Utah Pediatric Off-Line Medical Direction Protocol Guidelines

Version 1.0 — March 2009
The pediatric off-line protocols in this document were developed in partnership by Primary Children’s Medical Center and Utah Department of Health Emergency Medical Services for Children (EMSC) Program.

Special thanks to the Utah EMSC Advisory Committee and the following individuals for their untiring dedication to the development of the EMSC Pediatric Off-line Protocol Guidelines.

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Icon Glossary

??
Ask additional questions.

??
Obtain blood pressure.

??
Contact Medical Control.

??
Provide detailed documentation.

??
Wear protective gloves and mask.

??
Follow Biohazard protocols.
Give medications.

Be mindful of Family Centered Care.

Arrange for rotor or fixed wing transport.

Provide warming measures.

Contact Poison Control.

Provide medications via nebulizer.
In the Institute of Medicine’s (IOM) Emergency Care for Children Growing Pains Report (2006), they stated a family centered approach to care can mutually benefit the patient, family, and provider. The IOM recommended “EMS agencies and hospitals integrate family-centered care into emergency care practices.”

There are several protocols within this document for which family centered care will be crucial to providing patient care. In order to highlight this fact, the symbol shown below is placed within the protocol.
# Pediatric General Assessment Protocol

Use Pediatric Assessment Triangle to form a general impression of the child.

## Appearance

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Features to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tone</strong></td>
<td>Good muscle tone OR limp, listless, flaccid</td>
</tr>
<tr>
<td><strong>Interactiveness</strong></td>
<td>Alert, will reach for toy, light, OR is uninterested in playing or interacting</td>
</tr>
<tr>
<td><strong>Consolability</strong></td>
<td>Can be consoled OR crying or agitation is unrelieved</td>
</tr>
<tr>
<td><strong>Look/Gaze</strong></td>
<td>Fixes on face, object OR glassy eyed stare</td>
</tr>
<tr>
<td><strong>Speech/Cry</strong></td>
<td>Cry strong and spontaneous OR weak or high pitched</td>
</tr>
<tr>
<td></td>
<td>Is Speech age appropriate OR confused, garbled?</td>
</tr>
</tbody>
</table>

## Breathing

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Features to Look For</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abnormal Airway Sounds</strong></td>
<td>Snoring, muffled or hoarse speech, Stridor, grunting, wheezing</td>
</tr>
<tr>
<td><strong>Abnormal positioning</strong></td>
<td>Sniffing position, tripoding, refusing to lie down</td>
</tr>
<tr>
<td><strong>Retractions</strong></td>
<td>SuprACLAVICULAR, intercostal, substernal retractions of the chest wall; head bobbing in infants</td>
</tr>
<tr>
<td><strong>Flaring</strong></td>
<td>Flaring of the nares on inspiration</td>
</tr>
</tbody>
</table>

## Circulation/Skin Color

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Features to look for</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pallor</strong></td>
<td>White or pale skin or mucous membranes</td>
</tr>
<tr>
<td><strong>Mottling</strong></td>
<td>Patchy/lacey skin discoloration due to vasoconstriction/vasodilataion</td>
</tr>
<tr>
<td><strong>Cyanosis</strong></td>
<td>Bluish discoloration of skin/mucous membranes</td>
</tr>
</tbody>
</table>

*If patient is in severe distress expedite transport*
Airway—Ensure airway is patent; if not, take appropriate action

**Refer to Appropriate Protocol**

- Respiratory Failure
- Upper Airway Obstruction
- Lower Airway Obstruction
- Anaphylaxis/Allergic Reaction

Breathing—Count respiratory rate
- Assist ventilations if less than 12 breaths per minute
- Look at chest rise and fall, check for work of breathing
- Listen to breath sounds

<table>
<thead>
<tr>
<th>Sound</th>
<th>Cause</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stridor</td>
<td>Upper Airway Obstruction</td>
<td>Croup, foreign body aspiration, throat abscess</td>
</tr>
<tr>
<td>Wheezing</td>
<td>Lower Airway Obstruction</td>
<td>Asthma, foreign body, bronchiolitis</td>
</tr>
<tr>
<td>Expiratory Grunting</td>
<td>Inadequate Oxygenation</td>
<td>Pulmonary contusion, pneumonia, drowning</td>
</tr>
<tr>
<td>Inspiratory Crackles</td>
<td>Fluid, Mucous or Blood in the airway</td>
<td>Pneumonia, pulmonary contusion</td>
</tr>
<tr>
<td>Absent breath sounds despite work of breathing</td>
<td>Complete Airway Obstruction (Upper or Lower)</td>
<td>Physical barrier to transmission of breath sounds: foreign body, severe asthma, Hemothorax, pneumothorax, pleural fluid, pneumonia, pneumothorax *2</td>
</tr>
</tbody>
</table>

Circulation—Count heart rate
- Evaluate skin temperature, pulses, and capillary refill time

**Start CPR if Heart Rate is less than:**

- 80 for infants (up to 1 year of age)
- 60 for children (1 year to 8 years)
Disability—Evaluate level of consciousness with AVPU Scale

<table>
<thead>
<tr>
<th>Category</th>
<th>Stimulus</th>
<th>Response Type</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Normal Environment</td>
<td>Appropriate</td>
<td>Normal interactivity for age</td>
</tr>
<tr>
<td>Verbal</td>
<td>Simple command or sound stimulus</td>
<td>Appropriate or Inappropriate</td>
<td>Responds to name. Nonspecific or confused</td>
</tr>
<tr>
<td>Painful</td>
<td>Pain</td>
<td>Appropriate, Inappropriate, Pathological</td>
<td>Withdraws from pain. Sound or motion without purpose or localization of pain. Posturing.</td>
</tr>
<tr>
<td>Unresponsive</td>
<td></td>
<td></td>
<td>No perceptible response to any stimulus</td>
</tr>
</tbody>
</table>

Contact medical control per local protocols

Additional Assessments

Exposure—Fully expose child to check for injuries, rashes; be sure to maintain warmth; consider patient’s temperature

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
<th>Onset and nature of symptoms or pain or fever-age appropriate signs of distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergies</td>
<td>Known drug reactions or other allergies</td>
</tr>
<tr>
<td>Medications</td>
<td>Exact names and doses of ongoing drugs; timing and amount of last dose</td>
</tr>
<tr>
<td>Past medical problems</td>
<td>Previous illnesses, injuries, or congenital problems; immunizations; history of labor and delivery (infants/toddlers)</td>
</tr>
<tr>
<td>Last food or liquid</td>
<td>Timing of the child’s last food or drink, including bottle or breast feeding</td>
</tr>
<tr>
<td>Events leading to the injuries or illness</td>
<td>Key events leading to the current incident; fever history</td>
</tr>
</tbody>
</table>

Focused History and Physical Exam
- SAMPLE History
- determine mechanism of injury or nature of illness
- perform head to toe exam
Detailed Physical Exam (Trauma)
- Head to toe assessment to check for and treat injuries

