization as indicated.
3. **DO NOT** forcibly restrain patient during seizure activity.
4. If narcotic overdose is suspected, refer to protocol PODP-06.

## Base Hospital Orders

1. Make base contact for additional medication if seizures continue after maximum dose of midazolam.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Pediatric Environmental

# Pediatric Allergic Reaction/Anaphylaxis

Allergic reactions occur when your immune system reacts to a foreign substance and can range from mild to severe.
Anaphylaxis is a severe, potentially life-threatening allergic reaction. It can occur within seconds or minutes of exposure.

Definitions:

1. **Mild-** Hives, rash to arms or legs, itching, anxiety.
2. **Moderate-** Hives, rash to torso, bronchospasm, wheezing, nausea, delayed capillary refill.
3. **Severe-** Respiratory distress, chest tightness, difficulty swallowing, altered mental status.
4. **Anaphylactic shock-** Signs of hemodynamic instability, tachycardia, ALOC, hypotension, syncope.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
   D. SpO2.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. Blood glucose level.
   C. Pain Scale.
   D. Physical assessment.
   E. Skin assessment.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Sneezing.<br>2. Itching of the nose, eyes or roof of the mouth.<br>3. Runny, stuffy nose.<br>4. Swelling of the lips, tongue, face or throat.<br>5. Hives.<br>6. Edema at the sting site.<br>7. Cough, chest tightness, wheezing or shortness of breath.<br>8. Loss of consciousness.<br>9. A drop in BP.<br>10. Urticaria.<br>11. Lightheadedness.<br>12. A rapid, weak pulse.<br>13. Nausea and vomiting. | 1. Known allergy.<br>2. Asthma.<br><br>Home Meds:<br>1. Epi-pen.<br>2. Diphenhydramine. | 1. Asthma.<br>2. Toxic exposure. |

# Pediatric Allergic Reaction/Anaphylaxis

Treatment #1- Mild Reaction:
1. Age >2 years of age, diphenhydramine 1mg/kg PO, max of 50 mg.

Treatment #2- Moderate Reaction:
1. Consider IV, NS, TKO.
2. Diphenhydramine 1mg/kg PO/IV/IM, max 50mg.
3. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
4. If wheezing, albuterol 2.5 mg/3ml NS via nebulizer, repeat as needed.

Treatment #3- Severe Reaction:
1. Monitor SpO2, if <94%, 1-15 LPM O2 via NC or NRB, titrate to 94%.
2. Cardiac monitor.
3. IV/IO, NS, TKO.
4. Epinephrine 0.01 mg/kg **1:1,000** IM in lateral thigh, max 0.3mg.
5. Diphenhydramine 1 mg/kg IM/IV/IO, max dose of 50mg.
6. If wheezing, albuterol 2.5 mg/3ml NS via nebulizer, repeat as needed.
7. If stridor, 2.25% racemic epinephrine 0.5mL nebulized in 2.5mL NS.

Treatment #4- Anaphylactic Shock:
1. Monitor SpO2, if <94% 1-15 LPM O2 via NC or NRB, titrate to 94%.
2. Cardiac monitor.
3. IV/IO, NS, TKO.
4. Epinephrine 0.01 mg/kg **1:1,000** IM to lateral thigh, max 0.5mg.
5. If wheezing, albuterol 2.5 mg/3ml NS via nebulizer, repeat as needed.
6. Diphenhydramine 1 mg/kg IM/IV/IO, max dose of 50mg.
7. If stridor, 2.25% racemic epinephrine 0.5mL Nebulized in 2.5mL NS.
8. If SBP is below length based treatment tape low value, without evidence of fluid overload NS 20ml/kg IVF bolus, may repeat x2.
   ~~If after 3 fluid boluses and SBP is below length based treatment tape low value, **DILUTED** epinephrine 1ml IV/IO every 3-5 minutes as needed, titrate to length based appropriate SBP, normal mental status or brisk capillary refill.~~

If patient becomes unresponsive with no pulses:
9. Epinephrine 0.01 mg/kg **1:10,000** IV/IO, max of 0.5mg then go to Pediatric cardiac arrest protocol PCAR-03.

Considerations:
1. Attempt to identify allergen if it can be done SAFELY.
2. Remove allergen if possible.
3. If patient or Optional Skill EMT-B gives epi auto injector prior to arrival and patient is:
   A. Asymptomatic: give diphenhydramine 1mg/kg PO, max dose 50mg.
   B. Mildly symptomatic: give diphenhydramine 1 mg/kg IM/IV, max dose of 50mg.

~~To make **DILUTED** epinephrine:~~
~~Mix epinephrine 0.01mg/kg 1:10,000 to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.

~~1. To increase diluted epinephrine pushes to every 2 minutes~~

2. Consult Base Hospital if additional orders are needed **or** patient has atypical presentation.

# Pediatric Bites & Envenomation

Common poisonous spiders to the Central Valley are the brown widow (brown with orange hourglass on belly) and black widow (black with red hourglass on body) spiders and the brown recluse spider. The only indigenous poisonous snake in the Central Valley is the rattlesnake.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Abrasions.<br>2. Punctures.<br>3. Swelling and edema.<br>4. Pain to site. | 1. Working on or around woodpiles or agriculture storage.<br>2. Hiking. | 1. Abscess.<br>2. Cellulitus.<br>3. Necrosis.<br>4. Necrotizing fasciitis.<br>5. Allergic reaction.<br>6. Anaphylaxis. |

# Pediatric Bites & Envenomation

Treatment #1- Animal Bite:
1. Ensure personal safety.
2. Clean and dress wound as appropriate.
3. For possible fracture, see protocol PTRA-01.
4. For complaint of pain, apply ice packs.
5. If pain continues, consider pain management see protocol PGEN-03.

Treatment #2- Insect Bite or Sting:
1. Ensure personal safety.
2. Scrape away stinger if appropriate; **DO NOT** squeeze venom sac.
3. If allergic reaction or anaphylaxis, see protocol PENV-01.
4. For complaint of pain apply ice packs.
5. If pain continues, consider pain management see protocol PGEN-03.
6. Consider cardiac monitoring if tachycardic or bradycardic heart rates per child age.
7. Consider monitoring SpO2, if <94%, O2 1-6 LPM, NC, titrate to 94%.

Treatment #3- Snake Bite:
1. Ensure personal safety.
2. Clean and dress wound as appropriate.
3. Remove rings, watches, or other constricting items.
4. AVOID excessive movement of extremity.
5. Circle erythema around puncture site with ink pen and note time.
6. Monitor distal pulses.
7. Monitor SpO2, if <94% 1-15 LPM O2 via NC or NRB, titrate to 94%.
8. For complaint of pain **DO NOT** apply ice packs.
9. Consider pain management see protocol PGEN-03.
10. Consider cardiac monitoring if tachycardic or bradycardic heart rates per child age.

Considerations:
1. Do not apply constricting band or tourniquet.
2. Do not incise snakebites.
3. If dead or captured, have animal control transport snake for identification.
4. If safe, package insect or spider for transport and positive identification.
5. All bites (dog, cat, human, etc.) need to be transported for further evaluation at a hospital for further cleansing and potential antibiotic therapy.
6. Time since envenomation is important as anaphylaxis rarely occurs more than 60 minutes after inoculation.
7. Chemical ice packs should never be in direct contact with patient's skin. Ice pack should be wrapped in towel or other fabric material.

## Base Hospital Orders

1. For known and confirmed black widow bite:
   A. Calcium chloride 8mg/kg, IV/IO, max 500mg.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Hyperthermia

Hyperthermia is a condition caused by your body overheating, usually as a result of prolonged exposure to or physical exertion in high temperatures. Heatstroke, the most serious form of heat injury, can occur if your body temperature rises to 104°F (40°C) or higher. The condition is most common in the summer months.

Definitions:

1. **Mildly Symptomatic-** Signs of heat cramps and heat exhaustion.
2. **Grossly symptomatic-** Heat stroke.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Temperature.
   G. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Headache.<br>2. Chest pain.<br>3. Cramps.<br>4. Nausea.<br>5. Weakness.<br>6. Abnormal temperature.<br><u>Heat cramps and heat exhaustion:</u><br>1. Temperature normal to slightly elevated.<br>2. Mental status alert to slightly confused.<br>3. Skin signs diaphoresis, warm or hot to touch.<br>4. Muscle cramps and weakness.<br><u>Heat stroke:</u><br>1. High core temperature usually above 104°F.<br>2. Altered mental status.<br>3. Skin hot to touch and flushed.<br>4. Possible seizure activity.<br>5. Low BP.<br>6. Tachycardia. | Note: Persons at greatest risk of hyperthermia are:<br>1. The immune suppressed.<br>2. Athletes.<br>3. Persons on medications, which impair the body's ability to regulate heat. | 1. Always rule out other causes of ALOC. |

# Pediatric Hyperthermia

Treatment #1- Mildly Symptomatic:
1. Move patient to cool environment.
2. Remove excess clothing.
3. Spray or sprinkle patient's face with cool (not cold) water and use fan to evaporate.
4. Ice packs to palms of hands and soles of feet.
5. If able to swallow safely, cool water PO.
6. Consider IV, NS, TKO.
7. If no fluid restrictions exist and lungs are clear NS 20ml/kg IVF bolus IV, max 2,000 ml.

Treatment #2- Grossly Symptomatic:
1. Move patient to cool environment.
2. Remove excess clothing.
3. Cardiac monitor.
4. Monitor SpO2, if <94%, O2 1-15 LPM via NC or NRB, titrate to 94%.
5. Obtain blood glucose level.
6. Ice packs to palms of hands and soles of feet.
7. IV/IO, NS, TKO.
8. If no fluid restrictions exist and lungs are clear, NS 20ml/kg IVF bolus IV/IO, Max 2,000 ml.
9. If seizing, see seizure protocol PNRO-04.

Considerations:
1. Chemical ice packs should never be in direct contact with patient's skin and should be wrapped in towel or other fabric material.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Hypothermia

Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 98.6°F (37°C). Hypothermia occurs as your body temperature falls below 95°F (35°C).

Definitions:

1. **Mildly Symptomatic-** Signs and symptoms of hypothermia.
2. **Grossly symptomatic-** Signs and symptoms of hypothermia with ALOC, loss of consciousness or hypotension.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.
   G. Patient's body temperature.
3. Length of exposure.
4. Air temperature, water temperature?
5. Was patient wet or dry?
6. Time of mental status changes?

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Shivering.<br>2. Slurred speech or mumbling.<br>3. Slow, shallow breathing.<br>4. Weak pulse.<br>5. Lack of coordination.<br>6. Drowsiness.<br>7. Confusion or memory loss.<br>8. Loss of consciousness.<br>9. Altered mental status.<br>10. Evidence of local cold injury-blanching, red or wax looking skin especially ears, nose and fingers, burning or numbness in affected areas.<br>11. Stuporous or comatose.<br>12. Dilated pupils.<br>13. Hypotensive or pulseless, slowed or absent respirations. | 1. Trauma.<br>2. Alcohol consumption, medications.<br>3. Pre-existing medical problems.<br>4. Recent illness. | 1. Rule out other causes for ALOC.<br>2. Severe sepsis.<br>3. Environmental exposure.<br>4. Drug use. |

# Pediatric Hypothermia

Treatment #1- Mildly Symptomatic:
1. Move patient to warm environment.
2. Remove clothing if wet and cover with warm blankets.
3. Apply heat packs to groin and axillary.
4. Consider IV, NS, TKO.
5. If no fluid restrictions exist and lungs are clear, consider **WARM** NS 20 ml/kg IVF bolus, no repeat.

