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March 21, 2019

On behalf of the Alabama Department of Public Health Office of Emergency Medical Services, I would like to express our appreciation to the individuals who were tasked with the responsibility of creating the Alabama EMS Critical Care Patient Care Protocols. As you may know, creating this type of document is not an easy accomplishment; however, it is very important to ensure the advancement of EMS in Alabama, and it is a milestone to which we can all be proud.

I hope that you will agree that collective efforts yielded a great outcome for EMS in Alabama and for the EMS industry. This was only possible through dedication and commitment of time and effort, which is especially notable given the regular responsibilities of our providers. Again, thank you for your continued commitment to the values and mission of the Office of Emergency Medical Services, as we look forward to continuing the progress of EMS in Alabama.

Sincerely,

Stephen Wilson, B.S., NRP, Director
Office of Emergency Medical Services
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Purpose:
To identify burn injuries that should be referred to a burn unit.

Procedure:
Burn patients should be entered into the Alabama Trauma System where applicable. Refer all burns to a burn unit which include the following criteria:

- Partial thickness burns greater than 10% total body surface area (TBSA).
- Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
- Third degree burns in any age group.
- Electrical burns, including lightning injury.
- Chemical burns.
- Inhalation injury.
- Burn injury in patients with preexisting medical disorders that could complicate management, prolongs recovery, or affects mortality.
- Any patients with burns and concomitant trauma in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be initially stabilized in a trauma center before being transferred to a burn unit.
- Burned children in hospitals without qualified personnel or equipment for the care of children.
- Burn injury in patients who will require special social, emotional, or long-term rehabilitative intervention.
STANDARD POLICIES
GENERAL TRANSPORT 2

Purpose: To provide a safe transport of patients.

Procedure:

- Use Patient Care Universal Precautions.
- Perform initial assessment of the patient.
- Talk with local physician, nurse, EMT, and consider verbal contact with medical control about care already provided and problems encountered.
- Explain briefly to the patient and family about the transport.
- Obtain written approval of consent to transport and care and signed medical release for information by patient or next of kin.
- Obtain a set of vital signs.
- Prepare patient for loading onto vehicle.
- Administer Zofran for nausea or vomiting as needed during transport.
  - Adults: 4 mg IM/IO/IV/ODT. May repeat 4 mg dose once.
  - Pediatrics: 0.1 mg/kg IM/IO/IV. Maximum dose of 4 mg.
- Ensure adequate airway, oxygenation, and ventilation with attention to spinal precautions, if appropriate.
- Ensure appropriate IV access.
- Apply monitoring equipment (BP, EKG, pulse ox monitor, continuous waveform ETCO2 if applicable, temp, etc.).
- Strap patient securely onto stretcher/sled board.
- Reassure patient about transport.
- Gather all equipment together and move to the vehicle.
- Make appropriate contact with receiving facility via radio or phone.
- Monitor vital signs as frequently as appropriate for patient acuity.
- Make frequent verbal contact with patient to reassure and check for complaints.
STANDARD POLICIES
GENERAL TRANSPORT 2 CONTINUED

- Prepare for landing. When the vehicle stops moving, remove all equipment from brackets, and move patient from the vehicle to appropriate gurney with appropriate numbers of personnel.
- Maintain vehicle temperatures between 50-90 degrees Fahrenheit. External warming measures should be taken for all chemically paralyzed and hypothermic patients.
- Transfer patient care at appropriate unit after verbal report is given and questions answered.
- Obtain a set of vitals at turnover.
- Obtain signature of person accepting patient care.

For the purpose of these standards of care and standing orders, the following age definitions shall apply:
- Neonate = birth to 1 month.
- Pediatric/Infant = 1 month to less than age 12.
- Adult = 12 years of age or greater, or signs of puberty in those less than this age.
**Purpose:** To ensure receiving facilities are given a patient report in a timely and standardized process.

**Procedure:**
- All critical patients must be communicated as soon as possible, if not communicated by the field EMS team or referring facility. If possible, include the name of the patient’s physician.
- When transporting all critical/trauma center patients, the crew must assure that the receiving facility is contacted and advised of the patient’s expected response level.
- When providing a hospital report to the receiving facility the report must contain at least the following information:
  - MIVT Report where appropriate.
  - Age/gender.
  - Chief complaint.
  - Onset/history of present illness.
  - Pertinent medical history (chronic/acute).
  - Vital signs.
  - RTS/GCS (if applicable).
  - Pertinent medications/allergies.
  - Treatment(s)/action taken and corresponding patient response(s).
  - Requests for orders.
  - ETA to the receiving hospital.
  - Ensure that appropriate alerts are activated.
Purpose: To provide a standard of care for inter-facility transports.

Procedure:
1. Receive patient transfer form and chart copies. Ensure signature form is completed.
2. If STEMI: obtain STEMI worksheet if available, do not delay transport.
3. If CVA: obtain Stroke Transfer form if available, do not delay transport. Enter the patient into the Alabama Stroke System.
4. If the patient is on a mechanical ventilator or intubated, obtain settings and follow Breathing: Use of Mechanical Ventilator Procedure.
5. Follow General Transport Policy.
Purpose: To honor those who have obviously expired prior to EMS arrival.

Assessment:
If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria, CPR and ALS therapy need not be initiated:

- Body decomposition.
- Rigor mortis.
- Dependent lividity.
- Traumatic arrest in asystole or PEA per Alabama Protocols.
- Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction).
- Extended downtime or un-witnessed arrest with asystole on the EKG confirmed in three leads, with OLMD contacted.

Procedure:
- If a bystander or first responder has initiated CPR or automated defibrillation prior to EMS paramedic or transport crew arrival and any of the above criteria (signs of obvious death) are present, the transport crew may discontinue CPR and ALS therapy after contacting OLMD.
- If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:
  ◦ Resuscitation efforts meet the criteria for implementing the discontinuation of pre-hospital resuscitation.
  ◦ Patient care responsibilities are transferred to the destination hospital staff.
  ◦ Orders to terminate resuscitation are received by Medical Control.
• Compressions should be initiated on patients found unconscious, apneic, and pulseless until a rhythm determination is made unless the patient has obvious signs of death.

• In spite of an order to discontinue resuscitation, the crew member may, at his or her discretion, elect to continue resuscitative measures and transport to the hospital in response to mitigating circumstances.

• The decision to discontinue resuscitative measures should be a collaborative team decision by rescuers on the scene and the crew members.

• If the patient has an active advance directive or DNAR, follow the Alabama DNAR protocol.
Purpose: To standardize the care of trauma patients.

Procedure:
- Perform a quick assessment of scene safety and assess for airway, breathing, and/or circulation problems.
- Correct life-threatening problems and administer oxygen as soon as possible.
- Begin rapid transport to the nearest trauma center.
- Maintain patient body temperature, and actively warm where indicated.
- All IV lines should be of warm fluid and initiated enroute to the trauma center unless the patient is trapped, or the IV is required to perform other lifesaving interventions. IV access should not delay transport.
- All head trauma patients, with a decreased level of consciousness, should receive proper airway maintenance. Monitor and treat for appropriate systolic blood pressure and MAP, ventilate with 100% oxygen.
- All patients with suspected spinal injury should be immobilized based on the Alabama Spinal Injury Algorithm.
- Crews should attempt to leave the scene within 15 minutes.
- Reassessment of vitals and neurological status is important and should be performed every 5 minutes while treating the patient.
- Patients should be entered into the Alabama Trauma System per Alabama Protocol.
• Information to be called in to the receiving trauma center for each critical trauma patient
  ◊ Request appropriate trauma activation.
  ◊ Vital signs, including GCS.
  ◊ Age.
  ◊ Mechanism of injury (i.e. motor vehicle collision, gunshot wound, etc.).
  ◊ Area(s) of injury.
  ◊ Treatments rendered.
  ◊ ETE (estimated time enroute).
Clinical Indications:
Pre-oxygenation of the **Rapid Sequence Intubation (RSI)** candidate.

Procedure:
1. Position the patient in a semi-recumbent position (head-up greater than 20°).
2. Place patient on Oxygen via nasal cannula at 8-10 lpm.
3. Place a non-rebreather at 12-15 lpm over the nasal cannula.
4. If the patient is not saturating above 90%, remove non-rebreather and provide ventilations utilizing a bag valve mask connected to O2 at 12-15 lpm with oral or nasal adjunct in place.
5. Follow the **RSI** procedure and leave the nasal cannula in place during the procedure for passive oxygenation.
6. Prior to **RSI** attempt, have equipment present for failed airway attempt.
7. It is required the airway be monitored continuously through waveform capnography and pulse oximetry.
Clinical Indications:
- Reactive airway disease patients with suspected inadequate ventilation, adequate mental status, and enough respiratory drive to allow CPAP to function.
- Respiratory distress associated with congestive heart failure, pulmonary edema, etc.
- Patient is awake, oriented, and able to follow commands.
- Patient has the ability to maintain an open airway.
- Have a respiratory rate greater than 25 breaths per minute and pulse oximetry reading less than 95%.

Contraindications:
- Systolic blood pressure less than 90mmHg.
- Respiratory arrest or agonal respirations.
- Patient is unresponsive.
- Shock with cardiac insufficiency.
- Penetrating chest trauma.
- Persistent nausea/vomiting.
- Active upper gastro-intestinal bleeding or recent history of gastric surgery.
- Facial abnormalities which will not allow a proper mask seal.
- Must contact online medical direction for patients <Age 12.

Procedure (BIPAP):
1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Set the IPAP at 16 and set the EPAP display at 6.
5. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
Procedure (BIPAP) continued:

6. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
7. Evaluate the response of the patient by assessing breath sounds, oxygen saturation, and general appearance.
8. Follow manufacturer recommendations based on BIPAP device utilized.

Procedure (CPAP):

1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. Oxygen should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. For reactive airway disease (i.e., COPD) set the positive end expiratory pressure (PEEP) at 3-5 cm H2O. Use the lowest possible setting to avoid barotrauma.
7. For pulmonary edema, near drowning, aspiration, and pneumonia set the PEEP at 5-10 cm H2O. Use the lowest possible setting to avoid barotrauma.
8. Evaluate the response of the patient by assessing breath sounds, oxygen saturation, and general appearance.
9. Oxygen levels should be titrated to the patient’s response.
10. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for use of the CPAP device.
11. Follow manufacturer recommendations based on the CPAP device utilized.
Clinical Indications:
Patient meets clinical indications for oral intubation.

Contraindications:
Three attempts at orotracheal intubation.

Procedure:
1. Prepare, position, and oxygenate the patient with 100% Oxygen.
2. Follow Apneic Oxygenation protocol.
3. Select proper endotracheal tube (ETT) without stylet, test cuff, and prepare suction.
4. Select proper size endotracheal tube introducer (Bougie®).
5. Lubricate the distal end and cuff of the ETT and the distal 1/2 of the endotracheal tube introducer (Bougie®).
6. Using laryngoscopic techniques, visualize the vocal cords, if possible, using Sellick Maneuver/BURP as needed.
7. Introduce the Bougie® with curved tip anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized.
8. Once inserted, gently advance the Bougie® until you meet resistance.
9. Withdraw the Bougie® only to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie®.
10. Gently advance the Bougie® and loaded ETT until you meet resistance again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie®.
11. While maintaining a firm grasp on the proximal Bougie®, introduce the ETT over the Bougie® passing the tube to its appropriate depth.
12. Once the ETT is correctly placed, hold the ETT securely and remove the Bougie®.
13. Inflate the cuff with 3-10 mL of air.
14. Confirm tube placement by: bilateral breath sounds, chest rise and fall, absence of gastric sounds, end tidal CO2 measurement, waveform capnography, and continuous SPO2 readings.
15. Secure the tube and ensure cervical immobilization during transport.
16. It is required the airway be monitored continuously through waveform capnography and pulse oximetry.
Purpose:

- This procedure is intended for assisting a physician with placement on interfacility transports.

Clinical Indications:

Tension Pneumothorax, pneumothorax with respiratory compromise, open pneumothorax, penetrating thoracic injury with respiratory compromise, hemothorax, or after needle thorocostomy has been preformed.

Procedure:

1. Select tube size according to patient size and thoracostomy use. Gather and prepare all equipment prior to beginning.
2. Determine and prep the insertion site: 4th ICS on the anterior midaxillary line just behind the lateral edge of the pectoralis major muscle. In pregnancy, the tube should be placed in the third ICS due to the elevated diaphragm.
3. Anesthetize site with 1% Lidocaine from the subcutaneous tissue through muscle, periosteum, anterior rib margin to the pleura. Lidocaine dose is 0.5 cc/kg (4mg/kg). 10cc of 1% Lidocaine is usually sufficient. ***Do not anesthetize the skin on unstable patients and/or Traumatic Arrest Patients***.
4. Estimate the length of tube to be inserted into the chest and occlude with large hemostat.
5. Make a 2-3 cm horizontal incision over the 5th rib and anterior to the midaxillary line.
6. Insert curved clamp and bluntly dissect through the tissue making a tunnel into the 4th ICS. Separate the clamp to separate the tissue.
7. Puncture the parietal pleura using a gentle but forcible manner with the tip of the closed clamp holding it close to the upper rib margin as it goes through. Enlarge the opening by opening the clamp. Anchor the clamp with your hand during this process to prevent the clamp from entering the pleural cavity too far.
8. Insert finger along side the clamp and into the pleural cavity making a 360-degree sweep of the interior wall to remove any excess debris from around the puncture site. Maintain the site patency until the chest tube is inserted. (In the Presence of traumatic cardiac arrest, a simple “finger” thoracostomy is acceptable, use steps 1-8.) An appropriate chest seal should be used following a simple “finger” thoracostomy if no improvement.

9. Insert tube until all fenestrations are inside the lateral aspect of the chest wall and/or the number 10 on the chest tube.

10. Connect chest tube to heimlich valve or closed drainage system.
11. Suture chest tube in place and place Vaseline gauze around the insertion site.
12. Secure chest tube with bulky dressing and tape in place.
Clinical Indications:
Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

Procedure: *Always follow current AHA Guidelines*
1. Assess the degree of foreign body obstruction.
2. Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
3. In severe foreign body obstructions, the patient may not be able to make a sound. The victim may clutch his/her neck in the universal choking sign.
4. For an infant, deliver 5 back blows followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
5. For a child, perform a sub-diaphragmatic abdominal thrust (Heimlich maneuver) until the object is expelled or the victim becomes unresponsive.
6. For adults, a combination of maneuvers may be required.
7. First, sub-diaphragmatic abdominal thrusts (Heimlich maneuver) should be used in rapid sequence until the obstruction is relieved.
8. If abdominal thrusts are ineffective, chest compressions should be used. Chest compressions should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy.
9. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign body is visible, remove it.
10. DO NOT perform blind finger sweeps in the mouth and posterior pharynx.
11. In unresponsive patients, visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign body using Magill® forceps.
Clinical Indications:

- Tracheal intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.

Contraindications

- Uncontrolled airway secretions (vomitus, blood, etc.).
- Laryngeal edema, burns, deforming trauma of oral cavity, esophageal pathology (tears, varices, etc.).
- Caustic substance ingestion.
- Intact gag reflex.

Procedure:

1. Prepare, position, and oxygenate the patient with 100% Oxygen.
2. Follow Apneic Oxygenation protocol.
3. Select the appropriate tube size for the patient.
4. Lubricate the tube.
5. Grasp the patient’s tongue and jaw with your gloved hand and pull forward.
6. Gently insert the tube rotated laterally 45°-90° so that the blue orientation line is touching the corner of the mouth.
7. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
8. Inflate the pilot balloon with 45-90 mL of air depending on the size of the device used.
9. Ventilate the patient while gently withdrawing the King LT until the patient is easily ventilated.
10. Auscultate for breath sounds over the lungs, epigastrium, and look for the chest to rise and fall.
11. Confirm tube placement by: bilateral breath sounds, chest rise and fall, absence of gastric sounds, end tidal CO2 measurement, waveform capnography, and continuous SPo2 readings.

12. Secure the tube and ensure cervical immobilization during transport.

13. It is required that the airway be monitored continuously throughout transport by waveform capnography and pulse oximetry.

14. Cuff pressure must be assessed and documented at a minimum of three times during transport (initial intubation, during transport, and at receiving hospital) based on company policy. Proper King LT cuff pressure is 60cm H₂O.
Clinical Indications:
- Tracheal intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.

Clinical Contraindications:
- Uncontrolled airway secretions (vomitus, blood, etc.).
- Laryngeal edema, burns, esophageal pathology (tears, varices, etc.).
- Caustic substance ingestion.
- Intact gag reflex.

Procedure:
1. Prepare, position, and oxygenate the patient with 100% Oxygen.
2. Follow Apneic Oxygenation protocol.
3. Check the tube for proper inflation and deflation.
4. Lubricate with a water-soluble lubricant.
5. Insert the LMA into the hypopharynx until resistance is met.
6. Inflate the cuff until a seal is obtained.
7. Connect the LMA to a bag valve device and assess for breath sounds and air entry.
8. Confirm tube placement by: bilateral breath sounds, chest rise and fall, absence of gastric sounds, end tidal CO2 measurement, waveform capnography, and continuous SPo2 readings.
9. Secure the tube and ensure cervical immobilization during transport.
10. It is required that the airway be monitored continuously throughout transport by waveform capnography and pulse oximetry.
11. Cuff pressure must be assessed and documented at a minimum of three times during transport (initial intubation, during transport, and at receiving hospital) based on company policy. Proper King LT cuff pressure is 60cm H₂O.
Clinical Indications:
A patient with the inability to maintain a patent airway despite interventions.

Procedure:
1. Prepare, position, and oxygenate the patient with 100% Oxygen.
2. Follow Apneic Oxygenation protocol.
3. Select proper endotracheal tube (ETT) (and stylet, if used).
4. Have suction ready.
5. Consider utilization of endotracheal tube introducer (Bougie®) according to Airway: Endotracheal Tube Introducer.
6. Using your laryngoscope, visualize vocal cords (use Sellick maneuver/BURP to assist). First attempt is with the video laryngoscope.
7. Limit each intubation attempt to 30 seconds OR SPO2 falls below 91%, OR heart rate falls below 60 bpm with bag valve mask ventilation between attempts.
8. Visualize tube passing through vocal cords.
9. Inflate the cuff with 3-10 mL of air.
10. Confirm tube placement by: bilateral breath sounds, chest rise and fall, absence of gastric sounds, end tidal CO2 measurement, waveform capnography, and continuous SPo2 readings.
11. Secure the tube and ensure cervical immobilization during transport.
12. It is required that the airway be monitored continuously throughout transport by waveform capnography and pulse oximetry.
13. Cuff pressure must be assessed and documented at a minimum of three times during transport (initial intubation, during transport, and at receiving hospital) based on company policy.
14. Insert a nasogastric or orogastric tube for transports > 15 minutes OR when deemed necessary.
PROCEDURES: AIRWAY

NEEDLE CRICOTHYROTOMY 9

Clinical Indications:
- Management of an airway when standard airway procedures cannot be performed or have failed.

Precautions:
- Laryngeal injury.
- Tracheal rupture.
- Anterior neck swelling that obscures anatomical landmarks.
- Anatomic anomalies or distortion of the larynx and trachea.
- Bleeding disorder.

Procedure:
1. Have suction and supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Use the non-dominant hand to secure the membrane.
4. Prep the skin with an antiseptic solution.
5. Draw up 2 ½ cc of Normal Saline with a 5 cc syringe and attach the needle supplied in the needle cricothyrotomy kit. (Usually a 5-cc syringe attached to a 14 gauge catheter-over-needle device.) Insert the needle through the cricothyroid membrane at a 45 to 60 degree caudal angle (toward the feet).
6. Aspirate for air with the syringe throughout the procedure.
7. Once air bubbles return easily, stop advancing the device.
8. Secure the tube and ensure cervical immobilization during transport.
9. Remove the needle and leave the catheter in place.
10. Attach a 15 mm adapter (from a 3.0 mm ET tube) to the catheter hub. Ventilate with highest possible oxygen concentration using a bag VALVE device.
11. Make certain ample time is used not only for inspiration but also for expiration. Assess for adequate oxygenation and ventilation by monitoring pulse oximetry and continuous waveform capnography.
PROCEDURES: AIRWAY

PLEURAL DECOMPRESSION 10

Clinical Indications:

- **Primary-Absolute Requirements**
  - Absent breath sounds on one side.
  - Profound shock with a systolic blood pressure less than 80mmHg in adults.
    Profound shock in pediatrics must be determined by online medical direction.
  - A patient with a flail chest severe enough to require endotracheal intubation for persistent hypoxia should have a precautionary needle decompression on the side of the injury.

- **Secondary-Suggestive but not sufficient without the above**
  - Distended neck veins.
  - Tracheal shift away from the affected side.
  - Altered mental status.
  - Increased airway resistance, especially in intubated patients.
  - Tympany to percussion on the affected side.
  - Subcutaneous air in the intubated patient.

Contraindications:

- Patient has a simple pneumothorax.
- Patient with a symptomatic tension pneumothorax that can be relieved by the removal of an occlusive dressing from an open chest wound.

Procedure:

1. Elevate head of stretcher to 20-30 degrees (if not contraindicated).
2. Obtain age appropriate needle.
   - Adult: 14G over the needle device.
   - Pediatric: 18G over the needle device.
3. Clean the chest cavity vigorously with alcohol or betadine.

4. On the affected side, locate the mid-clavicular line and insert the IV catheter over the superior margin of the third rib (2\textsuperscript{nd} intercostal space) or along the anterior axillary line at the 4\textsuperscript{th} intercostal space.

5. Once the needle makes contact with the rib, slide over the top of it.

6. Advance the catheter and then remove the needle.

7. Auscultate breath sounds.

8. Attach a one way valve if possible.

9. Reassess frequently and repeat the procedure as needed.

10. Leave the catheter in place until it is replaced by a chest tube at the hospital.
PROCEDURES: AIRWAY
RAPID SEQUENCE INTUBATION 11

Clinical Indications:
A patient with the inability to maintain a patent airway.

Contraindications:
- Ketamine should not be used as an induction agent for infants < 3 months old, patients with a known history of schizophrenia, or in patients with severe uncontrolled hypertension.
- Etomidate should not be used in patients with known sepsis.

Procedure (Adults):
1. Pre-oxygenate. Follow Apneic Oxygenation Procedure and provide passive Oxygenation throughout the procedure.
2. Consider pain management with Fentanyl (Sublimaze) per Pain Management Protocol.
3. Administer Ketamine 2 mg/kg SLOW IO/IV (Maximum dose of 200mg). May repeat bolus of 1 mg/kg IV/IO post intubation every 10 minutes as needed or infuse at 1mg/kg/hr after the initial loading dose.
4. Consider administration of a push dose pressor, in accordance with the Push Dose Pressor Procedure, if hypotensive.
5. Alternatively, administer Etomidate (Amidate) 0.3 mg/kg slow IO/IV (max dose of 40 mg).
6. Administer Succinylcholine (Anectine) 2 mg/kg IO/IV. If contraindicated, consider Rocuronium (Zemuron) 1mg/kg IV/IO OR Vecuronium (Norcuron) 0.1 mg/kg IO/IV (max of 10 mg).
7. Once appropriate medications have been administered, intubation should be initiated. In some cases, a paralytic may not be necessary. Discontinue intubation attempt and ventilate with 100% oxygen if: thirty seconds has passed OR SPo2 falls below 91% OR heart rate falls below 60 bpm.
8. Confirm tube placement by: bilateral breath sounds, chest rise and fall, absence of gastric sounds, cholomeric ETCO2 detector, end tidal CO2 measurement, waveform capnography, and continuous SPo2 readings.
9. Secure the tube and ensure cervical immobilization during transport.
10. Unless contraindicated, insert a nasogastric or orogastric tube for transports when deemed necessary.

11. Post intubation, administer:
   - Midazolm (Versed) 0.1 mg/kg IO/IV/IN up to 10mg AND
   - Fentanyl (Sublimaze) 1 mcg/kg IO/IV/IN (max dose 100 mcg), repeat at 1 mcg/kg as needed.
   - May also consider Lorazepam (Ativan) 1 – 2 mg IO/IV/IN, may repeat to a total dose of 4 mg.
   - Ketamine 1 mg/kg every 10 minutes as needed or infuse at 1mg/kg/hr, after the initial loading dose.
   - For long transports (if needed) administer Vecuronium (Norcuron) 0.1 mg/kg IO/IV (max of 10 mg) OR Rocuronium (Zemuron) 1mg/kg IO/IV (max of 100 mg), OR Pavulon (Pancuronium) 0.1 mg/kg IV/IO. **A long acting paralytic should only be utilized if appropriate analgesia and sedation are not effective.**

12. Have receiving physician verify tube placement and chart findings.

13. It is required that the airway be monitored continuously throughout transport via waveform capnography and pulse oximetry. Reassess airway placement frequently and with every patient move.