Ongoing assessment
- obtain blood pressure if possible
- measure oxygen saturation
- repeat vital signs every 5 minutes for unstable patients, every 15 minutes for stable patients
- review effectiveness and safety of treatments

Transport

Vital Signs that would be abnormal according to age of child:

<table>
<thead>
<tr>
<th>Age of Patient</th>
<th>HR</th>
<th>RR</th>
<th>Systolic BP</th>
<th>Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days – &lt; 1 mo</td>
<td>&lt;80</td>
<td>&gt;205</td>
<td>&lt;60</td>
<td>&lt;60</td>
</tr>
<tr>
<td>≥ 1 mo – &lt; 3 mos</td>
<td>&lt;80</td>
<td>&gt;205</td>
<td>&lt;60</td>
<td>&lt;60</td>
</tr>
<tr>
<td>≥ 3 mos – &lt; 1 yr</td>
<td>&lt;75</td>
<td>&gt;190</td>
<td>&lt;60</td>
<td>&lt;60</td>
</tr>
<tr>
<td>≥ 1 yr – &lt; 2 yrs</td>
<td>&lt;75</td>
<td>&gt;190</td>
<td>&lt;70</td>
<td>&lt;70</td>
</tr>
<tr>
<td>≥ 2 yrs – &lt; 4 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
<td>&lt;70 + (age x 2)</td>
<td>&lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 4 yrs – &lt; 6 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
<td>&lt;70 + (age x 2)</td>
<td>&lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 6 yrs – &lt; 10 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
<td>&lt;70 + (age x 2)</td>
<td>&lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 10 yrs – &lt; 13 yrs</td>
<td>&lt;60</td>
<td>&gt;100</td>
<td>&lt;70 + (age x 2)</td>
<td>&lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 13 yrs – &lt; 18 yrs</td>
<td>&lt;60</td>
<td>&gt;100</td>
<td>&lt;70 + (age x 2)</td>
<td>&lt;70 + (age x 2)</td>
</tr>
</tbody>
</table>

Estimated Weights

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>3 kg</td>
</tr>
<tr>
<td>3 months</td>
<td>5 kg</td>
</tr>
<tr>
<td>6 months</td>
<td>7 kg</td>
</tr>
<tr>
<td>12 months</td>
<td>10 kg</td>
</tr>
<tr>
<td>2 years</td>
<td>13 kg</td>
</tr>
<tr>
<td>3 years</td>
<td>15 kg</td>
</tr>
<tr>
<td>4 years</td>
<td>18 kg</td>
</tr>
<tr>
<td>5-6 years</td>
<td>20 kg</td>
</tr>
<tr>
<td>8 years</td>
<td>25 kg</td>
</tr>
<tr>
<td>10 years</td>
<td>35 kg</td>
</tr>
<tr>
<td>14 years</td>
<td>50 kg</td>
</tr>
<tr>
<td>18 years</td>
<td>65 kg</td>
</tr>
</tbody>
</table>
**X-tra Information**

**Appropriate mask size for Bag/Valve/Mask ventilation:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Mask #</th>
<th>Mask Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm neonate</td>
<td>#0</td>
<td>Neonatal</td>
</tr>
<tr>
<td>Newborn–1 year</td>
<td>#1</td>
<td>Infant</td>
</tr>
<tr>
<td>1–6 years</td>
<td>#2</td>
<td>Toddler</td>
</tr>
<tr>
<td>6–12 years</td>
<td>#3</td>
<td>Pediatric</td>
</tr>
<tr>
<td>&gt;12 years</td>
<td>#4</td>
<td>Small Adult</td>
</tr>
</tbody>
</table>

**Appropriate bag size for Bag/Valve/Mask ventilation:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Bag Size</th>
<th>Bag Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn–3 months</td>
<td>Neonatal</td>
<td>400–500 mL</td>
</tr>
<tr>
<td>Child &lt;30 kg</td>
<td>Pediatric</td>
<td>750 mL</td>
</tr>
<tr>
<td>Child &gt;30 kg</td>
<td>Adult</td>
<td>1000–1200 mL</td>
</tr>
</tbody>
</table>

**Endotracheal tube size and depth per length based tape**

<table>
<thead>
<tr>
<th>Weight</th>
<th>ET Tube Size</th>
<th>ET Tube Insertion Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–5 kg</td>
<td>2.5 uncuffed, 3.0 uncuffed</td>
<td>3kg: 9–9.5cm; 4kg: 9.5–10cm; 5kg: 10–10.5cm</td>
</tr>
<tr>
<td>6–7 kg</td>
<td>3.5 uncuffed</td>
<td>10.5–11cm</td>
</tr>
<tr>
<td>8–9 kg</td>
<td>3.5 uncuffed</td>
<td>10.5–11cm</td>
</tr>
<tr>
<td>10–11 kg</td>
<td>4.0 uncuffed</td>
<td>11–12cm</td>
</tr>
<tr>
<td>12–14 kg</td>
<td>4.5 uncuffed</td>
<td>13.5cm</td>
</tr>
<tr>
<td>15–18 kg</td>
<td>5.0 uncuffed</td>
<td>14–15cm</td>
</tr>
<tr>
<td>19–23 kg</td>
<td>5.5 uncuffed</td>
<td>16.5cm</td>
</tr>
<tr>
<td>24–29 kg</td>
<td>6.0 cuffed</td>
<td>17–18cm</td>
</tr>
<tr>
<td>30–36 kg</td>
<td>6.5 cuffed</td>
<td>18.5–19.5cm (7)</td>
</tr>
</tbody>
</table>

**References**

1. Table 1-1, 1-2, 1-3
2. Table 1-5
3. Table 1-9
4. Table 1-10

*Intermountain Healthcare Primary Children’s Medical Center Emergency Department Shock/Sepsis Protocol.* 5
*Intermountain Healthcare Primary Children’s Medical Center Trauma/Critical Care Flow Sheet.* 6
Section I: Respiratory Emergencies Protocols
Anaphylaxis