Treatment #2- Grossly Symptomatic:
1. Move patient to warm environment.
2. Remove clothing if wet and cover with warm blankets.
3. Apply heats packs to groin and axillary.
4. Cardiac monitor.
5. Monitor SpO2, if <94% O2, 1-15 LPM via NC or NRB, titrate to 94%.
6. Obtain blood glucose level, if >70 mg/dL, see protocol PNRO-02. If >200 mg/dL see protocol PNRO-01.
7. Consider 12 lead EKG.
8. IV/IO, NS, TKO.
9. If no fluid restrictions exist and lungs are clear **WARM** NS 20 ml/kg IVF bolus, may repeat x2, max total dose 2,000 ml.

Considerations:
1. **DO NOT** attempt to thaw out frost bitten areas or apply heat packs to frostbite sites.
2. Chemical heat packs should never be in direct contact with patient's skin. Heat pack should be wrapped in towel or other fabric material.
3. Drive with caution and avoid bumps and hard shocks in all patient movements.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Pediatric Trauma

# Pediatric Trauma

Trauma can either be blunt or penetrating, open or closed, or any combination of all.

Definitions:

1. **Blunt Trauma-** Traumatic injury caused by a blunt object or surface.
2. **Penetrating-** Traumatic injury caused when an object enters the body.
3. **Open-** Traumatic injury with a break in the skin**.**
4. **Closed-** Traumatic injury without a break in the skin.
5. **TBSA-** Total burn surface area.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.
   G. Head to toe exam.

Objective Findings:

1. Mechanism of injury.
2. Medical history of cardiovascular problems, diabetes, or seizure disorder.
3. Check for DCAP-BTLS (Deformity, Contusion / Crepitus, Abrasion, Puncture, Bleeding, Tenderness, Laceration, Swelling).
4. Glasgow coma score.
5. Neurological impairment or focal deficit – paralysis, weakness.
6. Eyes/vision – pupil inequality and reactivity, eye tracking, impaired vision – double vision, stars.
7. Check for paradoxical chest wall movement (flail chest), rib cage, and sternal instability.
8. Check for pelvic instability, abdominal rigidity and guarding.
9. Check for range of motion, distal pulses, sensation, skin color, and associated injuries.

# Pediatric Trauma

Treatment #1 Asymptomatic:
1. If bleeding, see injury specific guidelines.
2. Place in spinal motion restriction if indicated.
3. See injury specific guidelines starting on PTRA-02.

Treatment #2- Symptomatic:
1. If bleeding, see injury specific guidelines.
2. Place in spinal motion restricting if indicated.
3. Monitor SpO2, if <94% 1-6 LPM O2 via NC, titrate to 94%.
4. See injury specific guidelines.
5. Consider treating for pain. See protocol PGEN-03.
6. If ALOC, loss of consciousness, obtain blood glucose level.
7. If chest pain Cardiac monitor.
8. Consider 12 lead ECG.

Treatment #3- Grossly Symptomatic or Signs of Shock:
1. If bleeding, see injury specific guidelines.
2. Place in spinal motion restricting if indicated.
3. Patients with ineffective respirations, support ventilations with BVM and airway adjunct.
4. Suction as needed.
5. TRANSPORT.
6. Cardiac monitor.
7. Monitor SpO2, if <94%, 1-15 LPM O2 via NC or NRB, titrate to 94%.
8. Consider treating for pain. See protocol PGEN-03.
9. If loss of consciousness or ALOC obtain blood glucose level, If <70 mg/dL, see protocol PNRO-03.
10. If chest injury, consider 12 Lead.
11. 2 large bore IV, NS, TKO.
12. If SBP is below length based treatment tape low value, lung sounds are clear and no fluid restrictions exist NS 20ml/kg IVF bolus, may repeat x1.
13. See injury specific guidelines.

Considerations:
1. Continually assess for signs of shock.
2. If brain injury is suspected, elevate the head of the patient as long as no signs of shock are present.
3. Significant internal thoracic and abdominal trauma may occur without any signs of injury.
4. Transport patient in position of comfort if not in spinal precautions. Place pregnant patients in left lateral recumbent position.
5. Avoid supraglottic airway unless no gag is present and unable to ventilate with BVM and OPA.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Injury Specific Guidelines

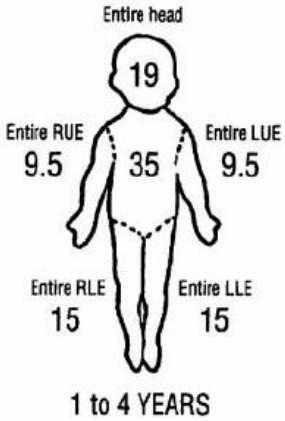
| Trauma: Injury Specific Treatments | |
|---|---|
| Treatment for Bleeding Control | Treatment Considerations |
| 1. Direct pressure.<br>2. If unable to control with direct pressure alone, use hemostatic dressing on wound and pack wound if applicable.<br>3. Elevate extremity<br>4. If bleeding still not controlled, apply tourniquet. | 1. Secure tourniquets as high on arm or leg as possible.<br>2. Note time of placement. |
| Treatment for Eye Injury | Treatment Considerations |
| 1. Apply dressing as appropriate.<br>2. Loosely cover affected and unaffected eye. | 1. **DO NOT** attempt to re insert eye. |
| Treatment for Tooth Injury | Treatment Considerations |
| 1. Keep avulsed teeth in saline soaked gauze,<br>**OR**<br>2. Commercial tooth saver kit.<br>3. Transport tooth with patient. | 1. **DO NOT** attempt to re-insert teeth.<br>2. **DO NOT** attempt to remove partially avulsed teeth. |
| Treatment for Mandible Fracture | Treatment Considerations |
| 1. Splint with cravat or bandage. | 1. Monitor airway compromise or difficulty breathing. |
| Treatment for Impaled Object | Treatment Considerations |
| 1. Stabilize with large bulky dressings.<br>2. Leave in place. | 1. Removal of impaled objects should only be considered if object interferes with CPR or airway cannot be managed.<br>2. Consider base contact for consult. |
| Treatment for Flail Chest | Treatment Considerations |
| 1. Stabilize chest with large bulky dressing. | |
| Treatment for Open Chest Wound | Treatment Considerations |
| 1. Cover wound with loose dressing, do not seal.<br><br>Sucking chest wounds:<br>2. Immediately cover with gloved hand.<br>3. Cover with occlusive dressing taped on three sides,<br>**OR**<br>4. Use commercially available chest seal. | 1. Continuously monitor patient for tension pneumothorax.<br>2. Attempt to “burp” the wound by removing occlusive dressing, allowing air to escape and then recovering the wound, prior to needle decompression. |
| Treatment for Tension Pneumothorax | Treatment Considerations |
| 1. Perform needle decompression:<br>A. 2nd or 3rd intercostal space mid clavicular. | 1. Tension pneumothorax occurs when a patient has:<br>A. Absent or decreased lung sounds.<br>B. Difficulty breathing.<br>C. Hypotension. |

| Trauma: Injury Specific Treatments | |
|---|---|
| Treatment for Cardiac Tamponade | Treatment Considerations |
| 1. Cardiac monitor.<br>2. 12 Lead ECG.<br><br>If SBP is below length based treatment tape low value, lung sounds are clear and no fluid restrictions exist:<br>3. 20ml/kg NS Bolus, titrate to length based treatment tape low value, may repeat x1. | |
| Treatment for Cardiac Contusion | Treatment Considerations |
| 1. Cardiac monitor for dysrhythmias:<br>A. V-Tach- see protocol PCAR-08. | 1. Consider 12 lead with blunt chest trauma. |
| Treatment for Evisceration of Organs | Treatment Considerations |
| 1. Cover eviscerated organs with normal saline soaked gauze. | 1. Frequently assess gauze for dryness and add additional normal saline if needed.<br>2. **DO NOT** attempt to reinsert organs. |
| Treatment for Genital Injuries | Treatment Considerations |
| 1. Cover genitalia with saline soaked gauze. | 1. If necessary, apply direct pressure to control bleeding.<br>2. Treat amputation as extremity amputation. |
| Treatment for Extremity Injuries | Treatment Considerations |
| 1. Check for range of motion, distal pulses, sensation, skin color, and associated injuries.<br>2. Elevate extremity.<br>3. Apply cold packs to reduce pain and decrease soft tissue swelling.<br>4. Splint injured extremity in position found unless precluded by extrication consideration, no palpable pulses, or patient discomfort. | 1. Pad all splinted extremities and recheck distal pulses and neurological function every 5 minutes.<br>2. **DO NOT** apply traction or attempt to reduce an open extremity fracture. |
| Treatment for Mid Shaft Femur Fracture | Treatment Considerations |
| 1. Apply traction splint. | |
| Treatment for Extremity Amputation | Treatment Considerations |
| 1. Place/cover amputated part in/with dry sterile dressing.<br>2. Place in sealed plastic bag or wrap with plastic.<br>3. Place dressed and wrapped part on top of ice or cold pack. | 1. If patient condition allows, transport amputated part with patient. Chemical ice packs should never be in direct contact with patient's skin. Ice pack should be wrapped in towel or other fabric material. |
| Treatment for Soft Tissue Injuries | Treatment Considerations |
| 1. Cover open wounds with sterile dressings. | |

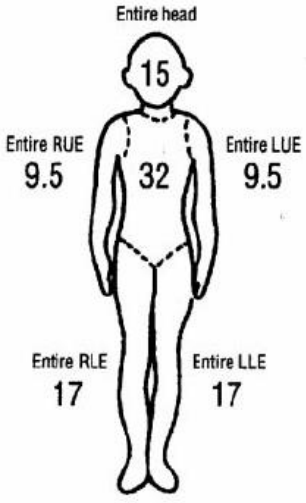
# Trauma: Injury Specific Treatments

| Treatment for Burns | Treatment Considerations |
|---|---|
| 1. Remove clothing from burned area if possible without removing skin.<br>2. Patients with respiratory distress see protocol PRSP-01 to 04.<br><br>If <20% TBSA:<br>3. Estimate depth of burn (full thickness, partial thickness, surface burn).<br>4. Calculate TBSA using rule of nines, see chart below.<br>5. Cover with sterile dressing soaked with sterile water.<br><br>If >20% TBSA:<br>6. Cover with dry sterile burn sheet or cleanest dry sheet.<br>7. Place patient on dry sterile burn sheet for transport.<br>8. IV, NS, titrate fluids to Parkland Formula.<br>9. Transport to trauma center. If **AIRWAY** is compromised, or **LOW SPO2**, go to **NEAREST ED.**<br><br>**Chemical**<br>1. Follow appropriate decontamination or hazmat procedures.<br>2. Brush off dry powders.<br>3. Remove contaminated clothing.<br>4. Irrigate with copious amounts of water.<br>**Thermal and Electrical**<br>1. Stop the burning process.<br>2. Cool with water for up to 30 minutes.<br>3. Remove jewelry and non-adhered clothing.<br>4. Cover burn. | 1. Always attempt to identify type and source of burn:<br>A. Chemical.<br>B. Electrical.<br>C. Steam.<br>D. Smoke.<br>E. Open flame.<br>**Parkland Formula**<br>**2. 4 ml x %TBSA x body weight (kg) = Total for 24 hours.**<br>**3. 50% given in first 8 hours; 50% given in next 16 hours.**<br>**Chemical**<br>4. **DO NOT** attempt to remove tar or other adhered material.<br>5. If possible, bring chemical Safety Data Sheet (SDS) with patient to hospital.<br><br>**Thermal and electrical**<br>6. Avoid prolonged cool water usage due to risk for hypothermia and local cold injury.<br>7. **DO NOT** use ice water or apply ice or ice packs to patient.<br>8. **DO NOT** break blisters. |

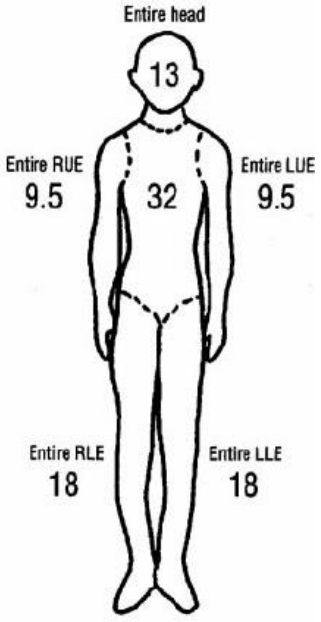
Rule of Nines Burn Chart



1 to 4 YEARS



5 to 9 YEARS



10 to 14 YEARS

# Pediatric Traumatic Arrest

Loss of cardiac and pulmonary function due to traumatic event.