14. If unable to intubate patient using conventional intubation technique or video laryngoscope assisted intubation, then use an appropriately sized BIAD. If unable to intubate or ventilate with a simple adjunct or BIAD device, follow the **Airway: Surgical Cricothyrotomy Procedure.**
PROCEDURES: AIRWAY
RAPID SEQUENCE INTUBATION 11 CONTINUED

Procedure (Pediatrics):

1. Preoxygenate. Follow **Apneic Oxygenation Procedure** and provide passive Oxygenation throughout the procedure.
2. Consider **Atropine** 0.02 mg/kg IO/IV (minimum of 0.1 mg, max of 1 mg) to prevent bradycardia for patients 2 years old or younger. Be prepared to administer in older patients.
3. Consider pain management with **Fentanyl (Sublimaze)** per the **Pain Management Protocol**.
4. Consider administration of a push dose pressor, in accordance with the **Push Dose Pressor Procedure**, if hypotensive.
5. Administer **Ketamine** 2 mg/kg SLOW IO/IV (max dose 200mg), followed by 1 mg/kg every 10 minutes as needed or infuse at 1mg/kg/hr, after the initial loading dose.
6. Alternatively, administer **Etomidate (Amidate)** 0.3 mg/kg slow IO/IV/IN push (max dose of 40 mg). May also consider **Midazolam (Versed)** 0.1mg/kg IV/IO/IN to a max dose of 5mg.
7. Administer **Succinylcholine (Anectine)** 2 mg/kg IO/IV. If contraindicated, consider **Rocuronium (Zemuron)** 1mg/kg IV/IO OR **Vecuronium (Norcuron)** 0.1 mg/kg IO/IV (max of 10 mg).
8. Once medications have been administered, intubation should be initiated. In some cases, a paralytic may not be necessary. Discontinue intubation attempt and ventilate with 100% oxygen if: thirty seconds has passed OR SpO2 falls below 91%, OR heart rate falls below 60 bpm.
9. Confirm tube placement by: bilateral breath sounds, chest rise and fall, absence of gastric sounds, end tidal CO2 measurement, waveform capnography, and continuous SPO2 readings.
10. Secure the tube and ensure cervical immobilization during transport.
11. Insert a nasogastric or orogastric tube for transports > 15 minutes or when deemed necessary.

12. For post intubation analgesia, administer:
   - **Midazolm (Versed)** 0.1 mg/kg IO/IV/IN to max of 5mg (may be repeated in 0.05 mg/kg doses as needed).
   - **Fentanyl (Sublimaze)** 1 mcg/kg IO/IV/IN to max of 100mcg, repeated in 0.5 mcg/kg doses as needed.
   - May also consider **Lorazepam (Ativan)** 0.05 mg/kg IO/IV/IN up to 4 mg max.
   - **Ketamine** 1mg/kg every 10 minutes as needed.

13. For long transports (if needed) administer:
   - **Vecuronium (Norcuron)** 0.1 mg/kg IO/IV (max of 10 mg).
   - or **Rocuronium (Zemuron)** 1mg/kg IO/IV (max of 100 mg).
   - or **Pavulon (Pancuronium)** 0.1 mg/kg IV/IO.

   **A long acting paralytic should only be utilized if appropriate analgesia and sedation are not effective.**

14. Reassess airway frequently and with every patient move.

15. Have receiving physician verify tube placement and chart findings.

16. It is required that the airway be monitored continuously throughout transport via waveform capnography and pulse oximetry.

17. If unable to intubate patient using conventional intubation technique or video laryngoscope assisted intubation, then use an appropriately sized BIAD. If unable to intubate or ventilate with a simple adjunct or BIAD device, follow the **Airway: Needle Cricothyrotomy Procedure.**
PROCEDURES: AIRWAY
SURGICAL CRICOTHYROTOMY 12

Purpose

- This procedure is intended for cases where the patient is unable to be intubated, will not accept a blind insertion device, and is unable to be ventilated by bag-valve device.

Clinical Indications

- Management of an airway when standard airway procedures cannot be performed or have failed.

Contraindications

- Unfamiliarity with technique.
- Pre-existing laryngeal pathology.
- Coagulopathy.
- Inability to identify appropriate landmarks.
- Pediatric patients less than 12 years of age.

Procedure

1. Don appropriate PPE.
2. Locate the cricothyroid membrane by palpating the prominence of the thyroid cartilage and moving the finger inferiorly into the depression between the thyroid and cricoid cartilages.
3. Hold the trachea in place and provide skin tension with the thumb and middle finger of the non-dominant hand placed on either side of the trachea and use the index finger to locate the cricothyroid membrane.
4. Prepare the site for incision. Quickly cleanse the site with antiseptic solution. Start from the membrane and wipe in widening circles until a broad margin around the site is cleansed.
5. Make a vertical incision in the skin 1.5 to 2.5 cm in length over the cricothyroid membrane.
6. Use blunt dissection to expose the cricothyroid membrane.
7. Secure the tube with a commercial tube holder if available or prepackaged tube securing tie.
8. Once the membrane is exposed, make a horizontal incision through the membrane.
9. Insert the endotracheal tube until the cuff is in the trachea, inferior to the incision site. Consider the use of a Bougie as a guide into the trachea.
10. Inflate the cuff.
11. Confirm placement as you would an ETT.
12. Note the depth on insertion.
Clinical Indications:

- The mechanical ventilator shall be used on all intubated patients unless they weigh 5kg or less, there is a direct physician order not to use the ventilator, or other lifesaving treatment priorities exist. In those rare cases, every effort should be made to place the patient on the ventilator as soon as the immediate life threats are addressed.

Procedure:

1. Obtain ventilator setting from the respiratory therapist or by observing the settings on the current ventilator. Ensure settings are appropriate for the patient. Chart these settings in the PTA vital signs column.

2. If the patient was just intubated or was not on a ventilator previously, then set the ventilator as follows:
   a. PRVC/SIMV mode.
   b. Tidal Volume = 5 – 8 ml/kg (using patient’s ideal weight) See chart on next page.
   c. FiO2 of 90%, titrate to keep SPo2 between 94 – 99%.
   d. Peep = 5 ml.
   e. Based on patient’s condition and for pediatrics, pressure mode may be utilized with the following starting settings.
      - Initial PIP should be 15-20 above the PEEP.
      - I time of 0.5 seconds for infant or 0.7 seconds for a child.
      - Rate of 20-30 for infants or 20 for a child.

3. After determining settings, begin ventilation of the patient with the transport ventilator.

4. The settings may be adjusted at the determination of the clinician to maintain the comfort of the patient with an SPo2 consistent with the baseline of the patient and an ETCO2 between 35 – 45. Ventilator settings should not be adjusted more often than every 5 minutes.

5. Unless contraindicated, insert a nasogastric or orogastric tube for transports > 15 minutes or when deemed necessary.
6. If the patient is not sedated by a continuous IV drip, then sedation and analgesia shall be maintained with:
   ◦ **Midazolm (Versed)** Adults: 0.1 mg/kg IO/IV/IN (may be repeated in 2.5 mg doses as needed). Pediatrics: 0.1 mg/kg IO/IV/IN (may be repeated in 0.05 mg/kg doses as needed). Max dose 5mg.
   ◦ **Fentanyl (Sublimaze)** 1 mcg/kg IO/IV/IN (maximum dose of 100 mcg), repeated in 1 mcg/kg doses as needed.
   ◦ **Ketamine** 1mg/kg, repeated every 10 minutes as needed or infuse at 1 mg/kg/hr, after the initial loading dose.
7. For long transports (if needed) administer:
   ◦ **Vecuronium (Norcuron)** 0.1 mg/kg IO/IV (max of 10 mg).
   ◦ or **Rocuronium (Zemuron)** 1mg/kg IO/IV (max of 100 mg).
   ◦ or **Pavulon (Pancuronium)** 0.1 mg/kg IV/IO.

* A long acting paralytic should only be utilized if appropriate analgesia and sedation are not effective.*
## PROCEDURES: BREATHING

### MECHANICAL VENTILATION 13 CONTINUED

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PROCEDURES: CIRCULATION

ARTERIAL LINES 14

Clinical Indications

• Transport of a patient with an existing arterial line.
• Establishing a radial arterial line for continuous blood pressure monitoring.

Existing Arterial Lines:

1. Make certain the arterial line is secured prior to transport, including the insertion site of the arterial, IV lines, and monitoring lines.
2. Use available equipment for the monitoring of arterial pressures via the arterial line.
3. Do not use the arterial line for administration of any IV fluids or medications.
4. If there is any question regarding dislodgement of the arterial line and bleeding results, remove the line and apply direct pressure over the site for at least 5 minutes before checking for hemostasis.

Radial Arterial Line Procedure:

Indication:

Used in patients requiring invasive arterial blood pressure monitoring due to hemodynamic instability and monitor effects of vasoactive medication prior to or during transport.

Precautions:

The Allen Test must be preformed prior to radial arterial line placement to ensure adequate collateral arterial flow to the hand. Caution must be ensured during procedure due to the risk of hematoma or ischemia caused from puncture of artery.
Recommended Equipment:

- Over the wire catheter insertion kit or 20 ga angiocath.
- Betadine or other antimicrobial.
- Sterile gloves.
- 4x4s or other gauze.
- 2.0 silk suture.
- Pressure tubing with arterial line transducer.
- 500 mL bag NS with pressure bag.
- Rolled towel and/or arterial arm board.
- Local anesthetic – lidocaine 1% without epinephrine.
- Transparent occlusive dressing.

Procedure:

1. Perform Allen Test to confirm ulnar collateral circulation.
Procedure continued:

2. Position patients wrist and hand, dorsiflex wrist over towel then tape palm and upper forearm to table or other stationary object (may use arm board as well).
3. Cleanse entry site with betadine or other antimicrobial and sterile drape insertion site.
4. Inject insertion site with lidocaine.
5. Identify radial artery by palpation starting distally.
6. Using sterile technique, insert arterial needle into the skin just distal to the palpated artery site at a 30-45 degree.

7. Advance needle into artery until pulsatile bright red blood spontaneously appears.
8. Advance guidewire.
9. Advance plastic catheter over guidewire (seldinger technique).
10. Connect to pressure tubing and transducer.
11. Suture arterial line and dress with transparent occlusive dressing.
12. Attach arm board if not done.
**PROCEDURES: CIRCULATION**

**ARTERIAL LINES 14 CONTINUED**

**Special Considerations:**

- Arterial thrombosis.
- Air embolism.
- Hematoma.
- Arterial vasospasm.
- Bleeding.
- Infection.
- Only the radial artery can be cannulated in this procedure.
- Requires approval from physician (OLMD or sending/receiving physician).
PROCEDURES: CIRCULATION
BLOOD ADMINISTRATION 15

Clinical Indications:

- Any of the following may necessitate the need for the administration of blood in a hypotensive patient:
  - Blunt or penetrating trauma to the torso.
  - Obvious massive external blood loss from any site.
  - Abdominal or thoracic aneurysm with suspected dissection.
  - Significant GI bleeding.
  - Intracranial hemorrhage or other types of uncontrolled/non-compressible bleeding in the presence of elevated PT/INR.
  - Other unspecified conditions with direct physician order.

- Absolute Criteria:
  - Patient has persistent hypotension. **Adults** - SBP < 90 mmHg or MAP <65 after 2L of crystalloid. **Pediatrics** - signs of shock after two challenges of 20 ml/kg of crystalloid infused. In cases of extremis, proceed directly to blood product administration concurrent with crystalloid administration.

Procedure:

- **Adult Patients**
  1. Continue resuscitation with crystalloid solution and transfuse 2 units Type "O" Negative Packed Red Blood Cells along with 2 units Type AB Fresh Frozen Plasma via large bore IV or IO.
  2. Administer 2 liters of warmed crystalloid solution via large bore IV/IO. If the patient is in extremis and massive bleeding is suspected, blood products should be initiated prior to the administration of the crystalloid solution.
  3. Monitor patient for signs and symptoms of transfusion reaction. If symptoms of transfusion reaction are present **STOP** the blood products and administer **Methylprednisolone (Solumedrol)** 125 mg IO/IV and **Diphenhydramine (Benadryl)** 50 mg IO/IV. Follow **Adult: Anaphylactic Shock/Allergic Reaction Protocol.**
PROCEDURES: CIRCULATION
BLOOD ADMINISTRATION 15 CONTINUED

- Pediatric Patients

1. Administer 2 challenges of 20 ml/kg of crystalloid solution.

2. Continue resuscitation with crystalloid solution and transfuse 10 ml/kg Type “O” Negative PRBCs along with 10ml/kg Type “AB” Fresh Frozen Plasma via large bore IV/IO. Use a syringe to draw the blood products from the bag to administer volumes less than one unit.

3. If additional boluses are deemed necessary by the medical crew, a physician order is required.

4. Monitor patient for signs and symptoms of transfusion reaction. If symptoms of transfusion reaction are present STOP the blood products and administer **Methylprednisolone** (Solu-Medrol) 2 mg/kg IO/IV (max of 125 mg) and **Diphenhydramine** (Benadryl) 1 mg/kg IO/IV (max of 30 mg). Follow **Pediatric: Anaphylactic Shock/Allergic Reaction Protocol**.

Procedure for Administering FFP only:

1. FFP should be administered for patients with intracranial hemorrhage or other types of uncontrollable/non-compressible bleeding in the presence of elevated PT/INR.

2. FFP should also be administered for any patient who is known to be on anticoagulant therapy and has a suspected head injury.
   - Adult patients should receive 2 units FFP and pediatrics should receive 10 ml/kg FFP.
   - If additional boluses are deemed necessary, a physician order is required for pediatrics.
   - The administration of PRBCs in these circumstances should be guided by the orders above.
   - If patient does not meet criteria for PRBC administration, FFP may be given alone.
Notes:
- All blood products should be administered through the inline fluid warmers and extra care should be taken to prevent hypothermia.
- If the patient is in extremis and massive bleeding is suspected, blood products can be initiated concurrent with the administration of the crystalloid solution.

Documentation Requirements:
- Patient hypotension documented after required bolus of crystalloid administered.
- Proper use of protocol for patient with above criteria.
- Transfusion reaction observation, critical during the first 15 minutes of administration.

Procedure for Administering Tranexamic Acid (Cyklokapron®)
1. Patient presents with signs and symptoms of hemorrhagic shock (SBP <90 mmHg and HR >110), major blunt or penetrating torso or pelvic fracture and, within the first 3 hours of the time of the injury.
2. One or more major amputations, evidence of severe bleeding, external manual efforts to control the hemorrhage have been instituted, and within the first 3 hours of the time of the injury.
3. Tranexamic Acid (Cyklokapron) 1 gram mixed in 100 ml NS or LR administered over 10 minutes. Write time of administration on the 100cc bag and leave bag hanging for added documentation at receiving facility.
4. Ensure that the receiving facility is made aware of the TXA administration in the prehospital report, and that it is in the oral report given at bedside.
5. The repeat or second dose of TXA will require speaking with the receiving MD.
**Clinical Indications:**
Any patient where intravenous (IV) access is indicated.

**Procedure:**
1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the clinician.
2. May use intraosseous (IO), external jugular (EJ), or preexisting venous catheter where threat to life exists and no obvious peripheral site is available.
3. Use the largest catheter bore necessary based upon the patient’s condition and size of veins.
4. In post-mastectomy patients, avoid IV, blood draw, injection, or blood pressure in arm on affected side.
5. Prep the IV site with an alcohol wipe.
6. IV Bolus rates:
   - Adult: 250-1000ml.
   - Pediatric/Infant: 20 ml/kg.
   - Neonate: 10 ml/kg via syringe push.
   - May repeat fluid boluses for continued decreased perfusion.
   - Utilize an IV pump or controlled device.
7. Follow *Blood Administration* protocol if appropriate.
8. IV rates should be calculated using the 4:2:1 rule.
9. Consider a second IV line.

**Notes:**
- For patients under 12 years old, use the 4:2:1 Rule to calculate maintenance fluids:
  - 1 – 10 kg: 4 ml/kg/hr.
  - 10 – 20 kg: 2 ml/kg/hr.
  - > 20 kg: 1 ml/kg/hr.
PROCEDURES: CIRCULATION
INTRA-AORTIC BALLOON PUMP (IABP) 17

Clinical Indications:
• Transport of a patient on an IABP. Crew members should be trained on the specific device being transported or a person trained in operation should be transported to operate the device.

Procedure:
Prior to Transport:
1. The transport crew shall receive a detailed report from ICU staff of patient’s condition.
2. Verify adequate helium supply for completion of the transport.
3. Prepare the following equipment:
   • 60 ml luer lock tip Syringe and 3 way stop-cock.
   • Appropriate IABP Adapters – Datascope to arrow tubing, Arrow to Datascope.
   • Adapters X2 sizes (25 – 40cc and 50cc).
   • Scissors and Kelly or tube clamps.
   • ECG Patches.
   • Operators Manual.
   • AC power inverter with cord.
   • Art line transducer kit.
   • Cables for art line and EKG.
4. Check IABP batteries to assure that it’s fully charged.
5. Verify clean ECG and AP transducer signal on IABP screen.
6. Verify that the balloon catheter is secured with sutures or commercial kit.
7. Take measurement of depth of insertion.
8. Consider using a knee immobilizer or splint to stabilize catheter and prevent kinking.
9. Transport personnel should check the following prior to transporting patient:
   a. Complete physical assessment and hemodynamic profile.
   b. Assess patient’s rhythm.
   c. Verify status of infusions and establish an IV site for emergency medication.
   d. If the patient will tolerate it, place IABP in 1:2 to verify appropriate timing of inflation and deflation on arterial pressure waveform. Print pre and post strips in 1:2.
   e. Verify IABP settings especially trigger, balloon volume, and assist ratio. R wave trigger should be utilized.
   f. Assess and document peripheral pedal pulses and perfusion of limb with catheter along with left radial or brachial pulse, and groin site.
   g. Assess patient’s dependence on IABP support. This will impact how long IABP can be disconnected to load the pump.
   h. Place monitor SPo2 on distal toe of the affected groin site.
   i. Place secondary SPo2 on the left hand.

**During Transport:**
1. Position the patient in supine position on the stretcher.
2. Make sure that the transport personnel can easily assess the groin site, balloon catheter tubing, and lines.
3. During the loading of the patient into the vehicle, if it is absolutely necessary to disconnect the patient briefly from the pump in order to safely load the patient and equipment into the vehicle, place the IABP in “Standby Mode.”
4. Properly secure the IABP in the vehicle.
5. Connect the IABP power cord to vehicle inverter for transport (if available).
6. Assure pump alarms are enabled at all times.
Patient Assessment During Transport:

1. Assess and document the vital signs including BP, HR, and MAP. (Do not document BP off of NIBP cuff as it is not accurate and not needed. You must document BP per balloon pump reading. Remember when utilizing a balloon pump you are most concerned with the MAP as your actual systolic and diastolic will decrease due to augmentation).

2. Assess the arterial pressure waveform for timing and optimal diastolic augmentation.

3. Assess the patient with regard to rhythm, urine output, and peripheral perfusion.

4. Periodic documentation of symmetry of radial pulses should be done as an indicator that the balloon has not advanced superiorly.

5. Urine output should be documented to assure that the balloon has not moved downward in the aorta.

Motion Sickness During Transport:

1. Nausea may develop during transport.

2. Retching and vomiting may induce high pressure alarm states on IABP console.

3. Treat per the Nausea/Vomiting Protocol.

Altitude Considerations for Air Transport:

1. Altitude increases cause an inversely proportional decrease in barometric pressure (Boyle’s Law).

2. The helium volume of the IAB will increase in size during ascents.

3. Helium has potential to cross the IAB membrane and enter the patient’s blood stream if a leak occurs.

4. ALWAYS operate IABP with gas alarms active.

5. During ascent, the consoles will auto vent for altitude changes.
Altitude Considerations for Air Transport Continued:

6. Assure the pilot performs a gradual descent due to the fact the helium volume will shrink during descent. The gradual descents will assure proper autofill of the balloon and prevent alarms.

7. Arrow pump will not adjust to altitude. Must zero at altitude and at landing.

Complications: Blood in the Gas Line Tubing

1. STOP IABP PUMPING. Clamp tubing. Notify receiving facility of probable balloon rupture and the need for balloon removal upon arrival.

2. Support the patient’s hemodynamics with drug therapy.

Complications: Bleeding at the Insertion Site

1. Apply manual pressure to site.

2. Reassess immobilization of insertion site.

Complications: Balloon Partially Pulled Out

1. Do not attempt to reposition balloon.

2. Check distal pulses for perfusion.

3. Decrease the balloon volume based on balloon pressure waveform reading.

4. Notify receiving facility of need for repositioning.

Complications: Dysrhythmias

1. Decrease the effectiveness of balloon counter-pulsation.

2. Decreased augmentation noted.

3. Administer antiarrhythmics per guidelines.
Complications: Limb Ischemia

1. Observe and monitor pedal pulses and coloration of legs.
2. Keep legs warm to reduce vasoconstriction due to cold.
3. Maintain adequate volume status to reduce vasoconstriction due to hypovolemia.
4. Notify the receiving facility of possible limb ischemia.

Complications: Cardiac Arrest

1. Initiate appropriate ACLS PCGs.
2. Place IABP console in arterial pressure trigger and initiate pumping at 1:1 assist once chest compressions have been started.

Complications: IABP Console Malfunction

1. Initiate manual balloon inflation and deflation using a 60 ml luer lock syringe with 3 way stop cock attached.
2. Aspirate balloon catheter prior to inflating and deflating balloon to check the integrity of the balloon membrane.
3. Inflate and deflate the balloon once every 2-3 minutes. You can inflate and deflate the balloon with 10ml over the size of the balloon.
4. Manual inflation will not provide hemodynamic support, but will prevent clot formation on the balloon.
PROCEDURES: CIRCULATION

UMBILICAL VEIN CATHETER 18

Indications:

• For administration of medications or fluids in the newborn.

Equipment Needed:

• IV fluid and administration set.
• Scalpel.
• 3.5 or 5 Fr Umbilical Vein Catheter (UVC).
• Umbilical Ties.
• Tape.
• Dressing.

Procedure:

1. Prepare equipment.
2. Maintain sterile technique.
3. Loosely tie the umbilical tie at the base of the cord.
4. Hold the umbilical stump firmly and trim (with the scalpel) several cm above the abdomen.
5. Locate the umbilical vein.
6. Insert the UVC until blood is freely obtained. Do not insert the UVC more than 6-8 cm past the umbilicus.
7. Draw a blood sample if needed.
8. Secure the catheter in place by tightening the tie at the base of the stump and tape/cover with a sterile dressing.
9. Monitor the site for any changes.
10. Dispose of the scalpel in a sharps container.
11. Document the date, time, type of catheter, fluid infusion, and securing method.
PROCEDURES: CIRCULATION

VENTRICULAR ASSIST DEVICE (VAD) 19

Interventions:

1. Assess and manage airway, breathing, and circulation.
2. Provide supplemental oxygen to maintain SpO2 > 93%.
3. Contact the emergency phone number on the tag or bracelet for assistance.
4. Check all lead connections.
5. Reconnect any loose or disconnected leads.
6. Auscultate heart sounds to determine if the device is functioning and what type of device it is. If it is continuous flow device, you should hear a “humming sound.” This indicates the device has power.
7. Assess the device for any alarms.
8. Look on controller usually found around the waist of the patient and to see what color tag and device it is OR look for the colored medical alert bracelet.
9. Establish IV access of NS/LR at KVO rate.
10. Assess vital signs. Use Mean BP with Doppler – the first sound you hear is the Mean Arterial Pressure (MAP).
11. Transport to the VAD center listed on the tag on the patient’s medical alert bracelet or the controller (located in the Travel Bag).
12. Transport the significant other if space is available and the pilot/team approves. The caregiver is a valuable source of information regarding the device.
13. Take the patient’s equipment (Travel Bag). It is vitally important for back up equipment while in transport.
Special Considerations:

- CPR is determined by the sending or receiving cardiothoracic surgeon based on the type of device.
- ACLS drug interventions will not harm the device.
- Defibrillate VT or VF only if the patient is symptomatic. Electrical function is unchanged in the native heart, but mechanical function is supported by the device. Defibrillation/Cardioversion does not harm device, provide shocks per AHA guidelines.
PROCEDURES: GENERAL

CONSCIOUS SEDATION 20

Clinical Indications:
- Conscious patients that require conscious sedation for procedures, such as, but not limited to:
  - Cardioversion.
  - Pacing.

Contraindications:
- This order is not intended to replace or circumvent the Airway: Rapid Sequence Intubation Procedure. If the patient meets the criteria for RSI, follow RSI procedures.
- This order is not intended for pain management.
- This order is not intended for the sedation of unruly behavioral patients.