**Definition:** Anaphylaxis is a serious systemic allergic reaction that is rapid in onset and may cause death.

**Clinical Presentation:** Is highly variable and cutaneous symptoms may be transient and brief. Symptoms include: itching, hives, flushing, cough, wheeze, dyspnea, stridor, respiratory distress, mouth, throat or chest tightness, difficulty swallowing, hypotension, angioedema, abdominal cramps, diarrhea, vomiting, syncope, dizziness, seizure, arrhythmia. Anaphylaxis can present with hypotension alone especially in a known allergic individual.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Assess and maintain airway patency, oxygen 10-15 lpm via non-rebreather
   a. If respirations are ineffective, begin BVM ventilation with 100% oxygen
   b. Suction airway as needed
3. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific pediatric dysrhythmia guideline)
4. Use epinephrine auto-injector, call medical control for repeat doses (IM administration, lateral-superior thigh)
   a. For children < 15 kg, call medical control
   b. Epinephrine auto-injector (0.15 mg/0.3 mL) for children 15-25 kg
   c. Epinephrine auto-injector (0.3 mg-0.3 mL) for children > 25 kg
5. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place patient on a cardiac monitor including pulse oximeter
3. Intubate if patient is apenic, has a significantly depressed LOC, or if the patient has severe respiratory distress or depression
4. If the patient is unconscious and has significant oral edema, place an oral airway while preparing to intubate
5. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific pediatric dysrhythmia guideline)
6. Administer epinephrine (1:1,000) .01 mg/kg, maximum 0.3 mg, IM (lateral superior thigh), repeat every 5-15 minutes prn persistent symptoms
7. Administer nebulized albuterol if patient has significant wheezing
   a. < 1 year of age: 1.25 mg
   b. > 1 year of age: 2.5 mg
8. Administer nebulized epinephrine if patient has significant stridor
9. Place an IV and administer a 20 mL/kg NS bolus, repeat x2 for persistent hypotension
10. If hypotension persists, consult medical control
11. **Following stabilization of the patient**, administer diphenhydramine IV 1.25 mg/kg, maximum 50 mg
12. Transport for medical evaluation
Key Points/Considerations

1. It is extremely important to give IM epinephrine as soon as the diagnosis of anaphylaxis has been established.
2. Place an IV as quickly as possible but no not delay epinephrine administration.
3. If the patient has any respiratory distress and is conscious, allow them to achieve a “position of comfort” and keep the child with the parent.

Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:1000 (1mg/mL)</td>
<td>2mL in 3 mL saline</td>
<td>Neb</td>
<td>Call for additional doses</td>
<td>DO</td>
<td>DO</td>
<td>DO</td>
<td></td>
</tr>
<tr>
<td>Epinephrine Autoinjector</td>
<td>0.15 mg for children 15–25 kg 0.3 mg for children &gt; 25 kg</td>
<td>IM</td>
<td>Call for additional doses</td>
<td>ST*</td>
<td>ST*</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Epinephrine 1:1000 (1mg/mL)</td>
<td>0.01 mg/kg Repeat q 5-15min prn persistent symptoms</td>
<td>IM</td>
<td>0.3mg</td>
<td>ST*</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Albuterol</td>
<td>1.25 mg &lt; 1 year of age 2.5 mg for &gt; 1 y.o.</td>
<td>Neb</td>
<td>One dose</td>
<td>ST*</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>1.25 mg/kg</td>
<td>IV</td>
<td>50 mg</td>
<td>ST</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DO: Direct order from on line medical control  
ST: Standing Order  
ST*: Standing Order if medical control not immediately available

Teaching Points: Epinephrine and stridor with sound clips  
Epinephrine solution for nebulization is made by mixing epinephrine 2m, 2 mL of epinephrine 1:1000, with 3mL NS.
Bronchospasm

**Definition:** Bronchiolitis is a viral disease that affects infants and young children and causes inflammation of the small airways and may cause significant respiratory distress, hypoxemia, respiratory arrest, and apnea in infants.

**Clinical Presentation:** Symptoms may include: wheezing, altered level of consciousness, tachypnea, abnormal skin color, nasal flaring, retractions, grunting, apnea and cyanosis.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen via NRB
   - If respirations are ineffective, begin BVM ventilation
   - Oral suctioning for copious nasal and/or oral secretions as needed
3. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific pediatric dysrhythmias protocol)
4. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardiac monitor and continuous pulse oximeter
3. Intubate if patient is apenic, unresponsive, or if the patient has severe respiratory distress or depression
4. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific pediatric dysrhythmias)
5. Administer nebulized albuterol if patient has significant wheezing
   - < 1 year of age: 1.25 mg
   - ≥ 1 year of age: 2.5 mg
6. If patient “responds” (i.e. has decreased work of breathing, decreased wheezing or oxygen need), may repeat the treatment every 30-60 minutes as needed
7. If no response to albuterol, consider nebulized epinephrine if patient has severe respiratory distress
8. Transport for medical evaluation

### Key Points/Considerations

1. Keep patients NPO if they have any respiratory distress or have a respiratory rate > 60
### Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:1000</td>
<td>2mL in 3 mL saline</td>
<td>Neb</td>
<td>Call for additional doses</td>
<td>DO</td>
<td>DO</td>
<td>DO</td>
<td></td>
</tr>
<tr>
<td>(1mg-mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albuterol</td>
<td>1.25 mg &lt; 1 year of age</td>
<td>Neb</td>
<td>3 doses</td>
<td>ST*</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 mg &gt; 1 y.o.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order

**Teaching Points:** Discuss oxygen administration, BVM, NRB mask, simple mask, nasal cannula or blow-by. Recognize seasonal nature of this very common pediatric illness. Epinephrine solution for nebulization is made by mixing epinephrine 2m, 2 mL of epinephrine 1:1000, with 3mL NS.
Respiratory Failure & Impending Failure

**Definition:** A clinical state characterized by inadequate ventilation or oxygenation

**Clinical Presentation:** May include increased or decreased respirations, cyanosis, nasal flaring, grunting, retractions, absent or diminished breath sounds, or decreased responsiveness

---

### Basic Life Support

1. Follow General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen via NRB
3. Begin BVM ventilation with 100% oxygen for:
   a. Ineffective respiratory effort
   b. Heart rate
      i. < 80 for infants
      ii. < 60 for children
   c. Cyanosis despite 100% oxygen via NRB
   d. Decreased level of consciousness
4. If patient does not respond to BVM, start chest compressions
5. Oral suctioning for copious nasal and/or oral secretions as needed
6. Immobilize cervical spine for suspected trauma
7. Refer to appropriate protocol for suspected **Upper Airway Obstruction, Anaphylaxis, or Bronchospasm**
8. Transport for medical evaluation

---

### Advanced Life Support

1. Refer to BLS guidelines
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. If unable to effectively perform BMV, consider intubation
4. Establish IV / IO access and give 20mL/kg NS if indicated
5. Consider NG or OG for gastric decompression
6. Treat based on suspected diagnosis: **Upper Airway Obstruction, Anaphylaxis, or Bronchospasm**
7. Transport for medical evaluation

---

### Key Points/Considerations

1. Confirm and document ETT position by auscultation and secondary device.
2. Limit intubation attempts to 3 per patient.
Upper Airway Obstruction

**Definition:** A clinical state characterized by a blockage of the upper airway, which can be in the mouth, trachea, larynx or pharynx.

**Clinical Presentation:** May include increased respiratory rate or effort, nasal flaring, inspiratory stridor, barky cough, sudden onset of choking/gagging, drooling, cyanosis, absent or diminished breath sounds, depressed mental status.

