



2017 Pediatric Care Protocols

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ACLS-Pediatric Bradycardia

Note:

- Hypoxia is the # 1 cause of bradycardia in children < 8 years of age.
- Maintain adequate oxygenation and ventilation
- Bradycardia may also be caused by allergic reactions, hypothermia, vagal stimulation, increased intracranial pressure and medication ingestion or poisoning.

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	Weakness, unresponsiveness,
OPQRST	Determine onset of symptoms along with possible causes.
Associated Symptoms/ Pertinent Negatives	Respiratory distress, chest pain, nausea, vomiting, headache, decreased mental status, coma/unresponsiveness
SAMPLE	Patient with past respiratory or cardiac event history, current medications and compliance, exposure to family member medications.
Initial Exam	Assess ABCs. Check for/relieve foreign body obstruction, support airway and breathing as necessary.
Detailed Focused Exam	<p>General Appearance: Somnolent, flaccid or poor muscle tone. Look for signs of poisoning.</p> <p>Skin: Cool, pale, gray, mottled, or cyanotic?</p> <p>Respiratory Effort: May be normal or signs of distress, ie: subcostal and intercostal retractions, sternal retraction, nasal flaring, etc.</p> <p>Lung Sounds: May be diminished or sound “wet”</p> <p>Heart Sounds: Normal, except in some cases of cardiac disease</p> <p>Extremities: Poor muscle tone, weak or no pulses, poor capillary refill</p> <p>Neuro: ALOC, unresponsive</p>
Goals of Therapy	Increase heart rate and restore normal perfusion, oxygenation and ventilation
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER (EMR)

- Routine Medical Care
- Maintain normal body temperature
- Apply oxygen
 - If signs of hypoventilation are present, assist ventilation with a BVM and high-flow oxygen
- If hypoxic with good ventilatory effort, titrate oxygen therapy to the lowest level required to maintain an oxygen saturation greater than 93%
 -
 - If the child does not tolerate a mask, give oxygen via blow-by or nasal cannula
 - Use airway adjuncts as needed.
- Begin chest compressions if bradycardia and signs of inadequate perfusion persist after oxygen therapy.

EMERGENCY MEDICAL TECHNICIAN (EMT) / ADVANCED EMT (AEMT)

- Continue airway support; avoid use of non-visualized airways
- CPR until heart rate maintains >60 and adequate perfusion evident.
- Assess blood glucose level. If glucose <60 mg/dL see *Pediatric Hypoglycemia Guidelines*
- **Consider IV/IO NS @ TKO**
- **12 Lead EKG or Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**

Contact Medical Control for the following:

Additional orders

INTERMEDIATE

- Establish IV/IO, NS @ TKO
 - If signs of hypovolemia or inadequate perfusion are present, give an initial bolus of NS 20 ml/kg.
- Consider endotracheal intubation if unable to maintain an airway or in respiratory failure
- If airway and breathing are adequate, and temperature is normal, but heart rate is still <60
 - Give **Epinephrine** 0.01 mg/kg (0.1 ml/kg 1:10,000) IV/IO (preferred)
 - May repeat every 3-5 min
 - Maximum single dose 1 mg

Contact Medical Control for the following:

- Additional fluid orders
- Consider Atropine (0.1 mg/ml)
 - If vagal tone is increased or AV block present
 - 0.02 mg/kg; minimum dose 0.1mg (1 ml) give fast IVP
 - Max dose 1 mg from 6 months to 8 years; 2 mg over 8 years
- Repeat doses of Epinephrine and/or Atropine
- If bradycardia persists, despite the above measures, initiate external transcutaneous pacing at 100 per minute.
- Epinephrine administration by ET if IV/IO not available
 - 0.1 mg/kg (0.1 ml/kg Epinephrine 1:1,000)

- Additional pacing orders

PARAMEDIC

- Consider transcutaneous pacing using pediatric pads, set rate at 100 – 120
- Sedation orders as needed for pacing
- Consider **Atropine** (0.1 mg/ml)
 - 0.02 mg/kg; minimum dose 0.1mg (1 ml) give fast IVP
 - Max dose 1 mg from 6 months to 8 years; 2 mg over 8 years

Contact Medical Control for the following:

- Additional orders



ACLS-Pediatric SVT

Note:

- This protocol pertains to unstable children or those suspected of deterioration at any time. Stable children should be transported for evaluation.
- Remember children have higher underlying heart rates, a thorough history of events is very important
- AHA suggests pulse rates for SVT are >180 for ages 1-8 years and >220 for ages newborn – 1 year.
- History of the complaint is the key. SVT symptoms usually show a normal child suddenly deteriorating with minimal or no history of other recent illness or injury

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	Weakness, any altered LOC, signs of inadequate perfusion
OPQRST	Determine onset of symptoms along with possible causes.
Associated Symptoms	Respiratory distress, chest pain, nausea, vomiting, poor capillary refill
SAMPLE	Patient with known congenital heart defects, respiratory insufficiencies and current medications.
Initial Exam	Assess ABCs, support airway and breathing as necessary.
Detailed Focused Exam	<p>General Appearance: Somnolent, flaccid or poor muscle tone.</p> <p>Skin: Cool, pale or gray.</p> <p>Respiratory Effort: May be normal or signs of distress, ie: sub and intercostals retractions, nasal flaring, etc.</p> <p>Lung Sounds: May be diminished or sound “wet” due to poor cardiac output.</p> <p>Heart Sounds: difficult to hear due to poor cardiac output.</p> <p>Extremities: Poor muscle tone, weak or no pulses, mottled, poor capillary refill</p> <p>Neuro: ALOC, unresponsive</p>
Goals of Therapy	Decrease heart rate and restore normal perfusion
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER (EMR)

- Routine Medical Care, maintain normal body temperature
- Titrate oxygen therapy to the lowest level required to maintain an oxygen saturation greater than 93%
- Assist ventilations as necessary
- Use airway adjuncts as needed.