## Definitions:

1. High Quality CPR- Use TEAM approach:
   A. 100 to 120 compressions per minute.
   B. **15:2** ratio compression to ventilation ratio.
   C. Compress at least 1/3 the depth of the chest.
   D. Allow complete recoil.
   E. Minimize interruptions.
   F. Rotate compressors every 2 minutes.
   G. Pre-charge monitor for defibrillation while CPR is in progress.

## Documentation Standards:

1. Every 5 minutes:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Capnography.
   D. Blood glucose.
   E. Physical assessment.
   F. Lung sounds.

## Objective Findings:

1. Obtain patient history and document the following:
   A. Estimated down time.
   B. Quickly assess for obvious signs of death:
      i. Decapitation.
      ii. Decomposition.
      iii. Burnt beyond recognition.
      iv. Lividity.
      v. Rigor mortis.
   C. Circumstances surrounding the arrest:
      i. Onset (witnessed or unwitnessed).
      ii. Preceding symptoms.
      iii. Bystander CPR.
      iv. Medications.
      v. Environmental factors (hypothermia, inhalation, and asphyxiation).

# Pediatric Trauma Arrest

Treatment- Treat reversible causes upon identification.

Reversible Causes

1. **Hypovolemia-** (history suggesting volume depletion)
   Start 2nd IV, NS 20ml/kg bolus IV/IO, repeat x2.
2. **Hypoxia-** (SpO2 <94%)
   Maintain ventilations at 8-10 minutes, with 100% O2, BVM & OPA.
   If unable to ventilate, insert supraglottic airway.
3. **Hydrogen Ion-** (acidosis, long down time, dialysis patient)
   Sodium bicarbonate 1mEq/kg IV/IO. Max 50mEq.
4. **Hypoglycemia-** (Blood glucose level <70 mg/dL)
   dextrose 10% 5 ml/kg IV/IO,
   **OR**
   dextrose 50% 1 ml/kg IV/IO.
5. **Hypocalcemia-** (long down time, dialysis patient)
   Calcium chloride 10%, 10mg/kg IV/IO, max 1 gm.
6. **Hyperkalemia-** (long down time, dialysis patient)
   sodium bicarbonate 1mEq/kg IV/IO, max 50mEq.
7. **Hypothermia-** (body temp <34°C)
   Active rewarming with warm IV/IO fluids, hot packs to neck and groin.
8. **Tension Pneumothorax-** (absent lung sounds on affected side)
   Needle decompression.
9. **Tamponade, Cardiac-**
   If SBP is below length based tape low level:
   NS 20 ml/kg IVF bolus IV/IO, may repeat x2.
10. **Toxins-**
    See protocol PODP-01 to 07.
11. **Torsade's De pointes-**
    Magnesium sulfate 25mg/kg IV/IO, max 2g.

Considerations:

1. The goal is high quality CPR.
2. **DO NOT** delay vascular access with IV attempts. Go directly to IO.
3. Monitor capnography with BVM & OPA.
4. Transport immediately. After spinal motion restriction, perform all treatment enroute.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Trauma Arrest

**Treatment**

**Transport**
**To approved Trauma Center perform ALL treatment enroute**

1. 200 compressions
2. OPA & BVM,
3. Bilateral needle decompression
4. NS 20ml/kg IO/IV bolus, may repeat x2.
5. Consider advanced airway

2 Min.

Rhythm check #2

| V-Fib / pV-Tach | Asystole / PEA | ROSC |
|---|---|---|

Shock 2 Joules/kg

1. 200 compressions

See protocol PTRA-01.

2 Min.

Rhythm check #1

| V-Fib/V-Tach | Asystole/PEA | ROSC |
|---|---|---|

Shock 4 Joules/kg

1. 200 compressions
2. Lidocaine 1mg/kg IV/IO, max 3mg/kg, No Repeat

1. 200 compressions

See protocol PTRA-01.

2 Min.

Return to Rhythm check #1

**All Joules-** are in Biphasic, use of equivalent Monophasic dose if equipped to do so is appropriate. Follow manufacturer's recommendations for single shocks.

Always consider reversible causes and treat when identified

2 Min.

# Pediatric Overdose

# Pediatric Acute Dystonic Reactions

Acute dystonic reactions are an extrapyramidal side effect of antipsychotic and certain other medications such as phenothiazines. Dystonia refers to sustained muscle contractions, frequently causing twisting, repetitive movements, or abnormal postures. They may affect any part of the body. Patients experiencing acute dystonic reactions are often frightened and fearful, and may be in considerable pain.

## Definitions:

1. **Symptomatic/Mild Reaction-** Intermittent spasms or sustained involuntary contractions isolated to extremities, tongue or jaw.
2. **Grossly Symptomatic/Severe Reaction-** Intermittent spasms or sustained involuntary contractions affecting back or entire body.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.
3. Name of medication.
4. Estimated number of pills or dose.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Inability to move eyes.<br>2. Muscle spasms of face, neck, body, arms, or legs causing unusual postures or unusual expressions on face.<br>3. Rapid or worm-like movements of tongue.<br>4. Sticking out of tongue.<br>5. Tic-like or twitching movements.<br>6. Trouble breathing, speaking, or swallowing.<br>7. Uncontrolled chewing movements.<br>8. Uncontrolled movements of arms or legs.<br>9. Uncontrolled twisting movements of neck, trunk, arms, or leg. | 1. Abdominal pain.<br>2. Nausea and vomiting.<br>3. Bipolar disorder.<br>4. Schizophrenia.<br><br>Common Med Names<br>1. Prochlorperazine (Compazine, Compro, Procomp).<br>2. Chlorpromazine (Promapar, Thorazine).<br>3. Fluphenazine (Permitil, Prolixin).<br>4. Perphenazine.<br>5. Trifluoperazine (Stelazine).<br>6. Thioridazine (Mellaril). | 1. Seizure. |

# Pediatric Acute Dystonic Reactions

Treatment #1- Symptomatic/Mild Reaction:
1. Monitor SpO2, if <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Diphenhydramine 1mg/kg PO, max of 50mg.

Treatment #2- Grossly Symptomatic/Severe Reaction:
1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM NC or NRB, titrate to 94%.
3. IV, NS, TKO.
4. Diphenhydramine 1mg/kg IV, max of 50mg,

**OR**

5. Diphenhydramine 1mg/kg PO, max of 50mg.

Considerations:
1. If benzodiazepines have already been administered to treat seizures, **DO NOT** withhold diphenhydramine.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Beta Blockers Overdose

Beta blockers, also known as beta-adrenergic blocking agents, are medications that are commonly used to reduce BP. Beta blockers work by blocking the effects of the adrenaline.

Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibly of beta blocker overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals beta blocker overdose and patient is showing signs and symptoms related to beta blockers.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Pupils.
   G. Lung sounds.
3. Name of medication.
4. Estimated number of pills or amount of liquid.
5. Route of administration.
6. Time of administration.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Hypotension.<br>2. Bradycardia.<br>3. AV block.<br>4. Heart failure.<br>5. Bronchospasm.<br>6. Hypoglycemia.<br>7. Hyperkalemia.<br>8. Stupor.<br>9. Coma.<br>10. Seizures. | 1. High BP.<br>2. Irregular heart rhythm (arrhythmia).<br>3. Heart failure.<br>4. Chest pain (angina).<br>5. Heart attacks.<br>6. Migraine.<br>7. Certain types of tremors.<br><br>Home Meds:<br>1. Acebutolol (Sectral).<br>2. Atenolol (Tenormin).<br>3. Bisoprolol (Zebeta)<br>4. Metoprolol (Lopressor, Toprol-XL).<br>5. Nadolol (Corgard).<br>6. Nebivolol (Bystolic).<br>7. Propranolol (Inderal LA, InnoPran XL). | 1. Co-ingestion.<br>2. Calcium channel OD.<br>3. Digoxin toxicity.<br>4. Complete heart block.<br>5. Renal failure. |

# Pediatric Beta Blockers Overdose

1. Cardiac monitor.
2. 12 Lead ECG.
3. Monitor SpO2, if < 94% 1-15 LPM O2 via NC or NRB, titrate to 94%.

Treatment #1- Asymptomatic:
1. Consider, IV, NS, TKO.
2. Blood glucose level every 15 minutes.
3. If blood glucose level <70 mg/dL, administer oral glucose, titrate to blood glucose level >70 mg/dL,

**OR**

4. Dextrose 10% 5 ml/kg IV, titrate to blood glucose level >70 mg/dL.

Treatment #2- Symptomatic:
1. IV, NS, TKO.
2. Blood glucose level every 15 minutes.
3. If blood glucose level <70 mg/dL, dextrose 10% 5 ml/kg IV/IO, titrate to blood glucose level >70 mg/dL,
4. If SBP is below length based treatment tape low value without evidence of fluid overload, NS 20 ml/kg IVF bolus, may repeat x2.
5. If SBP remains below length based treatment tape low value, see base hospital order below.
6. For seizure activity, see protocol PNRO-04.

Considerations:
1. Monitor QRS duration closely even in asymptomatic patients.
2. If patient is on a hold or there is potential for intentional OD consider 4 point restraints.
3. If patient is physically combative, consider involving law enforcement to assist in putting patient in 4 point restraints.

~~To make **DILUTED** epinephrine:~~
~~Mix epinephrine 0.01 mg/kg **1:10,000** to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. Additional 10ml/kg, NS, IV/IO.
2. If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.
2. ~~DILUTED epinephrine 1 ml IV/IO every 3-5 minutes.~~

3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Calcium Channel Blocker Overdose

Calcium channel blockers are used in the treatment of hypertension, angina pectoris, cardiac arrhythmias, and other disorders. These medications are available in both immediate-release and extended-release preparations. The potential toxicity of these agents is substantial, and is often under appreciated by the public.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibly of calcium channel blocker overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals calcium channel overdose and patient is showing signs and symptoms related to calcium channel.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose level.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.
3. Name of medication.
4. Estimated number of pills or amount of liquid.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Constipation.<br>2. Headache.<br>3. Palpitations.<br>4. Dizziness.<br>5. Rash.<br>6. Drowsiness.<br>7. Flushing.<br>8. Nausea.<br>9. Swelling in the feet and lower legs.<br>10. Bradycardia.<br>11. Hypotension.<br>12. Shortness of breath. | 1. Hypertension.<br>2. Angina pectoris.<br>3. Cardiac arrhythmias.<br><br>Home Meds:<br>1. Amlodipine (Norvasc).<br>2. Diltiazem (Cardizem, Tiazac, others).<br>3. Felodipine.<br>4. Isradipine.<br>5. Nicardipine.<br>6. Nifedipine (Adalat CC, Afeditab CR, Procardia).<br>7. Nisoldipine (Sular).<br>8. Verapamil (Calan, Verelan). | 1. Co- ingestion.<br>2. Beta blocker OD.<br>3. Digoxin toxicity.<br>4. Complete heart block.<br>5. Renal failure. |

# Pediatric Calcium Channel Blocker Overdose

1. Cardiac monitor.
2. 12 lead ECG.
3. Monitor SpO2 if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.

Treatment #1- Asymptomatic:
1. Consider, IV, NS, TKO.