### Basic Life Support

1. Follow General Pediatric Assessment Guidelines
2. Assess airway patency
3. If audible stridor present, but breathing is adequate, place child in position of comfort and administer high flow 100% O2; use non-rebreather mask or blow by as tolerated
4. If patient is not breathing, position airway, start bag-valve-mask ventilations with high flow, 100% O2 (refer to Respiratory Failure Protocol)
5. If unable to ventilate after repositioning, and foreign body is suspected, perform:
   a. Infant: 5 back blows followed by 5 chest thrusts
   b. Child: Heimlich maneuver
   c. If patient is or becomes unconscious, start chest compressions
6. Continue to attempt BMV after efforts to remove obstruction
7. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS guidelines
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. If breathing is adequate:
   a. Consider 3mL NS via nebulizer ("cool mist")
   b. If clinical evidence of stridor, administer Epinephrine (1:1000 2cc in 3ml NS) via nebulizer
4. If patient not breathing attempt ventilation
5. If unable to effectively ventilate, do direct visualization to determine if there is object obstructing airway and if object identified, attempt removal with McGill forceps
6. If unable to remove and ventilate effectively around object, consider emergency cricothyrotomy
7. Once airway is clear, if no spontaneous respiratory effort, consider intubation (refer to Respiratory Failure Protocol)
8. Establish IV/IO access
### Common Causes of Upper Airway Obstruction in Children

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Croup</strong></td>
<td>Usually &lt; 5 years old</td>
</tr>
<tr>
<td></td>
<td>Hoarse “barky” cough</td>
</tr>
<tr>
<td></td>
<td>URI symptoms; often worse at night</td>
</tr>
<tr>
<td><strong>Epiglottitis</strong></td>
<td>Usually &gt; 2 years old</td>
</tr>
<tr>
<td></td>
<td>High fever; very ill appearing</td>
</tr>
<tr>
<td></td>
<td>Drooling; leaning forward</td>
</tr>
<tr>
<td><strong>Anaphylaxis</strong> (refer to Anaphylaxis Protocol)</td>
<td>+/- history exposure to allergen</td>
</tr>
<tr>
<td></td>
<td>Facial/lips/tongue swollen; stridor</td>
</tr>
<tr>
<td></td>
<td>Absent or diminished breath sounds</td>
</tr>
<tr>
<td><strong>Foreign Body Aspiration</strong></td>
<td>Sudden onset of choking/gagging</td>
</tr>
<tr>
<td></td>
<td>+/- witnessed with object in mouth</td>
</tr>
</tbody>
</table>

### Key Points/Considerations

1. Agitation increases airway obstruction; leave child in position of comfort, with parent if possible; if any intervention causes agitation—STOP!
2. Never perform blind finger sweeps of the mouth or throat.

### Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:1000 (1mg-mL)</td>
<td>2mL in 3mL saline</td>
<td>Neb</td>
<td>Call for additional doses</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order

**Note:** Epinephrine solution for nebulization is made by mixing epinephrine 2m, 2 mL of epinephrine 1:1000, with 3mL NS.
Section II: Children with Special Health Care Needs Protocols
Assessment of a Child With Special Health Care Needs

**Definition:** Children with special health care needs (CSHCN) are children who have chronic health issues (physical, developmental, behavioral or emotional) and who require health and related services that other children do not.

**Clinical Presentation:** Children with multiple medical problems, neurological disorders, sensory deficits (hearing and vision loss). Children with uncommon or complex medical conditions, chronically ill and technology dependent children.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Ask if child has special health care needs
3. Ask for Emergency Health Information Sheet (and, if appropriate, for Life with Dignity (DNR) Order)
4. Assess ABCs, know that interventions may vary according to age but also to patients size and medical condition
5. See specific protocol for Tracheostomy, Ventilator, Feeding tube, Internal pacemaker, Seizures, Behavioral issues, DNR
6. Explain interventions, to children and family members when appropriate
7. Transport in position of comfort for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place cardiorespiratory monitor and continuous pulse oximetry
3. See specific protocol for Tracheostomy, Ventilator, Feeding tube, Internal pacemaker, Seizures, Behavioral issues
4. Transport in position of comfort for medical evaluation

### Key Points/Considerations

1. Family members are many times the best resource for patient care.
2. Interventions may vary according to age, but also on size and medical condition.

**Teaching Points:** Do not become overwhelmed by equipment. Staying focused on ABCs will help you succeed with care of the special needs patient. Remember that the parents take care of these kids 24/7. They are experts on their children. Do not be afraid to ask them for guidance.
# Feeding Tube

**Definition:** Feeding tubes are used in the home care setting to provide feedings for children. They can be placed in the stomach or jejunum (upper part of small intestine) through the nose, mouth or abdomen.

**Indications:** Impaired or insufficient oral intake.

**Clinical presentation:** These tubes may be positioned in the nasal orifice or percutaneous.

## Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Obtain accurate history. Include type of feeding tube, its patency, accessibility including how and when it was placed
3. Document site of feeding tube whether present or not, for color, drainage and/or malfunction
4. Assess for dehydration (see Non-traumatic shock protocol)
5. If stoma is bleeding apply sterile dressing and use pressure to stop bleeding
6. Keep NPO and nothing per feeding tube
7. Transport in position of comfort for medical evaluation

## Advanced Life Support

1. Follow BLS procedures
2. If feeding tube is percutaneous and has come out, place an 8 Fr suction catheter in the stoma 2-3 inches to prevent it closing
3. If patient has G-tube and is in respiratory and/or abdominal distress, the G-tube may be gently aspirated or opened to air to allow for gastric content drainage and decompression. Wrap end with diaper. (A G-tube button needs access adapter to do this)
   a. Consider nasogastric tube placement if gastric tube dislodged, non functional or significant abdominal distension
4. Transport in position of comfort for medical evaluation

## Key Points/Considerations

1. Family members are many times the best resource for patient care.
2. Some tubes continue on to jejunum, do not try to replace or remove tube.

**Teaching Points:** Demonstrate different types of feeding tubes, the most common ED visits for patients with feeding catheters include the tube has come out, is falling apart, is leaking, blocked or the stoma site has unusual drainage or bleeding.
Internal Pacemaker and Defibrillator

**Definition:** An internal pacemaker is a medical device placed under the skin and connected with wires to the heart to regulate the heart rate. An internal defibrillator is an electronic device implanted under the skin to monitor the heart rhythm and deliver shock as necessary to treat excessively fast heart rates that originate in the ventricles.

**Clinical Presentation:** Symptoms of failure of pacemaker or defibrillator may include: palpitations, inappropriate delivery of electric shock, increased respiratory rate, pallor or cyanosis, delayed capillary refill, poor perfusion, and altered mental status.

---

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Assess and maintain airway patency, oxygen 10-15 lpm via non-rebreather
   a. If respirations are ineffective, begin BVM ventilation with 100% oxygen
   b. Suction airway as needed
3. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific protocol)
4. Attach AED if patient is 12 months or older and follow AED instruction, treat underlying rhythm
5. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Continue bag-valve mask ventilation with 100% oxygen, intubate if unable to adequately ventilate or oxygenate child by BVM
4. Establish IV/IO access
   a. Treat shock as indicated
5. Treat underlying rhythm
6. Transport for medical evaluation

### Key Points/Considerations

1. Internal pacemakers and defibrillators may easily be felt near the clavicle or in the abdomen of small children.
2. Never place defibrillator paddles, patches or AED patches directly over the internal pacemaker or defibrillator generator.
3. The battery life for implanted pacemakers and defibrillators is 3 to 5 years.