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Continue airway support as needed using airway adjuncts
- Assess blood glucose level, if approved. If glucose <60 see *Pediatric Hypoglycemia Guidelines*
- Cardiac monitor as needed
- **12 Lead EKG or Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**

ADVANCED EMT (AEMT)

- IV/IO access as needed

INTERMEDIATE

- Attempt valsalva maneuvers as able by child, ie; forceful cough, cold packs on face and neck, or blow through a straw
- Establish IV/IO NS. Do not withhold IO if unable to start IV promptly and child is unstable
- If unable to maintain airway, consider endotracheal Intubation
- If child is rapidly deteriorating perform immediate synchronized cardioversion at 0.5J/kg. Consider pain management or sedation
- If time allows may try **Adenosine** first at 0.1mg/kg IV or IO, being sure to administer rapidly and follow with a rapid fluid flush. During administration, record a rhythm strip.

Contact Medical Control for the following:

- Repeat doses of Adenosine

PARAMEDIC

Sedation prior to cardioversion with **Versed** 0.1mg/kg IV/IO

Contact Medical Control for the following:

- Possible use of Amiodarone



ACLS-Pediatric Wide Complex Tachycardia

Note:

- Wide complex rhythms have a QRS duration > 0.09 sec
- Although some wide complex tachycardias develop from supraventricular tachycardias, prehospital providers should always assume that wide complex rhythms are ventricular tachycardia (VT), particularly if the patient is unstable.
- Because all arrhythmia therapies have the potential for serious adverse effects, children who are hemodynamically stable should not have rhythm directly treated

Priorities	Assessment Findings
Chief Complaint	Palpitations, fast heart rate, shortness of breath, chest pain, weakness, syncope, cardiac arrest/pulseless non-breather
OPQRST	Onset and duration, precipitating factors and circumstances, associated symptoms, stroke symptoms, nausea vomiting
Associated Symptoms	Chest pain, shortness of breath, weakness, anxiety, leg swelling
SAMPLE	<ul style="list-style-type: none"> • Previous history, history of thyroid disease, CAD, Cardiac Medications • Obtain history of previous episodes of tachycardia, including diagnoses if known. Pay particular attention to whether there is an underlying history of pre-excitation, including the Wolff-Parkinson-White (WPW) Syndrome. • Obtain history of what medications have been used to treat previous arrhythmias, if known. • Obtain history of any previous complications from previous arrhythmia treatments, if known. • Obtain history of the duration of the current episode of tachycardia, if known.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	General Appearance: ill-appearing? Skin: Cool, pale diaphoretic Neck: JVD? Chest: Labored breathing Lungs: Wheezes, rales, rhonchi? Decreased breath sounds? Heart: Regular, rate fast or slow, murmur Legs: Edema Neuro: ALOC?
Goals of Therapy	Decrease rate, improve perfusion, treat chest pain, treat CHF
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER (EMR) /

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Routine Medical Care
- Ensure an adequate airway.
- Titrate oxygen therapy to the lowest level required to maintain an oxygen saturation greater than 93%
- If the patient is having difficulty breathing allow them to find a position of comfort
- If the patient becomes unresponsive, pulseless and non-breathing, follow the *Pediatric Cardiac Arrest Guidelines*.
- If the patient also experiences signs of respiratory distress or inadequate breathing, follow the *Pediatric Respiratory Distress Guidelines*
- **Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**

ADVANCED EMT (AEMT)

- IV/IO NS @ TKO
- If SPB < 100 mmHg give 20 ml/kg fluid bolus, then reassess
- 12 Lead EKG if possible.

Contact Medical Control for the following:

- Additional fluid orders

INTERMEDIATE / PARAMEDIC

- Monitor the heart rhythm
 - Identify a wide complex rhythm (QRS > 0.09 sec)
- If the patient has no palpable pulses, proceed according to the *Pediatric Cardiac Arrest Guidelines*
- Evaluate the perfusion status
 - If the patient has good perfusion prepare for transport

Contact Medical Control for the following:

- Consultation about rhythm analysis
- If the patient is has signs of poor perfusion
 - Prepare to perform synchronized cardioversion
 - Perform first synchronized cardioversion @ 0.5 – 1 J/kg
 - If unsuccessful, increase to 2 J/kg for the second shock
 - If unsuccessful, consider Amiodarone 5mg/kg over 20-60 min or Lidocaine 1 mg/kg IV/IO.
- If the patient maintains adequate perfusion, further treatment can be safely delayed until the patient arrives in the emergency department.



Pediatric Allergy & Anaphylaxis

Note:

- Allergic reactions span a continuum from minor to life threatening.
- If due to a bee sting, remove stinger promptly.
- If anaphylactic shock is present, treat for shock and maintain warmth. Administer IM Epinephrine ASAP.
- Angioedema with significant swelling of the tongue increases the risk of obstructed airway.
- IV epinephrine should be used with caution, because of the risk of inducing dysrhythmias. In moderate to severe allergy and anaphylaxis, there is no contraindication to epinephrine.

Priorities	Assessment Findings
Chief Complaint	"Allergic Reaction", "Hives" "Itching Rash"
OPQRST	What provoked the reaction? Food, medication, sting, bite, contact? Has the patient taken or been given diphenhydramine (Benadryl) or used an epinephrine auto-injector (EpiPen), and how did they respond?
Associated Symptoms/ Pertinent Negatives	Subjective swelling of facial, oral or pharyngeal structures, difficulty breathing, wheezing, stridor, itching, light headedness and changes in mental status (agitation or lethargy).
SAMPLE	Does the patient have any environmental, medication, food or other allergies? Is the patient taking an antibiotic or other medication? Has the patient had a reaction in the past? If so, how severe?
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	<p>General: Identify degree of severity: mild, moderate or severe.</p> <p>Skin: Urticaria (hives), Cyanosis?</p> <p>HEENT: Swelling of the lips, tongue or pharynx (angioedema)</p> <p>Chest: Sternal, subcostal or intercostal retractions? Use of accessory muscles of respiration, labored breathing?</p> <p>Lungs: Wheezing, stridor</p> <p>Cardiovascular: Hypotension, tachycardia, delayed capillary refill</p> <p>Neurological: ALOC</p>