Procedure:
1. Administer one of the following medications:
   - **Adults:**
     - Lorazepam (Ativan) 1 – 2 mg IM/IO/IV/IN, repeated up to 4 mg max
     - OR Midazolam (Versed) 1 – 2 mg IM/IO/IV/IN, repeated up to 5 mg max
     - OR Diazepam (Valium) 5-10 mg IO/IV or 0.2 mg/kg rectal, up to 20 mg max
     - OR Ketamine (Ketalar) 1 mg/kg IV/IO, up to a max dose of 25 mg
   - **Pediatrics:**
     - Lorazepam (Ativan) 0.05 – 0.1 mg/kg IM/IO/IV/IN repeated up to 4 mg max
     - OR Midazolam (Versed) 0.1 mg/kg IM/IO/IV/IN up to 2mg max initial dose repeated up to 5 mg
     - OR Diazepam (Valium) 0.1 mg IO/IV up to 5 mg or 0.5 mg/kg rectal up to 5 mg max
     - OR Ketamine (Ketalar) 1 mg/kg IV/IO, up to a max dose of 25 mg
2. Monitor patient’s airway/breathing and vital signs carefully.

3. It is required that the airway be monitored continuously throughout transport via capnography and pulse oximetry.
Clinical Indications:
- To mitigate short-lived hypotension in the case of intubation in high risk patients.
- Transient hypotension (to serve as a bridge while other interventions, which the clinician anticipates will result in improved blood pressure, are being implemented).

Procedure:
1. **Epinephrine (Adrenalin):** Epinephrine is an inopressor that has Alpha 1 and 2, and Beta 1 and 2 effects. The onset of effects are seen in < 1 min and the duration of effects may last 5-10 min.

   **Mixing:**
   - Take a 10 ml syringe with 9 ml of normal saline. Draw up 1 ml (0.1 mg) of 1:10,000 Epinephrine (Adrenalin) from a pre-mixed vial. The resulting concentration is 10 mcg/ml of Epinephrine (Adrenalin) (1:100,000) concentration.

   - Alternatively, take 1 ml of 1:1,000 Epinephrine (Adrenalin) and mix into a 100 ml bag of normal saline. The resulting concentration is also 10 mcg/ml of Epinephrine (Adrenalin) (1:100,000) concentration. Label the syringe as 10 mcg/ml to prevent errors.

   **Dose:** 0.5-2 ml (5-20 mcg) every 2-5 min, with a 5-10 min duration.

2. **Phenylephrine (Neosynephrine):** Phenylephrine (Neosynephrine) is a pure Alpha agent and is the preferred push dose pressor in the presence of tachycardia. The onset of effects is seen in < 1 min and the duration of effects may last 10-20 min.

   **Mixing:**
   - Take a 3 ml syringe and draw up 1 ml of Phenylephrine (Neosynephrine) with a 10 mg/ml concentration. Inject this into a 100 ml bag of normal saline. The resulting concentration is 100 mcg/ml of Phenylephrine (Neosynephrine). Draw up into a syringe and label as 100 mcg/ml to prevent errors.

   **Dose:** 0.5-2 ml (50-200 mcg) every 2-5 min, with a 10-20 min duration.
Intervention:

1. Assess for adequate effort and rate of breathing. If adequate, administer oxygen to maintain oxygen saturations between 94% – 99%.

2. Consider appropriate medications to calm and reassure patient.

3. Consider CPAP/BIPAP protocol if appropriate.

4. If inadequate effort and rate of breathing, check for gag reflex.
   - Gag Reflex: follow Airway: Rapid Sequence Intubation Procedure.

5. Consider use of endotracheal tube introducer (Bougie®) according to Airway: Endotracheal Tube Introducer (Bougie®).

6. If unsuccessful at oral intubation, consider BIAD. Follow the Airway: King Airway Insertion or Airway: LMA Placement Procedure.

7. If unable to secure airway by any of the above routes, then consider performing a cricothyrotomy: follow Airway: Needle Cricothyrotomy Procedure OR Airway: Surgical Cricothyrotomy Procedure, depending on patient age.
ADULT CARDIAC
ACUTE CORONARY SYNDROME 2

Assessment:
- ACS includes: Unstable Angina, ST Elevation MI (STEMI), Non ST Elevation MI (NSTEMI), and Silent MI.
- Significant assessment findings include: non-traumatic pain thought to be cardiac in nature between the level of the navel and the chin, cardiac risk factors (AHA Guidelines) and atypical presentations thought to be cardiac in nature.

Interventions: *Always follow current AHA Guidelines*
2. Monitor cardiac rhythm.
3. Perform and print a 12 lead EKG within 5 minutes of arrival. Transmit to receiving facility if capable.
4. Administer oxygen to maintain oxygen saturations between 94% – 99%.
5. Administer chewable Aspirin 324 mg PO.
7. Administer Nitroglycerin 0.4 mg SL.
   ♦ Systolic blood pressure must be greater than 90 mm Hg.
   ♦ May be repeated at 5-minute intervals until pain is relieved (no maximum administration as long as blood pressure stays above 90 mm Hg).
   ♦ A Nitroglycerin infusion OR Nitroglycerin paste may be considered for extended transports.
   ♦ If patient has a suspected Right Ventricular Infarct, Nitroglycerin may be administered in stable patients (B/P >120) and after an IV of NS is established.
   ♦ Withhold Nitroglycerin in any patient who has used an erectile dysfunction medication (i.e., Viagra or Levitra within 24 hrs; or Cialis within 36 hrs) due to potential severe hypotension.
   ♦ Consider Zofran (Ondanestrone) 4 mg IM/IO/IV/ODT for nausea. May repeat once.
ADULT CARDIAC
ACUTE CORONARY SYNDROME 2 CONTINUED

8. If a STEMI is identified:
   - Advise receiving facility of the STEMI ALERT as soon as possible.
   - Consider Heparin 5,000 units IV/IO (*Adults only, requires OLMD, and only used within specifically authorized services*).
   - Administer analgesia as needed per Pain Management protocol.
   - Consider a Normal Saline bolus.
   - Consider Metoprolol (Lopressor) 5 mg IO/IV. May be repeated 2 times while monitoring BP, heart rate, and EKG. May especially benefit anterior and lateral wall myocardial infarction.

Notes:
- **DO NOT** administer Aspirin or Heparin if patient has an ACS in the presence of other etiology such as CVA or trauma.
ADULT CARDIAC
ASYSTOLE/PEA 3

Assessment:
- Asystole is to be confirmed and documented in three different EKG leads.
- If rhythm is unclear and is possibly fine ventricular fibrillation, follow Ventricular Fibrillation and Pulseless Ventricular Tachycardia Protocol

Interventions: *Always follow current AHA Guidelines*
1. Immediate CPR for 2 minutes (5 cycles of 30 compressions: 2 ventilations).
2. Check rhythm / pulse.
3. Immediate CPR for 2 minutes (5 cycles of 30 compressions: 2 ventilations); continue CPR / rhythm-pulse check cycle throughout Asystole / PEA.
5. Administer Epinephrine (Adrenalin) 1:10,000 solution 1mg IO/IV, repeat every 3 to 5 minutes until rhythm changes.
6. If hemodialysis patient or hyperkalemia is suspected, administer Calcium Gluconate (Kalcinate) 1 -2 grams IV/IO OR Calcium Chloride 1 gram IV/IO, and Sodium Bicarbonate 1 mEq/kg IO/IV to a max of 50 mEq.
ADULT CARDIAC
ATRIAL FIBRILLATION/FLUTTER (STABLE) 4

Assessment:

- Perform patient assessment – Heart rate > 150 bpm (not due to hypovolemia).

Interventions: *Always follow current AHA Guidelines*

2. Perform and print a 12 lead EKG. If STEMI, follow Adult: Acute Coronary Syndromes Protocol.
5. Administer Diltiazem (Cardizem) 0.25 mg/kg IV/IO over 2 minutes if systolic BP > 90. If patient remains in uncontrolled Atrial Fibrillation after 15 minutes, administer 0.35 mg/kg IV/IO over 2 minutes.
6. Consider Amiodarone (Cordarone) 150 mg IV/IO, administered over 10 min, followed by an infusion at 1 mg/hr for the first 8 hours, then decreased to 0.5 mg/hr.
7. Repeat and print a 12 lead EKG.

Notes: Search for and treat possible contributing factors:

- Hypovolemia.
- Hypoxia.
- Hypo/Hyperkalemia.
- Hypothermia.
- Hydrogen Ion (acidosis).
- Toxins.
- Tamponade, cardiac.
- Tension pneumothorax.
- Thrombosis coronary.
- Thrombosis pulmonary.
ADULT CARDIAC
ATRIAL FIBRILLATION/FLUTTER (UNSTABLE) 5

Assessment:
- Perform patient assessment – Heart rate > 150 bpm (not due to hypovolemia).
- Signs and symptoms of poor perfusion or the patient is hemodynamically unstable.

Interventions: *Always follow current AHA Guidelines*

2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
5. Consider Cardioversion:
   a) 120 joules
   b) 150 joules
   c) 200 joules; repeat shocks at 200 joules
6. Consider Diltiazem (Cardizem) 0.25 mg/kg IV/IO over 2 minutes if systolic BP > 90. If patient remains in uncontrolled Atrial Fibrillation after 15 minutes, administer 0.35 mg/kg IV/IO over 2 minutes.
7. Consider Amiodarone (Cordarone) 150 mg IV/IO, administered over 10 min, followed by an infusion at 1 mg/hr for the first 8 hours, then decreased to 0.5 mg/hr.
8. Repeat and print a 12 lead EKG.

Notes: *Always follow manufacturer guidelines for defibrillation/cardioversion.*
ADULT CARDIAC
BRADYCARDIA (ADULT) 6

Assessment:

- Heart rate less than 60 bpm in adults.

Interventions: *Always follow current AHA Guidelines*


2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.


4. If the patient has signs or symptoms of poor perfusion caused by the bradycardia (e.g. acute altered mental status, ongoing chest pain, hypotension, or other signs of shock):
   a. Administer Atropine 0.5 mg IO/IV as initial therapy, may repeat every 3-5 mins for a max of 3 mg total.
   b. If ineffective:
      i. Begin Transcutaneous Pacing.
      iii. Administer Dopamine (Intropin) 5-20 mcg/kg/min IO/IV OR Epinephrine (Adrenalin) infusion at 0.5-10 mcg/min IO/IV.
   c. Administer a Normal Saline fluid bolus of 250 - 500 ml (rule out pulmonary edema).
   d. If Beta Blocker overdose is suspected: Consider Glucagon 1-4 mg IO/IV/IN if patient is still bradycardic after above interventions.

5. If patient is on Calcium Channel Blockers: Consider Calcium Gluconate (Kalcinate) 1-2 gram IO/IV OR Calcium Chloride 1 gram IO/IV if patient is still bradycardic after above interventions.

Notes: *Always follow manufacturer guidelines for defibrillation/cardioversion.*
Assessment:

- Significant findings: Severe shortness of breath, air hunger, tachypnea, tachycardia, elevated blood pressure, bi-lateral rales, neck vein distention, edema, pink frothy sputum, and diaphoresis.

Interventions: *Always follow current AHA Guidelines*

1. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
2. Follow Airway Management protocol.
4. Administer Nitroglycerin 0.4 mg SL.
   - Systolic blood pressure must be greater than 90 mm Hg.
   - May be repeated at 5 minute intervals as long as blood pressure stays above 90 mm Hg.
   - Withhold Nitroglycerin in any patient who has used an erectile dysfunction medication (i.e., Viagra or Levitra within 24 hours; or Cialis within 36 hours) due to potential severe hypotension.
   - Consider a Nitroglycerin infusion or paste for extended transports.
5. Morphine sulfate 3 mg to reduce myocardial oxygen demand, reduce preload, and reduce anxiety.
6. Consider Lasix (Furosemide) 40-80 mg.
7. Consider bronchodilators.
8. Consider CPAP or BiPAP.
ADULT CARDIAC
POST RESUSCITATION 8

Assessment:
- Determine successful termination of lethal rhythm.

Interventions: *Always follow current AHA Guidelines*

1. Follow the Airway Management Procedure.

2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.

3. If the patient has signs or symptoms of poor perfusion or the patient is hemodynamically unstable, administer Normal Saline bolus.

4. If signs of ventricular ectopy are present, administer Amiodarone (Cordarone) 150 mg IV/IO over 10 minutes, followed by an infusion at 1 mg/min for the first 8 hours, then reduced to 0.5 mg/hr, OR Lidocaine (Xylocaine) 1.5mg/kg IV/IO followed by 0.75 mg/kg, up to a max dose of 3mg/kg, followed by a maintenance infusion of 2-4 mg/min.

5. Consider a pressor:
   - Dopamine (Intropin) 5-20 mcg/kg/min IV/IO.
   - OR Norepinephrine (Levophed) 2-20 mcg/min IV/IO.
   - OR Epinephrine (Adrenalin) 0.5-10 mcg/min IV/IO.
   - OR Dobutamine (Dobutrex) 2-20 mcg/kg/min IV/IO.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion.
ADULT CARDIAC
SUPRAVENTRICULAR TACHYCARDIA (STABLE) 9

Assessment:
- Perform patient assessment – Heart rate > 150 bpm (not due to hypovolemia).
- Confirm rhythm with 12 lead EKG and print.

Interventions: *Always follow current AHA Guidelines*
2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
4. Attempt vagal maneuvers.
5. Administer Adenosine (Adenocard) 6 mg IO/IV followed by 20 ml flush.
6. After 1-2 minutes, if rhythm has not changed, administer Adenosine (Adenocard) 12 mg IO/IV followed by 20 ml flush.
7. Consider Amiodarone (Cordarone) 150 mg IV/IO, administered over 10 min, followed by an infusion at 1 mg/hr for the first 8 hours, then decreased to 0.5 mg/hr.
8. Alternatively, consider Metoprolol (Lopressor) 5 mg IO/IV. May be repeated 2 times while monitoring BP, heart rate, and EKG.
9. If no change in patient condition, consider following Atrial Fibrillation/Atrial Flutter (Stable) protocol.
10. Repeat and print a 12 lead EKG.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion.
ADULT CARDIAC
SUPRAVENTRICULAR TACHYCARDIA (UNSTABLE) 10

Assessment:
Perform patient assessment – Heart rate > 150 bpm QRS < 0.12 seconds (not due to hypovolemia).
Signs and symptoms of poor perfusion or the patient is hemodynamically unstable.

Interventions: *Always follow current AHA Guidelines*

2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
5. If unstable SVT remains, Cardiovert (synchronized).
   a) 100 joules.
   b) 120 joules.
   c) 150 joules.
   d) 200 joules; repeat shocks at 200 joules.
6. Repeat and print 12 lead EKG and print.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion.
Assessment:
- Confirm rhythm of ventricular fibrillation or pulseless ventricular tachycardia.

Interventions: *Always follow current AHA Guidelines*

1. Defibrillate 120 joules.
2. CPR (30 compressions: 2 ventilations) for at least 2 minutes.
3. Check rhythm.
4. Defibrillate 150 joules.
5. Immediate CPR (30 compressions: 2 ventilations) for 2 minutes.
6. Check rhythm.
7. Defibrillate 200 joules (continue at this setting every 2 minutes as needed).
8. Immediate CPR (30 compressions: 2 ventilations) for 2 minutes (continue as needed).
9. Check rhythm.
11. Administer Epinephrine (Adrenalin) 1:10,000 solution 1.0 mg IO/IV. Continue CPR for 2 minutes then check for a pulse.
12. Administer Amiodarone (Cordarone) 300 mg IO/IV. Continue CPR for 2 minutes then check for a pulse. OR administer Lidocaine (Xylocaine) 1.5mg/kg IV/IO.
13. Administer Epinephrine (Adrenalin) 1:10,000 solution 1.0 mg IO/IV. Continue CPR for 2 minutes then check for a pulse.
14. Administer Amiodarone (Cordarone) 150 mg IO/IV. Continue CPR for 2 minutes then check for a pulse. OR administer Lidocaine (Xylocaine) 0.75 mg/kg up to a maximum dose of 3mg/kg, followed by a maintenance infusion of 2-4 mg/min.
15. Perform 12 lead EKG; if STEMI follow Acute Coronary Syndromes Protocol.
16. Administer Epinephrine (Adrenalin) 1:10,000 solution 1.0 mg IO/IV. Continue CPR for 2 minutes then check for a pulse. Continue administering Epinephrine every 3-5 minutes.
17. If hemodialysis patient and hyperkalemia is suspected, administer **Calcium Gluconate (Kalcinate)** 1–2 grams IO/IV or **Calcium Chloride** 1 gram IO/IV or **Sodium Bicarbonate** 1 mEq/kg IO/IV to a max of 50 mEq.

18. Consider **Magnesium Sulfate** 2 grams slow IO/IV push over 5 - 20 minutes if patient is in refractory Ventricular Tachycardia unresponsive to Amiodarone, or if patient is in Torsades de Pointes.


**Notes:**
Search for and treat possible contributing factors:
- Hypovolemia.
- Hypoxia.
- Hypo/Hyperkalemia.
- Hypothermia.
- Hydrogen Ion (acidosis).
- Toxins.
- Tamponade, cardiac.
- Tension pneumothorax.
- Thrombosis coronary.
- Thrombosis pulmonary.

**Notes:** *Always follow manufacturer guidelines for defibrillation/cardioversion.*
ADULT CARDIAC

VENTRICULAR TACHYCARDIA (STABLE) 12

Assessment:
- Stable ventricular tachycardia is defined as ventricular tachycardia which does not meet the Ventricular Tachycardia (Unstable) Protocol, and is NOT Polymorphic Ventricular Tachycardia (Torsades).

Interventions: *Always follow current AHA Guidelines*
2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
4. Consider administering a one-time dose of Adenosine (Adenocard) 6 mg IO/IV for stable monomorphic, regular wide-complex tachycardia that may be SVT with aberrancy.
5. Consider Amiodarone (Cordarone) 150 mg IO/IV over 10 minutes, followed by an infusion at 1 mg/min OR Lidocaine (Xylocaine) 1.5 mg/kg IV/IO, followed by 0.75 mg/kg, up to a max total dose of 3 mg/kg, followed by an infusion of 2-4 mg/min.
6. Repeat and print a 12 lead EKG.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion.
ADULT CARDIAC
VENTRICULAR TACYCARDIA (UNSTABLE) 13

Assessment:
An unstable patient is defined as:

- Heart rate > 150 beats per minute.
- Signs or symptoms of poor perfusion or the patient is hemodynamically unstable.

Interventions: *Always follow current AHA Guidelines*

2. Perform and print a 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
5. If ventricular tachycardia with a pulse remains: Cardiovert (synchronized).
   i. 100 joules (If Torsades de Pointes, begin at 120 joules unsynchronized).
   ii. 120 joules.
   iii. 150 joules.
   iv. 200 joules; repeat subsequent shocks at 200 joules.
6. Administer Amiodarone (Cordarone) 150 mg IO/IV over 10 minutes. May repeat in 10 minutes if patient remains in unstable ventricular tachycardia, followed by an infusion at 1 mg/min. OR Lidocaine (Xylocaine) 1.5 mg/kg IV/IO, followed by 0.75 mg/kg, up to a max total dose of 3 mg/kg, followed by an infusion of 2-4 mg/min.
7. Consider Magnesium Sulfate 2 grams slow IO/IV push over 5 - 20 minutes if patient is in refractory Ventricular Tachycardia unresponsive to Amiodarone (Cordarone), or if patient is in Torsades de Pointes.
8. Repeat 12 lead EKG and print.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion.
**ADULT MEDICAL**

**ANAPHYLACTIC SHOCK/ALLERGIC REACTION 14**

**Interventions:**

1. Follow **Airway Management Protocol.**
2. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure.**
3. Monitor cardiac rhythm.
4. Administer **Diphenhydramine (Benadryl)** 25-50 mg IM/IO/IV.
5. If the patient has respiratory distress and other signs / symptoms of an allergic reaction, administer **Epinephrine 1:1000** solution 0.3 to 0.5 mg IM. This may be repeated every 20 minutes up to 3 times for a total of 4 doses.
6. If the patient is hemodynamically unstable, consider **Epinephrine 1:10,000** solution 0.3 mg IO/IV. Slowly titrate to effect.
7. Consider **Normal Saline** bolus and/or vasopressors.
8. Administer **Pepcid (Famotidine)** 20 mg IO/IV.
9. Administer **Methylprednisolone (Solu-Medrol)** 125 mg IO/IV.
10. If wheezing is present, administer **Albuterol (Ventolin)** 2.5 mg via nebulizer. May repeat as needed.
ADULT MEDICAL

BEHAVIORAL EMERGENCIES/CHEMICAL RESTRAINT 15

Assessment:
- Consider causes of delirium (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.).

Interventions:
2. Remove patient from stressful environment.
3. Use verbal calming techniques.
4. Obtain BGL. If appropriate, follow the Diabetic Emergencies Protocol.
5. Administer Midazolam (Versed) 1-5 mg IV/IO/IN or 5-7.5mg IM/IN.
6. If the patient is extremely violent or does not calm within 10 minutes of Versed administration, consider Lorazepam (Ativan) 1-2 mg IM/IN/IV/IO. May repeat up to 4 mg maximum.
7. Alternatively, consider Ketamine (Ketalar) 4 mg/kg IM. 1 mg/kg slow IV push. May repeat every 10 minutes.
8. Consider Haloperidol (Haldol) 5 mg IM up to 20 mg with Diphenhydramine (Benadryl) 25 mg IM. Do not mix in the same syringe. May repeat Haloperidol (Haldol) every 15 minutes up to a total dose of 20 mg.
9. If suspected agitated delirium (hyper-aggression, hyperthermia, diaphoretic), administer Normal Saline bolus.
10. Restraints: Crew members may use physical and/or chemical restraints on patients who threaten mission safety or who pose danger to themselves or others. Use the minimum amount of restraint necessary. Reassess pulse, motor, and sensory function every 15 minutes.

Notes:
- In extreme cases, the Rapid Sequence Intubation protocol may be utilized to ensure patient, crew, and transport safety.
Assessment:
- Attempt to identify the type of snake, spider, etc. responsible for the bite.
- Obtain a time of onset of the bite or sting.

Interventions:
1. Provide advanced airway management as needed.
3. Initiate IV NS. Titrate IV to patient’s hemodynamic status. Follow the Medical Hypotension Protocol.
4. Remove jewelry and tight fitting clothing from the affected area. Monitor for signs of compartment syndrome.
5. Immobilize the affected extremity. Position in a dependent position, no higher than the level of the heart.
6. Mark and time area of edema / erythema and evaluate pulse every 15 MINUTES, and document findings. The use of tourniquets, ice packs, or making an incision over the bite is NOT advised.
7. Contact receiving facility so anti-venom treatment may be established prior to the patient’s arrival.
**ADULT MEDICAL**

**DECOMPRESSSION SICKNESS 17**

**Assessment:**
- Obtain appropriate history related to the incident (length of exposure, temperature of the liquid medium, type of liquid medium, potential for injury, depth and duration of dive, onset of complications), including past medical history, current medications, drug allergies, and substance abuse.
- If available, obtain dive log or computer, air tank, and regulator for evaluation.

**Interventions:**
1. Contact the ATCC to arrange acceptance by the closest available hyperbaric facility.
2. Transport the patient in the left lateral position.
3. Administer Oxygen via non-rebreather mask to facilitate Nitrogen elimination.
4. Provide advanced airway management as needed and ventilate with 100% Oxygen with 5 cmH2O of PEEP.
5. Provide pain management per the **Pain Management Protocol**.
6. For air transports, transport at the lowest possible safe altitude.
Assessment:
- Perform a blood glucose check.

Interventions:
2. Establish IV at KVO rate – follow Circulation: Intravenous Infusion Procedure.
3. Perform blood glucose level determination.
4. If BGL < 70 Adult
   a) Administer Dextrose 50% (D50) 25 grams IO/IV.
   b) If unable to establish IV access, administer Glucagon (GlucaGen) 1 mg IM/IN.
   c) Consider Thiamine 100 mg IV/IM if BGL > 250 with signs of poor perfusion and dehydration.
   d) Administer Normal Saline bolus.
ADULT MEDICAL

DISSEMINATED INTRAVASCULAR COAGULATION 19

Assessment/Indications:

- Abnormal clotting profiles.
- Prolong PT and/or aPTT.
- Suppressed clotting factors.
- Positive D-dimer.
- Underlying or associative causes for DIC include shock states (sepsis, anaphylactic, circulatory), blood transfusions reactions, neoplasms, vascular and hematopoietic disorders, obstetric complications (retained fetus, eclampsia, septic abortion, and abruption placentae), crush and tissue injury, or necrosis and liver disease.

Interventions:

1. Follow the Airway Management Procedure.

2. Continue infusion of blood products if already initiated such as: PRBCs, platelets, FFP (to correct clotting factors consumption), cryoprecipitate (factor VIII) to correct hypofibrinogenemia; utilize CBC, INR and ABG if available.

3. Fluid resuscitation will be needed to maintain cardiac output, urine output, and blood pressure. Follow the Medical Hypotension protocol.

4. Invasive hemodynamic monitoring if available, reduce temp with 325mg Tylenol (Acetaminophen) or if unable to administer Tylenol, Toradol (Ketorolac) 30 mg IV.

5. Consider mechanical ventilation w/sedation, analgesia, and NMBA as needed.
ADULT MEDICAL

DYSTONIC/EXTRAPARYMIDAL REACTION 20

Assessment:
- Dystonic reactions are characterized by involuntary muscle contractions of the face, chest, neck, back, and pelvis along with deviated pupils and a swollen tongue.
- Common medication groups that cause dystonic reactions include antipsychotics (Zyprexa, Haldol, Thorazine, and Geodon) and antiemetics (Compazine and Phenergan).