Treatment #2- Symptomatic:
1. IV/IO, NS, TKO
2. Calcium chloride 10% 20 mg/kg IV/IO over 3-5 minutes max 2g.
3. If SBP is below length based treatment tape low value, lung sounds are clear, NS 20ml/kg IVF bolus, may repeat x2.
4. If SBP remains below length based treatment tape low value, lung sounds are clear and no fluid restrictions exist, see base order below.

Considerations:
1. Monitor QRS duration closely even in asymptomatic patients.
2. Monitor ECG for presence of AV nodal blocks.
3. If patient is on a hold or there is potential for intentional OD, consider 4 point restraints.
4. If patient is physically combative consider involving law enforcement to assist in putting patient in 4 point restraints.

~~To make **DILUTED** epinephrine:~~
~~Mix epinephrine 0.01mg/kg 1:10,000 to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. Additional NS 10ml/kg IVF bolus.
2. If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.
2. ~~DILUTED epinephrine 1ml IV/IO every 3-5 minutes, titrate to length based treatment tape SBP low value.~~

3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Acute Drug Intoxication

Acute drug intoxication refers to the immediate and deleterious effects of drugs such as cocaine, amphetamines, PCP or bath salts, on the body. Although acute drug intoxication and drug dependence can be present in the same individual, these syndromes present with different symptoms.

Definitions:

1. **Intoxication**- History reveals or patient is showing signs and symptoms of acute drug intoxication however patient is cooperative.
2. **Intoxication with serious agitation**- History reveals or patient is showing signs and symptoms of acute drug intoxication however, patient is not cooperative, is a safety risk to crews or a safety risk to themselves. Safety risks include physically combative or erratic dangerous behavior.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose level.
   D. Physical assessment.
   E. Pupils.
   F. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Tachycardia.<br>2. Hypertension.<br>3. Dilated pupils.<br>4. Hyperthermia.<br>5. Restlessness.<br>6. Anxiety, panic, paranoia.<br>7. Erratic behavior.<br>8. Tremors.<br>9. Psychosis.<br>10. Nausea.<br>11. Agitation. | 1. Drug use.<br>2. Previous OD.<br><br>Home Meds:<br>1. Methadone. | 1. Co-ingestion.<br>2. Stimulant induced MI.<br>3. Encephalopathy.<br>4. Drug induced psychosis. |

# Pediatric Acute Drug Intoxication

Treatment #1- Intoxication:

1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. If chest pain obtain 12 lead EKG.
4. If ALOC blood glucose level, if <70 mg/dL, see protocol PNRO-02.

Considerations:

1. Safety is the highest priority. Consider law enforcement assistance if the patient is agitated.
2. If patient is physically combative consider involving law enforcement to assist in putting the patient in 4 point restraints.

## Base Hospital Orders

1. Midazolam 0.05 mg/kg IM/IN, max of 2mg for serious agitation.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Cyclic Antidepressants Overdose

The clinical presentation of cyclic antidepressant overdose is extremely variable. Patients can present alert with normal vital signs or comatose and hypotensive. In any case, rapid onset of symptoms and rapid deterioration are characteristic of cyclic antidepressant overdose.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibly of cyclic antidepressants overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals cyclic antidepressants overdose and patient is showing signs and symptoms related to cyclic antidepressants or is having dysrhythmias.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose level.
   D. Pain scale.
   E. Physical assessment.
   F. Pupils.
   G. Lung sounds.
3. Name of medication.
4. Estimated number of pills or amount of liquid.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Blurred vision.<br>2. Dry mouth.<br>3. Constipation.<br>4. Weight gain or loss.<br>5. Rash.<br>6. Hives.<br>7. Increased heart rate.<br>8. Cardiac conduction delays.<br>9. Dysrhythmias.<br>10. Hypotension.<br>11. Respiratory depression.<br>12. Seizures.<br>13. Coma. | 1. Depression.<br>2. Previous OD.<br>3. Panic disorder.<br>4. Bulimia.<br>5. Chronic pain.<br>6. Migraine.<br>7. Tension headaches.<br>8. Diabetic neuropathy.<br>9. Phantom limb pain.<br>10. Chronic itching.<br><br>Home Meds:<br>1. Amitriptyline.<br>2. Amoxapine.<br>3. Desipramine (Norpramin).<br>4. Doxepin.<br>5. Imipramine (Tofranil).<br>6. Nortriptyline (Pamelor).<br>7. Protriptyline (Vivactil).<br>8. Trimipramine (Surmontil). | 1. Co-ingestion. |

# Pediatric Cyclic Antidepressants Overdose

1. Cardiac monitor.
2. Monitor SpO2, if <94%, 1-15 LPM O2 via NC or NRB, titrate to 94%.
3. 12 lead ECG.

Treatment #1- Asymptomatic:
1. Consider IV, NS, TKO.

Treatment #2- Symptomatic or has Dysrhythmias:
1. IV/IO, NS, TKO.
2. If QRS complex is greater than 0.10 ms, sodium bicarbonate 1mEq/kg IV/IO, max single dose 50 mEq. Repeat until QRS <0.10ms
3. For seizure activity, see protocol PNRO-04.
4. If SBP is below length based treatment tape low value, and lung sounds are clear, NS 20ml/kg IVF bolus, may repeat x2.
5. If SBP remains below length based treatment tape low value, see base hospital order below.
6. If assisting ventilations hyperventilate.
7. Monitor EtCO2 if using a supraglottic airway or BVM.

Considerations:
1. Monitor ECG closely even in asymptomatic patients as TCA overdose patients deteriorate suddenly and quickly.
2. If patient is on a hold or there is potential for intentional OD consider 4 point restraints.
3. If patient is physically combative consider involving law enforcement to assist in putting patient in 4 point restraints.

~~To make **DILUTED** epinephrine:~~
~~Mix epinephrine 0.01mg/kg **1:10,000** to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. Additional NS 10ml/kg IVF bolus.
2. If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.
~~2. DILUTED epinephrine 1ml IV/IO every 3-5 minutes, titrate to length based treatment tape SBP low value.~~

3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Opiate Overdose

Physical and mental symptoms that occur after taking too many opioids, a substance found in certain prescription pain medications and illegal drugs like heroin.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibility of opiate overdose but patient is showing no signs or symptoms of overdose.
2. **Symptomatic-** Patient has admitted or history reveals opiate overdose and patient is showing signs and symptoms related to opiate overdose, including respiratory depression or apnea.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose if diabetic history or continues to have ALOC.
   D. Physical assessment.
   E. Pupils.
   F. Lung sounds.
3. Name of medication.
4. Estimated number of pills or amount of liquid.
5. Route of administration.
6. Time of administration.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Lethargy.<br>2. ALOC.<br>3. Shortness of breath.<br>4. Pinpoint pupils.<br>5. Slow or absent respirations.<br>6. Hypotension. | 1. Short-term pain management.<br>2. Chronic pain management.<br>3. Heroin use.<br><br>Home Meds:<br>1. Hydrocodone (Vicodin®).<br>2. Oxycodone (OxyContin®, Percocet®).<br>3. Oxymorphone (Opana®).<br>4. Morphine (Kadian®, Avinza®).<br>5. Codeine.<br>6. Fentanyl. | 1. Pontine stroke.<br>2. Co-ingestion.<br>3. Hypoxia.<br>4. Hypothermia.<br>5. Seizure. |

# Pediatric Opiate Overdose

1. Cardiac monitor.
2. Monitor EtCO2.
3. Monitor SpO2.

Treatment #1- Symptomatic with Inadequate Respiration:

1. If SpO2 <94%, 1-15 LPM via NC, NRB or BVM, titrate to 94%.
2. Ventilate with BVM and OPA for bradypnea or ineffective respirations.
3. IV/IO, NS, TKO or saline lock.
4. Naloxone 0.4-2mg IV/IO, max 2mg,

**OR**

5. Naloxone 0.1 mg/kg IM or IN (half in each nostril), max 4 mg.

Titrate to normal respiration rate based on length based tape,
**DO NOT** titrate to level of consciousness or pupil size.

Considerations:

1. Ventilate patient prior to administration of Naloxone.
2. USE LOWEST DOSE OF NALOXONE AVAILABLE TO PREVENT WITHDRAWAL.
3. Preferred route is IV. However, if unable to start IV, IN and SL are acceptable.

## Base Hospital Orders

1. Additional naloxone 2mg.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

| Naloxone Pediatric Dose Chart | |
|---|---|
| **Weight KG/lbs.** | **Dose** |
| **5kg / 11lbs.** | 0.5mg |
| **10kg / 22 lbs.** | 1.0mg |
| **15kg / 33 lbs.** | 1.5.mg |
| **20kg / 44 lbs.** | 2.0mg DO NOT EXCEED 2MG |

# Pediatric Organophosphates Exposure

Organophosphates are a group of chemicals that poison insects and mammals. Organophosphates are the most widely used insecticides today. They are used in agriculture, the home, gardens, and veterinary practice. Organophosphate work by damaging an enzyme acetylcholinesterase.

## Definitions:

1. **Asymptomatic-** Patient has admitted or history reveals possibility of organophosphates Exposure but patient is showing no signs or symptoms.
2. **Symptomatic-** Patient has admitted or history reveals organophosphates exposure and patient is showing signs and symptoms related to organophosphates exposure, but is still hemodynamically stable.
3. **Grossly Symptomatic-** Patient has admitted or history reveals organophosphates Exposure and patient is showing signs and symptoms related to organophosphates Exposure, but is **NOT** hemodynamically stable.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain Scale.
   E. Physical assessment.
   F. Lung sounds.
3. If safe to identify:
   A. Chemical labels.
   B. Safety data sheet.
   C. Placards.
   D. Chemical type.
   E. Chemical amount.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Salivation.<br>2. Lacrimation.<br>3. Urination.<br>4. Defecation.<br>5. Gastrointestinal distress.<br>6. Emesis. | 1. Agricultural setting.<br>2. Industrial setting.<br><br><u>Common Names</u><br>1. Parathion.<br>2. Malathion.<br>3. Methyl parathion.<br>4. Chlorpyrifos.<br>5. Diazinon.<br>6. Dichlorvos.<br>7. Phosmet.<br>8. Fenitrothion.<br>9. Tetrachlorvinphos.<br>10. Azamethiphos.<br>11. Azinphos-methyl.<br>12. Terbufos. | 1. Nerve agent exposure. |

# Pediatric Organophosphates Exposure or Ingestion

1. Avoid contamination.
2. Cardiac monitor.
3. Monitor SpO2, O2 if <94%, 1-15 LPM via NC or NRB, titrate to 94%.

Treatment #1- Asymptomatic:
1. Consider IV, NS, TKO.