### Teaching Points:

Discuss reasons for pacemaker/defibrillator placement. Obtain history: Heart problems, underlying rhythm, has the child felt shocks? Symptoms? Do not become distracted by equipment. The assessment and treatment of children with implanted medical devices should progress as with any child. Assessment and management of airway, breathing and circulation is primary. Defibrillation or cardioversion, when indicated, is appropriate in a patient with an internal pacemaker or defibrillator.
Tracheostomy

**Definition:** A tracheostomy is a surgical opening that creates a stoma between the trachea and the anterior surface of the neck in order to bypass the upper airway.

**Indication:** Upper airway obstruction, long-term ventilation and facilitating the movement of secretions in those with ineffective or no gag or swallow reflex.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Position child to open and assess airway (placing a towel roll under the shoulders)
3. Assist ventilations with bag valve with 100% O₂ if patient is apenic, unresponsive, or if the patient has severe respiratory distress or depression
4. If unable to ventilate, suction tracheostomy, then reattempt ventilatory efforts
5. If still unable to ventilate: attempt BVM (may need to place gloved finger over tracheostomy)
6. Initiate CPR for **Pulseless Systole** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmia protocol)
7. Perform tracheal, oral and nasal suctioning for secretions
   a. Oxygenate between passes with the suction catheter
8. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. If unable to ventilate through tracheostomy, change tracheostomy tube with a same sized or smaller tracheostomy tube
4. If unable to pass a smaller tracheostomy tube: pass an endotracheal tube through stoma about 1-2 inches, secure and ventilate. Gauge depth based on breath sounds; a right mainstem intubation is likely
5. If still unable to ventilate attempt oral endotracheal intubation, laryngeal mask airway (LMA), King™ airway or Combitube™
6. Once airway secure: If stridor or wheezing present administer nebulized epinephrine
7. Initiate CPR for **Pulseless Arrest** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmia protocol)
8. For abdominal distension: place NG tube or open gastric tube to decompress stomach
9. Continue to reassess airway with suctioning, positioning and ventilation
10. Transport for medical evaluation

### Key Points/Considerations

1. Keep patients NPO and nothing per gastric tubes if they have respiratory distress or a respiratory rate > 60.
2. If patient has a gastric tube, open it up to allow for gastric decompression (may need adapter for GT buttons).
3. Family members are many times the best people to change tracheostomy tube, suction, and use as a resource for patient care.
<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Maximum Dose</th>
<th>EMT Basic</th>
<th>EMT IA</th>
<th>EMT IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:1000</td>
<td>2mL in 3mL saline</td>
<td>Neb</td>
<td>Call for additional doses</td>
<td>ST/DO</td>
<td>ST/DO</td>
<td>ST/DO</td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order

**Teaching Points:** Discuss oxygen administration, ventilation with a tracheostomy, BVM with tracheostomy in place, changing a tracheostomy tube, tracheostomy tube suctioning, and securing of tracheostomy tube.

Epinephrine solution for nebulization is made by mixing epinephrine 2m, 2 mL of epinephrine 1:1000, with 3mL NS.
Ventilator/BiPAP

Definition: Ventilators and BiPAP are medical devices designed to assist with ventilation of the special needs child.

Clinical Presentation: Symptoms of failure of the ventilator or BiPap machine may include: apnea and cyanosis, retractions, nasal flaring, altered level of consciousness.

Basic Life Support
1. Refer to General Pediatric Assessment Guidelines
2. Assess and maintain airway patency
3. Assess patient for tracheostomy, follow Tracheostomy Protocol
4. Assess ventilations
   a. If ventilator is working properly and patient needs transport for non-respiratory medical evaluation; keep on ventilator/bipap for transport
   b. If ventilator is not working properly
      i. Assist ventilations with BVM as needed and 100% oxygen
5. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific pediatric dysrhythmia protocol)
6. Oral suctioning for copious nasal and/or oral secretions
7. If patient is being transported for other medical condition, initiate appropriate medical protocol as indicated
8. Transport for medical evaluation

Advanced Life Support
1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. For patients with tracheostomy, follow Tracheostomy protocol
4. For patients without tracheostomy:
   a. Assess and maintain airway patency, oxygen 10-15 lpm via non-rebreather
   b. If respirations are ineffective, begin BVM ventilation with 100% oxygen
   c. Suction airway as needed
5. Continue bag-valve mask ventilation with 100% oxygen, intubate if unable to adequately ventilate or oxygenate child by BVM
6. Transport for medical evaluation

Key Points/Considerations
1. Patients with home medical devices have caregivers that are well educated as to their usage. If they are calling EMS it is usually because they are in trouble and have tried everything to get things back to normal, OR they are not having a problem with equipment but the child is sick and they need help transporting equipment and child to hospital.
2. Through EMSC and TAC (Technology-Assisted Children) EMS will be notified of special health care needs children in their area. You are strongly encouraged to get to know the patient when they are well and their medical devices so that you can be of better assistance in case of emergency.
**Teaching Points**: Parents usually know these children the best. Ask them for assistance; most are adept at suctioning, bagging, changing tracheostomy tubes, and troubleshooting medical devices.

Do not become distracted by equipment. The assessment and treatment of children with assisting medical devices should progress as with any child. Assessment and management of airway, breathing and circulation is primary.
Section III: Trauma Protocols
Blunt Trauma

**Definition:** A type of physical trauma caused to a body part by direct impact. The impact may cause injury to underlying tissue or organs.

**Clinical Presentation:** Varies widely and ranges from minor complaints to severe shock. The presentation depends on the mechanism of injury and the organ systems injured. Patients may present with tachycardia, tachypnea, increased pain in the affected body part, and possibly altered mental status.