Interventions:
2. Perform 12 lead EKG; if STEMI follow Adult: Acute Coronary Syndromes Protocol.
4. Administer Diphenhydramine (Benadryl) 25-50 mg IM/IO/IV.
ADULT MEDICAL
HYPERTENSIVE CRISIS 21

Assessment:
- Signs and symptoms of end organ damage such as headache, blurred vision, focal neurologic deficit, chest pain, congestive heart failure.
- The goal of treatment is to lower the mean arterial pressure (MAP) by 20-25% over 30-60 minutes. Avoid sudden or precipitous changes in MAP (>25% or 50mmHg from known baseline). Maintain MAP > 90. The sending physician or OLMD should be consulted for blood pressure parameters in specific cases. Hypertension in suspected stroke patients should rarely be treated. OLMD should be contacted prior to treating BP in suspected stroke patients in the field.

Interventions:
2. Perform 12 lead EKG and print; if STEMI, follow Adult: Acute Coronary Syndromes Protocol.
4. Consider managing blood pressure with the following medications:
   - Consider Cardene infusion at 5-15 mg/hr, titrated for desired effect. Cardene is contraindicated in patients with aortic valve stenosis.
   - OR, Labetalol 20 mg IV over 2 minutes. Give additional 20-40-80 mg (in that progression) at 10 minute intervals as needed. Maximum cumulative dose of 300 mg.
   - OR, Hydralazine 5mg IV/IO over 2 minutes. May repeat to a max of 20mg, if necessary.
   - OR, Metoprolol (Lopressor) 5 mg IO/IV. May be repeated 2 times while monitoring BP, heart rate, and EKG.
   - OR, Nitroprusside (Nipride) 0.5-10 mcg/kg/min IO/IV titrated to goal BP.
Assessment:
- Patients with elevated temperature, hot, dry, or sweaty skin, hypotension or shock, seizures, and/or nausea.

Procedure:
1. Perform a full assessment of the patient.
2. Follow the Airway Management Procedure as needed.
3. Remove all clothing.
4. Perform and print a 12 Lead EKG.
5. Obtain a core temperature and re-assess every 15 min.
6. Use passive cooling measures.
7. Administer a Normal Saline bolus of 500ml IV/IO. Repeat to maintain a SBP > 90.
8. Consider immersion therapy, prior to transport, based on local protocols.
ADULT MEDICAL

HYPOTHERMIA 23

Assessment:
- Determine respiratory rate.
- Determine core temperature <95° F.

Interventions:
1. Handle gently and remove wet clothing.
2. Do not allow patient to ambulate and instruct the patient to limit movements.
3. Apply warming blankets.
4. Apply noninvasive monitoring equipment.
6. Obtain BGL. If appropriate, follow the Adult: Diabetic Emergencies Protocol.
ADULT MEDICAL

MEDICAL HYPOTENSION 24

Assessment:
- Rule out acute pulmonary edema (Congestive Heart Failure).
- Determine cause of hypotension.

Interventions:
2. Place the patient on all non-invasive monitors and consider 12 lead EKG.
4. Determine cause of hypotension:
   - Cardiogenic Shock
     - Administer Dopamine (Intropin) 5-20 mcg/kg/min IO/IV to maintain a SBP > 90 mm Hg.
     - OR, Norepinephrine (Levophed) at 2-20 mcg/min (Especially in suspected sepsis).
     - OR, Epinephrine (Adrenalin) at 0.5-10 mcg/min IO/IV to maintain a SBP > 90 mm Hg.
     - OR, Dobutamine (Dobutrex) 2-20mcg/kg/min IO/IV to maintain a SBP>90 mmHG.
     - OR, Phenylephrine (Neo-Synephrine) 40-180 mcg/min IO/IV.
   - Non-Cardiogenic
     - Normal Saline bolus IO/IV, may repeat fluid bolus if necessary.
     - Follow Blood Administration protocol if appropriate.
5. Consider administration of a push dose pressor, following the Push Dose Pressor Procedure, as bridge to long term treatments.
Interventions:

1. Follow **Airway Management Protocol**.
2. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure**.
3. Administer **Zofran (Ondansetron)** 4-8 mg slow IM/IO/IV or 4mg ODT.
4. Alternatively, consider **Diphenhydramine (Benadryl)** 25-50 mg IV/IO/IM.
5. Alternatively, consider **Metoclopramide (Reglan)** 5-10 mg IO/IV diluted in 10ml of normal saline or 5-10 mg IM every 6-8 hours.
6. Alternatively, consider **Promethazine (Phenergan)** 6.25mg IV, diluted with 10-20 ml of normal saline, administered over 5-10 min.
ADULT MEDICAL
PAIN MANAGEMENT 26

Assessment:
- If cardiac in nature, follow the Adult: Acute Coronary Syndromes Protocol.

Interventions:
2. Establish IV at KVO rate – follow Circulation: Intravenous Infusion Procedure.
3. For pain control, administer one of the following:
   - Morphine 0.1 mg/kg (up to 5 mg) IM/IO/IV. SBP must be > 90 mm Hg. May be repeated every 10 minutes.
   - Fentanyl (Sublimaze) 1 mcg/kg IM/IO/IV/IN. May repeat at 1 mcg/kg. Max single dose 100mcg. May be repeated every 10 minutes.
   - Ketamine 0.1-0.5 mg/kg IV/IO. May be repeated every 10 minutes.
   - For renal colic, burns, and isolated extremity injuries, consider Toradol (Ketoralac) 15-30 mg IV/IO/IM. May be repeated every 6 hours.
4. Administer Zofran (Ondansetron) 4 mg IM/IO/IV/ODT as needed.
ADULT MEDICAL
POISONING/OVERDOSE 27

Assessment:
- Determine substance patient ingested.

Interventions:
2. Establish IV at KVO rate – follow Circulation: Intravenous Infusion Procedure.
3. Monitor cardiac rhythm.
4. Determine overdose substance
   - **Beta Blockers**: Administer Glucagon (GlucoGen) 1 mg IM/IO/IV/IN. Prepare for possible cardiac pacing.
   - **Calcium Channel Blockers**: Administer Calcium Gluconate (Kalcinate) 1-2 GM SLOW over 1 minute IV/IO or Calcium Chloride 1 gram. Prepare for possible cardiac pacing.
   - **Cholinesterase (Organophosphates, wild mushrooms)**: Administer Atropine 1 -2 mg IO/IV; may repeat every 5 minutes to a max dose of 6 mg.
   - **Narcotics**: Administer Naloxone (Narcan) 0.4-2 mg IM/IN/IO/IV slow, titrate to respirations. May repeat to maximum dose of 10 mg.
   - **Tricyclic Antidepressant**: Administer Sodium Bicarbonate 1 mEq/kg to max of 50mEq. Signs/Symptoms: Hypotension, Tachycardia, and QRS width > 0.12. Consider Activated Charcoal for poisoning by mouth in the conscious patient, if within 90 minutes of ingestion.
ADULT MEDICAL
PULMONARY EMBOLISM 28

Assessment:
- Pulmonary emboli to the lung can result in syndromes ranging from mild pleuritis, to an acute asthmatic attack, to a sudden onset supraventricular tachycardia, to a cardiopulmonary arrest.
- For interfacility transfers, evaluate lab results to include D-dimer.

Interventions:
1. Follow Airway Management Protocol and maintain oxygen saturations >93%.
2. Establish IV at KVO rate – follow Circulation: Intravenous Infusion Procedure.
3. Continuous monitoring of vital signs during transport, to include: cardiac monitoring, pulse oximetry, and non-invasive blood pressure monitoring.
4. For confirmed pulmonary embolism on inter-facility transfers, consider a Heparin bolus of 80 units/kg (max of 4,000 to 7,500 units), followed by an infusion of 18 units/kg/hr (max of 1,300-1,800 units/hr).
5. For interfacility transfers, discuss Lovenox 1mg/kg SQ with the sending physician.
Interventions:
2. Administer **Combivent (DuoNeb)** 3.5 mg OR **Albuterol (Ventolin)** 2.5 mg via nebulizer. May repeat as needed.
3. Perform and print a 12 lead EKG; if STEMI, follow **Adult: Acute Coronary Syndromes Protocol.**
4. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure.**
5. If no fever, consider **Methylprednisolone (Solu-Medrol)** 125 mg IO/IV.
6. Consider **Magnesium Sulfate** 2 grams IO/IV over 20 minutes.
7. In case of Magnesium Sulfate toxicity, administer **Calcium Gluconate (Kalcinate)** 1-2 GM SLOW over 1 minute or **Calcium Chloride** 1 gram IV/IO.
8. Consider **Epinephrine (Adrenalin)** 1:1,000 0.3 mg IM.
9. For bronchospasm, consider **Levalbuterol (Xopenex)** 1.25 to 2.5 mg nebulized every 20 minutes for up to 3 doses, then, 1.25 to 5 mg every 1 to 4 hours as needed.
10. Consider CPAP or BIPAP. Follow the CPAP or BiPAP protocol.
Interventions:

1. Follow **Airway Management Protocol**.
2. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure**.
3. Monitor cardiac rhythm.
4. Obtain BGL. If appropriate, follow the **Adult: Diabetic Emergencies Protocol**.
5. Administer a Benzodiazepine:
   - **Lorazepam (Ativan)** 1 – 2 mg IM/IN/IO/IV. May be repeated as needed.
   - **OR Midazolam (Versed)** 2 mg IV/IO/IN. May be repeated as needed.
   - **OR Diazepam (Valium)** 5-10 mg IO/IV. May repeat as needed.
6. If the patient is having a seizure due to eclampsia, follow **Adult: Eclampsia/Preeclampsia Protocol**.
7. Consider **Keppra (Levetiracetam)**, 10 mg/kg IV/IO, up to 500mg, diluted in 100 ml of **Normal Saline** and administered over 15 min.
ADULT MEDICAL
SEPSIS 31

Assessment:

- SIRS/SEPSIS Criteria: Known or suspected infection plus two or more of the following criteria:
  - Temperature > 38.8 (101.0) or < 36 (96.8) degrees.
  - SBP < 90 or > 40 point SBP from baseline.
  - Heart Rate > 90.
  - Respiratory Rate > 20 or PaCO2 < 32 mm Hg.
  - Altered Mental Status.
  - Hyperglycemia with glucose > 149 mg/dL in the absence of diabetes.
  - Lactic Acid > 1.2.
  - Urine Output < 0.5 ml/kg/hr.
  - Leukocytes > 12,000 or < 4,000 or more than 10% bands.

Interventions:

2. Establish IV at KVO rate – follow Circulation: Intravenous Infusion Procedure.
3. Monitor cardiac rhythm and obtain and print a 12 lead EKG.
4. Obtain BGL. If appropriate, follow the Adult: Diabetic Emergencies Protocol.
5. Notify receiving facility of SEPSIS ALERT.
6. Administer Normal Saline bolus of 30 ml/kg IO/IV.
7. If appropriate antibiotics have not been administered and cultures have already been drawn on inter-facility transfers:
   - Administer Rocephin 1GM IV/IO for suspected pneumonia.
   - OR Zosyn 3.375GM or 4.5GM IV/IO for other suspected sources.
8. If hypotension is unresponsive to fluid bolus, administer:
   - **Norepinephrine (Levophed)** at 2-20 mcg/min IO/IV.
   - **OR** **Epinephrine (Adrenalin)** at 0.5-10 mcg/min IO/IV.

9. Administer **Acetaminophen (Tylenol)** 15 mg/kg IV/IO up to 1 gram, administered over 15 min on IV pump.

**Notes:**

- If cultures have not been (or cannot be) obtained, do not administer antibiotics.
- Fluid resuscitation end points:
  - MAP >65.
  - Urine Output > 0.5ml/kg/hr.
  - CVP 8-10.
Assessment:

- Perform both Glasgow Coma Scale and FAST exam on patients who present with signs / symptoms of an acute stroke.
- Determine blood glucose level.

Interventions:

2. Establish IV at KVO rate – follow Circulation: Intravenous Infusion Procedure.
3. Monitor cardiac rhythm and obtain and print a 12 lead EKG.
4. Obtain BGL. If appropriate, follow the Adult: Diabetic Emergencies Protocol.
5. Perform an EMSA stroke scale on patient; if positive, notify the ATCC and receiving facility as soon as possible of the STROKE ALERT.
6. If symptoms began within 4 ½ hours, complete Prehospital Stroke Thrombolytic Checklist and, if time permits, an approved stroke scale.
7. If significant stroke is suspected and the patient meets the criteria, consider Airway: Rapid Sequence Intubation Procedure.
8. Patient should be transported supine. If they will not tolerate supine, transport with head elevated <30 degrees.
9. Administer a bolus of 500 ml of Normal Saline.
10. For inter-facility transfers with known intracranial hemorrhage, maintain a goal BP of < 160 Systolic, while maintaining a MAP >90. Individual cases should be discussed with the sending and/or receiving physician or OLMD.
11. For inter-facility transfers where tPA was initiated, continue therapy and complete the NIH paperwork as indicated. Maintain a goal BP of <180 Systolic, or as directed by the receiving neurologist. Follow the Hypertensive Crisis Protocol.
Assessment:
- Obtain a history of the event: time of onset, location, description of the pain, any stroke symptoms, and previous aortic pathology.
- Obtain diagnostic results from the sending facility.
- Assess for distal pulses and obtain blood pressures from both upper extremities.
- Assess for neurological deficits.

Interventions
1. Monitor non-invasive blood pressure every 5 minutes or continuously if an arterial line is available.
2. If the patient has pain or anxiety, treat per the Pain Management Protocol.
3. Administer one of the following:
   - **Esmolol** 500 mcg/kg IV/IO over 1 min, then begin an infusion at 50 mcg/kg/min. Consider repeating the bolus and increase the infusion by 50 mcg/kg/min increments every 5-15 min up to 300 mcg/kg/min.
   - **OR Labetalol** 10-20mg slow IV/IO push (over 2 min). May be repeated every 10 minutes with additional doses doubled, until a SBP of 100 mmHg or a maximum of 300 mg is administered.
   - **OR Metoprolol** 5 mg IV/IO every 5 min x 3 doses.
   - **OR Cardene (Nicardipine)** 2.5 mg/hr IV/IO continuous infusion. It may be increased by 2.5 mg/hr every 5-15 minutes to a max dose of 15 mg/hr. Once target BP was achieved, titrate the dose down by 2.5 mg/hr to target 3mg/hr infusion.
   - **OR Nitroprusside (Nipride)** 0.5-10 mcg/kg/min IO/IV titrated to goal BP.
4. If the patient is experiencing hypotension, administer fluids IV fluids per the Hypotension Protocol or blood products if available.
Notes:

- In patients with associated MI confirmed by EKG, avoid Heparin, Aspirin, and Thrombolytics.
- Treatment should be driven to maintain SBP >90 or <120 (MAP 60-70) and HR 60-70 to the lowest level possible while still maintaining adequate renal, cerebral, and cardiac perfusion.
Interventions:

1. Safely remove the patient from the source of the burn and decontaminate:
   ◦ **Chemical**: Flush as soon as possible with copious clean water or saline solution.
   ◦ **Electrical**: Attempt to locate contact points and identify the nature of the source (AC/DC) and amperage the patient may have been exposed to during the electrical shock. Anticipate ventricular or atrial irregularity.
   ◦ **Radiation**: Determine the exposure type and amount of exposure.

2. Follow **Airway Management Protocol**.

3. Consider spinal precautions.


5. Protect burns/wounds with dry sterile dressings. Do not attempt to remove clothing that is adhered to burn area.

6. Establish IV and initiate fluid resuscitation based on the Consensus or Parkland Formula using Lactated Ringers or Normal Saline.

7. Maintain body temperature.

8. If multi-trauma patient, prepare to transport to closest Level One Trauma Center.

9. Enter patients into the Alabama Trauma System as required.

Notes:

- **Parkland Formula** = 4 ml x pt weight in Kg x TBSA burned. Divide by 2 and then by 8 to calculate hourly fluid administration rate for the first 8 hours post burn.
- **Consensus formula** = 2 ml x pt weight x TBSA then treat as above.
Interventions:
2. Consider Rapid Sequence Intubation protocol for conditions such as flail chest.
3. Consider spinal precautions and pelvic stabilization as needed.
4. Consider the necessity to follow Breathing: Pleural Decompression Procedure.
5. Patient Assessment: Cullen’s, Grey Turners, referred pain, abdomen for rigidity and deformity, stabilize, do not remove impaled objects.
6. Consider NG/OG to empty gastric contents.
7. Open wounds should be covered with sterile occlusive dressings as necessary.
   a. Initiate 2 large bore IVs.
   b. Administer Normal Saline bolus to maintain acceptable MAP.
   c. If signs/symptoms of hypovolemic shock continue follow Circulation: Blood Administration Procedure. May proceed directly to it in cases of extremis.
Interventions:

2. Consider spinal precautions.
3. Apply full noninvasive monitoring.
5. Obtain BGL. If appropriate, follow the Adult: Diabetic Emergencies Protocol.
7. If patient’s temperature is <95°F (35°C), then follow Adult: Hypothermia Protocol.

Notes:

- All near drowning patients with a known submersion time of less than 90 minutes in cold water (water temperature <70°F) shall be resuscitated unless other obvious signs of death are present.
Interventions:

2. Consider spinal precautions.
3. Obtain and record GCS: GCS < 8, consider intubation.
4. Obtain BGL. If appropriate, follow the Adult: Diabetic Emergencies Protocol.
   a. Initiate 2 large bore IVs.
   b. Administer Normal Saline bolus to maintain acceptable MAP >90.
   c. If signs/symptoms of hypovolemic shock continue, follow Circulation: Blood Administration Procedure or proceed directly to it in cases of extremis.
7. Consider Mannitol 1g/kg over 10 min (filter must be used) OR 3% Saline (Hypertonic Saline) 250 ml IO/IV if cerebral edema is suspected. Elevate head 20-30 degrees.

Notes:

- In cases of extreme hypertension, where signs and symptoms of herniation are suspected, consider treating by the Hypertensive Crisis Protocol after contacting OLMD.
**Interventions:**

1. Follow **Airway Management Protocol**.
2. Consider spinal precautions.
3. Consider the necessity to follow **Breathing: Pleural Decompression Procedure**.
4. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure**.
   a. Initiate 2 large bore IVs.
   b. Administer **Normal Saline** bolus to maintain a MAP > 60 mmHg.
   c. If signs/symptoms of hypovolemic shock continue, follow **Circulation: Blood Administration Procedure** or proceed directly to it in cases of extremis.
ADULT TRAUMA
MUSCULOSKELETAL TRAUMA 39

Interventions:
2. Consider spinal precautions.
3. Follow Circulation: Intravenous Infusion Procedure.
5. Determine type of injury:
   a. Amputation:
      ◊ If possible, wrap in sterile dressing and place in a sealed container on ice/ice packs.
   b. Crush Injury: If patient has signs and symptoms of hyperkalemia (peaked t-waves and QRS > 0.12).
      ◊ Administer Calcium Gluconate 10% (Kalcinate) or Calcium Chloride 1GM slow IV/IO, followed by 100 ml of Normal Saline.
      ◊ Administer Sodium Bicarbonate 1 mEq/kg IV/IO over 30 minutes in 1 liter of Normal Saline. Max dose 50mEq
      ◊ Administer Albuterol (Ventolin) 2.5 mg via nebulizer.
   c. Fracture:
      ◊ Stabilize/Splint.
      ◊ Consider placement of a pelvic binder if pelvic fracture is suspected.
   d. Hemorrhage:
      ◊ Apply direct pressure and elevate.
      ◊ If bleeding not controlled, consider application of tourniquet.
      ◊ If unable to utilize tourniquet, consider hemostatic dressing.
      ◊ If signs/symptoms of hypovolemic shock continue follow Circulation: Blood Administration Procedure.
   e. Suspension Injury:
      ◊ Do not lay patient flat if possible.
**Assessment:**
Asystole is to be confirmed and documented in three different EKG leads (increase gain as necessary).

**Interventions:** *Always follow current AHA/PALS Guidelines*
1. Immediate CPR for 2 minutes (5 cycles of 15 compressions: 2 ventilations).
2. Check rhythm / pulse.
3. Immediate CPR for 2 minutes (5 cycles of 15 compressions: 2 ventilations); continue CPR/ rhythm-pulse check cycle throughout Asystole/PEA.
5. Administer **Epinephrine (Adrenalin)** 1:10,000 solution 0.01 mg/kg (0.1 ml/kg) IO/IV, repeat every 3 to 5 minutes until rhythm changes or physician directs. If no IV/IO access is available, administer Epinephrine 1:1,000 via ET, at 2.5x the IV dose.
7. Assess blood glucose.
8. Perform and print a 12 lead EKG.

**Notes:**
Search for and treat possible contributing factors:
- Hypovolemia.
- Hypoxia.
- Hypo/Hyperkalemia.
- Hypothermia.
- Hydrogen Ion (acidosis).
- Toxins.
- Tamponade, cardiac.
- Tension pneumothorax.
- Thrombosis coronary.
- Thrombosis pulmonary.
PEDIATRIC/INFANT CARDIAC:

BRADYCARDIA 41

Assessment:
- Assess for low heart rate for patient’s age with symptoms of poor perfusion, hypotension, and respiratory difficulty.

Interventions: *Always follow current AHA/PALS Guidelines*
1. Keep patient warm, actively warm patient.
4. Perform and print a 12 lead EKG.
5. Follow Circulation: Intravenous Infusion Procedure.
6. If no improvement in patient condition after 2 minutes of hyperventilation, and the patient’s heart rate is < 60 beats per minute, then begin CPR.
7. If no change in patient condition, administer Epinephrine 1:10,000 solution 0.01 mg/kg (0.1 ml/kg) IO/IV; repeat every 3 to 5 minutes until rhythm changes or physician directs otherwise.
8. For primary heart block or vagal induced bradycardia, consider Atropine Sulfate 0.02 mg/kg (0.2 ml/kg) IO/IV, minimum single dose 0.1 mg, maximum single dose 1 mg, may repeat at 0.02 mg/kg (0.2 ml/kg) once in 3-5 minutes.
9. If ineffective, consider transcutaneous pacing.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion, and pacing.
Assessment:

- Perform patient assessment – If < 1 year Heart rate > 220 bpm (not due to hypovolemia), If > 1 year Heart rate > 180 bpm (not due to hypovolemia).
- Confirm rhythm with 12 lead EKG and print.

Interventions:  *Always follow current AHA/PALS Guidelines*

2. Perform and print a 12 lead EKG.
5. Administer Adenosine (Adenocard) 0.1 mg/kg IO/IV followed by 10 ml flush. Max dose of 6 mg.
6. After 1-2 minutes, if rhythm has not changed, administer Adenosine (Adenocard) 0.2 mg/kg IO/IV followed by 20 ml flush. Max dose of 12 mg.
7. If no change in patient condition, consider synchronized cardioversion:
   ◦ Cardiovert at 0.5 – 1 joules/kg; may increase to 2 joules/kg if necessary.
   ◦ Consider sedation: Follow the Disability: Conscious Sedation Procedure.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion, and pacing.
Assessment:
- Confirm rhythm of ventricular fibrillation or ventricular tachycardia.

Interventions: *Always follow current AHA/PALS Guidelines*
1. Defibrillate 2 joules/kg.
2. Immediate CPR (5 cycles 15 compressions:2 ventilations).
4. Check rhythm/ pulse.
5. Defibrillate 4 joules/kg; all subsequent shocks at 4 joules/kg. (Continue at this setting every 2 minutes as needed.) May increase in stepwise fashion up to 10 joules/kg.
7. Administer Epinephrine 1:10,000 solution IO/IV 0.01 mg/kg (0.1 ml/kg); circulate drug for 1 minute; repeat every 3 to 5 minutes until rhythm changes or physician directs otherwise. If no IV/IO access is available, administer Epinephrine 1:1,000 via ET, at 2.5x the IV dose.
8. Administer Amiodarone (Cordarone) 5 mg/kg IO/IV rapid bolus; circulate drug for 1 minute. Followed by an infusion at 5 mcg/kg/min.
9. Consider Magnesium Sulfate 50mg/kg slow IO/IV over 5-20 minutes if patient is in refractory V-Tach unresponsive to Amiodarone, or if patient is in Torsades de Pointes. Max dose 2GM.
11. Perform and print a 12 lead EKG.

Notes: Always follow manufacturer guidelines for defibrillation/cardioversion, and pacing.
PEDIATRIC/INFANT CARDIAC:

POST RESUSCITATION 44

Assessment:
- Determine successful termination of lethal rhythm.