Treatment #2- Mildly Symptomatic:
1. IV/IO NS, TKO.
2. If HR <100 bpm, atropine 0.05 mg/kg IV/IO every 5 minutes, max 4 mg.

Treatment # 3- Grossly Symptomatic:
1. IV/IO NS, TKO.

Atropine 0.05 mg/kg, every 5 minutes, max of 4 mg. Base hospital contact for further atropine.

Considerations:
1. Safety is top **PRIORITY**.
2. Patient must be grossly decontaminated prior to transport.
3. Patient must be fully decontaminated prior to entering ED.

## Base Hospital Orders

1. Additional atropine beyond 4 mg Max dose.
2. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

## Nerve Agent Exposure

If *EMS Chempack* is deployed and atropine auto injectors, pralidoxime (2-Pam) auto linjectors, and are available they **MAY NOT BE USED** on **pediatrics**, diazepam can be used as outlined below:

1. Cardiac monitor.
2. Monitor SpO2, if <94% 1-15 LPM O2 via NC or NRB, titrate to 94%.
3. Consider IV/IO, NS, TKO.

If SBP is below length based treatment tape low value, lung sounds are clear and no fluid restrictions exist:

4. NS 20 ml/kg IVF bolus, may repeat x2. Titrate treatment tape low value.

Seizure activity:

5. Diazepam 0.1 mg/kg IV/IM, max total dose of 5mg.

**OR**

6. Diazepam 0.2 mg/kg IN (half in each nostril), max total dose of 5mg.
7. Atropine 0.05 mg/kg every 5 minutes, max of 4mg.
8. Do not administer 2-Pam auto injector.

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# Pediatric General

# Pediatric Brief, Resolved, Unexplained, Event

Brief, Resolved, Unexplained Event (BRUE) indicates an episode that is frightening to the observer (may think the infant has died). Occurs in a child younger than 1 year of age and lasts less than 1 minute. These events usually occur in infants less than 12 months old; however, any child less <2 years old who exhibits the symptoms listed below should still be evaluated for BRUE.

## Definitions:

1. Must have resolved and patient back to baseline and has one or more of the following:
   A. Central cyanosis or pallor (discoloration of face, gums and/or trunk).
   B. Absent, decreased or irregular breathing.
   C. Marked change in tone (hypertonia or hypotonia).
   D. Altered level of responsiveness.

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Lung sounds.
   F. Complete physical exam.
3. The general appearance of the child.
4. Skin color.
5. Extent of interaction with environment.
6. Evidence of trauma.
7. Medical history if any.

## Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Cyanosis or pallor.<br>2. Absent, decreased or irregular breathing.<br>3. Marked change in tone (hyper- or hypotonia).<br>4. Altered responsiveness<br>5. No explanation for the event after full history and exam. | 1. Family history of sudden death.<br>2. Family history of infant death.<br>3. Born ≥32 weeks gestation<br>4. Post-conception age ≥45 weeks. | 1. Hypoglycemia.<br>2. Seizure.<br>3. Poisoning.<br>4. Overdose.<br>5. Choking.<br>6. Arrhythmia.<br>7. Sepsis. |

# Pediatric Brief, Resolved, Unexplained, Event

Treatment

1. Consider Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. Assess capillary refill.

Consider and treat any identifiable causes:

4. Blood glucose level, if >70 mg/dL, see protocol PNRO-02.
5. For seizure activity see protocol PNRO-04.
6. For signs of shock see protocol PCAR-04.

Considerations:

1. Must have resolved and patient back to baseline
2. Assume the history given is accurate.
3. Consider and treat any identifiable causes.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Nausea

Nausea may be due to a viral illness (such as gastroenteritis), motion sickness, or medication side effects. It is important to remember that serious medical conditions also produce nausea or vomiting such as stroke, head injuries, toxic ingestions, bowel obstruction, appendicitis, and acute coronary syndrome. Generally, benign causes of nausea or vomiting do not have any associated pain complaints, or alterations in level of consciousness (LOC).

## Definitions:

1. **Contraindications-** Known sensitivity to ondansetron or other 5-HT-3 antagonists e.g.: Granisetron (Kytril), Dolasetron (Anzamet), Palonosetron (Aloxi).

## Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose if history of diabetes.
   D. Pain scale.
   E. Physical assessment.
   F. Abdominal exam.
   G. Lung sounds.

## Objective Findings:

| Possible Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Nausea.<br>2. Vomiting.<br>3. Abdominal pain.<br>4. Diarrhea. | 1. Gastritis.<br>2. Gastroenteritis. | 1. Appendicitis.<br>2. Bowel obstruction. |

# Pediatric Nausea

Treatment #1- Persistent Mild Nausea:
1. Weight of 8-15 kg ondansetron 2 mg oral disintegrating tablet (ODT).
2. Weight >15 kg ondansetron 4 mg ODT.
3. Obtain blood glucose level.

Treatment #2- Persistent Moderate to Severe Nausea:
1. Cardiac monitor.
2. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
3. IV, NS, TKO.
4. Obtain blood glucose level.

5. Weight of 8-15kg ondansetron 2 mg IV over 1 minute.

**OR**

6. Weight >15kg ondansetron 4 mg IV over 1 minute.

Ondansetron 4mg, may be given via IO, **IF** IO is established for other treatments. An IO should not be established solely for the purpose of nausea treatment.

Considerations:
1. Rapid administration of ondansetron has been associated with syncope.
2. Rare side effects include headache, dizziness, tachycardia, sedation, or hypotension.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Pain Management

This protocol is intended for the treatment of pain associated with traumatic injuries, burns, or medical conditions that cause significant **ACUTE** pain or **SEVERE exacerbation** of chronic pain.

Definitions:

1. **Pain-** is a significantly unpleasant sensation, occurring in varying degrees of severity, due to injury, disease, or emotional distress.
2. **Max Single Dose (Max SD)**- is maximum medication given in one administration.
3. **Max total Dose (Max TD)-** is the most the patient can have overall without a base order
4. **Mild to Moderate pain-** Pain on movement, chronic pain, or pain that is managed with, positioning, ice, stabilization, or immobilization.
5. **Moderate to Severe Pain-** patient pain is unable to be managed with, positioning, ice, stabilization, or immobilization and patient is showing outward signs of being symptomatic secondary to pain. Symptoms may include guarding, grimacing at rest, tachycardia, tachypnea, hypertension, and diaphoresis, etc.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Lung sounds.

Objective Findings:

| Possible signs and symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. Guarding.<br>2. Grimacing.<br>3. Deformity.<br>4. Swelling.<br>5. Diaphoresis.<br>6. Splinting. | 1. Recent traumatic event.<br>2. Chronic pain. | 1. Chronic pain exacerbation.<br>2. Complex regional pain.<br>3. Compartment syndrome.<br>4. Arterial occlusion.<br>5. Nerve injury. |

Pain management medication guidelines:

| Medication | Best use | Contraindications |
|---|---|---|
| **Acetaminophen** | Mild to moderate pain due | Allergy, Liver failure, ETOH intoxication |
| **Ibuprofen** | | Currently taking ASA, or NSAID, GI Bleed, on blood thinners |
| **Morphine** | Visceral pain | Hypotension |
| **Fentanyl** | Somatic pain, patients with hypotension | GI obstruction, |

# Pediatric Pain Management

Treatment #1- Mild to Moderate:
1. Consider SpO2, if <94%, O2 1-6 LPM via NC, titrate to 94%.
2. Elevate as appropriate.
3. Ice as appropriate.
4. Position as appropriate.
5. Stabilize as appropriate.
6. Acetaminophen 15 mg/kg, PO, max 650 mg (withhold if had in last 4 hours).

**OR**

7. Ibuprofen 10mg/kg PO, max 400mg, do not give to children age <6 months old (withhold if had in last 6 hours).

Treatment #2- Moderate to Severe Pain:
1. Monitor SpO2, if <94% O2 1-15 LPM via NC or NRB, titrate to 94%.
2. IV/IO, NS, TKO.
3. Consider monitoring EtCO2.
4. If pain scale greater than 5 and symptomatic from pain, see dose chart below.

Considerations:
1. Treatment should not be based on pain scale alone, use objective signs to support
2. If SBP is low, consider fentanyl for pain management.
3. If pain scale greater than 5 and symptomatic from pain. An IO SHOULD NOT be established solely for the purpose of pain management. An IO may be utilized for pain management where indicated, only if IO was established for other treatments. (For example, a burn patient's IO that was established for fluid replacement may be also used for pain medications).

| **Morphine** | | |
|---|---|---|
| Burns, Trauma & Other | Max SD | Max TD |
| 1. 0.1 mg/kg slow push IV/IO, every 5 minutes,<br>**OR**<br>2. 0.1 mg/kg IM, every 30 minutes. | 2 mg | 10 mg |
| **Fentanyl** | | |
| Trauma & Other | Max SD | Max TD |
| 1. 1 mcg/kg slow push IV/IO, every 5 minutes,<br>**OR**<br>2. 1 mcg/kg IN (half per nostril), every 5 minutes. | 50 mcg | 2 mcg/kg |
| Burn | Max SD | Max TD |
| 1. 1 mcg/kg slow push IV/IO, every 5 minutes,<br>**OR**<br>2. 1 mcg/kg IN (half per nostril), every 5 minutes. | 50 mcg | 3 mcg/kg |

**Base Hospital Orders**

1. Medication dose above listed maximums.
2. In the presence of any finding listed below.
   A. Allergy or sensitivity to the medication being administered.
   B. SBP below length based treatment tape low value.
   C. Respirations less than 12.
   D. History of loss of consciousness.
   E. Decreased mental status.
   F. Pregnancy greater than 20 weeks.
3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Pediatric Patients from Out Patient Offices

This protocol is in place to allow paramedics on a 911/pre hospital call (Not to include IFT) to transport patients that may be currently under anesthesia or having an adverse reaction to out of hospital anesthesia, such as at dental offices or outpatient care facilities.

Definitions:

1. **Local anesthesia** - a type of pain prevention used during minor procedures to numb a small site where the pain is likely to occur without changing the patient's awareness.
2. **General anesthesia** - a medically induced coma with loss of protective reflexes, resulting from the administration of one or more general anesthetic agents.
3. **Nerve and regional blocks** - deliberate interruption of signals traveling along a nerve, often for the purpose of pain relief.
4. **Conscious sedation-** is a combination of medicines to help you relax (a sedative) and to block pain (an anesthetic) during a medical or dental procedure.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood Glucose.
   D. Pain Scale.
   E. Physical assessment.
   F. Lung sounds.
3. Type of anesthetic used.
4. Procedure being performed.
5. Reaction to anesthetic.
6. Treatments administered prior to arrival.
   A. Shock.
   B. Airway management.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. ALOC.<br>2. Unconscious.<br>3. Apneic.<br>4. Uncontrolled airway.<br>5. Patients that have received:<br>A. Procedural sedation.<br>B. Local anesthesia.<br>C. General anesthesia. | 1. Outpatient procedure.<br>2. Dental procedure.<br><br>Possible Anesthetic Drugs:<br>1. Nitrous oxide.<br>2. Ativan.<br>3. Barbiturates:<br>A. Amobarbital.<br>B. Methohexital.<br>C. Thiamylal.<br>4. Benzodiazepines:<br>A. Diazepam.<br>B. Lorazepam.<br>C. Midazolam.<br>5. Etomidate.<br>6. Ketamine.<br>7. Propofol. | 1. CVA/TIA.<br>2. Hypoglycemia.<br>3. Seizure. |

# Pediatric Patients from Out Patient Offices

Treatment

1. Cardiac monitor.
2. Monitor SpO2, if <94%, O2 1-15 LPM via NC/NRB/BVM, titrate to 94%.
3. Monitor EtCO2 if patient received any sedation or analgesic medications or if using an advanced airway or BVM.
4. Consider IV/IO, NS, TKO.
5. 12 lead ECG.
6. Obtain blood glucose level, if <70 mg/dL, see protocol PNRO-02.
7. If SBP is less than length based tape, lung sounds are clear and no fluid restrictions exist, see protocol PCAR-04.
8. If patient was administered narcotics and respirations are depressed, naloxone 0.4- 2mg IV/IN/IM/SL max 4 mg. Titrate to respiration of 12-20 per minute. **DO NOT** titrate to level of consciousness.