### Basic Life Support Box

1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen
   - If respirations are ineffective, begin BVM ventilation with 100% oxygen
   - Suction airway as needed
3. Employ **Spinal Immobilization Protocol** as indicated
4. Apply direct pressure to any obvious external hemorrhage
5. Expose patient and immobilize any obvious injuries
   - Maintain warmth using hat, sheet towels and blankets to minimize heat loss
6. Assess mental status prior to and every 15 minutes during transport (GCS/AVPU)
7. Transport for medical evaluation

### Advanced Life Support Box

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Consider intubation if indicated
4. Initiate IV / IO access
5. Infuse NS or LR 20 ml/kg
   - Repeat bolus if needed for shock (see table below)
   - For signs of **Spinal Shock** (hypotension with bradycardia) administer Epinephrine
6. Assess pain and initiate **Pain Protocol**
7. Continue to reassess mental status, vital signs, and pain score
8. Transport for medical evaluation
<table>
<thead>
<tr>
<th>AVPU TABLE</th>
<th>Stimulus</th>
<th>Response type</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Normal environment</td>
<td>Appropriate</td>
<td>Normal interactiveness for age</td>
</tr>
<tr>
<td>Verbal</td>
<td>Simple command or sound stimulus</td>
<td>Appropriate or Inappropriate</td>
<td>Responds to name Nonspecific or confused</td>
</tr>
<tr>
<td>Painful</td>
<td>Pain</td>
<td>Appropriate Inappropriate Pathological</td>
<td>Withdraws from pain Nonpurposeful Response Posturing</td>
</tr>
<tr>
<td>Unresponsive</td>
<td>Above stimuli</td>
<td>No perceptible response to any stimulus</td>
<td>No perceptible response to any stimulus</td>
</tr>
</tbody>
</table>

**Glasgow Coma Scale**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Score</th>
<th>Infant Response</th>
<th>Adult Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Opening</td>
<td>4</td>
<td>Spontaneous</td>
<td>Spontaneous</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>To speech or sound</td>
<td>To speech</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>To painful stimuli</td>
<td>To pain</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Verbal</td>
<td>5</td>
<td>Appropriate words, sounds and social smile</td>
<td>Oriented to person, place, month and year</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Cries but consolable</td>
<td>Confused</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Persistently irritable</td>
<td>Inappropriate words</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Restless/agitated</td>
<td>Incomprehensible</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Motor</td>
<td>6</td>
<td>Spontaneous movement</td>
<td>Obeys commands</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Localizes pain</td>
<td>Localizes pain</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Withdraws to pain</td>
<td>Withdraws to pain</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Abnormal extremity flexion</td>
<td>Abnormal extremity flexion</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Abnormal extremity extension</td>
<td>Abnormal extremity extension</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**Age of Patient**

<table>
<thead>
<tr>
<th>Age of Patient</th>
<th>HR</th>
<th>Systolic BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days - &lt; 1 mo</td>
<td>&lt;80</td>
<td>&gt;205</td>
</tr>
<tr>
<td>≥ 1 mo - &lt; 3 mos</td>
<td>&lt;80</td>
<td>&gt;205</td>
</tr>
<tr>
<td>≥ 3 mos - &lt; 1 yr</td>
<td>&lt;75</td>
<td>&gt;190</td>
</tr>
<tr>
<td>≥ 1 yr - &lt; 2 yrs</td>
<td>&lt;75</td>
<td>&gt;190</td>
</tr>
<tr>
<td>≥ 2 yrs - &lt; 4 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
</tr>
<tr>
<td>≥ 4 yrs - &lt; 6 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
</tr>
<tr>
<td>≥ 6 yrs - &lt; 10 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
</tr>
<tr>
<td>≥ 10 yrs - &lt; 13 yrs</td>
<td>&lt;60</td>
<td>&gt;100</td>
</tr>
<tr>
<td>≥ 13 yrs - &lt; 18 yrs</td>
<td>&lt;60</td>
<td>&gt;100</td>
</tr>
</tbody>
</table>
Key Points/Considerations
1. Severe internal trauma may not have obvious visible external injuries.
2. Altered mental status may be a result of blunt head trauma or significant internal hemorrhage.
3. Prevention of hypoxia and hypotension in the pediatric trauma patient can significantly improve patient outcomes.

Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
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<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000 (0.1 mg/mL)</td>
<td>0.01mg/kg Repeat q 3-5 minutes prn</td>
<td>IV/IO</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Epinephrine 1:1,000 (1 mg/mL)</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn</td>
<td>ETT</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

DO: Direct order from online medical control
ST: Standing Order

Teaching Points: Kids don’t always verbalize pain, need for pain assessment

Tables adapted from Pediatric Education for Prehospital Professionals
Burn

Definition: A burn is an injury to tissue resulting from exposure to flames or hot liquids, contact with hot objects, exposure to caustic chemicals, radiation or contact with electric current.

Clinical Presentation: The severity of a burn injury is determined primarily by the extent of the body surface area involved and, to a lesser extent, by the depth of the burn. Other factors must be considered such as age, concurrent medical problems, smoke inhalation and burns to special areas such as the face, hands and genitalia.

Basic Life Support

1. STOP THE BURN—
   a. Remove from electric contact in the case of electric injury
   b. Remove clothing and jewelry from the involved areas;
   c. In case of chemical burn, brush off any powder or residue and flush with copious amounts of water
2. Refer to General Pediatric Assessment Guidelines
3. Maintain airway, administer 15 lpm of oxygen per non-rebreather mask
   a. If respirations are ineffective begin bag-valve mask ventilation with 100% oxygen
   b. Suction airway as necessary
4. If trauma suspected, Initiate Spinal immobilization protocol
5. Place clean, dry dressings or sheets on burn area
6. Maintain warmth: bundle in blankets
   a. Use hat, sheet, towel or blanket to minimize heat loss
   b. Avoid contact with surfaces that might increase heat loss
7. Transport for medical evaluation

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximetry
3. AIRWAY SWELLING
   a. If unconscious, intubate (May require smaller ETT size related to swelling of airway)
   b. If patient conscious, nebulized epinephrine 2 mL of 1:1,000 Epinephrine in 3mL of saline
4. Rapid transport or consider air medical transport for early airway intervention
   a. Indicators of potential airway compromise, rapid airway decompensation or swelling.

<table>
<thead>
<tr>
<th>Smoke inhalation</th>
<th>Stridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposits in upper airway</td>
<td>Inability to swallow</td>
</tr>
<tr>
<td>Carbonaceous sputum</td>
<td>Respiratory distress</td>
</tr>
<tr>
<td>Edema</td>
<td>Large body surface area burned</td>
</tr>
<tr>
<td>Facial burn</td>
<td>Singed eyebrows or nasal hairs</td>
</tr>
</tbody>
</table>

5. Establish IV/IO access preferably through non-burned tissue, if no choice may use burn area
6. Bolus 20 mL/kg LR or NS  
   a. Additional fluid boluses may be required for signs of shock  
   b. Carefully monitor total fluid administered  
7. Place NG/OG for intubated patients  
8. Treat per Pain protocol  
9. Calculate body surface area involved using attached chart or may be estimated  
   using the patient’s palm size as approximately 1% of BSA  
10. Transport for medical evaluation

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine Sulfate</td>
<td>0.1 mg/kg</td>
<td>IV/IO/IM</td>
<td>4mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1000 (1 mg/mL)</td>
<td>2mL in 3mL of saline</td>
<td>Nebulized</td>
<td>Call for additional doses</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>1mcg/kg</td>
<td>IV/IO</td>
<td>75 mcg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 mcg/kg</td>
<td>IN</td>
<td>100 mcg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order

**Key Points/Considerations**

1. Types of Burns  
   - **Thermal**: Direct contact with hot object, flame or hot liquid.  
   - **Chemical**: Contact with a variety of solids, liquids, powders or gasses that irritate or burn the skin surface, mucous membranes or internal organs.  
   - **Electrical**: Contact with a source of electricity or lightning. Electrical injuries have an entry and exit wound. The entrance wound is dry, charred and depressed in the center. Exit wounds have a blown out appearance. Electrical burns may be much more severe than their appearance. Patients with electrical burns are also at risk for arrhythmias and should be placed on a cardiac monitor.