Interventions: *Always follow current AHA/PALS Guidelines*
1. Perform and print a 12 lead EKG.
2. If signs of ventricular ectopy, administer Amiodarone (Cordarone) 5 mg/kg IO/IV up to 150mg over 20 minutes. May repeat up to a maximum of 15 mg/kg. Consider an infusion after administration. Contact OLMD for dosing.
3. If the patient has signs or symptoms of poor perfusion or the patient is hemodynamically unstable, administer age/weight appropriate Normal Saline bolus. If patient remains hypotensive, administer additional bolus.
4. If still hypotensive after fluid bolus, administer:
   - OR Dopamine (Intropin) 2-20 mcg/kg/min IO/IV.
   - OR Epinephrine (Adrenalin) 0.1-1 mcg/kg/min.
   - OR Levophed (Norepinephrine) 0.1-2mcg/kg/min.

Notes: *Always follow manufacturer guidelines for defibrillation/cardioversion, and pacing.*
Interventions:

2. If the patient is hemodynamically unstable, consider Epinephrine (Adrenalin) 1:10,000 solution 0.01 mg/kg IO/IV. Max dose 0.5mg.
4. Monitor cardiac rhythm.
5. Administer Diphenhydramine (Benadryl) 1 mg/kg IM/IO/IV. Maximum dose of 50 mg.
6. If patient is hypotensive, administer Normal Saline bolus.
7. If patient remains hypotensive, administer additional bolus and consider:
   - Epinephrine (Adrenalin) at 0.1-1mcg/kg/min.
   - OR Dopamine (Inotropin) 2-20 mcg/kg/min.
8. Administer Pepcid (Famotidine) 0.25-0.5 mg/kg mg IO/IV. Maximum dose of 20 mg.
9. Administer Methylprednisolone (Solu-Medrol) 2mg/kg up to 125 mg IO/IV.
10. If wheezing is present, administer Albuterol (Ventolin) 2.5 mg via nebulizer. May repeat as needed.
Assessment:
- Attempt to identify the type of snake, spider, etc., responsible for the bite.
- Obtain a time of onset of the bite or sting.

Interventions:
1. Provide advanced airway management as needed.
4. Remove jewelry and tight fitting clothing from the affected area. Monitor for signs of compartment syndrome.
5. Immobilize the affected extremity. Position in a dependent position, no higher than the level of the heart.
6. Mark and time area of edema / erythema and evaluate pulse every 15 MINUTES, and document findings. The use of tourniquets, ice packs, or making an incision over the bite is NOT advised.
7. Contact receiving facility so anti-venom treatment may be established prior to the patient’s arrival.
Interventions:
2. Follow Circulation: Intravenous Infusion Procedure.
3. Perform blood glucose level determination. If BGL < 60 mg/dl then:
   a. Administer Dextrose 10% (D10) 2–4 ml/kg IO/IV or Dextrose 25% (D25) 4 ml/kg.
   b. Repeat blood glucose level. Repeat as needed.
   c. If unable to establish IV access, administer Glucagon (GlucoGen) 0.1 mg/kg IM/IN up to a max dose of 1 mg.
4. If BGL > 250 with signs of poor perfusion and dehydration administer Normal Saline bolus.

Notes:

- To mix: Discard 40 ml from a D-50 pre-filled syringe and draw up 40 ml of normal saline. The resulting concentration is Dextrose 10%.

- To mix: Discard 25 ml from a D-50 pre-filled syringe and draw up 25 ml of normal saline. The resulting concentration is Dextrose 25%.
Assessment:

- Dystonic reactions are characterized by involuntary muscle contractions of the face, chest, neck, back, and pelvis along with deviated pupils and a swollen tongue.
- Common medication groups that cause dystonic reactions include antipsychotics (Zyprexa, Haldol, Thorazine, and Geodon) and antiemetics (Compazine and Phenergan).

Interventions:

1. Follow **Airway Management Protocol**.
2. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure**.
3. Administer **Diphenhydramine (Benadryl)** 1 mg/kg IM/IO/IV. Max dose of 30 mg.
Assessment:
- Patients with elevated temperature, hot, dry, or sweaty skin, hypotension or shock, seizures, and/or nausea.

Procedure:
1. Perform a full assessment of the patient.
2. Follow the Airway Management Procedure as needed.
3. Remove all clothing.
4. Perform and print a 12 Lead EKG.
5. Obtain a core temperature and re-assess every 15 min.
6. Use passive cooling measures.
7. Administer a Normal Saline bolus of 20 mL/KG/IV or IO. Repeat to maintain an age appropriate BP.
8. Consider immersion therapy based on local protocol.

Notes:
- Age based hypotension:
  - < 1 year: less than 70 SBP.
  - 1-10 years: less than 70 + (2 x age) SBP.
  - 11-12 years: less than 90 + (2 x age) SBP.
- For patients under 12 years old, use the 4:2:1 Rule to calculate maintenance fluids:
  - 1 – 10 kg: 4 ml/kg/hr.
  - 10 – 20 kg: 2 ml/kg/hr.
  - > 20 kg: 1 ml/kg/hr.
- For inter-facility transfers, the preferred maintenance fluid is D5 1/2NS.
Assessment:
- Determine respiratory rate.
- Determine core temperature (< 95ºF).

Interventions:
1. Handle gently and remove wet clothing.
2. Do not allow patient to ambulate and instruct patient to limit movements.
3. Apply warming blankets.
4. Apply noninvasive monitors.
6. Obtain BGL. If appropriate, follow the Pediatric/Infant: Diabetic Emergencies Protocol.
Assessment:
- Determine cause of hypotension.

Interventions:

2. Follow Circulation: Intravenous Infusion Procedure.
3. Determine cause of hypotension:
   - Cardiogenic Shock
     1. **Dopamine (Intropin)** 2-20 mcg/kg/min IO/IV to maintain age appropriate SBP.
     2. **OR Norepinephrine (Levophed)** at 0.1-2 mcg/kg/min IO/IV.
     3. **OR Epinephrine (Adrenalin)** at 0.1-1 mcg/min IO/IV.
     4. **OR Dobutamine** .5-1 mg/kg/min initial dose followed by 2-20 mcg/kg/min, not to exceed 40 mg/kg/min.
     5. **OR Phenylephrine (Neo-Synephrine)** 0.1-0.5 mcg/kg/min IO/IV.
   - Non-Cardiogenic
     a. Normal Saline bolus, may repeat fluid bolus if necessary.
     b. Follow Blood Administration protocol if appropriate.
     c. Consider the above pressors if the patient remains hypotensive after appropriate volume resuscitation.

Notes:
- Age based hypotension:
  1. < 1 year: less than 70 SBP.
  2. 1-10 years: less than 70 + (2 x age) SBP.
  3. 11-12 years: less than 90 + (2 x age) SBP.
- For patients under 12 years old, use the 4:2:1 Rule to calculate maintenance fluids:
  1. 1 – 10 kg: 4 ml/kg/hr.
  2. 10 – 20 kg: 2 ml/kg/hr.
  3. > 20 kg: 1 ml/kg/hr.
- For inter-facility transfers, the preferred maintenance fluid is D5 1/2NS.
Interventions:

1. Follow **Airway Management Protocol**.
2. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure**.
3. Administer and antiemetic medication:
   - **Zofran (Ondansetron)** 0.1 mg/kg IM/IO/IV. May administer up to 4 mg.
   - **OR Diphenhydramine (Benadryl)** 1 mg/kg IM/IO/IV up to 30 mg.
   - **OR Reglan (Metoclopramide)** 0.1-0.2 mg/kg IO/IV diluted in 10ml of normal saline or 0.1-0.2 mg IM, up to 10 mg, every 6-8 hours.
   - **OR Promethazine (Phenergan)** 0.5 mg/kg IV, diluted with 10-20 ml of normal saline, administered over 10-15 min. Max dose 6.25 mg. Do not administer if under 2 years of age.
4. Consider a bolus of 20 ml/kg of **Normal Saline**.
   - Maintenance fluids should be initiated using the 4:2:1 Rule.

Notes:

- For patients under 12 years old, use the 4:2:1 Rule to calculate maintenance fluids:
  - 1 – 10 kg: 4 ml/kg/hr.
  - 10 – 20 kg: 2 ml/kg/hr.
  - > 20 kg: 1 ml/kg/hr.

- For inter-facility transfers, the preferred maintenance fluid is D5 1/2NS.
Interventions:

1. Follow **Airway Management Protocol**.
2. Establish IV at KVO rate – follow **Circulation: Intravenous Infusion Procedure**.
3. Administer one of the following if BP is age appropriate (see notes below):
   - **Morphine** 0.1 mg/kg (up to 5 mg) IM/IO/IV. May repeat dose up to a total of 10 mg.
   - **OR Fentanyl (Sublimaze)** 1 mcg/kg IM/IO/IV maximum dose of 100 mcg, 1.5 mcg/kg IN. May repeat as needed.
   - **OR Ketamine** 0.2 mg/kg IV/IO, max dose of 25 mg, or 0.5 mg/kg IM, max dose of 50 mg
     - **OR** 0.75 mg/kg IN, max dose 75 mg, may repeat every 10 minutes.
   - **OR** For Renal Colic, Burns, and isolated extremity injuries, consider **Toradol (Ketoralac)**
     0.5 mg/kg, up to a max dose of 30 mg IV/IO/IM. May be repeated every 6 hours.
4. If pain not relieved by the above doses, may contact OLMD for further dosing.
5. Consider **Zofran (Ondansetron)** 0.1 mg/kg IM/IO/IV, maximum of 4 mg as needed.

Notes:

- **Age based hypotension**:
  - < 1 year: less than 70 SBP.
  - 1-10 years: less than 80 + (2 x age) SBP.
  - 11-12 years: less than 90 + (2 x age) SBP.

- For patients under 12 years old, use the 4:2:1 Rule to calculate maintenance fluids:
  - 1 – 10 kg: 4 ml/kg/hr.
  - 10 – 20 kg: 2 ml/kg/hr.
  - > 20 kg: 1 ml/kg/hr.
Assessment:
- Determine substance ingested.

Interventions:
2. Follow Circulation: Intravenous Infusion Procedure.
3. Monitor cardiac rhythm.
5. Determine overdose substance:
   - **Beta Blockers**: Administer Glucagon (GlucoGen) 0.1 mg/kg IM/IO/IV/IN. Max dose 4mg. Prepare for possible cardiac pacing.
   - **Calcium Channel Blockers**: Administer Calcium Gluconate (Kalcinate) 60mg/kg (0.6ml/kg of standard 10% solution) IV/IO (max 2GM) or Calcium Chloride 1 gram. Do not exceed 100mg/min. Consider transcutaneous pacing.
   - **Cholinesterase** (Organophosphates, wild mushrooms): Administer Atropine 0.02 mg/kg (min 0.1mg/ max 1mg) May repeat as needed to a max total dose of 6 mg.
   - **Narcotics**: Administer Naloxone (Narcan) 0.1 mg/kg IM/IN/IO/IV slowly and repeat every 2–3 minutes as needed, up to max dose of 2 mg.
   - **Tricyclic Antidepressant**: Administer Sodium Bicarbonate 1 mEq/kg (especially if tachycardic, hypotensive, or QRS > 0.08 sec for infant and pediatric and QRS > 0.10 sec for adolescent). Max dose 50mEq.
Interventions:
2. Administer Combivent (DuoNeb) 1.75 - 3.5 mg or Albuterol (Ventolin) 2.5 mg via nebulizer OR Racemic Epinephrine 0.5 ml via nebulized. May repeat as needed.
3. Follow Circulation: Intravenous Infusion Procedure.
4. Administer Methylprednisolone (Solu-Medrol) 2 mg/kg mg IO/IV. Max dose of 125 mg.
5. Consider Magnesium Sulfate 40 mg/kg IO/IV diluted in 10ml/kg NS over 15-30 minutes.
   • Monitor closely for hypotension. Follow the Pediatric/Infant: Medical Hypotension Protocol.
   • In case of toxicity, administer Calcium Gluconate (Kalcinate) 60mg/kg (0.6ml/kg of standard 10% solution) SLOW IV/IO (max 2GM) Do not exceed 100mg/min.
6. For bronchospasm, consider Levalbuterol (Xopenex) 0.075 mg/kg/dose (minimum dose: 1.25 mg/dose) every 20 minutes for 3 doses, then 0.075 to 0.15 mg/kg/dose (maximum dose: 5 mg/dose) every 1 to 4 hours as needed.
7. Consider Epinephrine (Adrenalin) 1:1,000 0.01 mg/kg IM up to 0.3mg.
Interventions:

2. Follow Circulation: Intravenous Infusion Procedure.
3. Obtain a blood glucose level.
4. Monitor cardiac rhythm.
5. Obtain BGL. If appropriate, follow the Pediatric/Infant Diabetic Emergencies Protocol.
6. If the patient actively seizing administer:
   - Lorazepam (Ativan) 0.05 – 0.1 mg/kg IM/IO/IV. Max single dose of 2 mg. May repeat to max total dose of 4mg.
   - OR Midazolam (Versed) 0.1 mg/kg IM/IV/IO or 0.2-0.25 mg/kg IN. Max single dose of 2mg. May repeat to max total dose of 10 mg.
   - OR Diazepam(Valium) 0.1 mg/kg IO/IV to a max dose of 5mg or 0.5 mg/kg rectal to a max dose of 5 mg.
7. Consider Keppra (Levetiracetam ), 10 mg/kg IV/IO, up to 500mg, diluted in 100 ml of Normal Saline and administered over 15 min.
8. If febrile seizure, remove external clothing to cool patient down. Do not cool aggressively and cause shivering.
Assessment:

- SIRS/SEPSIS Criteria: Known or suspected infection plus two or more of the following criteria:
  - Temperature > 38.8 (101.0) or < 36 (96.8) degrees.
  - Age specific hypotension.
  - Age specific tachycardia.
  - Age specific tachypnea or PaCO2 < 32 mm Hg.
  - Poor perfusion - delayed cap refill, cool extremities, etc.
  - Lethargy/Decreased level of responsiveness.
  - Hyperglycemia with glucose > 149 mg/dL in the absence of diabetes.
  - Urine Output < 0.5 ml/kg/hr.
  - Leukocytes > 12,000 or < 4,000 or more than 10% bands.

Interventions:

2. Follow Circulation: Intravenous Infusion Procedure.
3. Monitor cardiac rhythm.
4. Obtain BGL. If appropriate, follow the Pediatric/Infant: Diabetic Emergencies Protocol.
5. Notify receiving facility of SEPSIS ALERT.
6. If patient is hypotensive, administer 20ml/kg Normal Saline bolus. May repeat up to 60 ml/kg. Follow the Pediatric/Infant: Medical Hypotension Protocol.
7. If hypotension is unresponsive to fluid bolus, consider:
   - For warm shock: Norepinephrine (Levophed) at 0.05-2 mcg/kg/min IO/IV.
   - For cold shock: Epinephrine (Adrenalin) at 0.5-10 mcg/min IO/IV.
8. If fever is present, administer Acetaminophen (Tylenol) 15 mg/kg rectal, up to a max dose of 1 gram.
9. Contact receiving physician for specific antibiotic orders.
Interventions:

1. Safely remove the patient from the source of the burn and decontaminate:
   - **Chemical**: Flush as soon as possible with copious amounts of clean water.
   - **Electrical**: Attempt to locate contact points and identify the nature of the source (AC/DC) and amperage the patient may have been exposed to during the electrical shock. Anticipate ventricular or atrial irregularity.
   - **Radiation**: Determine the exposure type and amount of exposure.

2. Follow **Airway Management Protocol**.

3. Consider spinal precautions.


5. Protect burns/wounds with dry sterile dressings. Do not attempt to remove clothing that is adhered to burn area.

6. Establish IV and initiate fluid resuscitation based on the Consensus or Parkland Formula using Lactated Ringers or Normal Saline.

7. Maintain body temperature.

8. If multi-trauma patient, prepare to transport to closest Level One Trauma Center.

9. Enter patients into the Alabama Trauma System as required.

Notes:

- **Parkland Formula** = 4 ml x pt weight in Kg x TBSA burned. Divide by 2 and then by 8 to calculate hourly fluid administration rate for the first 8 hours post burn.
- **Consensus formula** = 2 ml x pt weight x TBSA then treat as above.
- For patients under 12 years old: Use above formula concurrently with maintenance fluid of D5W to maintain glucose levels.
  - 1 – 10 kg: 4 ml/kg/hr.
  - 10 – 20 kg: 2 ml/kg/hr.
  - > 20 kg: 1 ml/kg/hr.
Interventions:
2. Consider Rapid Sequence Intubation protocol for conditions such as flail chest.
3. Consider spinal precautions and pelvic stabilization as needed.
4. Consider the necessity to follow Breathing: Needle Decompression Procedure.
5. Consider NG/OG tube to empty gastric contents.
6. Open wounds should be covered with sterile occlusive dressings as necessary.
7. Follow Circulation: Intravenous Infusion Procedure.
   a. Initiate 2 large bore IVs.
   b. Consider Normal Saline bolus if signs of shock are present. Bolus may be repeated if necessary.
   c. If signs/symptoms of hypovolemic shock continue follow Circulation: Blood Administration Procedure. May proceed directly to it in cases of extremis.
PEDIATRIC/INFANT TRAUMA:
DROWNING AND SUBMERSION INJURIES 60

Interventions:
2. Consider spinal precautions.
3. Follow Circulation: Intravenous Infusion Procedure.
4. Obtain BGL. If appropriate, follow the Pediatric/Infant: Diabetic Emergencies Protocol.
5. Perform 12 lead EKG.
6. If patient’s temperature is <95°F (35°C), then follow Pediatric/Infant: Hypothermia Protocol.
7. Consider CPAP.

Notes:
• All near drowning patients with a known submersion time of less than 90 minutes in cold water (water temperature <70°F) shall be resuscitated unless other obvious signs of death are present.
Interventions:
2. Consider spinal precautions.
3. Obtain and record GCS: GCS < 8 consider intubation.
4. Obtain BGL. If appropriate, follow the Pediatric/Infant: Diabetic Emergencies Protocol.
5. Follow Circulation: Intravenous Infusion Procedure.
   a. Initiate 2 large bore IVs.
   b. Consider Normal Saline bolus. May repeat if necessary.
   c. If signs/symptoms of hypovolemic shock continue follow Circulation: Blood Administration Procedure or proceed directly to it in cases of extremis.
7. If cerebral edema is suspected, contact the receiving physician to administer:
   ◊ 3% Saline (Hypertonic Saline) 5ml/kg.
   ◊ OR Mannitol 1g/kg over 10 min (filter must be used).

Notes:
• In cases of extreme hypertension, where signs and symptoms of herniation are suspected, consider treating by the Hypertensive Crisis Protocol after contacting OLMD. Maintain a MAP of 90 mmHg.
**Interventions:**

1. Follow **Airway Management Protocol**.
2. Consider spinal precautions.
3. Consider the necessity to follow **Breathing: Pleural Decompression Procedure**.
4. Follow **Circulation: Intravenous Infusion Procedure**.
   a. Initiate 2 large bore IVs.
   b. Administer **Normal Saline** bolus of 20ml/kg. Repeat if necessary.
   c. If signs/symptoms of hypovolemic shock continue follow **Circulation: Blood Administration Procedure**. May proceed directly to it in cases of extremis.

**Notes:**

- Maintain a MAP > 60 mmHg.
Interventions:
2. Consider spinal precautions.
3. Follow Circulation: Intravenous Infusion Procedure.
5. Determine type of injury:
   a. **Amputation:** If possible, wrap in sterile dressing and place in a sealed container on ice/ice packs.
   b. **Crush Injury:**
      ◦ If patient has signs and symptoms of hyperkalemia (peaked t-waves and QRS > 0.12).
      ◦ Administer **Calcium Gluconate 10% (Kalcinate)** 60 mg/kg slow (0.6ml of standard 10% solution) IV/IO (Max 2 grams) followed by 100 ml of **Normal Saline**. Do not exceed 100 mg/min.
      ◦ Administer **Sodium Bicarbonate** 1 mEq/kg IV/IO over 30 minutes in 1 liter of **Normal Saline**. Max dose 50mEq.
      ◦ Administer **Albuterol (Ventolin)** 2.5 mg via nebulizer.
   c. **Fracture:** Stabilize/Splint.
   d. **Hemorrhage:**
      ◦ Apply direct pressure and elevate.
      ◦ If bleeding not controlled, consider application of tourniquet.
      ◦ If unable to utilize tourniquet, consider hemostatic dressing.
      ◦ If signs/symptoms of hypovolemic shock continue follow **Circulation: Blood Administration Procedure**.
   e. **Suspension Injury:** Do not lay patient flat if possible.
NEONATAL/OBSTETRICAL:

ABRUPTIO PLACENTA/PLACENTA PREVIA 64

Assessment:

- Pregnancy greater than 20 weeks gestation and either of the following:
  - Hemorrhage with little or no pain (Placenta Previa).
  - Continuous painful contractions with or without bleeding (Abruptio Placenta).

Interventions:

2. Monitor maternal vital signs and assess fetal heart rate (FHR) prior to transport if possible.
3. Follow Intravenous Infusion procedure. Establish 2 large bore IVs.
4. Maintain SBP > 90 mm Hg.
5. Use abdominal uterine fundal massage to help uterus contract down and slow bleeding.
6. Transport patient rolled slightly onto left side (or right if more appropriate). Resuscitate as per Circulation: Blood Administration Procedure.
NEONATAL/OBSTETRICAL:
ECLAMPSIA/PRE-ECLAMPSIA 65

Assessment:
• Preeclampsia – Pregnancy greater than 20 weeks gestation and any of the following:
  ◦ Systolic blood pressure > 160 mmHg and/or diastolic blood pressure > 110 mmHg.
  ◦ Proteinuria.
  ◦ Generalized edema.
• Eclampsia -- Preeclampsia with seizure activity.

Interventions:
2. Monitor maternal vital signs and assess fetal heart rate (FHR) prior to transport if possible.
3. Follow Intravenous Infusion procedure.
4. If possible, place patient in left (or right) lateral position.
5. Blood pressure elevated if SBP > 160 mmHg and/or DBP >110 mmHg on at least 2 recordings greater than 10 minutes in duration:
   ◦ If HR >60 beats per minute, administer Labetalol 20 mg IO/IV over 2 minutes. May be repeated every 10 minutes, with successive increases of 20 mg , not to exceed a maximum cumulative dose of 300 mg without MD approval. Do not decrease diastolic blood pressure below 85.
   ◦ OR Hydralazine 5mg IV/IO over 2 minutes. May repeat to a max of 20mg.
6. If patient is seizing:
   a. Follow Adult Seizure Protocol.
   b. Administer Magnesium Sulfate 4 grams IO/IV over 2-3 minutes. If an IO/IV is not available, then administer 4 grams in each dorso-gluteal muscle for a total of 8 grams. Initiate Magnesium Sulfate drip at 2 gram/hr. Closely monitor for decreased respiratory rate and decreased in deep tendon reflexes (DTR). If present, decrease Magnesium Sulfate to 1 gram/hr.
   c. Consider Calcium Gluconate (Kalcinate) 1 gram or Calcium Chloride 1 gram over 2-3 minutes if toxicity is suspected.
**NEONATAL/OBSTETRICAL:**

**EMERGENCY CHILDBIRTH 66**

**Assessment:**
- Pregnancy with signs of imminent delivery including crowning, mother with urge for bowel movement, frequent contractions < every 2 minutes, or worsening of perineal discomfort.

**Interventions:**

2. If during air transport, instruct the pilot to find the closest suitable landing site and have flight dispatch notify the closest available ground transport unit.

**Normal Delivery:**

1. Instruct mother to push only during contractions.
2. Upon delivery of the infant’s head, turn the head gently. Deliver the anterior shoulder with gentle downward traction. Lift up and deliver the posterior shoulder.
3. Once the placenta is delivered, massage the fundus to control bleeding.
4. Volume resuscitate to maintain maternal SBP > 90 mm Hg.
5. Follow Blood Administration protocol if necessary.

**Breech Presentation:**

1. If possible, mother’s hips should be at edge of stretcher.
2. Allow the buttocks and trunk to deliver with gentle support and guidance, turning its back up to the ceiling (i.e. face down).
3. Once the baby’s “belly button” (cord insertion) is out, for frank breech gently flex the legs across the baby’s belly to bring them down.
4. Once the axillae are out, flex each arm across the baby’s chest to bring them out.
5. Support the baby’s body while waiting for the head to deliver.
**NEONATAL/OBSTETRICAL:**

**EMERGENCY CHILDBIRTH 66 CONTINUED**

**Breech Presentation continued:**

6. The head delivers in a flexed position ("chin to chest") whether spontaneously or with our assistance. If head does not deliver within 3 minutes: insert your middle and index finger into the vagina; move along the baby’s face up to the baby’s nose; push the vaginal wall away from the baby’s nose and mouth to create an airway until the baby delivers. **DO NOT TRY TO PULL BABY OUT WITH FORCE.**

7. Follow Blood Administration protocol if necessary.

**Prolapsed Cord:**

1. Immediately place mother in a knee-chest position. If this is not possible, position mother so her hips and buttocks are elevated, in Trendelenburg, if possible.

2. Immediately insert a gloved hand into the vagina; gently push the baby’s head off the cord; maintain this position at all times during transport and until relieved at the receiving institution.