Considerations:

1. Secure airway as appropriate.
2. As soon as feasible, advise doctor on scene they may maintain care if they ride with you to ED and they do not delay transport.
3. Only the Base Hospital Physician can give field personal orders.
4. Contact the base hospital for any questions or concerns.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

# Sepsis

Sepsis is the body's overwhelming and life-threatening response to infection. When an infection occurs at any potential site in the body, the immune system's inflammatory response can be overwhelmed leading to SIRS (Systemic Inflammatory Response Syndrome) which causes tissue damage that can lead to organ dysfunction, failure and death.

Definitions:

1. **SIRS Criteria-**possible infection (abnormal WBC), fever, tachypnea, tachycardia or hypotension.
2. **Asymptomatic- DOES NOT** meet TWO or MORE SIRS criteria.
3. **Symptomatic-** Meets TWO or MORE SIRS criteria, hemodynamically stable and **ALOC.**
4. **Septic Shock-** Meets TWO or MORE SIRS criteria and is hemodynamically **UNSTABLE**.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose.
   D. Pain scale.
   E. Physical assessment.
   F. Temp.
   G. Lung sounds.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. SIRS Criteria:<br>A. Temp: >100.4 F. or <96F.<br>B. Tachycardia.<br>C. Tachypnea.<br>2. Significantly decreased urine output.<br>3. Abrupt change in mental status.<br>4. Difficulty breathing.<br>5. Abdominal pain.<br>6. Identifiable infection. | 1. Evidence of infection.<br>2. Clotting problems.<br>3. Abnormal liver or kidney function.<br>4. Impaired oxygen availability.<br>5. Electrolyte imbalances.<br><br>Home Meds:<br>1. Antibiotics. | 1. Pneumonia.<br>2. Abdominal infection.<br>3. Kidney infection.<br>4. Bloodstream infection (bacteremia). |

# Sepsis

1. Monitor SpO2, if <94%, O2 1-15 LPM via NC/NRB, titrate to 94%.

Treatment #1- Asymptomatic (fever only):
1. Consider cardiac monitor.
2. Acetaminophen 15 mg/kg PO, max dose 650 mg. (Withhold if had in last 4 hours)

Treatment #2- Symptomatic Meets TWO or more SIRS Criteria:
1. Cardiac monitor.
2. Consider 12 lead ECG.
3. Obtain blood glucose level, if >70 mg/dL, see protocol PNRO-02. If >200 mg/dL, see protocol PNRO-01.
4. If ALOC, see protocol PNRO-03.
5. IV, NS, TKO.
6. NS 20ml/kg IVF bolus. May repeat once for delayed capillary refill.
7. If fever and able to swallow acetaminophen 15 mg/kg PO, max single dose 650 mg. (Withhold if had in last 4 hours)

**OR**

8. If greater than 6 months old, Ibuprofen 10mg/kg PO, max dose 400 mg. (Withhold if had in last 6 hours)

Treatment #3- Shock meets two or more SIRS Criteria and Hemodynamically UNSTABLE:
1. Cardiac monitor.
2. Monitor EtCO2 if using a supraglottic airway or BVM.
3. Obtain blood glucose level, if >70mg/dL, see protocol PNRO-02. If >200 mg/dL, see protocol PNRO-01.
4. If ALOC, perform CPSS if positive, see protocol PNRO-03.
5. If fever and able to swallow acetaminophen 15 mg/kg, PO, max single dose 500mg. (Withhold if had in last 4 hours)
6. IV/IO, NS, TKO.
7. If SBP is below length based treatment tape low value, lung sounds are clear and no fluid restrictions exist NS 20ml/kg IVF bolus, may repeat twice if blood glucose level <200 mg/dL without base hospital order. Titrate to mental status, capillary refill and SBP.

Considerations:
1. If patient is in shock and does not meet TWO or more SIRS Criteria, see protocol PCAR-04.
2. **SIRS** Criteria:
   a. Temp: >100.4F or <96F.
   b. Tachycardia.
   c. Tachypnea.

~~To make **DILUTED** epinephrine:~~
~~Mix epinephrine 0.01mg/kg **1:10,000** to a total volume of 10ml with NS.~~

## Base Hospital Orders

1. Additional NS 10ml/kg IVF bolus.
2. If SBP remains below Aged Based low value after fluids, epinephrine, 1 mcg/kg, IV/IO, every 3-5 minutes, titrate to normal age-based SBP.
~~2. DILUTED epinephrine 1mL IV/IO, every 3-5 minutes.~~

3. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

## Agitation/Behavioral Emergency (PGEN-06)

Agitation or behavioral emergency is an acute, often severe disturbance in mood, thought, or behavior that poses an immediate risk of harm to the patient, others, or the environment, and requires urgent assessment and intervention.

Definitions:

1. Mild/moderate agitation: distressed or agitated but cooperative, able to engage, and willing to take oral medication.
2. Severe agitation: behavior creating an immediate or credible risk of physical harm to the patient, responders, or others.
3. Physical restraint is not required before medication when attempting restraint alone would create unnecessary risk.

Documentation Standards:

1. Every 5 minutes for unstable patients, every 15 minutes for stable patients:
   A. BP.
   B. Respirations.
   C. Pulse.
2. If performed, before and after intervention or if condition changes:
   A. ECG.
   B. SpO2.
   C. Blood glucose if history of diabetes.
   D. Pain scale.
   E. Physical assessment.
   F. Abdominal exam.

Objective Findings:

| Signs & Symptoms | Comorbidities | Differentials |
|---|---|---|
| 1. **Restlessness and motor agitation**: pacing, fidgeting, wringing hands, clenching fists, purposeless movements<br>2. **Emotional signs**: irritability, hostility, inner tension, difficulty focusing .<br>3. **Verbal behaviors**: excessive or pressured speech, rapid talking, difficulty following conversation<br>4. **Aggression**: verbal threats, physical assault, destruction of property, or violence toward others<br>5. **Self-harm risk**: self-injurious actions, suicidal gestures or statements<br>**Altered mental status**: confusion, disorientation, hallucinations, delusions, or psychotic features | 1. Cardiovascular disease,<br>2. Diabetes,<br>3. psychiatric illness<br>4. Withdrawal<br>5. Alzheimer's / Dementia | 1. Alcohol intoxication<br>2. Epilepsy, Postictal<br>3. Hypoglycemia / Hyperglycemia<br>4. Overdose / Underdose<br>5. Uremia<br>6. Trauma<br>7. Infection<br>8. Psychosis<br>9. Shock |

## Agitation/Behavioral Emergency

*****All pharmaceutical management for patients under 18 require base hospital contact*****

Treatment #1 - Mild to Moderate Agitation

1. IF age is greater than 13 - Olanzapine ODT 5 mg PO.
2. May repeat 5 mg once after 20 minutes if agitation persists without adverse effects.
3. Obtain 12 Lead ECG if known long-QT, ventricular dysrhythmia, concerning syncope, QT-prolonging overdose, significant electrolyte-loss state, or evidence of dysrhythmia.

Contraindications for Olanzapine:

1. Violent behavior requiring immediate control.
2. Patient unwilling or unable to take oral medication.
3. Altered level of consciousness or suspected delirium.
4. Suspected medical, traumatic, or toxicologic cause.
5. Suspected alcohol, opioid, sedative-hypnotic, or other CNS-depressant intoxication.
6. Hypotension/shock or olanzapine hypersensitivity.

Considerations:

1. Goal is sufficient improvement for safe interaction and transport, not elimination of all psychiatric symptoms.
2. Olanzapine Medication should be offered **voluntarily**; it is not to be administered forcibly.

Treatment #2 - Severe Agitation

1. IF age is greater than 13, midazolam 2.5 mg IM, or IV/IO 2.5 mg SLOW push.
    a. If received olanzapine no repeat dose.
    b. If pt. did not receive olanzapine, may repeat in 10 min to a max total dose of 5 mg.
2. IF patient is >64 or is clinically frail, midazolam 2.5 mg IM, or 1 mg IV/IO.
    a. If pt did not receive olanzapine max total dose of 2.5 mg.

Considerations:

1. Do not administer midazolam IF respiratory depression, hypotension, or excessive sedation occur.
2. No mandatory waiting interval when an immediate safety threat develops.
3. Do not establish vascular access solely to administer midazolam when IM is safer and faster.
4. IN may be retained only as a secondary option when it can be administered safely and reliably.

Anticipate CNS/respiratory depression and hypotension.

## Base Hospital Orders

1. Consult Base Hospital if additional orders are needed or patient has atypical presentation.

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# Interfacility Transport

# Monitoring Mechanical Ventilators – ALS (IFT-01)

PURPOSE: The purpose of this protocol is to authorize paramedics to use and monitor preset mechanical ventilators during interfacility transport.

POLICY:

I. ALS Ambulance providers must apply to and be approved by the San Joaquin County EMS Agency (SJCEMSA) prior to initiating service to perform monitoring of preset mechanical ventilators during interfacility transports.

II. The monitoring of preset mechanical ventilators is restricted to San Joaquin County accredited paramedics that have successfully completed a training program approved by the SJCEMSA for the monitoring of preset mechanical ventilators during interfacility transports.

III. Patients that are candidates for paramedic transport will have preexisting mechanical ventilation established. Prehospital personnel may not initiate mechanical ventilator use.

IV. Preset Mechanical Ventilators

In accordance with the provisions of this policy, a paramedic may transport a patient who is on mechanical ventilation only when following these parameters:

A. A completed interfacility transfer form signed by the transferring physician must be obtained prior to transport.

B. The transferring physician must provide orders for maintaining mechanical ventilation during transport and certify that the patient is stable for transfer or that the benefits of transport outweigh the risks of transport.

C. Patient is placed on capnography, cardiac and pulse oximetry monitors and monitored continuously during transport.

D. Vital signs will be monitored and documented no less than every 10 minutes during patient transport.

E. Paramedics shall not make mechanical ventilator setting changes unless parameters of changes are outlined in the sending physician's orders.

F. If any complications related to mechanical ventilation arise during transport mechanical ventilation is to be discontinued and patient is to be ventilated with a bag valve mask.

G. If complications arise during transport and mechanical ventilation is stopped, transport shall be diverted to nearest emergency department.

V. Continuous Quality Improvement

All calls involving the transfer of patients with preexisting mechanical ventilation shall be reviewed through the ambulance provider's CQI program to determine compliance with policy and transferring physician orders. Findings and data will be submitted to the SJCEMSA quarterly.

# Monitoring Potassium Chloride Infusions – ALS

PURPOSE: The purpose of this protocol is to authorize paramedics to monitor and adjust infusions of potassium chloride during interfacility transfers.

POLICY:

I. ALS Ambulance providers must apply to and be approved by the San Joaquin County EMS Agency (SJCEMSA) prior to initiating service to perform monitoring potassium chloride infusions during interfacility transports.