Goals of Therapy	Relieve bronchospasm, maintain ventilation and circulation, reverse the allergic reaction.
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER (EMR)

- Oxygen for difficulty breathing
- If loss of consciousness and gag reflex is absent, consider airway adjuncts. See *Pediatric Respiratory Distress Guidelines*.
- If authorized, immediately administer **Epi Pen Jr** 0.15mg or Draw up 0.15mg (0.15ml) **Epinephrine 1:1000** for IM injection **-OR-** **Epi Pen** 0.3 mg IM or Draw up 0.3mg (0.3ml) **Epinephrine 1:1000** for IM injection if 8 years or older for signs of shock and/or difficulty breathing.
- Nebulizer Therapy:
 - If authorized, **Albuterol** Unit Dose (2.5 mg in 3 ml) administer per hand held nebulizer or mask for wheezing or difficulty breathing. May repeat X 2 additional doses.

EMERGENCY MEDICAL TECHNICIAN (EMT)

- **Epinephrine** 0.01mg/kg (1:1000) IM; max dose 0.3 mg (0.3ml) or **Epi Pen/Epi Pen Jr**
- Assist with patient-prescribed medications.
 - **Albuterol** for wheezing or difficulty breathing
- Nebulizer Therapy:
 - **Albuterol** Unit Dose (2.5 mg in 3 ml) administer per hand held nebulizer or mask, if approved. May repeat X 2 additional doses.
- **Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**

Contact Medical Control for the following:

- Additional doses of **Epinephrine** or **Albuterol**

ADVANCED EMT (AEMT)

- For Anaphylaxis or hypotension, establish IV/IO. Administer fluid bolus at 20mL/kg.

Contact Medical Control for the following:

- Additional doses of **Albuterol**
- Additional fluid orders

INTERMEDIATE

- If loss of consciousness and no gag reflex, consider non-visualized airway or endotracheal intubation
- **Epinephrine** 0.01mg/kg (1:1000) max 0.5 mg IM for moderate to severe reactions. Repeat every 10-15 minutes x 2 if patient is not improving, or as ordered per Medical Control.

Contact Medical Control for the following:

- Additional Doses of **Epinephrine** IM
- For severe reactions: **Epinephrine IV/IO** 0.01mg/kg (1:10,000) max single dose 0.1mg (1ml) repeat every 5-10 minutes as ordered by Medical Control.

PARAMEDIC

- **Benadryl** 1 mg/kg IM/IV/IO for mild, moderate or severe reactions
- **Solu-Medrol** 2 mg/kg IV/IO for moderate to severe reactions

Contact Medical Control for the following:

- For severe reactions: **Epinephrine IV/IO** 0.01mg/kg (1:10,000) max single dose 0.1mg (1ml) repeat every 5-10 minutes as ordered by Medical Control.



PEDIATRIC ASTHMA

(Includes Reactive Airways Disease and Bronchospasm)

Note:

- Asthma is usually a disease that develops in childhood. There is usually an identifiable trigger, like infection, weather changes or exposure to certain allergens (e.g., dogs, pollen, smoking, etc.).
- The so-called classic triad of dyspnea, cough and wheezing may not always be present.
- Patients with a history of near fatal asthma or have had prior admissions to an ICU are at increased risk of recurrent severe attacks and asthma-related death.
- Remember: *“All that wheezes are not asthma!”*
- The absence of wheezing may be indicative of extreme airflow obstruction.

Priorities	Assessment Findings
Chief Complaint	Difficulty breathing, shortness of breath, coughing
OPQRST	Determine onset, duration and progression, triggering events, response to treatment at home, and subjective severity
Associated Symptoms/ Pertinent Negatives	Chest pain, fever/chills, cough/productive of what, recent changes in sputum color. Consider other possibilities such as croup, allergic reaction, foreign body ingestion, etc.
SAMPLE	Exposure to a known allergen. History of asthma or previous bronchospasm. Current or past medications for these problems (e.g., albuterol, Atrovent, Advair, prednisone, antibiotics). Compliance with these medications recently.
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	<p>General Appearance: Tripod positioning, purse-lipped breathing? Severity of distress?</p> <p>Skin: Cool, moist and pale? Warm, dry and flushed? Urticaria? Cyanosis?</p> <p>Respiratory Effort: Using accessory muscles, signs of fatigue; two-word sentences?</p> <p>Lung Sounds: Wheezes, rales, rhonchi or stridor? Decreased or absent lung sounds? Prolonged expiratory phase? Absence of wheezing?</p> <p>Heart Sounds: Rate, regularity?</p> <p>Neuro: ALOC, lethargy, somnolence, agitation?</p>
Goals of Therapy	Improve oxygenation and ventilation; reduce distress.
Monitoring	BP, HR, RR, EKG, SpO ₂ , serial auscultation of the chest.

EMERGENCY MEDICAL RESPONDER (EMR)

- Routine Medical Care
- Allow/assist the patient to assume a position of comfort (usually upright).
- Oxygen
- Assisted Ventilation. Support ventilation with BVM if apnea or hypopnea occurs.
- Airway Adjuncts: If there is loss of consciousness and no gag reflex, insert an oropharyngeal or advanced airway, if approved. Use a nasopharyngeal airway with gag reflex.