**Limb Presentation:**

- Fetus presents with a leg or arm first: transport to the closest hospital with emergency obstetrical facility.

**Neonatal Distress:**

- Follow: **Neonatal Resuscitation Protocol.**

**Notes:**

- Do not transport if precipitous delivery is suspected.
Assessment:
- Determine APGAR score.

Interventions: *Always follow Current NRP Guidelines*

2. Suction nose and mouth if necessary. Observe for possible meconium aspiration.
3. While maintaining the newborn at the level of the mother’s abdomen, place umbilical cord clamps/ties approximately 4 and 6 inches from the newborn and cut between the clamps/ties.
4. Warm, dry, and stimulate.
5. Determine if patient is a term infant, breathing or crying, and has good tone.
   - If yes: provide routine care.
   - If no: ensure open airway, and stimulate.
6. Assess if heart rate is less than 100 bpm and if the infant is gasping and apneic.
   - If yes: provide positive pressure ventilation and cardiac/SpO2 monitoring.
   - If no: ensure open airway, monitor cardiac and SpO2.
7. Assess if heart rate is less than 100 bpm after positive pressure ventilation.
   - If yes: ensure open airway and consider increasing pressure and oxygen.
8. Assess if heart rate is less than 60 bpm.
   a. If yes: ventilate with BVM with supplemental oxygen.
   b. After 30 seconds of ventilations and heart rate less than 60 bpm, begin CPR at a compression to ventilation ratio of 3:1; continue CPR until spontaneous heart rate > 60 bpm.
   c. If the patient remains symptomatic, intubate and ventilate; continue chest compressions.
   d. If the patient remains symptomatic (heart rate < 60 with good CPR and ventilations), obtain IV/IO access and administer Epinephrine 1:10,000 solution 0.01 mg/kg IV/IO.
9. Continue above until symptoms resolve or care is transferred at the receiving facility.
Assessment:

- Progression of labor and fetal gestational age < 37 weeks.

Interventions:

1. Follow Airway Management protocol.
3. Monitor maternal vital signs, intake and output, and assess fetal heart rate (FHR) prior to transport if possible.
4. Follow Intravenous Infusion protocol. Consider Normal Saline 500-1,000 ml bolus over 30 min.
5. If possible, place patient in slight left (or right if more appropriate) lateral tilt position.
6. Assess frequency and duration of contractions.
7. Consider administering Terbutaline (Brethine) 0.25 mg subcutaneous, may be repeated every 15 minutes. Monitor the patient’s heart rate closely.
8. If receiving tocolytic therapy: continue infusion at current rate unless Magnesium Sulfate infusion is > 4 gm/hr, if so, contact receiving physician.
9. If Magnesium Sulfate has been initiated, closely monitor for decreased respiratory rate and a decrease in deep tendon reflexes (DTR). If present, decrease Magnesium Sulfate to 1 gram/hr. Consider Calcium Gluconate (Kalcinate) 1 gram over 2-3 minutes if toxicity is suspected.

Notes:

- Do not transport if precipitous delivery is suspected.
NEONATAL/OBSTETRICAL:

POSTPARTUM HEMORRHAGE 69

Assessment:
- Perform a general obstetrical assessment.
- Estimate blood loss.
- Determine the absence or presence of contractions and frequency.
- Determine the amount of IV fluid administered prior to arrival.
- Assess uterine fundus tone.
- Watch for signs of DIC.
- Assess for perineum for visible lacerations or tearing.

Interventions:
2. Follow Circulation: Intravenous Infusion Procedure and establish 2 large bore IVs.
3. Follow the Hypotension Protocol.
4. Perform uterine massage.
5. Follow Blood Administration protocol if necessary.
6. Consider Pitocin (Oxytocin) at 20-40 milliunits/min.

Notes:
Pitocin (Oxytocin) is contraindicated in treatment of uterine rupture, as it may cause increased uterine rupture.
NEONATAL/OBSTETRICAL:
UTERINE RUPTURE 70

Assessment:
- Perform a general obstetrical assessment.
- Obtain frequent vital signs, assessing mother for sign/symptoms of shock—hypotension, tachycardia, large blood loss.
- Obtain fetal heart rate every 10 minutes.
- Assess abdomen. Uterine contour may change, fundus will be contracted and firm, uterine contractions will cease, and patient may have rebound tenderness suggestive of intraperitoneal hemorrhage.

Interventions:
2. Establish 2 large bore IVs. Administer NS/LR boluses as needed. Administer maintenance fluids at 125 ml/hr.
3. Follow the Hypotension Protocol.
4. Follow Blood Administration protocol if necessary.
5. Notify the receiving facility of the patient’s condition.

Notes:
Pitocin (Oxytocin) is contraindicated in treatment of uterine rupture, as it may cause increased uterine rupture.
APPENDIX 1:

12 LEAD EKG

<table>
<thead>
<tr>
<th>Lead I</th>
<th>Lead II</th>
<th>Lead III</th>
</tr>
</thead>
<tbody>
<tr>
<td>aVR</td>
<td>aVL</td>
<td>aVF</td>
</tr>
<tr>
<td>V1</td>
<td>V2</td>
<td>V3</td>
</tr>
<tr>
<td>V4</td>
<td>V5</td>
<td>V6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Infarction</th>
<th>Wave Abnormality</th>
<th>ECG Segments</th>
<th>Occlusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inferior</td>
<td>ST Elevation</td>
<td>II, III, aVF</td>
<td>RCA</td>
</tr>
<tr>
<td>Septal</td>
<td>ST Elevation</td>
<td>V1, V2</td>
<td>LAD of LCA</td>
</tr>
<tr>
<td>Anterior</td>
<td>ST Elevation</td>
<td>V3, V4</td>
<td>LAD of LCA</td>
</tr>
<tr>
<td>Lateral</td>
<td>ST Elevation</td>
<td>I, aVL, V5, V6</td>
<td>LCx of LCA</td>
</tr>
<tr>
<td>Posterior</td>
<td>ST ↓, Tall R wave</td>
<td>V1, V2</td>
<td>RCA &amp;/or LCx</td>
</tr>
</tbody>
</table>

Diagram showing the layout of 12 lead EKG with columns for Lead I, Lead II, Lead III, and rows for aVR, aVL, aVF, V1, V2, V3, V4, V5, V6, Infarction, Wave Abnormality, ECG Segments, and Occlusion.
### APPENDIX 2:

**VENTILATOR IDEAL BODY WEIGHT CHART**

#### NIH PREDICTED BODY WEIGHT (PBW) / TIDAL VOLUME CHART

<table>
<thead>
<tr>
<th>MALES</th>
<th>FEMALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEIGHT</td>
<td>PBW Male</td>
</tr>
<tr>
<td>Feet</td>
<td>Inches</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>4' 10&quot;</td>
<td>58</td>
</tr>
<tr>
<td>4' 11&quot;</td>
<td>59</td>
</tr>
<tr>
<td>5' 0&quot;</td>
<td>60</td>
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<tr>
<td>5' 1&quot;</td>
<td>61</td>
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<td>77</td>
</tr>
<tr>
<td>6' 6&quot;</td>
<td>78</td>
</tr>
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</table>
### APPENDIX 3: MIVT REPORT / GCS / RTS

<table>
<thead>
<tr>
<th>M</th>
<th>Glasgow Coma Scale Adult/Pedi</th>
<th>Glasgow Coma Scale Pediatric</th>
<th>Revised Trauma Score (RTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M=</strong> Mechanism</td>
<td>Eye Opening  Spontaneous 4 To Voice 3 To Pain 2 None 1</td>
<td>Eye Opening  Spontaneous 4 To Voice 3 To Pain 2 None 1</td>
<td>Spontaneous Respiratory Rate</td>
</tr>
<tr>
<td><strong>I=</strong> Injuries</td>
<td>Best Verbal Response  Oriented 5 Confused 4 Inappropriate Words 3 Incomprehensible Words 2 None 1</td>
<td>Best Verbal Response  Smiles, Interacts 5 Consolable 4 Persistently Irritable 3 Restless, Agitated 2 None 1</td>
<td>10-29/Min. 4</td>
</tr>
<tr>
<td><strong>V=</strong> Vital Signs GCS</td>
<td>Best Motor Response  Normal Spontaneous Movement 6 Purposeful Movement 5 Withdraws to Pain 4 Abnormal Flexion 3 Abnormal Extension 2 None 1</td>
<td>Best Motor Response  Normal Spontaneous Movement 6 Purposeful Movement 5 Withdraws to Pain 4 Abnormal Flexion 3 Abnormal Extension 2 None 1</td>
<td>&gt;29/Min. 3</td>
</tr>
<tr>
<td><strong>T=</strong> Time Treatments</td>
<td>Current VS and O2 sat Lowest BP GCS (arrival, on scene, ED arrival) Pupils</td>
<td>Current VS and O2 sat Lowest BP GCS (arrival, on scene, ED arrival) Pupils</td>
<td>6-9/Min. 2</td>
</tr>
<tr>
<td></td>
<td>Time of injury Entrapment duration Airway Fluids-type and volume infused Procedures</td>
<td></td>
<td>1-5/Min. 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>None 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No Pulse 0</td>
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<tr>
<td></td>
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<td>Systolic Blood Pressure</td>
</tr>
<tr>
<td></td>
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<td>&gt;89mmHg. 4</td>
</tr>
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<td>76-89mmHg. 3</td>
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<td>50-75mmHg. 2</td>
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<td>1-49mmHg 1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>No Pulse 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RTS=RR+SBP+GCS</td>
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<tr>
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<td>Total GCS Points</td>
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<tr>
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<td>13-15=4</td>
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<td>9-12=3</td>
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<td>6-8=2</td>
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<td>4-5=1</td>
</tr>
<tr>
<td></td>
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<td>3=0</td>
</tr>
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</table>

**MIVT Report:**

Blunt
Penetrating
Burn

Injuries identified or suspected

Current VS and O2 sat
Lowest BP
GCS (arrival, on scene, ED arrival) Pupils

Time of injury Entrapment duration Airway Fluids-type and volume infused Procedures
APPENDIX 4:
PEDIATRIC VITAL SIGNS AND SCORES/APGAR

### Pediatric Vital Sign Normal Ranges

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Respiratory Rate</th>
<th>Heart Rate</th>
<th>Systolic Blood Pressure</th>
<th>Weight in kilos</th>
<th>Weight in pounds</th>
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</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>30 - 50</td>
<td>120 - 160</td>
<td>50 - 70</td>
<td>2 - 3</td>
<td>4.5 - 7</td>
</tr>
<tr>
<td>Infant (1-12 months)</td>
<td>20 - 30</td>
<td>80 - 140</td>
<td>70 - 100</td>
<td>4 - 10</td>
<td>9 - 22</td>
</tr>
<tr>
<td>Toddler (1-3 yrs.)</td>
<td>20 - 30</td>
<td>80 - 130</td>
<td>80 - 110</td>
<td>10 - 14</td>
<td>22 - 31</td>
</tr>
<tr>
<td>Preschooler (3-5 yrs.)</td>
<td>20 - 30</td>
<td>80 - 120</td>
<td>80 - 110</td>
<td>14 - 18</td>
<td>31 - 40</td>
</tr>
<tr>
<td>School Age (6-12 yrs.)</td>
<td>20 - 30</td>
<td>70 - 110</td>
<td>80 - 120</td>
<td>20 - 42</td>
<td>41 - 92</td>
</tr>
<tr>
<td>Adolescent (13+ yrs.)</td>
<td>12 - 20</td>
<td>55 - 105</td>
<td>110 - 120</td>
<td>&gt;50</td>
<td>&gt;110</td>
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### APGAR Score Components

<table>
<thead>
<tr>
<th>Components</th>
<th>+2</th>
<th>+1</th>
<th>-1</th>
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<tbody>
<tr>
<td>1. Weight</td>
<td>&gt; 20 kg</td>
<td>10 – 20 kg</td>
<td>&lt; 10 kg</td>
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<tr>
<td>2. Airway patency</td>
<td>Normal</td>
<td>Maintainable</td>
<td>Unmaintainable</td>
</tr>
<tr>
<td>3. Systolic blood pressure</td>
<td>&gt; 90 mmHg</td>
<td>80 – 50 mmHg</td>
<td>&lt; 50 mmHg</td>
</tr>
<tr>
<td>4. CNS status</td>
<td>Awake</td>
<td>Obtunded/ loss of</td>
<td>Coma/ de cerebrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>consciousness Minor</td>
<td></td>
</tr>
<tr>
<td>5. Open wound</td>
<td>None</td>
<td>Closed fracture</td>
<td>Major/ penetrating</td>
</tr>
<tr>
<td>6. Skeletal injury</td>
<td>None</td>
<td></td>
<td>Open/ multiple fractures</td>
</tr>
</tbody>
</table>
APPENDIX 4:

PEDIATRIC VITAL SIGNS AND SCORES/APGAR

PEDiatric GLASgOW CoMA SCALE (PGeCS)

<table>
<thead>
<tr>
<th></th>
<th>&gt; 1 Year</th>
<th>&lt; 1 Year</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>EYE OPENING</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneously</td>
<td>Spontaneously</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>To verbal command</td>
<td>To shout</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>To pain</td>
<td>To pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>No response</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>MOTOR RESPONSE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obeys</td>
<td>Spontaneous</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Localizes pain</td>
<td>Localizes pain</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Flexion-withdrawal</td>
<td>Flexion-withdrawal</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Flexion-abnormal (decorticate rigidity)</td>
<td>Flexion-abnormal (decorticate rigidity)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Extension (decerebrate rigidity)</td>
<td>Extension (decerebrate rigidity)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>No response</td>
<td>No response</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>VERBAL RESPONSE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oriented</td>
<td>Appropriate words/phrases</td>
<td>Smiles/coos appropriately</td>
<td>5</td>
</tr>
<tr>
<td>Disoriented/confused</td>
<td>Inappropriate words</td>
<td>Cries and is consolable</td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>Persistent cries and screams</td>
<td>Persistent inappropriate crying and/or screaming</td>
<td>3</td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>Grunts</td>
<td>Grunts, agitated, and restless</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>No response</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

TOTAL PEDIATRIC GLASGOW COMA SCORE (3-15):

APGAR SCORING SYSTEM

<table>
<thead>
<tr>
<th>Activity (muscle tone)</th>
<th>0 Points</th>
<th>1 Point</th>
<th>2 Points</th>
<th>Points totaled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td></td>
<td>Arms and legs flexed</td>
<td>Active movement</td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td>Absent</td>
<td>Below 100 bpm</td>
<td>Over 100 bpm</td>
<td></td>
</tr>
<tr>
<td>Grime (reflex irritability)</td>
<td>Flaccid</td>
<td>Some flexion of Extremities</td>
<td>Active motion (sneeze, cough, pull away)</td>
<td></td>
</tr>
<tr>
<td>Appearance (skin color)</td>
<td>Blue, pale</td>
<td>Body pink, Extremities blue</td>
<td>Completely pink</td>
<td></td>
</tr>
<tr>
<td>Respiration</td>
<td>Absent</td>
<td>Slow, irregular</td>
<td>Vigorous cry</td>
<td></td>
</tr>
</tbody>
</table>

Severely depressed 0-3
Moderately depressed 4-6
Excellent condition 7-10
APPENDIX 5:  
STROKE ASSESSMENT

*Cincinnati Stroke Scale*

A system used to diagnose the presence of a stroke in a patient. It tests 3 signs for abnormal findings which may indicate that the patient is having a stroke. **If any one of the 3 tests shows abnormal findings, the patient may be having a stroke and should be transported to a hospital as soon as possible.**

**Facial droop:**

Have the person smile or show his or her teeth. If one side doesn't move as well as the other so it seems to droop, that could be sign of a stroke.

- **Normal:** Both sides of face move equally.
- **Abnormal:** One side of face does not move as well as the other (or at all).

**Arm drift:**

Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds. If one arm does not move, or one arm winds up drifting down more than the other, that could be a sign of a stroke.

- **Normal:** Both arms move equally or not at all.
- **Abnormal:** One arm does not move, or one arm drifts down compared with the other side.

**Speech:**

Have the person say, "You can't teach an old dog new tricks," or some other simple, familiar saying. If the person slurs the words, gets some words wrong, or are unable to speak, that could be sign of stroke.

- **Normal:** Patient uses correct words with no slurring.
- **Abnormal:** Slurred or inappropriate words or mute.
## EMERGENCY MEDICAL STROKE ASSESSMENT (EMSA)

Check any elements that are abnormal

<table>
<thead>
<tr>
<th>Element</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E: Eye Movement</strong></td>
<td></td>
</tr>
<tr>
<td>Horizontal Gaze</td>
<td>Ask patient to keep their head still and follow your finger left to right with their eyes</td>
</tr>
<tr>
<td></td>
<td>Abnormal: Patient is unable to follow as well in one direction compared to the other</td>
</tr>
<tr>
<td><strong>M: Motor – Face, Arm, or Leg Weakness</strong></td>
<td></td>
</tr>
<tr>
<td>Facial Weakness</td>
<td>Ask patient to show their teeth or smile</td>
</tr>
<tr>
<td></td>
<td>Abnormal: One side of the face does not move as well as the other</td>
</tr>
<tr>
<td>Arm Weakness</td>
<td>Ask patient to hold out both arms, palms up, for 10 seconds with eyes closed</td>
</tr>
<tr>
<td></td>
<td>Abnormal: One arm does not move or drifts down compared to the other</td>
</tr>
<tr>
<td>Leg Weakness</td>
<td>Ask patient to lift one leg and then the other for 5 seconds</td>
</tr>
<tr>
<td></td>
<td>Abnormal: One leg does not move or drifts down compared to the other</td>
</tr>
<tr>
<td><strong>SA: Slurred Speech or Aphasia</strong></td>
<td></td>
</tr>
<tr>
<td>Naming</td>
<td>Ask patient to name your watch and pen</td>
</tr>
<tr>
<td></td>
<td>Abnormal: Patient slurs words, says the wrong words, or is unable to speak</td>
</tr>
<tr>
<td>Repetition</td>
<td>Ask patient to repeat “They heard him speak on the radio last night” after you</td>
</tr>
<tr>
<td></td>
<td>Abnormal: Patient slurs words, says the wrong words, or is unable to speak</td>
</tr>
</tbody>
</table>
APPENDIX 5:
STROKE ASSESSMENT CONTINUED

<table>
<thead>
<tr>
<th><strong>Complete this checklist when treating any patient with an acute stroke</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EVENT INFORMATION</strong></td>
</tr>
<tr>
<td><strong>Date:</strong></td>
</tr>
<tr>
<td><strong>Destination:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>F-A-S-T ASSESSMENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Face:</strong> Assess facial droop: have pt show teeth or smile</td>
</tr>
<tr>
<td>• Normal: both sides of face move equally.</td>
</tr>
<tr>
<td>• Abnormal: one side of face does not move as well as the other.</td>
</tr>
<tr>
<td><strong>Arm:</strong> Assess arm drift: have pt close eyes and hold both arms straight out (palms up) for 10 seconds.</td>
</tr>
<tr>
<td>• Normal: both arms move the same or both arms do not move at all.</td>
</tr>
<tr>
<td>• Abnormal: one arm does not move or one arm drifts down compared to the other.</td>
</tr>
<tr>
<td><strong>Speech:</strong> Assess speech: have the pt say: “You can’t teach an old dog new tricks.”</td>
</tr>
<tr>
<td>• Normal: pt uses correct words with no shuffling.</td>
</tr>
<tr>
<td>• Abnormal: pt shurs words, uses the wrong words, or is unable to speak.</td>
</tr>
<tr>
<td><strong>Time:</strong> Estimated time symptoms began (Last time seen normal)</td>
</tr>
<tr>
<td>_______ Exact time ___ 4.5 hours or less ___ 4.5-6 hours ___ &gt;6 hours ___ Unknown</td>
</tr>
<tr>
<td><strong>Level of consciousness:</strong></td>
</tr>
<tr>
<td>Alert_____ Responds to Voice_______ Responds to Pain_______ Unresponsive_______</td>
</tr>
<tr>
<td><strong>GLUCOMETER READING:</strong> ______ mg/dL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>QUESTIONS</strong></th>
<th><strong>YES</strong></th>
<th><strong>NO</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>History of: stroke, brain tumor, aneurysm, arteriovenous malformations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Pregnant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past or Present Bleeding disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgery in last two weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticoagulant medications taken Last Taken:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intracranial or intraspinal surgery or trauma in the last 2 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal or genitourinary bleeding within last 7 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 5:  
STROKE ASSESSMENT CONTINUED

Rapid Arterial Occlusion Evaluation (RACE) Scale  
An EMS Assessment Tool for Acute Ischemic Stroke  
(Sensitivity 85%, Specificity 68%)

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Score = 0</th>
<th>Score = 1</th>
<th>Score = 2</th>
<th>Patient Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Palsy</td>
<td>Absent</td>
<td>Mild</td>
<td>Moderate/Severe</td>
<td></td>
</tr>
<tr>
<td>Arm Motor</td>
<td>Normal/Mild</td>
<td>Moderate</td>
<td>Severe</td>
<td></td>
</tr>
<tr>
<td>Leg Motor</td>
<td>Normal/Mild</td>
<td>Moderate</td>
<td>Severe</td>
<td></td>
</tr>
<tr>
<td>Head/Gaze Deviation</td>
<td>Absent</td>
<td>Present</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Aphasia* (If right hemiparesis)</td>
<td>Performs Both Tasks</td>
<td>Performs 1 Task</td>
<td>Performs Neither Tasks</td>
<td></td>
</tr>
<tr>
<td>Agnosia* (If left hemiparesis)</td>
<td>Patient Recognizes Arm and Impairment</td>
<td>Unable to Recognize Arm or Impairment</td>
<td>Unable to Recognize BOTH Arm and Impairment</td>
<td></td>
</tr>
</tbody>
</table>

* Aphasia: Ask the patient to: 1. “Close your Eyes” AND 2. “Make a Fist”  
  * Agnosia: Ask the patient and evaluate recognition of deficit:  
    1. While showing paretic arm: “Whose arm is this?”  
    2. Ask patient: “Can you lift both arms and clap?”