2. Airway Injury  
   Any child found in an enclosed space or a heavy smoke-filled environment is considered to have an inhalation injury. All patients need to have 100% Oxygen applied due to CO exposure. Exposure to heat and toxic fumes causes the airway to swell and occlude up to 50% of the total airway. Because the swelling process is continuous and rapid, the decision to intubate needs to be determined early, especially if there is a long transport time. BLS providers should rapidly transport this child for airway management or consider ALS intervention.

**Teaching Points:** Many children (usually <5 years of age) are burned as a result of child abuse. Circumferential scald burn to hands, feet, buttocks and genitalia are common burns seen in child abuse.
In the first few hours after a burn, fluid leaks out of the capillaries resulting in a loss of intravascular fluid. All burns require aggressive and accurate fluid management. Superficial burns may be very painful. Consider treatment for pain.

**Burn estimate diagrams: (A) adult; (B) adaptations for children; and (C) infants**

Subtract 1% from head for each year over one year of age
Add ½% to each leg for each year over one year of age

Closed Head Injury

**Definition:** Closed head injury refers to any infant or child with non-penetrating traumatic brain injury (TBI). “Mild closed head injury” applies to children with GCS 13-15 after TBI. “Moderate to severe closed head injury” applies to children with a GCS ≤ 12 after TBI.

**Clinical Presentation:** Children with closed TBI may be confused, combative, or unresponsive. They may have associated skull fracture or other traumatic injuries (c-spine, chest, abdominal, extremities). TBI victims may develop hypoxia or poor oxygen saturation, hypotension, alterations in respiratory drive, and unequal or unresponsive pupils. Children with TBI are more likely than adults to exhibit post-traumatic seizures.

### Basic Life Support

1. Refer to General Pediatric Assessment protocol
2. Maintain c-spine precautions at all times
3. Place on pulse oximeter. Administer supplemental oxygen for any saturation < 90% or if unable to obtain a reliable pulse oximeter reading
4. Maintain airway, administer 10-15 lpm of oxygen
   a. If respirations are ineffective, begin BVM ventilation. Target a normal respiratory rate for age
5. Check pupils. If one or both pupils are “blown” and patient is unresponsive, begin BVM to augment respiratory efforts. Target a normal respiratory rate for age (see chart below)
   a. Reassess pupils every 5 minutes. If a pupil “blows” during frequent assessments, increase respiratory rate by 10% (see chart below)
6. Assess for other traumatic injuries. Apply pressure to stop any obvious bleeding
7. If the child exhibits seizure activity, assure sufficient space to prevent contact injury
   Support the airway with jaw thrust, avoiding any neck extension
8. Transport for medical evaluation

### Advanced Life Support

1. Place on cardiac monitor—treat any arrhythmias
2. Continue to maintain airway, assist breathing as needed for inadequate respiratory effort
   a. Consider intubation if BVM is ineffective
   b. Target a normal respiratory rate for age (see chart below)
   c. If end-tidal CO2 (EtCO2) monitoring is available, note the baseline reading after 1 minute of assisted ventilation. Adjust respiratory rate to maintain EtCO2 reading at baseline ± 5
3. Initiate IV or IO access if GCS ≤ 12 or concern for poor perfusion or hypotension
   a. For patients with GCS > 12 and concern for other trauma, refer to blunt trauma protocol
4. Check blood pressure every 5-10 minutes
   a. Initiate NS or LR 20 ml/kg for hypotension (see chart below) or if unable to obtain blood pressure
b. If a hypotensive patient shows no improvement with initial treatment, may repeat 20 ml/kg up to a total of 60cc/kg. Improvement may be assessed by a more appropriate blood pressure or palpation of strong distal pulses

5. Continue to check pupils every 5 minutes. If a pupil “blows” during reassessment, increase respiratory rate by 10% (see chart below) and contact medical control as soon as possible
   a. If EtCO2 monitoring is available, increase respiratory rate in order to obtain a target reading that is 5-10 points lower than the baseline reading

6. If child exhibits seizure activity that lasts longer than 5 minutes or is recurrent, treat with medications and contact medical control as soon as possible. Follow seizure protocol

**Key Points/Considerations**

1. TBI is a leading cause of childhood death. Hypotension, hypoxia, and either excessive or inadequate ventilation early after TBI are associated with worse outcomes.

2. A blown pupil is concerning for life-threatening increased intracranial pressure. If present, MILD hyperventilation may be life saving. Aggressive hyperventilation does not provide any additional benefit and is associated with worse outcomes.

3. TBI may be painful; however, pain medications can cloud serial neurological assessments. Consequently, routine pain medications should not be administered to children with altered mental status after TBI.

4. Self-limited seizures immediately after TBI (impact seizures) are not associated with worse outcomes. Prolonged or recurrent seizures are associated with worse outcomes.

### Target Respiratory Rates for Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal</th>
<th>↑’d by 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days – &lt; 2 mo</td>
<td>30</td>
<td>33</td>
</tr>
<tr>
<td>≥ 2 mo – &lt; 12 mos</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>≥ 1 yr – 3 yrs</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>≥ 4 yr – &lt; 6 yrs</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>≥ 6 yrs – 15 yrs</td>
<td>12</td>
<td>14</td>
</tr>
</tbody>
</table>

### Lowest Acceptable Systolic BP for Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days – &lt; 1 mo</td>
<td>&lt;60</td>
</tr>
<tr>
<td>≥ 1 mo – &lt; 3 mos</td>
<td>&lt;70</td>
</tr>
<tr>
<td>≥ 3 mos – &lt; 1 yr</td>
<td>&lt;70</td>
</tr>
<tr>
<td>≥ 1 yr – &lt; 10 yrs</td>
<td>&lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 10 yrs</td>
<td>90</td>
</tr>
</tbody>
</table>
## Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam</td>
<td>0.1 mg/kg</td>
<td>IV/IO</td>
<td>5 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td></td>
<td>0.2 mg/kg</td>
<td>IN/IM</td>
<td>10 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>0.1 mg/kg</td>
<td>IV/IO</td>
<td>4 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Diazepam</td>
<td>0.05 mg/kg</td>
<td>IV/IO</td>
<td>5 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td></td>
<td>0.3 mg/kg</td>
<td>PR</td>
<td>10 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**DO/P:** Direct order from on line medical control or from a Paramedic  
**ST:** Standing Order

### Teaching Points

Discuss anoxic brain injury; abnormal neurological exam  
Consider trauma/ non-accidental trauma (NAT)
Penetrating Trauma

**Definition:** Penetrating trauma is defined as a trauma as a result of an object at high velocity entering the body through the skin causing an open wound and injury to the internal tissues.