EMERGENCY MEDICAL TECHNICIAN (EMT) (Standing Orders)

- Assist with patient-prescribed medications
 - **Albuterol** with or without **Atrovent** MDI 2 Puffs, if approved.
- Nebulizer Therapy:
 - **Albuterol** Unit Dose (2.5 mg in 3 ml) administer per hand held nebulizer or mask
 - May repeat X 1 additional doses.
 - Consider **Atrovent** (0.5mg in 3ml)
- **12 Lead EKG or Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**

Call for Orders:

- More than 1 doses of **Albuterol/Atrovent**
- Continuous **Albuterol** nebulizer treatments 3 unit doses back to back

ADVANCED EMT (AEMT) (Standing Orders)

- Continue with airway support and medications as directed
- Consider IV/IO NS @ TKO
- *Continuous **Albuterol** nebulizer treatments 3 unit doses back to back.*

Call for Orders:

- **Epinephrine IM** 0.01mg/kg (1:1000) max dose 0.5mg

INTERMEDIATE

- Consider IV NS @ TKO
- For severe asthma, consider **Epinephrine IM** 0.01mg/kg (1:1000) max dose 0.5mg

Contact medical control for the following:

- Repeat **Epinephrine IM** if the signs of severe distress continue after 10 minutes.

PARAMEDIC

- Advanced airway as indicated
- Consider **Solu-Medrol** 2 mg/kg IV max 125 mg

Contact Medical Control for the following:

- Additional doses of these medications appear to be needed.
- For refractory asthma: **Epinephrine IV** 0.01mg/kg (1:10,000) max single dose 0.1mg repeat every 5 – 10 minutes as ordered by Medical Control.
- Consider **Magnesium Sulfate** IV 50 mg/kg max 2 g over 10 minutes



Pediatric Cardiac Arrest

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	Collapsed, unresponsive, no pulse, not breathing
OPQRST	Witnessed? Estimated down time. Circumstances/trauma. Location of patient. Antecedent symptoms/signs (chest pain, difficulty breathing). Environmental factors, medication-related problems or overdose.
Associated Symptoms/ Pertinent Negatives	Bystander-initiated CPR. Pre-arrival CPR instructions from dispatch? Public access AED use. Drowning – warm or cold water.
SAMPLE	Does the patient have any allergies to medications? History of heart disease or surgery? Current cardiac medications?
Initial Exam	Establish Unresponsiveness. Check ABCs. Open or reposition airway.
Detailed Focused Exam	<p>General: Identify unresponsiveness. Look for rigor mortis, dependent lividity, or unsurvivable trauma. Skin: Warm/cold, dependent lividity, rash, ecchymosis?</p> <p>HEENT: Airway patent, foreign bodies, neck swelling or trauma, trachea in midline? Pupillary responses present?</p> <p>Chest: Spontaneous respirations, subcutaneous air or crepitation, or deformity?</p> <p>Lungs: Equal breath sounds, difficulty bagging or ventilating?</p> <p>Cardiovascular: Absence of heart sounds, brachial, carotid, or femoral pulses?</p> <p>Abdomen: Distended?</p> <p>Extremities: Rigor mortis, edema, deformity?</p> <p>Neurological: Unresponsive to verbal and painful stimulation? GCS</p>
Goals of Therapy	Return of spontaneous circulation and intact neurologic function
Monitoring	BP, HR, RR, EKG, SpO ₂ , ETCO ₂

EMERGENCY MEDICAL RESPONDER (EMR) /

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Establish that the patient is unresponsive, without a pulse, and not breathing
- Check for indications to withhold CPR.
- Initiate Resuscitation:
 - Follow *American Heart Association Guidelines* for use of the AED.
- Perform Effective Chest compressions
 - Push hard and fast
 - Allow for complete chest recoil
- Manage the airway
 - Head tilt/chin lift (jaw thrust if c-spine injury suspected)
 - Oropharyngeal or advanced airway as needed
 - Do not interrupt compressions to do this, unless absolutely necessary.
 - Ventilate per *American Heart Association Guidelines*
 - If there is ROSC, provide the following supportive interventions:
 - Oxygen by non-rebreather mask or bag-valve-mask
- 12 Lead EKG or Cardiac Monitor
- Rapid Transport
- Paramedic Intercept

ADVANCED EMT (AEMT)

- Initiate IV/IO NS without interrupting CPR, if approved. Run the IV/IO wide open.
- Consider pressure infusion via I/O

Contact Medical Control for the following:

- Additional orders

INTERMEDIATE / PARAMEDIC

- Direct EMRs and EMTs to continue CPR.
- If an advanced airway is not already in place, consider placement without interrupting CPR.
- Initiate cardiac rhythm monitoring and analysis.
- Initiate IO if IV not established
 - Medication administration routes in order of preference: IV – IO – ET
- Proceed to ACLS resuscitation medications according to the respective protocols for:
 - Asystole/Pulseless Electrical Activity
 - Ventricular Fibrillation/Pulseless Ventricular Tachycardia (VF/PVT)
- Asystole/PEA
 - If Asystole appears on the monitor, confirm true asystole
 - Check on/off switches
 - Check leads
 - Check gain and sensitivity settings
 - Confirm asystole in 2 or 3 leads
 - Identify and correct reversible causes: The Six H's and the Five T's
 - This applies mostly to PEA, but to a lesser extent, asystole, as well.
 - The Six H's
 - Hypovolemia
 - Rapid infusion of Normal Saline 20 ml/kg IVP followed by another 20 ml/kg IVP, if refractory
 - Hypoxia