II. The monitoring of potassium chloride infusions is restricted to San Joaquin County accredited paramedics that have successfully completed a training program approved by the SJCEMSA for the monitoring of potassium chloride infusions during interfacility transports.

III. Patients that are candidates for paramedic transport will have preexisting potassium chloride infusions. Prehospital personnel may not initiate potassium chloride infusions.

IV. Potassium Chloride Infusions

In accordance with the provisions of this policy, a paramedic may transport a patient who has a preexisting intravenous (IV) solution containing potassium chloride only when following these parameters:

A. A completed interfacility transfer form signed by the transferring physician must be obtained prior to transport. The transferring physician must provide orders for maintaining the potassium chloride infusion during transport and certify that the patient is stable for transfer or that the benefits of transport outweigh the risks of transport.

B. Patient is placed on cardiac and pulse oximetry monitors and monitored continuously during transport.

C. Infusion rates shall be maintained as ordered by the transferring physician not to exceed 10mEq/hr max concentration of 40mEq/liter.

D. Fluid boluses and medications shall not be administered using the IV line infusing potassium chloride.

E. Vital signs will be monitored and documented no less than every 10 minutes during patient transport.

F. Monitor patient for adverse effects during transport including:
   1. Cardiovascular: dysrhythmias, cardiac arrest.
   2. Respiratory: depression, arrest.
   3. Gastrointestinal: nausea, vomiting, diarrhea, abdominal pain.
   4. Neurological: paresthesia of extremities, muscular paralysis, confusion.
   5. IV infiltration: monitor IV site as infiltration may cause necrosis. If patient complains of burning or irritation at the insertion site, the I.V. should be checked for patency and the infusion rate slowed or

discontinued.

V. Continuous Quality Improvement

All calls involving the transfer of patients with preexisting potassium chloride infusions shall be reviewed through the ambulance provider's CQI program to determine compliance with policy and transferring physician orders. Findings and data will be submitted to the SJCEMSA quarterly.

VI. General Information on Potassium Chloride

A. Potassium is an essential macromineral in human nutrition with a wide range of biochemical and physiological roles. Among other things, it is important in the transmission of nerve impulses, the contraction of cardiac, skeletal and smooth muscle, the production of energy, the synthesis of nucleic acids, the maintenance of intracellular tonicity and the maintenance of normal blood pressure.

B. Indications for the use of potassium chloride
   1. The treatment of potassium depletion in patients with hypokalemia when oral replacement is not feasible.
   2. Treatment of digitalis intoxication.

C. Contraindications:
   1. Renal impairment with oliguria or azotemia.
   2. Untreated Addison's disease.
   3. Hyperadrenalism associated with adrenogenital syndrome.
   4. Extensive tissue breakdown as in severe burns.
   5. Adynamia episodica hereditaria.
   6. Hyperkalemia of any etiology.

D. Precautions:
   1. Pregnancy.
   2. Chronic renal disease.
   3. Adrenal insufficiency.
   4. Any other condition which impairs potassium excretion.
   5. Potassium should be used with caution in diseases associated with heart blocks.

E. Adverse Effects:
   1. Fever.
   2. Venous thrombosis, infection at injection site.
   3. Extravasation, phlebitis, pain at injection site.
   4. Hypervolemia.
   5. Hyperkalemia.
   6. Abdominal pain.
   7. Nausea/Vomiting.
   8. Paresthesias of the extremities.
   9. ECG abnormalities.
   10. Mental confusion.
   11. Hypotension.

F. Interactions:

1. Cardiac arrest can occur with high potassium conditions, such as chronic renal failure, burns, acidosis, dehydration, and potassium sparing diuretic usage.
2. Drug interactions causing elevation of potassium can occur with ACE inhibitors (used to treat high blood pressure) and certain diuretics (aldactone and triamterene).

G. Standard Dosages for potassium chloride infusions:

1. For serum potassium level >2.5mEq/L an IV infusion is administered continuously at 10mEq/hr in a concentration up to 40mEq/L. With maximum dose of 200mEq per day.

# Monitoring Heparin Infusions – ALS

PURPOSE: The purpose of this protocol is to authorize paramedics to monitor intravenous heparin infusions during interfacility transport.

POLICY:

I. ALS Ambulance providers must apply to and be approved by the San Joaquin County EMS Agency (SJCEMSA) prior to monitoring heparin infusions during interfacility transports.

II. The monitoring of heparin infusions is restricted to San Joaquin County accredited paramedics that have successfully completed a training program for monitoring heparin infusions and the use of infusion pumps.

III. Patients that are candidates for paramedic transport are limited to those with preexisting heparin infusions. Prehospital personnel may not initiate heparin infusions.

IV. Paramedics may restart heparin infusions if the heparin infusion is interrupted due to infiltration, accidental disconnection of the intravenous (IV) line, malfunctioning pump, etc. All lines must be restarted in accordance with the transferring physician's orders. Paramedics will ensure new IV line is patent prior to re-starting the infusion.

V. Heparin Infusions

The following parameters shall apply in all cases where paramedics transport patients with preexisting heparin drips:

A. Patient shall be placed on cardiac, blood pressure and pulse oximetry monitors and monitored continuously during transport.

B. A completed interfacility transfer form signed by the transferring physician must be obtained prior to transport. The transferring physician must provide orders for maintaining the heparin infusion during transport and certify that the patient is stable for transfer or that the benefits of transport outweigh the risks of transport.

C. Infusion fluid must be D5W, NS or ½ NS.

D. Medication concentration shall not exceed 100 units/ml of IV fluid or 50,000 units (e.g. 25,000 units/250ml or 50,000 units/500ml).

E. Infusion rates must remain constant during transport except for the discontinuation the infusion.

F. Infusion rates shall be maintained as ordered by transferring physician. Vital signs shall be monitored and documented every 15-20 minutes during transport.

VI. Continuous Quality Improvement

All calls involving the transfer of patients with preexisting heparin infusions shall be reviewed through the ambulance provider's CQI program to determine compliance with policy and transferring physician orders. Findings and data will be submitted to the SJCEMSA quarterly.

VII. General Information on Heparin

A. Heparin is an anticoagulant which acts to: prevent the conversion of fibrinogen to fibrin, prevent the conversion of prothrombin to thrombin, inactivate Factor X and enhance the inhibitory effects of antithrombin III.

B. Pharmacokinetics:

1. SC: Onset 20-60 minutes; duration 8-12 hours.
2. IV: Onset immediate; peak 5 minutes; duration 2-6 hours.
3. Metabolized in the liver and the spleen.
4. Excreted in urine.
5. Half-life of 1.5 hours.

C. Indications for the use of heparin:

1. In preventing additional clot formation or growth in DVT, MI, pulmonary embolism, DIC, stroke or arterial thrombosis.
2. Prophylactically to keep IV lines open (e.g. heparin flushes and locks).
3. Prophylactically before open heart surgery.
4. Prophylactically post DVT, PE and MI to prevent clotting.
5. Atrial fibrillation to prevent embolization.
6. As an anticoagulant in transfusion and dialysis.

D. Contraindications:

1. Allergy to heparin.
2. Bleeding disorders: hemophilia, etc.
3. Blood dyscrasias such as leukemia with bleeding.
4. Peptic ulcer disease.
5. Severe hypertension.
6. Severe hepatic disease.
7. Severe renal disease.
8. Subacute bacterial endocarditis.
9. Active bleeding from any site.

E. Precautions:

1. Pregnancy (class C).
2. Alcoholism (due to decreased liver function).
3. Elderly (due to decrease liver and renal function and increased injury capability).

F. Adverse Effects:

1. Hemorrhage from any site. May manifest as easy bruising, petechiae, epistaxis, bleeding gums, hemoptysis, hematuria, melena.
2. Fever and or chills (due to allergy).
3. Abdominal cramps, nausea, vomiting, diarrhea (due to allergy).
4. Anorexia (secondary to above).
5. Rash and or uticaria (due to allergy).

G. Interactions:

1. Oral anticoagulants (coumadin, warfarin) increase the actions of heparin.
2. Salicylates (aspirin) increase the actions of heparin.
3. Corticosteriods increase the actions of heparin.
4. Corticosteriods actions are decreased.
5. Dextran increases the action of heparin.
6. Nonsteriodal anti-inflammatory drugs (ibuprofen, Aleve, Midol, naprosyn, toradol, voltaren, feldene, indocin, clinoril) increase the actions of heparin.
7. Diazepam: Action increase by heparin.

H. Standard Dosages and Routes:

1. DVT/PE prophylaxis: 5,000 units subcutaneous every 8-12 hours.
2. Active Clot Suppression:
   a. Loading dose:
      i. Adult: 5000-7000 units IVP.
      ii. Child: 50-100 units/kg IVP.
   b. Maintenance:
      i. Adult: 1000-1600 units per hour IV titrated to PTT/ACT/INR level.
      ii. Child: 15-25 units per hour IV titrated to PTT/ACT/INR level.

I. Special Considerations:

1. Avoid IM injections or other procedures which may cause bleeding.
2. Overdoses are treated in hospital with protamine sulfate 1:1 solution (protamine is not authorized for paramedic use.)

# Monitoring Nitroglycerin Infusions – ALS

PURPOSE: The purpose of this protocol is to authorize paramedics to monitor and adjust intravenous nitroglycerin infusions in adult patients during interfacility transport.

POLICY:

I. ALS Ambulance providers must apply to and be approved by the San Joaquin County EMS Agency (SJCEMSA) prior to monitoring nitroglycerin infusions during interfacility transports.

II. The monitoring of nitroglycerin infusions is restricted to San Joaquin County accredited paramedics that have successfully completed a training program approved by the SJCEMSA for monitoring nitroglycerin and the use of infusion pumps.

III. Patients that are candidates for paramedic transport are limited to those with preexisting nitroglycerin infusions. Prehospital personnel may not initiate nitroglycerin infusions.

IV. Paramedics may restart nitroglycerin infusions if the nitroglycerin infusion is interrupted due to infiltration, accidental disconnection of the intravenous (IV) line, malfunctioning pump, etc. All IV lines must be restarted in accordance with the transferring physician's orders. Paramedics will ensure new IV line is patent prior to restarting the infusion.

V. Nitroglycerin Infusions

The following parameters shall apply in all cases where paramedics transport patients with preexisting nitroglycerin drips:

A. Patient shall be placed on cardiac, blood pressure and pulse oximetry monitors and monitored continuously during transport.

B. A completed interfacility transfer form signed by the transferring physician must be obtained prior to transport. The transferring physician must provide orders for maintaining the nitroglycerin infusion during transport and certify that the patient is stable for transfer or that the benefits of transport outweigh the risks of transport.

C. Nitroglycerin infusions must be regulated by a mechanical intravenous infusion pump. If pump failure occurs and cannot be corrected, the paramedic will stop the nitroglycerin infusion and notify the transferring hospital.

D. Infusion fluid shall be D5W or NS.

E. Nitroglycerin infusion concentration shall be 25 mg/250ml or 50 mg/250ml.

F. Regulation of the drip rate will be within parameters as defined by the transferring physician, but in no case will changes be in greater than 5 mcg/minute increments every 10 minutes.
G. In cases of hypotension (SBP <90), the medication drip will be discontinued and the transferring hospital and base hospital will be notified.
H. Infusion rates shall be maintained as ordered by the transferring physician.
I. Vital signs shall be monitored and documented every 10 minutes during transport or every 5 minutes if an increase in the drip rate is ordered by the base physician.