If RACE Score = 5 or greater, patient may have an ischemic stroke with a large vessel occlusion

Reference:  
## MEDICATION FORMULARY

### ACETAMINOPHEN (TYLENOL)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult Procedure / Protocol</th>
<th>Pediatric Procedure / Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acetaminophen</strong> (Tylenol)</td>
<td>15 mg/kg slow IVP over 15 min (via IV pump) *Max dose 1 Gram *13 years and older weighing &gt; 50 kg</td>
<td>15mg/kg rectal *Max dose 1 gram</td>
</tr>
</tbody>
</table>

**Indications**
- Fever

**Contraindications**
- Avoid in patients with severe liver disease

**Side Effects**

# Activated Charcoal

**Procedure / Protocol**
Adult/Pediatric Poisoning/Overdose

**Indications**
Poisoning by mouth within 90 minutes of ingestion

**Contraindications**
Altered mental status
Patients who have received an emetic

**Side Effects**
Nausea/Vomiting

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated Charcoal</td>
<td>1 gram/kg oral</td>
<td>1 gram/kg oral, up to max dose of 50 grams</td>
</tr>
<tr>
<td>Drug</td>
<td>Adult</td>
<td>Pediatric</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-----------</td>
</tr>
</tbody>
</table>
| **Adenosine**  
(Adenocard) | **Supraventricular Tachycardia**  
6 mg rapid IO/IV bolus initial dose  
If SVT rhythm has not changed after 5 minutes, repeat second dose of 12 mg rapid IO/IV bolus | **Supraventricular Tachycardia**  
0.1 mg/kg (over 1-2 seconds) IO/IV followed by rapid saline flush; max initial dose of 6 mg  
0.2 mg/kg within 1-2 minutes of continuing SVT=given rapid IO/IV; max single dose of 12 mg |
| **Procedure / Protocol**  
SVT  
V-Tach | **Indications**  
PSVT, SVT |  
**Contraindications**  
Second or third degree AV block |
| **Side Effects**  
Short-lasting, 2\textsuperscript{nd} or 3\textsuperscript{rd} AV block, transient asystole, various arrhythmias lasting only a few seconds | **Ventricular Tachycardia**  
12 mg rapid IO/IV bolus for stable monomorphic, regular wide complex tachycardia that may be SVT with aberrancy |
## ALBUTEROL SULFATE (VENTOLIN, PROVENTIL)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Albuterol Sulfate</strong> (Ventolin, Proventil)</td>
<td>2.5mg via handheld nebulizer or nebulizer mask May repeated as needed</td>
<td>2.5mg via handheld nebulizer or nebulizer mask May repeated as needed</td>
</tr>
</tbody>
</table>

### Procedure / Protocol
- Breathing: Neb Treatment
- Anaphylactic Shock / Allergic Reaction
- Drowning / Submersion
- Injury
- Extremity Injury
- Reactive Airway Disease

### Indications
- Acute Bronchospasm
- Cardiac arrest associated with asthma
- Hyperkalemia

### Side Effects
- Tremor, dizziness, nervousness, headache
- Nausea, tachycardia, bronchospasm
### MEDICATION FORMULARY

**AMIODARONE (CORDARONE)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amiodarone</strong> (Cordarone)</td>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulseless V-Tach / V-Fib</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V-Tach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ventricular Rhythm – Post Resuscitation</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shock resistant V-Fib or Pulseless V-Tach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ventricular Tachycardia</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiogenic shock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marked Sinus Bradycardia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd or 3rd degree AV Block</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypotension, bradycardia, AV</td>
<td></td>
</tr>
</tbody>
</table>

**Pulseless V-Tach / V-Fib**

- Rapid 300 mg IO/IV
- Repeat once at 150 mg IO/IV. Followed by an infusion of 1 mg/hr

**V-Tach with a pulse**

- Rapid 150 mg IO/IV bolus.
- May repeat once if patient remains in unstable V-Tach to a total dose of 300 mg over 20 minutes. Followed by an infusion of 1 mg/hr

**Pulseless V-Tach / V-Fib**

- Rapid 5 mg/kg IO/IV bolus.
- Followed by an infusion at 5 mcg/kg/min

**Ventricular Rhythm – Post Resuscitation**

- 5 mg/kg IO/IV over 20 minutes. Repeat doses of 5 mg/kg IO/IV over 20 minutes; maximum 15 mg/kg. Followed by an infusion at 5 mcg/kg/min
**ASPIRIN**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aspirin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Acute Coronary Syndrome</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Adult patients with acute coronary syndrome</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td>324 mg PO</td>
</tr>
<tr>
<td>Aspirin allergy or aspirin induced asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active GI bleeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If patient has taken 324 mg within the last 24 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May cause GI discomfort and nausea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May cause wheezing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**MEDICATION FORMULARY**

**ATROPINE SULFATE**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Atropine Sulfate</strong></td>
<td><strong>Procedure / Protocol</strong>&lt;br&gt;<strong>Airway: RSI</strong>&lt;br&gt;<strong>Bradycardia</strong>&lt;br&gt;<strong>Poisoning / Overdose</strong></td>
<td><strong>Indications</strong>&lt;br&gt;<strong>Anticholinergic drug used in bradycardias</strong>&lt;br&gt;<strong>Organophosphate poisoning (to block the parasympathetic response)</strong>&lt;br&gt;<strong>Peds: Symptomatic Bradycardia</strong>&lt;br&gt;<strong>Contraindications</strong>&lt;br&gt;<strong>Tachycardia, glaucoma, A-Fib/Flutter w/RVR</strong>&lt;br&gt;<strong>Side Effects</strong>&lt;br&gt;<strong>Tachycardia, dry mouth, thirst, flushing of skin, blurred vision, headache, pupillary dilation, urinary retention</strong>&lt;br&gt;<strong>Bradycardia</strong> 0.5 mg IO/IV; Repeat every 3 – 5 minutes to a total of 3 mg</td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

### CALCIUM GLUCONATE 10% (KALCINATE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calcium Gluconate</strong></td>
<td><strong>Asystole / PEA</strong>&lt;br&gt;1-2 GM IO/IV</td>
<td></td>
</tr>
<tr>
<td><strong>10%</strong>&lt;br&gt;<strong>(Kalcinate)</strong></td>
<td><strong>Bradycardia / Calcium Channel Blocker Overdose / Musculoskeletal Trauma</strong>&lt;br&gt;1-2 GM IV slow administration</td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td><strong>Eclampsia / Pre-eclampsia</strong>&lt;br&gt;Musculoskeletal Injury&lt;br&gt;Poisoning / Overdose&lt;br&gt;Preterm Labor</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td><strong>Poisoning / Overdose / Musculoskeletal Trauma</strong>&lt;br&gt;60 mg/kg IO/IV slow administration (max dose 2GM)</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td><strong>Use with extreme caution in patients taking digitalis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td><strong>Hypotension, bradycardia, arrhythmia, cardiac arrest, chalky or metallic taste</strong></td>
<td></td>
</tr>
</tbody>
</table>
**CALCIUM CHLORIDE 10%**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calcium Chloride 10%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asystole / PEA</td>
<td>1 GM IO/IV</td>
<td></td>
</tr>
<tr>
<td>Bradycardia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eclampsia / Pre-eclampsia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal Injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poisoning / Overdose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm Labor</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium Channel Blocker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>overdose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium Sulfate drip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>toxicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypocalcemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperkalemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use with extreme caution in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>patients taking digitalis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypotension, bradycardia,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>arrhythmia, cardiac arrest,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chalky or metallic taste</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Asystole / PEA**: 1 GM IO/IV
- **Bradycardia / Calcium Channel Blocker Overdose / Musculoskeletal Trauma**: 1 GM IV slow administration
- **Eclampsia / Preeclampsia / Preterm Labor**: 1 gram over 2-3 minutes if toxicity of Magnesium is suspected
- **Poisoning / Overdose / Musculoskeletal Trauma**: 20 mg/kg IO/IV slow administration (max dose 2GM)
### MEDICATION FORMULARY

#### CARDENE (NICARDIPINE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardene</strong></td>
<td>Infusion at 5-15 mg/hr. (25-75 cc/hr.) (50 mg/250 ml NS =0.2 mg/ml)</td>
<td>Not indicated in current protocol</td>
</tr>
<tr>
<td>(Nicardipine)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
Treatment of severe hypertension

**Indications** systolic BP > 180 mmHg, OR diastolic BP > 110 mmHg

**Contraindications** Patients who have aortic valve stenosis

**Side Effects**
Hypotension
### DEXTROSE 10% (D10)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dextrose 10%</strong> (D10)</td>
<td>Not indicated in current protocols</td>
<td>2 – 4 ml/kg</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Diabetic Emergencies (Peds)</td>
<td>May repeat</td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Suspected hypoglycemia</td>
<td>To mix: Discard 40 ml from a D-50 pre-filled syringe and draw up 40ml of normal saline. The resulting concentration is Dextrose 10%</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Intracranial hemorrhage Known CVA</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Local irritation, may precipitate severe neurologic symptoms in alcoholics</td>
<td></td>
</tr>
</tbody>
</table>
### MEDICATION FORMULARY

#### DEXTROSE 25% (D25)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dextrose 25%</strong></td>
<td><strong>Procedure / Protocol</strong></td>
<td><strong>Indications</strong></td>
</tr>
<tr>
<td>(D25)</td>
<td>Diabetic Emergencies (Peds)</td>
<td>Suspected hypoglycemia</td>
</tr>
<tr>
<td></td>
<td><strong>Indications</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suspected hypoglycemia</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Contraindications</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intracranial hemorrhage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Known CVA</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Side Effects</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Local irritation, may precipitate severe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>neurologic symptoms in alcoholics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not indicated in current protocols</td>
<td>4 ml/kg IO/IV slow administration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To mix: Discard 25ml from a D-50 pre-filled syringe and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>draw up 25 ml of normal saline. The resulting concentration is Dextrose 25%</td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

### DEXTROSE 50% (D50)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dextrose 50%</strong> (D50, Dextrose)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetic Emergencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspected hypoglycemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intracranial hemorrhage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known CVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local irritation, may precipitate severe neurologic symptoms in alcoholics, causes local tissue necrosis if IV infiltrates</td>
<td>25 grams IO/IV slow administration</td>
<td>Not indicated in current protocols</td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

### DIAZEPAM (VALIUM)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diazepam</strong> (Valium)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Seizures</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Seizures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol Intoxication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurological Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altered Mental Status</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### MEDICATION FORMULARY

#### DILTIAZEM (CARDIZEM)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diltiazem</strong> (Cardizem)</td>
<td>0.25 mg/kg up to 20 mg IV/IO over 2 minutes if systolic BP &gt; 90 If uncontrolled after 15 minutes administer 0.35 mg/kg IV/IO over 2 minutes</td>
<td>Not indicated in current protocols</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- A-Fib / A-Flutter
- SVT

**Indications**
- Rate control in refractory atrial fibrillation and SVT

**Contraindications**
- Concurrent or recent use of Beta Blockers

**Side Effects**
- Hypotension, heart block
# MEDICATION FORMULARY

## DIPHENHYDRAMINE (BENADRYL)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diphenhydramine</strong> (Benadryl)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circulation: Blood Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaphylactic Shock/ Allergic Reaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dystonic Reaction/ Extrapyramidal Reaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Anaphylaxis</td>
<td>Allergic reactions</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Urticaria, extrapyramidal reaction, asthma, COPD, pregnancy, COPD, nursing mothers, acute glaucoma</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Sedation, dries bronchial secretions, blurred vision, headache, palpations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25-50 mg IM/IO/IV</td>
<td>1 mg/kg IM/IO/IV Maximum dose of 30 mg</td>
</tr>
</tbody>
</table>
# MEDICATION FORMULARY

## DOBUTAMINE (DOBUTREX)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dobutamine</strong></td>
<td>2-20 mcg/kg/min IO/IV</td>
<td>2-20 mcg/kg/min IO/IV</td>
</tr>
<tr>
<td><strong>(Dobutrex)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Procedure / Protocol**
  - Medical Hypotension
  - Post Resuscitation
  - Bradycardia

- **Indications**
  - Cardiogenic shock associated with hypotension

- **Contraindications**
  - Hypersensitivity to drug

- **Side Effects**
  - Tachydysrhythmias, ectopy, headache, angina, nausea/vomiting, hypotension, hypertension
## MEDICATION FORMULARY

**DOPAMINE (INOTROPIN)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dopamine</strong></td>
<td><strong>Adult</strong></td>
<td><strong>Pediatric</strong></td>
</tr>
<tr>
<td>(Intropin)</td>
<td>5 – 20 mcg/kg/min IO/IV</td>
<td>5 – 20 mcg/kg/min IO/IV</td>
</tr>
</tbody>
</table>

### Procedure / Protocol
- Asystole / PEA, Bradycardia
- Medical Hypotension, Ventricular Rhythm, Post Resuscitation

### Indications
- Cardiogenic shock associated with hypotension

### Contraindications
- Hypovolemic shock where complete fluid resuscitation has not occurred
- Uncorrected tachydysrhythmias or V-fib

### Side Effects
- Tachydysrhythmias, ectopy, headache, angina, nausea/vomiting

***See drip calculations on following page***
Dopamine Infusion

Dopamine 1600 mcg/ml concentration infusion chart
Patient weight (kg) Infusion Rate (mcg/kg/min) = ml/hr

<table>
<thead>
<tr>
<th>Patient weight (kg)</th>
<th>5 mcg</th>
<th>10 mcg</th>
<th>15 mcg</th>
<th>20 mcg</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 kg</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>20 kg</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>30 kg</td>
<td>6</td>
<td>11</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>40 kg</td>
<td>8</td>
<td>15</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>50 kg</td>
<td>9</td>
<td>19</td>
<td>28</td>
<td>38</td>
</tr>
<tr>
<td>60 kg</td>
<td>11</td>
<td>23</td>
<td>34</td>
<td>45</td>
</tr>
<tr>
<td>70 kg</td>
<td>13</td>
<td>26</td>
<td>3</td>
<td>53</td>
</tr>
<tr>
<td>80 kg</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>90 kg</td>
<td>17</td>
<td>34</td>
<td>51</td>
<td>68</td>
</tr>
<tr>
<td>100 kg</td>
<td>19</td>
<td>38</td>
<td>56</td>
<td>75</td>
</tr>
<tr>
<td>110 kg</td>
<td>21</td>
<td>41</td>
<td>62</td>
<td>83</td>
</tr>
<tr>
<td>120 kg</td>
<td>23</td>
<td>45</td>
<td>68</td>
<td>90</td>
</tr>
<tr>
<td>130 kg</td>
<td>25</td>
<td>49</td>
<td>73</td>
<td>98</td>
</tr>
<tr>
<td>140 kg</td>
<td>26</td>
<td>53</td>
<td>79</td>
<td>102</td>
</tr>
<tr>
<td>150 kg</td>
<td>28</td>
<td>56</td>
<td>85</td>
<td>113</td>
</tr>
</tbody>
</table>
**MEDICATION FORMULARY**

**EPINEPHRINE (ADRENALIN)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Epinephrine</strong> (Adrenalin)</td>
<td><strong>Anaphylactic Shock / Allergic Reaction</strong>&lt;br&gt;0.3 – 0.5 mg 1:1,000 solution IM&lt;br&gt;May be repeated every 20 minutes up to three times for a total of 4 doses&lt;br&gt;If patient is hemodynamically unstable, administer 1:10,000 solution up to 0.5mg IO/IV. Titrate to effect</td>
<td><strong>Anaphylactic Shock / Allergic Reaction</strong>&lt;br&gt;0.01mg/kg 1:1,000 solution IM up to 0.5mg&lt;br&gt;May be repeated every 20 minutes up to three times for a total of 4 doses&lt;br&gt;If patient is hemodynamically unstable, administer 1:10,000 solution 0.01mg/kg up to 0.5mg IO/IV. Titrate to effect</td>
</tr>
<tr>
<td></td>
<td><strong>Asystole / PEA / V-Fib / V-Tach</strong>&lt;br&gt;1 mg 1:10,000 solution IO/IV every 3 – 5 minutes until ROSC</td>
<td><strong>Asystole / PEA / V-Fib / Pulseless V-Tach</strong>&lt;br&gt;0.01 mg/kg 1:1,000 solution IO/IV every 3 – 5 minutes until ROSC</td>
</tr>
<tr>
<td></td>
<td><strong>Bradycardia / Medical Hypotension</strong>&lt;br&gt;Infuse at 0.5 – 10 mcg/min IO/IV</td>
<td><strong>Bradycardia / Medical Hypotension</strong>&lt;br&gt;Infuse at 0.1 – 1 mcg/kg/min IO/IV</td>
</tr>
<tr>
<td></td>
<td><strong>Push Dose</strong>&lt;br&gt;Push Dose: 50-200 mcg (0.5-2ml) every 2-5 min</td>
<td><strong>Push Dose</strong>&lt;br&gt;Push Dose: 50-200 mcg (0.5-2ml) every 2-5 min</td>
</tr>
<tr>
<td></td>
<td><strong>Reactivate Airway Disease</strong>&lt;br&gt;0.3 mg 1:1,000 solution IM</td>
<td><strong>Reactivate Airway Disease</strong>&lt;br&gt;0.1mg/kg 1:1,000 solution IM</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Anaphylactic Shock / Allergic Reaction
- Bradycardia
- Medical Hypotension
- Neonatal Resuscitation
- V-Fib / Pulseless V-Tach

**Indications**
- V-Fib / Pulseless V-Tach
- Asystole / PEA
- Anaphylaxis
- Bronchospasm
- Hypotension

**Side Effects**
- Palpitations, hypertension, dysrhythmias, anxiety, tremors

**See Push Dose Pressor Procedure** for mixing instructions
### MEDICATION FORMULARY

#### EPINEPHRINE INFUSION

**Mixing Instructions:** Mix 1 mg of Epinephrine 1:1,000 in 150 ml of D5W or 2 mg in 500 ml.

**Dose Range:** 0.5 to 10 mcg/min

**Concentration:** 4 mcg/ml

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>Rate: ml/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>7</td>
<td>105</td>
</tr>
<tr>
<td>8</td>
<td>120</td>
</tr>
<tr>
<td>9</td>
<td>135</td>
</tr>
<tr>
<td>10</td>
<td>150</td>
</tr>
<tr>
<td>Drug</td>
<td>Adult</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td><strong>Etomidate</strong></td>
<td>0.3 mg/kg IV push over 30 seconds</td>
</tr>
<tr>
<td><strong>(Amidate)</strong></td>
<td>Maximum dose of 40 mg</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Airway: Rapid Sequence Intubation</td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>For use in RSI protocol – for induction</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Respiratory depression, venous pain, skeletal muscle movement</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Adrenal Insufficiency, Sepsis</td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

### FENTANYL (SUBLIMAZE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fentanyl</strong></td>
<td>1 mcg/kg IM/IO/IV</td>
<td>1 mcg/kg IM/IO/IV</td>
</tr>
<tr>
<td>(Sublimaze)</td>
<td>1.5 mcg/kg IN</td>
<td>1.5 mcg/kg IN</td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Pain control</td>
<td>Maximum 100 mcg</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Airway: Rapid Sequence Intubation</td>
<td>May be repeated as needed</td>
</tr>
<tr>
<td></td>
<td>Breathing: Use of Mechanical Ventilator</td>
<td>Maximum 100 mcg</td>
</tr>
<tr>
<td></td>
<td>Acute Coronary Syndrome Pain Management</td>
<td>May repeat as needed</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Bronchial asthma, concomitant MAO inhibitors, myasthenia gravis</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Muscle rigidity, respiratory depression, bradycardia, myoclonic movements, tachycardia, vein irritation, dermatitis</td>
<td></td>
</tr>
</tbody>
</table>
# MEDICATION FORMULARY

## FUROSEMIDE (LASIX)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
</table>
| **Furosemide**  
(Lasix) |       |           |
| **Procedure / Protocol** |       |           |
| CHF/Pulmonary Edema |       |           |
| **Indications** |       |           |
| Acute Pulmonary Edema such as CHF | 40-80 mg IV/IO | OLMD Required |
| **Contraindications** |       |           |
| Hypersensitivity |       |           |
| **Side Effects** |       |           |
| Hypovolemia, hypotension, hyponatremia, hypokalemia |       |           |
**GLUCAGON (GLUCAGEN)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
</table>
| Glucagon (GlucaGen) | **Beta Blocker OD / Bradycardia**  
1 mg IM/IO/IV/IN | **Beta Blocker OD / Bradycardia**  
0.1mg/kg IV/IO/IM/IN (max dose 2mg) |
| **Procedure / Protocol** | **Diabetic Emergency**  
1 mg IM/IN | **Diabetic Emergency**  
0.1mg/kg IM/IN (max dose 1mg) |
| Bradycardia, Diabetic Emergencies Poisoning / Overdose | | |
| **Indications** | | |
| Hypoglycemia, Beta Blocker overdose | | |
| **Contraindications** | | |
| Insulinoma, Pheochromocytoma | | |
| **Side Effects** | | |
| Nausea/vomiting, urticarial | | |
## MEDICATION FORMULARY

### HALOPERIDOL (HALDOL)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
</table>
| **Haloperidol** (Haldol)**
**Procedure / Protocol**
Behavioral Emergencies/
Chemical Restraint

**Indications**
Altered Mental Status when patient is combative and potential for harm to patient and/or personnel is present

**Contraindications**
Patients with known reversible cause of altered mental status. QT prolongation or history of torsades de pointes

**Side Effects**
Give with diphenhydramine to prevent extrapyramidal symptoms
Use caution when treating elderly patients who may require smaller doses to achieve therapeutic effect
Haloperidol has been associated with cardiac arrest in patients with prolonged QT intervals
Patients who receive haloperidol should be closely monitored for cardiac arrhythmia, particularly when the medication is given IV
May cause neuroleptic malignant syndrome

5 mg IM
May repeat every 15 minutes up to a total of 20 mg

0.1 mg/kg IM
Max dose of 5 mg
### Heparin

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heparin</strong></td>
<td><em>Only for use in the field by authorized services</em></td>
<td>Not indicated in current protocols</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
Acute Coronary Syndrome

**Indications**
Anticoagulant therapy

**Contraindications**
Severe thrombocytopenia, Uncontrolled active bleeding

**Side Effects**
No immediate side effects
Late side effects include hemorrhage

5,000 units IO/IV if > 100kg
4,000 units IO/IV if < 100kg
Consider continuous infusion for extended transports: 12 units/kg/hr, not to exceed 1,000 units/hr
**HYDRAZINE (APRESOLINE)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydralazine</strong></td>
<td>5mg IV/IO over 2 minutes Max of 20mg</td>
<td>Not indicated in current protocols</td>
</tr>
<tr>
<td>(Apresoline)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Hypertensive Crisis, Pre-eclampsia/Eclampsia</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Severe hypertension</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypotension. Tachycardia</td>
<td></td>
</tr>
</tbody>
</table>
### KETAMINE (KETALAR)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ketamine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(Ketalar)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**

Airway: Rapid Sequence Intubation

**Indications**

Induction agent for RSI

Pain Management

Sedation

**Contraindications**

<3mos age

Known schizophrenia

Severe HTN

**Side Effects**

Hallucinations, respiratory depression, elevated BP

**Induction**

2 mg/kg slow IO/IV push. May repeat bolus of 1 mg/kg every 10 minutes

**Post Intubation/Ventilation**

For mechanically ventilated patients, consider a continuous infusion of 1 mg/kg/hr, after the initial loading dose of 1 mg/kg

**Pain Management/Sedation**

0.1-0.5 mg/kg

**Sedation/Behavioral**

4 mg/kg IM

**Induction**

2 mg/kg slow IO/IV push. May repeat bolus of 1 mg/kg every 10 minutes

**Pain Management/Sedation**

0.1-0.5 mg/kg IV/IO

1 mg/kg IN

**Sedation/Behavioral**

4 mg/kg IM
Mix 1 to 1 ratio. 1mg Ketamine to 1 ml of normal saline.

<table>
<thead>
<tr>
<th>PT WEIGHT IN LBS.</th>
<th>PT WEIGHT IN KG</th>
<th>0.5mg/kg/hr ml/hr</th>
<th>1 mg/kg/hr ml/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>50</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>121</td>
<td>55</td>
<td>27</td>
<td>55</td>
</tr>
<tr>
<td>132</td>
<td>60</td>
<td>30</td>
<td>60</td>
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<tr>
<td>143</td>
<td>65</td>
<td>32</td>
<td>65</td>
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<tr>
<td>154</td>
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<td>165</td>
<td>75</td>
<td>37</td>
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<td>176</td>
<td>80</td>
<td>40</td>
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<tr>
<td>187</td>
<td>85</td>
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<td>85</td>
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<tr>
<td>198</td>
<td>90</td>
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<tr>
<td>209</td>
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<td>100</td>
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<td>100</td>
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<td>231</td>
<td>105</td>
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<td>242</td>
<td>110</td>
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<tr>
<td>253</td>
<td>115</td>
<td>57</td>
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<td>264</td>
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</tr>
<tr>
<td>275</td>
<td>125</td>
<td>62</td>
<td>125</td>
</tr>
<tr>
<td>286</td>
<td>130</td>
<td>65</td>
<td>130</td>
</tr>
<tr>
<td>297</td>
<td>135</td>
<td>67</td>
<td>135</td>
</tr>
<tr>
<td>308</td>
<td>140</td>
<td>70</td>
<td>140</td>
</tr>
</tbody>
</table>
# MEDICATION FORMULARY

## KEPRA (LEVETIRACETAM)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Keppra</strong> (Levetiracetam)</td>
<td>10 mg/kg IV/IO, up to 500mg, diluted in 100cc of Normal Saline and administered over 15 min</td>
<td>10 mg/kg IV/IO, up to 500mg, diluted in 100cc of Normal Saline and administered over 15 min</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
Seizures

**Indications**
Continued seizures after administration of a Benzodiazepine

**Contraindications**
Use with caution in pregnancy and renal impairment

**Side Effects**
Angioedema
# MEDICATION FORMULATORY

## LACTATED RINGERS

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lactated Ringers</strong> <em>(LR)</em></td>
<td>As indicated by the patient condition and situation being treated</td>
<td>As indicated by the patient condition and situation being treated</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Multiple</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Hypovolemic shock, Dehydration, Burns, Obstetrical Emergencies</td>
<td></td>
</tr>
</tbody>
</table>
### LABETALOL

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labetalol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td><strong>Eclampsia/Pre-eclampsia, stroke, aortic aneurysm, Hypertensive crisis</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td><strong>Hypertension</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td><strong>Bronchial asthma, overt cardiac failure, cardiogenic shock, bradycardia, hypotension</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td><strong>Dizziness, lightheaded, headache, nausea/vomiting, chest pain, shortness of breath, fatigue</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td>20 mg IO/IV over 2 minutes Successive increase of 20 mg may be administered every 10 minutes Maximum dose of 300 mg</td>
<td>Not indicated in current protocols</td>
</tr>
</tbody>
</table>
### MEDICATION FORMULATORY

#### LEVALBUTEROL (XOPENEX)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Levalbuterol</strong>&lt;br&gt;Xopenex</td>
<td>1.25 to 2.5 mg nebulized every 20 minutes for up to 3 doses, then 1.25 to 5 mg every 1 to 4 hours as needed</td>
<td>0.075 mg/kg/dose (minimum dose: 1.25 mg/dose) every 20 minutes for 3 doses, then 0.075 to 0.15 mg/kg/dose (maximum dose: 5 mg/dose) every 1 to 4 hours as needed</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Reactive Airway Disease</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Bronchospasm</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Hypersensitivity</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Urticaria, palpitations, dizziness, headache, chest pain, tremors, nervousness</td>
<td></td>
</tr>
</tbody>
</table>
### MEDICATION FORMULARY

#### LIDOCAINE (XYLOCAINE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lidocaine</strong> (Xylocaine)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Circulation: Alternative IV sites</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult Ventricular Fibrillation/Pulseless VT</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Pain Management for IO insertion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiac Arrest</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Known sensitivity</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypotension, decreased LOC, irritability, muscle twitching, eventually seizures</td>
<td></td>
</tr>
</tbody>
</table>