- Administer high-flow oxygen and perform ventilation: do not hyperventilate
- Hydrogen Ion, i.e. acidosis
 - Perform ventilation, EMT-P: Consider **Sodium Bicarbonate** 1 mEq/kg IV
- Hyperkalemia
 - EMT-P: Consider 20mg/kg **Calcium Chloride** 10% IV over 2 – 5 minutes. May repeat x1
 - EMT-P: Consider **Sodium Bicarbonate** 1 mEq/kg IV
 - Consider **Lasix** 1 mg/kg IV if ROSC
 - EMT-I/P: **Albuterol** nebulizer treatment with 1 – 2 unit doses
- Hypokalemia
 - Even if hypokalemia is suspected, it is not treated in the field.
- Hypothermia
 - See *Hypothermia and Frostbite Guidelines*
- Hypoglycemia
 - Follow *Pediatric Hypoglycemia Guidelines*
- The Five T's
 - Tablets
 - See *Toxic Exposure & Overdose Guidelines*
 - Tamponade
 - EMT-P: Pericardiocentesis
 - Tension pneumothorax
 - Perform needle decompression
 - Thrombosis, cardiac i.e. myocardial infarction
 - No specific prehospital treatment available
 - Thrombosis, pulmonary i.e. pulmonary embolism
 - No specific prehospital treatment available
- **Epinephrine** (1:10,000) 0.01mg/kg IV/IO every 3-5 minutes -or-
- **Epinephrine** (1:1000) 0.1mg/kg ET in 10cc saline every 3 – 5 minutes
- **VFib/Pulseless VT**
 - Defibrillate 2J/kg
 - Resume CPR immediately for 2 minutes
 - Defibrillate at 4J/kg
 - Resume CPR immediately for 2 minutes
 - **Epinephrine** 0.01mg/kg IV/IO every 3-5 minutes or 0.1mg/kg ET
 - If VT/VF persists, defibrillate at 4J/kg every 2 minutes with continuous CPR between defibrillation
 - Anti-arrhythmics
 - **Amiodarone** 5mg/kg IV bolus; (max single dose 300mg)
 - May repeat twice (max total dose 450mg) or-
 - **Lidocaine** 1mg/kg (max 100mg).
 - May repeat in 5-10 minutes x2 up to 3mg/kg
 - If converted, start infusion 20-50mcg/kg/min
 - **Magnesium Sulfate** 50mg/kg IV bolus for Torsades de Pointe
 - If chronic dialysis patient and suspected hyperkalemia
 - EMT-P: Consider **Calcium Chloride** 20mg/kg IV
 - EMT-P: Consider **Sodium Bicarbonate** 1mEq/kg IV
 - If patient has taken a calcium blocking agent such as Verapamil, Nifedipine, or Diltiazem
 - EMT-P: Consider **Calcium Chloride** 20mg/kg IV
 - EMT-P: Consider Glucagon 0.1mg/kg (max 1mg) IV

Contact Medical Control for the following:

- Additional orders



Pediatric Hyperglycemia

Note:

- Most pediatric patients with hyperglycemia have diabetic ketoacidosis (DKA), which is a life-threatening complication of diabetes that includes severe dehydration and metabolic acidosis.
- Sodium bicarbonate is contraindicated.
- In children, the parents may not know the child has diabetes before the first episode of DKA.
- The first clues of new onset diabetes may be excessive thirst or urination, including inappropriate wetting (e.g. wetting the bed or wetting pants).

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	“High blood sugar,” Breathing Fast, Vomiting, Abdominal Pain, “Diabetic Coma”
OPQRST	Check onset/duration of symptoms. Identify possible contributing factors.
Associated Symptoms/ Pertinent Negatives	Fever/Chills. Signs/Symptoms of infection. Polyuria, Polydipsia, Polyphagia, Adequate food and water intake? Increasing thirst? Increasing urine output?
SAMPLE	Known history of Diabetes. Medications for diabetes.
Initial Exam	ABCs and correct any immediately life-threatening problems.
Detailed Focused Exam	<p>General Appearance: Appears sick? Dehydrated? Kussmaul’s Respirations? Smell of Acetone on breath.</p> <p>Heart: Tachycardia? Hypotension?</p> <p>Resp: Rapid Respiration</p> <p>GI: Diffuse Abdominal Tenderness</p> <p>Skin: Cool, pale, diaphoretic? Warm, dry, flushed? Tenting?</p> <p>Neuro: ALOC? Focal deficits (CVA)?</p>
Goals of Therapy	Use IV fluids to reduce glucose level, improve hydration, improve acid-base balance. Transport to hospital for insulin therapy to treat acidosis. Monitor for cerebral edema.
Monitoring	BP, HR, RR, EKG, SpO ₂ , repeat glucose, neuro checks

EMERGENCY MEDICAL RESPONDER (EMR)

- Routine Medical Care.
- Oxygen as needed.
- Monitor vitals.

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Check blood glucose level
- If child has an altered mental status, transport urgently, monitor ABC's, prepare to support airway/breathing.
- **Rapid Transport**

ADVANCED EMT (AEMT) / INTERMEDIATE / PARAMEDIC

- If the child appears sick or dehydrated, initiate IV/IO NS, give 20 ml/kg bolus.

Contact Medical Control for the following:

- If the patient continues to appear very sick or dehydrated, consider a second 10 ml/kg fluid bolus NS. Consider risk of cerebral edema, avoid excessive fluid.
- If the child's mental status deteriorates, suspect cerebral edema, consider advanced airway management with capnography goal 35mmHg,. Avoid excessive hyperventilation.



Pediatric Hypoglycemia

Priorities	Assessment Findings
Chief Complaint	“Low blood sugar” “Altered Level of Consciousness”
OPQRST	Check onset/duration. Identify possible contributing factors. Recent history of frequent episodes, Last Meal.
Associated Symptoms/ Pertinent Negatives	Fever/Chills. Signs/Symptoms of infection, Possible Ingestions, Nausea/Vomiting.
SAMPLE	Medications for diabetes, Time and dose of last insulin
Initial Exam	ABCs and correct any immediately life-threatening problems.
Detailed Focused Exam	General Appearance: Unresponsive? Agitated and combative? Jitteriness? Skin: Cool, pale, diaphoretic? Neuro: ALOC? Focal deficits (CVA)?
Goals of Therapy	Restore normal mental status glucose level
Monitoring	BP, HR, RR, EKG, SpO ₂ , repeat blood glucose

EMERGENCY MEDICAL RESPONDER (EMR)

- Routine Medical Care.
- Oxygen as needed
- If conscious and able to swallow, administer one dose (15 – 30 grams) of **Oral Glucose**, regular soda or juice if available.
- Monitor vitals.