VI. Continuous Quality Improvement

All calls involving the transfer of patients with preexisting nitroglycerin infusions shall be reviewed through the ambulance provider's CQI program to determine compliance with policy and transferring physician orders. Findings and data will be submitted to the SJCEMSA quarterly.

VII. General Information on Nitroglycerin

A. Nitroglycerin is a vasodilating agent that belongs to a group of drugs referred to as nitrates. Nitroglycerin acts to: relax vascular smooth muscle; vasodilate both arteries and veins (especially veins); increase venous pooling; decrease venous return to the heart; increase arterial relaxation; decrease systemic vascular resistance; decrease cardiac workload; decrease cardiac oxygen consumption; dilate the large coronary arteries; and lower diastolic more than systolic blood pressure.

B. Pharmacokinetics:
1. SL: Onset 1-3 minutes; duration 30 minutes.
2. Transdermal (patch): Onset 0.5 - 1 hour; duration 12-24 hours.
3. Transdermal (ointment): Onset 0.5-1 hour; duration 2-12 hours.
4. PO (sustained release): Onset 20-40 minutes; duration 3-8 hours.
5. IV: Onset usually immediate; duration is variable.
6. Metabolized by the liver.
7. Excreted in urine.
8. Half-life of 1-4 minutes.

C. Indications for the use of Nitroglycerin
1. Sublingual:
   a. Relief of acute anginal pain or related ischemic symptoms.
   b. Congestive Heart Failure (CHF) to decrease myocardial workload.
2. Intravenous:
   a. Diagnosed MI or unstable angina pectoris, even in the absence of chest pain, to decrease myocardial workload.

b. Relief of persistent ischemic chest pain that does not respond to other medications.
c. Hypertension when associated with diagnosed MI or unstable angina pectoris (not used solely for blood pressure control).

D. Contraindications:
1. Allergy to nitrates.
2. Increased intracerebral pressure such as in cases of stroke, head trauma or intracerebral bleeding.
3. Hypotension.
4. Hypovolemia.
5. Treatment of hypertension without progressively worsening signs of organ damage, ischemia or neurologic deficit.

E. Precautions:
1. Pregnancy.
2. Glaucoma patients (can increase intraocular pressure).
3. Lactation (fetal effects in animal studies).
4. May require decreased dosing in patients with liver disease.

F. Adverse Effects:
1. Hypotension.
2. Headache (from vasodilation).
3. Dizziness and syncope (from hypotension).
4. Nausea/Vomiting.
5. Tachycardia (in response to hypotension).
6. Paradoxical bradycardia (in rare instances).
7. Pallor, sweating (from hypotension).
8. Flushing, sweating (from vasodilation).
9. Rash, if allergic to nitrates.

G. Interactions:
1. Alcohol combined with nitroglycerin can worsen hypotension.
2. Aspirin can increase serum nitrate concentrations.
3. Calcium channel blockers combined with nitroglycerin can worsen orthostatic hypotension.
4. ß-blockers, diuretics (anti-hypertensives) can increase actions of nitroglycerin.

H. Standard Dosages for Nitroglycerin drips:
1. For diagnosed patients with ischemic symptoms:
a. Continuous IV Infusion: starting at 10-20 mcg/min and increased by 5 or 10 mcg every 5-10 minutes until the desired hemodynamic or clinical response is achieved. Most patients respond to 50-200 mcg/min and the lowest possible

dose should be used. When indicated, rates should be decreased in 10 minute intervals.

I. Special Considerations:
   1. Glass infusion bottles and non-polyvinyl tubing must be used as plastics will absorb nitroglycerin and alter the dose administered.
   2. Do not use in-line filters.
   3. Attach drip to port closest to catheter insertion.

# Sedation of Intubated Patients during ALS Interfacility Transfer

PURPOSE: The purpose of this protocol is to authorize paramedics to use midazolam for sedation of intubated patients during interfacility transfers.

POLICY:

I. ALS Ambulance providers must apply to and be approved by the San Joaquin County EMS Agency (SJCEMSA) prior to initiating service to use midazolam for sedation of intubated patients during interfacility transports.

II. The use of midazolam for sedation of intubated patients is restricted to San Joaquin County accredited paramedics that have successfully completed a training program approved by the SJCEMSA for the use of midazolam for sedation of intubated patients during interfacility transports.

III. Patients that are candidates for paramedic transport will have preexisting sedation. Prehospital personnel may not initiate midazolam for sedation of intubated patients.

IV. Procedure:
- A. Inclusion Criteria:
  1. Patient with advanced airway, 20 minutes or longer after RSI.
- B. Exclusion Criteria:
  1. Unstable Patients
     - a. Pulse <50 or >100 bpm
     - b. SBP <100 or >200
     - c. DBP <50 or >100
     - d. Patient sedation unable to be managed with only midazolam.
  2. Place patient in soft restraints.
  3. Monitor and document:
     - a. ECG.
     - b. Pulse Oximetry.
     - c. Capnography.
     - d. Blood pressure every 5 minutes.
     - e. Heart Rate every 5-10 minutes.
- C. Max allowable dose 0.01mg/kg IV/IO Every 10 minutes.

VI. Continuous Quality Improvement

All calls involving the transfer of patients with midazolam use for sedation of intubated patients during interfacility transports, shall be reviewed through the ambulance provider's CQI program to determine compliance with policy and transferring physician orders. Findings and data will be submitted to the SJCEMSA quarterly.

# Monitoring Magnesium Sulfate Infusions – ALS

PURPOSE: The purpose of this protocol is to authorize paramedics to monitor magnesium sulfate Infusions during interfacility transfers.

POLICY:

I. ALS Ambulance providers must apply to and be approved by the San Joaquin County EMS Agency (SJCEMSA) prior to initiating service to monitor magnesium sulfate during interfacility transports.

II. Monitoring magnesium sulfate infusions is restricted to San Joaquin County accredited paramedics that have successfully completed a training program approved by the SJCEMSA to monitor magnesium sulfate during interfacility transports.

III. Patients that are candidates for paramedic transport will have preexisting sedation. Prehospital personnel may not initiate magnesium sulfate infusion.

IV. Procedure:
- A. Patient shall be placed on cardiac, blood pressure and pulse oximetry monitors and monitored continuously during transport.
- B. A completed interfacility transfer form signed by the transferring physician must be obtained prior to transport. The transferring physician must provide orders for maintaining magnesium sulfate infusions during transport and certify that the patient is stable for transfer or that the benefits of transport outweigh the risks of transport.
- C. Magnesium sulfate infusions must be regulated by a mechanical intravenous infusion pump. If pump failure occurs and cannot be corrected, the paramedic will stop the magnesium sulfate infusions infusion and notify the transferring hospital.
- D. Regulation of the drip rate will be within parameters as defined by the transferring physician, with a max of 2g per hour.
- E. Infusion rates shall be maintained as ordered by the transferring physician.
- F. Vital signs shall be monitored and documented every 10 minutes during transport.

VII. <u>General information on magnesium sulfate Infusions</u>
- A. Mechanism of Action
  1. Depresses CNS, blocks peripheral neuromuscular transmission, produces anticonvulsant effects; decreases amount of acetylcholine released at end-plate by motor nerve impulse.
  2. Slows rate of SA node impulse formation in myocardium and prolongs conduction time.
  3. Promotes movement of calcium, potassium, and sodium in and out

of cells and stabilizes excitable membranes.

4. Promotes osmotic retention of fluid in colon, causing distention and increased peristaltic activity, which subsequently results in bowel evacuation.

B. Absorption:
   1. Onset (anticonvulsant): IV, immediate; IM, 1 hr.
   2. Duration (anticonvulsant): IV, 30 min; IM, 3-4 hr.

C. Contraindications:
   1. Hypersensitivity.
   2. Myocardial damage, diabetic coma, heart block.
   3. Hypermagnesemia.
   4. Hypercalcemia.

D. Cautions:
   1. Fetal skeletal demineralization, hypocalcemia, and hypermagnesemia abnormalities reported with continuous long-term use (e.g. longer than 5-7 days) for off-label treatment of preterm labor in pregnant women; the effect on the developing fetus may result in neonates with skeletal abnormalities.
   2. In patients with renal impairment, ensure that renal excretory capacity is not exceeded.
   3. Use with caution in digitalized patients.
   4. Use with extreme caution in patients with myasthenia gravis or other neuromuscular disease.
   5. Hypomagnesemia is usually associated with hypokalemia (potassium levels must be normalized).

VIII. Continuous Quality Improvement

All calls involving the transfer of patients with magnesium sulfate during interfacility transports, shall be reviewed through the ambulance provider's CQI program to determine compliance with policy and transferring physician orders. Findings and data will be submitted to the SJCEMSA quarterly.

# Abbreviations Glossary

# A

AC – Antecubital

ALOC- Altered level of consciousness

AMA- Against medical advice

AMI- Acute myocardial infarction

ASA- Acetylsalicylic Acid

# B

BP- Blood pressure

BRUE – Brief resolved unexplained event

BVM- Bag valve mask

# C

CHF- Congestive heart failure

CL- Cormack Lehane

COPD- Chronic obstructive pulmonary disease

CPAP- Continuous positive airway pressure

CPSS- Cincinnati pre hospital stroke scale

CVA- Cerebral vascular accident

# D

DKA- Diabetic ketone acidosis

DVT- Deep vein thrombosis

# E

ECG- Electrocardiogram

ED- Erectile dysfunction

EJ- External jugular

ECG- Electrocardiogram

ESRD- End stage renal disease

ETCO2- End tidal carbon dioxide

ETOH- Alcohol

# *F*

# *G*

GCS- Glasgow coma scale

# *H*

HD- Hemodialysis

HR- Heart rate

HTN- Hypertension

HHNK- Hyperosmolar hyperglycemic nonketotic

# *I*

ICP- Intra cranial pressure

IFT- Inter facility transfer

IM -Intramuscular

IN- Intranasal

IV- Intravenous

IVF- Intravenous Fluid

IO- Intraosseous

# J

JVD- Jugular venous distention

# K

KG- Kilogram 2.2 pounds = 1KG

# L

LKWT- Last known well time

LPM- Liters per minute

# M

MAP- Mean arterial pressure

MS- Morphine sulfate

MSDS- Material safety data sheet

# N

NC- Nasal cannula

NRB- Non-rebreather mask

NS- Normal saline

NTG- Nitroglycerine

# O

O2- Oxygen

OD- Overdose

ODT- Orally dissolving tablet

OPA- Oropharyngeal airway

# *P*

PCN- Penicillin

PEA- Pulseless electrical activity

PO- Administered orally

PPV- Positive pressure ventilation

PSC- Primary stroke center

PTA- Prior to arrival

# *Q*

QRS- is a name for the combination of three of the graphical deflections seen on a typical electrocardiogram

# *R*

RACE- Rapid arterial occlusion evaluation

RLS- Red lights and sirens

ROSC- Return of spontaneous circulation

RR- Respirations

RVR- Rapid ventricular response

# *S*

SIRS- Systemic inflammatory response syndrome

SL- Sub lingual

SOB- Shortness of breath

SpO2- Pulse oximetry

SRC- STEMI receiving center

SVT- Supraventricular tachycardia

# *T*

TBSA- Total body surface area

TCA- Tricyclic antidepressants

TIA- Transient ischemic attack

TKO- To keep open

## *U*

## *V*

VAD- Ventricular Assist device

VT- Ventricular tachycardia

## *W*

WBC- White blood cell

WO- Wide open

## *X*

## *Y*

## *Z*