**IO Insertion**

**V-Fib/Pulseless V-Tach**

- 40 mg of 2%
- 1.5mg/kg IV/IO followed by 0.75 mg/kg, up to a max dose of 3mg/kg
- Followed by a maintenance infusion of 2-4 mg/min
- 0.5mg/kg (max dose 40 mg)
- Not indicated for pediatric arrest
# MEDICATION FORMULARY

## LORAZEPAM (ATIVAN)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lorazepam</strong> (Ativan)</td>
<td></td>
<td>0.05 – 0.1 mg/kg IM/IO/IV May repeat up to 4 mg maximum</td>
</tr>
</tbody>
</table>

**Procedure/ Protocol**
- Airway: Rapid Sequence Intubation
- Behavioral Emergencies
- Seizures

**Indications**
- Seizures and status-Epilepticus
- Conscious sedation
- Skeletal muscle relaxant
- Acute anxiety states
- Combative patients

**Contraindications**
- Respiratory depression

**Side Effects**
- Respiratory/ cardiac arrest, decreased LOC, hypotension

**Behavioral Emergencies**
- 1-2 IM/IO/IV

**RSI/ Seizures**
- 1-2 mg IM/IO/IV
  - May repeat up to 4 mg maximum
### MEDICATION FORMULARY

#### MAGNESIUM SULFATE

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
</table>
| **Magnesium Sulfate** | **Procedure / Protocol**  
Eclampsia / Pre-Eclampsia  
Premature Labor  
Pulseless V-Tach / V-Fib  
Reactive Airway Disease  
V-Tach (unstable)  | **Eclampsia / Pre-Eclampsia**  
4 grams IO/IV over 20 minutes, followed by a maintenance infusion of 2 grams/hr  | **Pulseless V-Tach / V-Fib**  
If patient is in refractory V-Tach unresponsive to Amiodarone or in Torsades de Pointes, administer 2 grams slow IO/IV push over 20 minutes  |
| **Indications** | **Torsades de Pointe**  
Digitalis induced ventricular arrhythmias  
Anticonvulsant in eclampsia  
Suspected hypomagnesium  | **Reactive Airway Disease**  
2 grams IO/IV over 10 minutes  
If patient is being transferred with Magnesium Sulfate administering, continue at current rate. If rate is > 4 grams/hr, contact receiving MD  | **Pulseless V-Tach / V-Fib**  
If patient is in refractory V-Tach unresponsive to Amiodarone or in Torsades de Pointes, administer 50 mg/kg slow IO/IV over 20 minutes  
Maximum 2 grams  |
| **Contraindications** | **Hypermagnesium**  
Hypocalcemia  
Anuria  
Heart block  
Active labor  | **Reactive Airway Disease**  
40 mg/kg IO/IV diluted in 10ml/kg NS over 15-30 minutes  |}

**Side Effects**  
Bradycardia, hypotension, hyporeflexia, diaphoresis and drowsiness, decreased respiratory rate, flaccid paralysis
# MEDICATION FORMULARY

## MANNITOL

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mannitol</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Adult/Pediatric Head and Face Trauma

**Contraindications**
- Known hypersensitivity
- Renal Disease
- Active Intracranial Bleeding
- Severe Pulmonary Edema/CHF

**Indications**
- Signs and symptoms of increased intracranial pressure, associated with cerebral edema

**Side Effects**
- Dizziness, fever, headache, seizures, angina, edema, hypotension, tachycardia, blurred vision, dehydration, urticarial, chills, thrombophlebitis, fluid and electrolyte imbalance, CHF, GI distress

1g/kg IV administered over 10 minutes. Filter must be used
# MEDICATION FORMULATORY

## METHYLПREDNISILOLONE (SOLU-MEDROL)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyпrednisolone (Solu-Medrol)</td>
<td>125 mg IO/IV</td>
<td>2 mg/kg mg IO/IV Maximum dose 125 mg</td>
</tr>
</tbody>
</table>

### Procedure / Protocol
- Circulation: Blood Administration
- Anaphylactic Shock / Allergic Reaction
- Reactive Airway Disease

### Indications
Steroid used in respiratory distress to reverse inflammatory and allergic reactions

### Side Effects
- Arrhythmias, bradycardia, headache, depression
<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metoprolol</strong> (Lopressor)</td>
<td>5mg IV bolus, may repeated two minutes apart while monitoring heart rate, BP, and EKG</td>
<td>Not currently indicated</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Acute Coronary Syndromes
- Supraventricular Tachycardia
- Hypertension

**Contraindications**
- Bradycardia
- Heart Block
- Cardiogenic Shock/Heart Failure

**Indications**
- Acute Coronary Syndromes
- Hypertension
- Tachydysrhythmias

**Side Effects**
- Hypotension, bradycardia, headache, GI discomfort, shortness of breath
# MEDICATION FORMULARY

## MIDAZOLAM (VERSED)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Midazolam</strong></td>
<td><strong>Eclampsia / Pre-Eclampsia</strong></td>
<td><strong>Eclampsia / Pre-Eclampsia</strong></td>
</tr>
<tr>
<td><strong>(Versed)</strong></td>
<td>RSI / Ventilator Use / Conscious Sedation Behavioral Emergencies / Seizures</td>
<td>RSI / Ventilator Use / Conscious Sedation Behavioral Emergencies / Seizures</td>
</tr>
<tr>
<td></td>
<td>1 – 5 mg slow IM/IO/IV</td>
<td>0.1 mg/kg IM/IO/IV</td>
</tr>
<tr>
<td></td>
<td>5-10 mg IN</td>
<td>0.2-0.25 mg IN</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Airway: Rapid Sequence Intubation
- Breathing: Use of Mechanical Ventilator
- Disability: Conscious Sedation
- Behavioral Emergencies
- Eclampsia / Pre-Eclampsia
- Seizures

**Indications**
- Seizures and status epilepticus
- Conscious sedation
- Skeletal muscle relaxant
- Acute anxiety states
- Combative patients

**Contraindications**
- Glaucoma, shock, ETOH, pregnancy, renal failure, coma

**Side Effects**
- Apnea, cardiac arrhythmias, hypotension
# MEDICATION FORMULATORY

## MORPHINE

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morphine</strong></td>
<td>0.1 mg/kg (up to 5 mg) IM/IO/IV. SBP must be &gt; 90 mm Hg. May repeat dose once to a max of 10 mg</td>
<td>0.1 mg/kg (up to 5 mg) IM/IO/IV. SBP must be &gt; 90 mm Hg. May repeat dose once to a max of 10 mg</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**

**Indications**
- Pain Management
- Pulmonary Edema

**Contraindications**
- Avoid use with hypotension
- Avoid in the presence of RV/Inferior wall MI

**Side Effects**
- Hypotension, AMS, Nausea/vomiting

*Higher doses may be required for patients with burn injuries*
**MEDICATION FORMULARY**

**NALOXONE (NARCAN)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Naloxone</strong></td>
<td>0.4-2 mg slow IM/IN/IO/IV titrated to respirations Maximum 10 mg</td>
<td>0.1 mg/kg slow IM/IN/IO/IV titrated to respirations Maximum 10 mg</td>
</tr>
<tr>
<td>(Narcan)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Poisoning / Overdose

**Indications**
- Narcotic overdose

**Side Effects**
- Vomiting with rapid administration, ventricular dysrhythmias, acute narcotic withdrawal, seizures, hypertension
## NITROGLYCERIN

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nitroglycerin</strong> (Nitro, Nitrostat, Nitro-Bid)</td>
<td><strong>Sublingual</strong> 0.4 mg repeated at 5 minutes intervals</td>
<td>Not indicated in current protocols</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Acute Coronary Syndrome CHF /Pulmonary Edema</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Chest pain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulmonary edema</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Increased ICP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypotension / Shock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glaucoma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use of Viagra, Levitra (within 24 hours) or Cialis (within 36 hours)</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Headache, dizziness, hypotension</td>
<td></td>
</tr>
<tr>
<td><strong>IV Infusion</strong></td>
<td>5 mcg/min, increasing by 5-20 mcg/min while monitoring pain and BP up to a max dose of 200 mcg/min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>See infusion table</td>
<td></td>
</tr>
<tr>
<td><strong>Topical (Paste)</strong></td>
<td>0.5-2 inches</td>
<td></td>
</tr>
</tbody>
</table>
## Nitroglycerin Infusion Chart

<table>
<thead>
<tr>
<th>Dose in mcg/min</th>
<th>50 mg/250 mL D5W 100 mg/500 mL D5W</th>
<th>25 mg/250 mL D5W 50 mg/500 mL D5W</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3 mL/hr</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>4.5</td>
<td>9</td>
</tr>
<tr>
<td>20</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>25</td>
<td>7.5</td>
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<td>30</td>
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<tr>
<td>35</td>
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<td>40</td>
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<tr>
<td>45</td>
<td>13.5</td>
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<tr>
<td>50</td>
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<td>30</td>
</tr>
</tbody>
</table>
### MEDICATION FORMULARY

**NITROPRUSSIDE (NIPRIDE)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nitroprusside</strong> (Nipride)</td>
<td>0.5-10 mcg/kg/min IO/IV titrated to goal BP</td>
<td>Not currently indicated</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Adult Hypertension, aortic dissection</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Hypersensitivity, Compensatory hypertension secondary to AV shunt or aortic insufficiency</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Headache, dizziness, hypotension, coma, dilated pupils, diaphoresis, GI distress, acidosis (cyanogens toxicity), tachycardia</td>
<td></td>
</tr>
</tbody>
</table>
# MEDICATION FORMULARY

## NOREPINEPHRINE (LEVOPHED)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Norepinephrine</strong> (Levophed)</td>
<td>2-20 mcg/min IO/IV Titrate every 3-5 minutes <em><strong>See infusion chart on following page</strong></em></td>
<td>0.1-2 mcg/kg/min Titrate every 3-5 minutes <em><strong>See infusion chart on following page</strong></em></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Asystole / PEA
- Ventricular Rhythm – Post Resuscitation
- Medical Hypotension
- Sepsis

**Indications**
- Hypotension

**Contraindications**
- Hypotension from blood volume deficits, mesenteric or peripheral vascular thrombosis

**Side Effects**
- Tissue hypoxia, bradycardia, anxiety, headache, respiratory difficulty, extravasation necrosis
**Norepinephrine**

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>7.6</td>
<td>11.2</td>
<td>15</td>
<td>18.8</td>
<td>22.6</td>
<td>26.2</td>
<td>30</td>
<td>33.8</td>
<td>37.6</td>
<td>41.2</td>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dose (mcg/min)</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>26</th>
<th>28</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate (ml/hr)</td>
<td>48.8</td>
<td>52.6</td>
<td>56.4</td>
<td>60</td>
<td>67.6</td>
<td>75</td>
<td>82.6</td>
<td>90</td>
<td>97</td>
<td>105</td>
<td>112.6</td>
</tr>
</tbody>
</table>

Mix 4 mg of Norepinephrine in 250 ml of DSW = 16 mcg/ml concentration
## ONDANSETRON (ZOFRAN)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ondansetron</strong> (Zofran)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure / Protocol</td>
<td>Nausea/vomiting</td>
<td>Pain Management</td>
</tr>
<tr>
<td>Indications</td>
<td>Nausea/vomiting</td>
<td></td>
</tr>
<tr>
<td>Contraindications</td>
<td>Patients with prolonged QT syndrome</td>
<td></td>
</tr>
<tr>
<td>Side Effects</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

- **4 mg IV or IM up to a max dose of 8 mg every 8 hours**
- **4 mg ODT**
- **0.1 mg/kg IV (max dose of 4 mg every 8 hours)**
<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pavulon</strong></td>
<td>0.1 mg/kg IV/IO</td>
<td>0.1 mg/kg IV/IO</td>
</tr>
<tr>
<td>(Pancuronium)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Rapid Sequence Intubation
- Breathing: Use of Mechanical Ventilator

**Indications**
- Facilitates endotracheal intubation by paralysis of skeletal muscle
to increase pulmonary compliance during mechanical ventilation

**Side Effects**
- Tachycardia, Hypertension, Apnea
<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pepcid</strong> (Famotidine)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Anaphylactic Shock / Allergic Reaction</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>H-2 blocker used for allergic reactions</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Fever, fatigue, arrhythmia, urticaria, depression, anxiety, tinnitus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 mg IV/IO</td>
<td>0.25-0.5 mg/kg Max dose of 20 mg</td>
</tr>
</tbody>
</table>
# MEDICATION FORMULARY

## PHENYLEPHRINE (NEO-Synephrine)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phenylephrine</strong> <em>(Neo-Synephrine)</em></td>
<td>40-180 mcg/min IO/IV</td>
<td>0.1-0.5 mcg/kg/min IO/IV</td>
</tr>
<tr>
<td><strong>Procedue / Protocol</strong></td>
<td>Adult/Pediatric Hypotension</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Hypovolemia</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Hypotension, Cardiogenic Shock, Neurogenic and Spinal Shock</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypertension, Bradycardia, Headache, Dizziness, Dysrhythmias</td>
<td></td>
</tr>
<tr>
<td><strong>Push Dose</strong></td>
<td>Push Dose: 20-200 mcg (0.5-2ml) every 2-5 min</td>
<td>Push Dose: 20-200 mcg (0.5-2ml) every 2-5 min</td>
</tr>
<tr>
<td><strong>Push Dose Pressor Procedure</strong></td>
<td><strong>See Push Dose Pressor Procedure for mixing instructions</strong></td>
<td><strong>See Push Dose Pressor Procedure for mixing instructions</strong></td>
</tr>
</tbody>
</table>
### PITOCIN (OXYTOCIN)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pitocin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(Oxytocin)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Post-partum hemorrhage

**Contraindications**
- Uterine rupture
- Incomplete delivery
- Hypertension

**Indications**
- Post-partum hemorrhage

**Side Effects**
- Hypotension
- Dysrhythmias
- Tachycardia

**Adult**
- Mix 20 units/1,000 ml of normal saline or LR.
- Administer at 20-40 milliunits/min or 120-240 ml/hr.
- If no IV access 10 units IM

**Pediatric**
- Not indicated
<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Promethazine</strong> (Phenergan)</td>
<td>12.5 mg IV diluted in 10-20 ml of normal saline, administered over 5-10 min</td>
<td>0.5mg/kg IV diluted in 10-20 ml of normal saline, administered over 10-15 min</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Nausea/Vomiting

**Contraindications**
- Lactating females, MAOI use, COPD, HTN, Pregnancy

**Indications**
- Nausea/vomiting

**Side Effects**
- Dizziness, Drowsiness

*Max dose 12.5 mg

*Do not administer less than 2 years of age
# MEDICATION FORMULARY

## PROPOFOL (DIPRIVAN)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Propofol</strong> (Diprivan)</td>
<td>5-200 mcg/kg/min Start at 5-10 mcg/kg/min and titrate up by 5-10 mcg/kg/min every 5-10 min</td>
<td>5-200 mcg/kg/min Start at 5-10 mcg/kg/min and titrate up by 5-10 mcg/kg/min every 5-10 min</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>NO BOLUS ALLOWED</td>
<td>NO BOLUS ALLOWED</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Hypotension, hypersensitivity</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Sedation of mechanically ventilated patients.</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypotension</td>
<td></td>
</tr>
</tbody>
</table>
# MEDICATION FORMULATORY

## RACEMIC EPINEPHRINE (VAPONEPHRINE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Racemic Epinephrine</strong></td>
<td>Not indicated in protocols</td>
<td>2.25% Solution in 0.5cc, dilute with 3cc normal saline in nebulizer</td>
</tr>
<tr>
<td><em>(Vaponephrine)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Reactive Airway</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronchospasm in bronchiolitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stridor at rest in croup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspected epiglottitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachycardia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palpitations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

### REGLAN (METOCLOPRAMIDE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reglan</strong> (Metoclopramide)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Pediatric/Adult Nausea/Vomiting

**Indications**
- Nausea/Vomiting

**Contraindications**
- Hypersensitivity, phenochromocytoma, seizures, GI bleeding, GI obstruction

**Side Effects**
- Dystonic reaction, seizures, hallucinations, CHF, hypertension, SVT, dizziness, hypotension, diarrhea, rash, laryngospasm, hepatic toxicity

**Adult**
- 5-10 mg IO/IV Diluted in 10 ml of normal saline every 6-8 hours
- 5-10 mg IM

**Pediatric**
- 0.1-0.2 mg/kg IO/IV Diluted in 10cc of normal saline, up to 10 mg every 6-8 hours
- 0.1-0.2 mg/kg IM
### MEDICATION FORMULARY

**ROCURONIUM (ZEMURON)**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rocuronium</strong> (Zemuron)</td>
<td>1 mg/kg IO/IV Maximum dose of 100 mg</td>
<td>1 mg/kg IO/IV Maximum dose of 100 mg</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
- Airway: Rapid Sequence Intubation
- Breathing: Use of Mechanical Ventilator

**Indications**
- Facilitates endotracheal intubation by paralysis of skeletal muscle to increase pulmonary compliance during mechanical ventilation

**Side Effects**
- Hypotension, hypertension, increased pulmonary vascular resistance
## MEDICATION FORMULARY
### 3% SALINE (HYPERTONIC SALINE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3% Saline</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hypertonic Saline)</td>
<td>250 ml IV/IO</td>
<td>5 ml/kg IV/IO</td>
</tr>
</tbody>
</table>

**Procedure / Protocol**
Head Trauma

**Indications**
Increased intracranial pressure with suspected herniation

**Contraindications**
Patients without suspected cerebral edema

**Side Effects**
Dehydration
### MEDICATION FORMULARY

#### SODIUM BICARBONATE (NaHCO3)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sodium Bicarbonate</strong> (NaHCO3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Asystole / PEA</td>
<td>Asystole / PEA / V-Tach / V-Fib</td>
</tr>
<tr>
<td></td>
<td>Musculoskeletal Trauma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poisoning / Overdose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulseless V-Tach / V-Fib</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Severe metabolic acidosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiac arrest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hyperkalemia</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Hypokalemia</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Metabolic alkalosis,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increased vascular volume,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pulmonary edema,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dysrhythmias through serum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>potassium depletion,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>transient raises the arterial</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCO2</td>
<td></td>
</tr>
<tr>
<td><strong>Asystole / PEA / V-Tach / V-Fib</strong></td>
<td>1 mEq/kg IO/IV</td>
<td>1 mEq/kg IO/IV</td>
</tr>
<tr>
<td></td>
<td>Max of 50 mEq</td>
<td>Max of 50 mEq</td>
</tr>
<tr>
<td><strong>Crush Injury</strong></td>
<td>1 mEq/kg IO/IV in 1 liter of NS over 30 minutes.</td>
<td>1 mEq/kg IO/IV</td>
</tr>
<tr>
<td></td>
<td>Max of 50 mEq</td>
<td>Max of 50 mEq</td>
</tr>
<tr>
<td><strong>Poisoning / Overdose</strong></td>
<td>1 mEq/kg IO/IV (especially if HR &gt; 100, QRS &gt; 0.12 secs, or &lt; 70 mm Hg)</td>
<td>1 mEq/kg IO/IV</td>
</tr>
<tr>
<td></td>
<td>Max of 50 mEq</td>
<td>Max of 50 mEq</td>
</tr>
<tr>
<td>Age &lt; 2 years: Must be diluted 1:1 with D5W or NS prior to administration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

### SODIUM CHLORIDE (NORMAL SALINE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sodium Chloride</strong></td>
<td><strong>IV/IO dependent upon patient condition and situation being treated</strong></td>
<td><strong>IV/IO dependent upon patient condition and situation being treated</strong></td>
</tr>
<tr>
<td><em>(Normal Saline)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Multiple</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Heat exhaustion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diabetic disorders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freshwater drowning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Head injury</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hypovolemia</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Congestive Heart Failure</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Volume overload, congestive heart failure, diuresis, thirst</td>
<td></td>
</tr>
</tbody>
</table>
# Medication Formulary
## Succinylcholine (Anectine)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Succinylcholine</strong></td>
<td>2 mg/kg IO/IV over 30 seconds&lt;br&gt;Maximum dose of 200 mg</td>
<td>2 mg/kg IO/IV over 30 seconds&lt;br&gt;Maximum dose of 200 mg</td>
</tr>
<tr>
<td>(Anectine)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Procedure / Protocol
Airway: Rapid Sequence Intubation

### Indications
Skeletal muscle relaxation
Facilitate management of patients undergoing mechanical ventilation

### Contraindications
Malignant hyperthermia
Skeletal muscle myopathies
Penetrating eye injury

### Side Effects
Cardiac arrhythmias, increased intraocular pressure, muscle fasciculation
## MEDICATION FORMULARY

### TERBUTALINE (Brethine)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Terbutaline</strong> (Brethine)</td>
<td>Pre-term labor 0.25 mg subcutaneous every 20 min to a max dose of 1 mg in 4 hrs</td>
<td>Not currently indicated</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Term labor</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premature labor</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypersensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tremors, anxiety, tachycardia, palpitations, drowsiness, nausea/vomiting, diaphoresis, muscle cramps</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Thiamine (Vitamin B1)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiamine</td>
<td>100 mg Intramuscular</td>
<td>Not currently indicated</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Diabetic Emergencies</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>- Vitamin B1 Deficiency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Wernicke-Korsakoff Syndrome</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Chronic Alcohol Abuse</td>
<td></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>Hypersensitivity</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Weakness, restlessness</td>
<td></td>
</tr>
</tbody>
</table>
## MEDICATION FORMULARY

# TICAGRELO

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ticagrelor</strong></td>
<td>180 mg PO</td>
<td>Not indicated</td>
</tr>
<tr>
<td><em>(Brilinta)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Procedure/Protocol**
- Acute Coronary Syndromes

**Indications**
- Confirmed STEMI

**Contraindications**
- History of intracranial hemorrhage
- Active bleeding
- Severe Hepatic Impairment
## MEDICATION FORMULARY

### TORADOL (KETOROLAC)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toradol</td>
<td>15-30 mg IV/IO/IM</td>
<td>0.5 mg/kg IV/IO/IM, up to a max dose of 30 mg</td>
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<tr>
<td>(Ketoralac)</td>
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</tbody>
</table>

**Procedure / Protocol**
- Pain Management

**Indications**
- Pain Management in Isolated hip or extremity trauma, burns, renal colic, musculoskeletal pain

**Contraindications**
- Hypersensitivity,
- NSAID/Ibuprofen use in 24 hrs, CVA/TBI in last 24 hrs, anticoagulation therapy, active bleeding, GI bleeding

**Side Effects**
- Bleeding, GI discomfort
### Tranexamic Acid (TXA) (Cyklokapron)

**Procedure/Protocol**
- Blood Products Administration

**Indications**
- Patient > 18 years
- Signs and symptoms of severe hemorrhage (internal or external)
- Hemodynamic Instability: SBP < 90, Pulse rate > 110 bpm, Respiratory rate > 24 breaths per minute, evidence of peripheral vasoconstriction
- Duration from initial injury is less than 180 min

**Contraindications**
- Time of initial traumatic injury > 180 min, patients who have contraindications to antifibrinolytic therapy agents, and medical control discretion

**Adult**
- Mix 1 gram of TXA in 100 ml of normal saline and administer over 10 min

**Pediatric**
- Not indicated for patients less than 18 years of age
### MEDICATION FORMULARY

#### VECURONIUM BROMIDE (NORCURON)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vecuronium Bromide</strong> (Norcuron)</td>
<td>0.1 mg/kg IO/IV over 30 – 60 seconds</td>
<td></td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>Airway: Rapid Sequence Intubation</td>
<td>Maximum dose of 10 mg</td>
</tr>
<tr>
<td></td>
<td>Breathing: Use of Mechanical Ventilator</td>
<td></td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td>Facilitates endotracheal intubation by paralysis of skeletal muscle</td>
<td>Maximum dose of 10 mg</td>
</tr>
<tr>
<td></td>
<td>To increase pulmonary compliance during mechanical ventilation</td>
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</tr>
</tbody>
</table>
# VITAMIN K1 (PHYTONADIONE)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Adult</th>
<th>Pediatric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vitamin K1</strong> <em>(Phytonadione)</em></td>
<td>2-10mg IM/SC</td>
<td>1-2mg IM/SC</td>
</tr>
<tr>
<td><strong>Procedure / Protocol</strong></td>
<td>2.5-10 mg diluted in 50 ml of 0.9% saline or D5W, administered over 20 min</td>
<td>30 mcg/kg diluted in 50 ml of 0.9% saline or D5W, administered over 20 min</td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reversal of Warfarin (Coumadin) overdose</td>
<td></td>
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<tr>
<td>Major bleeding with elevated INR</td>
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<tr>
<td>Intracranial hemorrhage with elevated INR</td>
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<tr>
<td><strong>Contraindications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypersensitivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachycardia, dizziness, sweating</td>
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<td></td>
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<tr>
<td>Prolonged Warfarin (Coumadin) reversal</td>
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<tr>
<td><strong>Contact OLMD</strong></td>
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