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Check blood glucose level,
 - Blood Sugar less than 60 (less than 40 for neonates), conscious and able to swallow, administer oral sugar (15 – 30 grams **Oral Glucose**).
 - If signs or symptoms persist, repeat oral sugar, juice or regular soda.
 - Blood Sugar less than 60 (less than 40 for neonates) and unconscious or unable to swallow:
 - **Glucagon** 0.1mg/kg IM (max 1 mg)
- **12 Lead EKG or Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**

Contact Medical Control for additional orders

ADVANCED EMT (AEMT) / INTERMEDIATE / PARAMEDIC

- Blood sugar less than 60 (less than 40 for neonates) and patient unconscious or unable to swallow: Initiate IV/IO NS @ TKO₂.
- Administer **Dextrose**
 - For 2 months and less **D 12.5** 2 - 4 ml/kg
 - For greater than 2 months **D 25** 2 - 4 ml/kg
- Recheck blood glucose level in 5 minutes. Repeat **Dextrose** if indicated.

Contact Medical Control for the following:

- If signs or symptoms persist, despite treatment
- If the patient wants to refuse transport contact medical control immediately, ensure patient safety, get release signed by parent/guardian.



Pediatric Hypovolemia & Shock

Note:

- Potential causes of hypovolemia and shock include:
 - Infections/sepsis
 - Burns
 - Hemorrhage (Internal, External)
 - Spinal cord injury
 - Pump Failure
 - Heart Rhythm Disturbances
 - Dehydration/Heat emergencies
 - Drugs and Toxins
 - Metabolic Disturbances
 - Anaphylaxis
 - Pulmonary Embolism
- Shock is defined as inadequate perfusion of vital organs, not merely hypotension.

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	“Altered Level of Consciousness,” Weakness, Pale
OPQRST	Identify onset, duration, progression and provocation.
Associated Symptoms/ Pertinent Negatives	Fever/Chills, Nausea/Vomiting, Trauma, New Medications
SAMPLE	Pertinent past history and medications may provide important clues.
Initial Exam	ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	<p>General Appearance: Does the patient appear ill? External Hemorrhage?</p> <p>Skin: Pale, cool, and moist? Flushed, warm and dry? Cyanosis, Rash? Petechiae, Purpura, Bruising? Insect bite or sting?</p> <p>Chest: Labored breathing?</p> <p>Lungs: Wheezes, rales or rhonchi?</p> <p>Heart: Rate and Rhythm?</p> <p>Abdomen: Internal hemorrhage? Tender? Distended? GI Blood loss?</p> <p>Extremities: Trauma? Edema?</p>

	Neuro: ALOC?
Goals of Therapy	Restore volume and support blood pressure
Monitoring	BP, HR, RR, EKG, SpO ₂

EMERGENCY MEDICAL RESPONDER (EMR) /

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Routine Medical -or- Trauma Care.
- Maintain airway, use airway adjuncts as needed
- Administer oxygen
- Control external hemorrhage
- Keep patient flat with lower extremities elevated (if possible).
- Splint fractures
- Conserve body temperature, and reassure patient.
- **12 Lead EKG or Cardiac Monitor**
- **Rapid Transport**
- **Specialty Hospital Activation i.e. (Children's Medical Center)**
- **Paramedic Intercept**
- **Air Transport**

ADVANCED EMT (AEMT) / INTERMEDIATE

- IV/IO NS, if approved.
- Administer a 20 ml/kg fluid bolus
- If no response repeat a 20 ml/kg fluid bolus.
- Check blood glucose level
- Consider advanced airway if needed

Contact Medical Control for the following:

- Need for additional fluid boluses

PARAMEDIC

- Identify underlying problem and refer to the appropriate protocol.

Contact Medical Control for the following:

- Consider Epinephrine and/or Dopamine
- Additional Orders



Pediatric Respiratory Distress

Note:

- This protocol may apply to the following conditions:
 - Asthma/Bronchospasm/Reactive Airways Disease
 - Allergy/Anaphylaxis
 - Pulmonary Infections
 - Spontaneous Pneumothorax
 - Upper Airway Obstruction
 - Anxiety and Hyperventilation Syndrome

Priorities	Assessment Findings
Chief Complaint	Difficulty breathing, Shortness of breath, Choking
OPQRST	Assess onset, duration, progression, subjective severity, possible triggering events, and response to treatments before EMS arrival.
Associated Symptoms/ Pertinent Negatives	Chest pain (what kind?), fever/chills, productive (of what?) cough
SAMPLE	Check for possible exposure to known allergens. Check past history, medications and compliance for clues to cause of present illness.
Initial Exam	Check ABCs and correct immediately life-threatening problems.
Detailed Focused Exam	<p>General Appearance: Severity of distress? Lethargic?</p> <p>Skin: Cool, moist and pale? Warm, dry and flushed? Urticaria? Cyanosis?</p> <p>HEENT: Nasal flaring?</p> <p>Chest: Sternal, subcostal or intercostal retractions?</p> <p>Respiratory Effort: Using accessory muscles, signs of fatigue; reduced or no verbal response (age appropriate)?</p> <p>Lung Sounds: Wheezes, rales, rhonchi or stridor?</p> <p>Heart Sounds: Rate, regularity.</p> <p>Lower Extremities: Pale, mottled?</p> <p>Neuro: ALOC, lethargy, somnolence?</p>
Goals of Therapy	Improve oxygenation and ventilation, reduce the work of breathing, and treat underlying conditions.

Monitoring	BP, HR, RR, EKG, SpO ₂ .
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EMERGENCY MEDICAL RESPONDER (EMR)

- Routine Medical Care
- Allow/assist the patient to assume a position of comfort (usually upright).
- Oxygen.
- Support ventilation with BVM if apnea or ineffective respirations.
- Airway Adjuncts:
 - If airway cannot be maintained and there is an altered level of consciousness and loss of gag reflex, insert an oropharyngeal airway
- **Epinephrine** or **Epi-pen Jr** may be needed in allergy or anaphylaxis

EMERGENCY MEDICAL TECHNICIAN (EMT) / ADVANCED EMT (AEMT)

- Assist with patient-prescribed medications or initiate the following therapies:
 - **Albuterol** as indicated for Asthma. See *Pediatric Asthma Guidelines*.
 - **12 Lead EKG or Cardiac Monitor**
 - **Rapid Transport**
 - **Paramedic Intercept**

Contact Medical Control for the following:

- Repeat of Medications as needed

ADVANCED EMT (AEMT) INTERMEDIATE / PARAMEDIC

- Airway Adjuncts:
 - If airway still cannot be maintained and there is an altered level of consciousness and loss of gag reflex, consider an advance airway
 - Administer **Epi 1:000** as outlined in Pediatric Asthma.
- If a spontaneous tension pneumothorax is suspected, perform a needle decompression.



Pediatric Seizure

Note:

- Seizures usually last from 1-3 minutes and involve a loss of consciousness and convulsions. Not uncommonly, the patient is incontinent and may bite his tongue or be injured in other ways.
- When the seizure is over, the patient enters a postictal state, characterized by confusion eventually giving way to normal alertness and orientation.
- Whenever seizures occur, look for an underlying cause and treat it.
- **Status epilepticus is defined as a seizure lasting longer than 5 minutes, or frequently recurring seizures without clearing of the postictal state between seizures. This is a life-threatening emergency!**

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	“Seizure” “Unresponsive” “Convulsions” “Passed out”
OPQRST	How long did it last? History of seizures? Possible contributing factors [1]
Associated Symptoms/ Pertinent Negatives	Unresponsive, Postictal, Incontinent
SAMPLE	History of seizures, Seizure medications?
Initial Exam	ABCs and correct any immediate life threats
Detailed Focused Exam	<p>General Appearance: Pt. currently seizing? Unresponsive? Postictal?</p> <p>Resp: Airway Patent? Breathing?</p> <p>HEENT: Neck Stiff, pupils fixed and not reactive, eyes are deviating</p> <p>Skin: Flushed, warm, rash</p> <p>Neuro: ALOC?, Focal deficits (CVA)</p>
Goals of Therapy	<p>Stop the seizure</p> <p>Treat the underline cause</p> <p>Monitor and maintain airway.</p>
Monitoring	BP, HR, RR, EKG, SpO ₂ .

EMERGENCY MEDICAL RESPONDER (EMR)

- Routine medical care
- Consider oropharyngeal or nasopharyngeal airway, if the patient is unable to maintain a patent airway. Avoid attempting oral airway insertion during a seizure
- Protect the patient with ongoing seizures from harming themselves by clearing away potential hazards and placing a pillow or padding under the head.
- Oxygen as necessary

EMERGENCY MEDICAL TECHNICIAN (EMT)

- Obtain blood glucose, if approved. If < 60 refer to *Hypoglycemia Guidelines*
- Consider checking Temperature. If >100.6 °F rectal. Report fever to Medical Control.
- Consider Capnography if available
- **Rapid Transport**
- **Paramedic Intercept**

ADVANCED EMT (AEMT)

- IV/IO NS TKO

Contact Medical Control for the following:

- Additional orders

INTERMEDIATE

- If the patient is still seizing
 - No IV/IO Access give;
 - **Midazolam (Versed)** 0.1-0.2 mg/kg IN/IM. Max 10 mg.
 - May repeat in 5 minutes. Note IN/IM Versed should be 5mg/ml concentration.
 or
 - **Diazepam (Valium)** rectally: 0.5 mg/kg <6 y/o; 0.3mg/kg 6-11 y/o; 0.2mg/kg >11y/o
 - May repeat in 10 minutes for continued seizure give 0.2 mg/kg/dose.
 - IV/IO access give;
 - **Lorazepam (Ativan)** 0.05-0.1mg/kg/dose up to 2 mg or
 - **Midazolam (Versed)** 0.1-0.2 mg/kg IV. Max 10 mg.
 - May repeat in 5 minutes. Note IN/IM Versed should be 5 mg/ml concentration.
- Intermediate agencies may have only one benzodiazepine on formulary
- Continue to monitor airway since respiratory depression can result

Contact Medical Control for the following:

- If pseudoseizures are suspected, withhold medication until you speak with Medical Control.

PARAMEDIC

- Alternative Benzodiazepines

Contact Medical Control for the following:

- Persistent seizures



Pediatric Toxic Exposure & Overdose

Note:

- Perform scene size-up and ensure crew safety. In a hazardous materials incident, stage up wind of the incident, and do not attempt to treat any patients who have not been decontaminated. Be especially suspicious of scenes in which many people or animals appear to be affected.
- Beware of the potential for the patient to vomit spontaneously. Following any form of cyanide ingestion, emesis may off-gas toxic hydrogen cyanide, placing rescuers and health care workers at risk.
- Beware of the potential for seizures or altered level of consciousness due to toxic exposures.
- Beware of the potential for cardiovascular collapse and respiratory compromise due to toxic exposures.

<i>Priorities</i>	<i>Assessment Findings</i>
Chief Complaint	“Overdose” “Ingestion” “Exposure to chemicals” “Unresponsive”
OPQRST	Determine type and kind of ingestion. Determine time of exposure/ingestion, Determine amount/length of exposure.
Associated Symptoms/ Pertinent Negatives	Dyspnea, nausea/vomiting, abdominal pain, unresponsive; Suicidal ideation or suicide attempt. Accidental or intentional exposure.
SAMPLE	Medication history and medications, exposure to chemicals.
Initial Exam	Check ABCs and correct any immediate life threats
Detailed Focused Exam	<p>General Appearance: level of alertness, signs of agitation, willingness to cooperate with authorities, signs of ingestion?</p> <p>Skin: Cool, pale and diaphoretic? Warm, dry and flushed? Rash?</p> <p>HEENT: Are the pupils constricted or dilated? Nystagmus?</p> <p>Lungs: Wheezes, rales or rhonchi?</p> <p>Heart: Rate, regularity, peripheral perfusion?</p> <p>GI: Abdominal Distention</p> <p>Neuro: Signs of intoxication? Ataxia? Slurred speech?</p> <p>Psych: Depressed affect? Bizarre thoughts? Signs of suicidal ideation or intent?</p>
Goals of Therapy	Reduce amount of substance absorbed into the body; Treat with antidotes if possible; Correct toxic effects on the CNS, cardiovascular and respiratory systems.

Monitoring	BP, HR, RR, EKG, SpO ₂ .
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EMERGENCY MEDICAL RESPONDER (EMR)

- Routine medical care
- Oxygen as appropriate.
- If the patient is unconscious, place him/her in the recovery position. Follow the *Altered Level Of Consciousness Guidelines*.
- If ALOC and loss of gag reflex, consider use of oropharyngeal or advanced airway, if approved.

EMERGENCY MEDICAL TECHNICIAN (EMT)

- If the patient is unconscious, check blood glucose, if approved. If < 60, follow the *Pediatric Hypoglycemia Guidelines*.
- If the patient has an altered level of consciousness and a narcotic overdose is suspected, consider **Narcan**
 - < 20 kg 0.1mg/kg/dose
 - ≥ 20 kg or > 5 years old give 0.4 – 2 mg/dose IV/IM/Sub-Q and repeat every 5 minutes X 1 total doses. If there is no response to Narcan, consider an alternative explanation or contact medical control for additional doses and orders.
- **12 Lead EKG or Cardiac Monitor**
- **Rapid Transport**
- **Paramedic Intercept**
- **Call POISON CONTROL 1-800-222-1222 (They will guide you and notify Hospital)**

ADVANCED EMT (AEMT) / INTERMEDIATE

- IV/IO NS @ TKO, if approved.
- Initiate a bolus of 20 ml/kg Normal Saline if the patient is hypotensive or tachycardic.
- If the patient has an altered level of consciousness and a narcotic overdose is suspected, consider **Narcan**
 - < 20 kg 0.1mg/kg/dose
 - ≥ 20 kg or > 5 years old give 0.4 – 2 mg/dose IV/IM/Sub-Q and repeat every 5 minutes X 3 total doses. If there is no response to Narcan, consider an alternative explanation or contact medical control.

Contact Medical Control for the following:

- Additional fluid orders
- Additional Narcan orders
- Consider for toxic ingestions (except those listed below), if the patient is conscious with an intact gag reflex, consider administration of **Activated Charcoal 50G**

Poison Control 1-800-222-1222

PARAMEDIC

- Specific overdose therapies are contained in the table below
 - If you do not recognize what class the drug or toxin belongs to, contact Medical Control.

<i>Class of drugs</i>	<i>Treatment Indications</i>	<i>Specific Treatment(s)</i>
Narcotics	<p>Narcan may be used in cases of oversedation due to narcotic administration, or in suspected narcotics overdoses in patients without a history of long-term use, chronic abuse or addiction. Signs of narcotic overdose or oversedation include: decreased level of consciousness, pinpoint pupils (except Demerol), and respiratory depression.</p> <p>Caveat: Giving Narcan to a long-term narcotic user, chronic abuser or addict can induce narcotic withdrawal, which creates a new set of difficult problems. Airway management and supportive care is the preferred approach.</p>	<p>For patients with narcotic overdose or oversedation give:</p> <p>Narcan per dosing as above. If no response, reconsider diagnosis. Contact medial control.</p>
Benzodiazepines (BZD)	<p>Benzodiazepine abuse or overdose can lead to decreased level of consciousness, respiratory depression and hypotension.</p>	<p>Treatment consists primarily of aggressive airway support.</p>
Tricyclic Antidepressants (TCA)	<p>Decreased level of consciousness; hypotension, seizures, malignant arrhythmias (e.g. <i>Torsades de Pointes</i>, VT), prolongation of the QT or QRS intervals.</p> <p>Caveat: Patients with TCA overdoses are prone to deteriorating very quickly.</p> <p>Note: Sodium containing solutions act like antidotes, because they protect the heart against the toxic effects of the TCA. Induced alkalosis from bicarbonate and hyperventilation also</p>	<p>Give 20ml/kg Normal Saline Bolus. May Repeat.</p> <p>Sodium Bicarbonate</p> <p>1 mEq/ml/kg IV bolus. Repeat as directed by medical control. Treat arrhythmias according to the appropriate protocol.</p> <p>Treat seizures according to the <i>Pediatric Seizure Guidelines</i>.</p>

	protect against the toxic effects of TCAs.	
Beta Blockers	Profound bradycardia, hypotension or conduction defects Hypoglycemia	Contact medical control. Consider Glucagon 0.03-0.1 mg/kg/dose every 20 minutes as needed slow IVP. Max Dose: 1 mg/dose.
Calcium Channel Blockers	Profound bradycardia, hypotension or conduction defects	Contact medial control.
Amphetamines	Agitation, psychosis, or ventricular arrhythmias Caveat: For patients with Excited Delirium, refer to the <i>Agitated & Combative Patients Guidelines</i> .	Contact Medical control.
Cocaine	Agitation, seizures, or ventricular arrhythmias	Contact Medical control.
Organophosphate Poisoning (Pesticides and Nerve Agents)	Profound bradycardia, seizures, abnormal (wet) lung sounds The organophosphate toxidrome: S – Salivation, Seizures L – Lacrimation U – Urination G – GI vomiting and diarrhea B – Bradycardia*, bronchorrhea, bronchospasm A – Arrhythmias M – Miosis (small pupils)* * Tachycardia and mydriasis (dilated pupils) are also possible Caveat: Organophosphates are highly toxic in very small quantities and pose a significant risk to EMS and health care workers through secondary contamination.	Atropine 0.02mg/kg IV or IM every 3-5 min until lung sounds clear to auscultation. Use atropine in the initial treatment of bradycardia and seizures. Contact Medical Control. For rescuers who inadvertently enter a vapor cloud of organophosphate (e.g. nerve agents), self administer 1 – 2 Mark I Auto Injector Kits and evacuate yourselves from the scene immediately.