**Clinical Presentation:** Penetrating trauma is rare in pediatric patients but can result from both accidental and intentional injury. The injury severity depends on many factors including the potential involvement of vital structures (blood vessels, nerve tissue, internal organs). As a result, patients may present with shock from ongoing blood loss or infection and altered mental status.

### Basic Life Support
1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen
   a. If respirations are ineffective, begin BVM ventilation
   b. Suction airway as needed
3. Employ **Spinal Immobilization** protocol as indicated
4. Apply direct pressure to any obvious external hemorrhage
5. Expose the patient
   a. Look for signs of trauma and immobilize any obvious injuries and penetrating object
   b. Do not attempt to remove penetrating object
   c. Maintain warmth using hat, sheet towels and blankets to minimize heat loss
6. Assess mental status prior to and every 15 minutes during transport (GCS/AVPU)
7. Transport for medical evaluation

### Advanced Life Support
1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximetry
3. Consider intubation if indicated
4. Initiate IV or IO access
5. Infuse NS or LR 20 mL/kg
   a. Repeat bolus if needed for shock (see table below)
   b. If signs of spinal shock (hypotension with bradycardia) give Epinephrine
6. Assess pain and initiate **Pain Protocol**
7. Continue to reassess mental status, vital signs, and pain score
8. Transport for medical evaluation
## AVPU TABLE

<table>
<thead>
<tr>
<th></th>
<th>Stimulus</th>
<th>Response type</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert</td>
<td>Normal environment</td>
<td>Appropriate</td>
<td>Normal interactivity for age</td>
</tr>
<tr>
<td>Verbal</td>
<td>Simple command or sound stimulus</td>
<td>Appropriate or Inappropriate</td>
<td>Responds to name Non-specific or confused</td>
</tr>
<tr>
<td>Painful</td>
<td>Pain</td>
<td>Appropriate Pathological</td>
<td>Withdraws from pain Non-purposeful Response Posturing</td>
</tr>
<tr>
<td>Unresponsive</td>
<td>Above stimuli</td>
<td>No perceptible response to any stimulus</td>
<td>No perceptible response to any stimulus</td>
</tr>
</tbody>
</table>

## Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Activity</th>
<th>Score</th>
<th>Infant Response</th>
<th>Adult Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Opening</td>
<td>4</td>
<td>Spontaneous</td>
<td>Spontaneous</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>To speech or sound</td>
<td>To speech</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>To painful stimuli</td>
<td>To pain</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Verbal</td>
<td>5</td>
<td>Appropriate words, sounds and social smile</td>
<td>Oriented to person, place, month and year</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Cries but consolable</td>
<td>Confused</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Persistently irritable</td>
<td>Inappropriate words</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Restless/agitated</td>
<td>Incomprehensible</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Motor</td>
<td>6</td>
<td>Spontaneous movement</td>
<td>Obeys commands</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Localizes pain</td>
<td>Localizes pain</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Withdraws to pain</td>
<td>Withdraws to pain</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Abnormal extremity flexion</td>
<td>Abnormal extremity flexion</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Abnormal extremity extension</td>
<td>Abnormal extremity extension</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

## Vital Signs that would be abnormal according to age of child

<table>
<thead>
<tr>
<th>AGE OF PATIENT</th>
<th>HR</th>
<th>SYSTOLIC BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days - &lt; 1 mo</td>
<td>&lt;80</td>
<td>&gt;205 &lt;60</td>
</tr>
<tr>
<td>≥ 1 mo - &lt; 3 mos</td>
<td>&lt;80</td>
<td>&gt;205 &lt;70</td>
</tr>
<tr>
<td>≥ 3 mos - &lt; 1 yr</td>
<td>&lt;75</td>
<td>&gt;190 &lt;70</td>
</tr>
<tr>
<td>≥ 1 yr - &lt; 2 yrs</td>
<td>&lt;75</td>
<td>&gt;190 &lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 2 yrs - &lt; 4 yrs</td>
<td>&lt;60</td>
<td>&gt;140 &lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 4 yrs - &lt; 6 yrs</td>
<td>&lt;60</td>
<td>&gt;140 &lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 6 yrs - &lt; 10 yrs</td>
<td>&lt;60</td>
<td>&gt;140 &lt;70 + (age x 2)</td>
</tr>
<tr>
<td>≥ 10 yrs - &lt; 13 yrs</td>
<td>&lt;60</td>
<td>&gt;100 &lt;90</td>
</tr>
<tr>
<td>≥ 13 yrs - &lt; 18 yrs</td>
<td>&lt;60</td>
<td>&gt;100 &lt;90</td>
</tr>
</tbody>
</table>
Key Points/Considerations
1. Severe internal trauma may not have obvious visible external injuries.
2. The speed of the projectile is a more important factor than its mass in determining how much damage is done.
3. The penetrating object may remain in the tissues, exit the body the way it entered, or pass through the tissues and exit from another area.

Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
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<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000</td>
<td>0.01mg/kg</td>
<td>IV/IO</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>(0.1 mg/mL)</td>
<td>Repeat q 3-5 minutes prn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1,000</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn</td>
<td>ETT</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>(1 mg/mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DO: Direct order from online medical control
ST: Standing Order

Epinephrine solution for nebulization is made by mixing epinephrine 2m, 2 mL of epinephrine 1:1000, with 3mL NS.
Spinal Immobilization

**Definition:** Immobilization of a patient’s spine from cervical spine to lumbar spine, to prevent further damage to spinal vertebrae or spinal cord.

**Symptoms indicating need for spinal immobilization are but are not limited to the following:**
- Neck muscle spasm
- Numbness/tingling
- Bowel/bladder incontinence
- Hypotension with bradycardia (spinal shock)
- Altered gait
- Pain on neck palpation
- Limitation of motion
- Muscle weakness/flaccidity
- Priapism

**Mechanisms of injury indicating need for spinal immobilization are:**
- Head trauma
- Fall
- Motorized sports vehicle event
- Axial loading injury
- Facial trauma
- Auto-Pedestrian event
- MVC

**Symptoms of Neurogenic Shock**
- Bounding pulses
- Warm extremities
- Hypotension despite adequate fluid resuscitation
- Bradycardia
- Flaccid paralysis

Spinal immobilization requires an appropriate sized c-collar, head blocks (towel rolls), head strap (tape) to secure the head, and a pediatric/adult backboard with spider straps across the chest, pelvis, and knees to ensure patient immobilization. Use pediatric backboards for children less than 8 yrs old and adult backboards for children 8 yrs old or older. In case of multiple casualties or other cases when a pediatric specific backboard is not available use an adult backboard and raise the body (not the head) to ensure spinal alignment. (See diagram below)

Children less than 2 years of age should be immobilized in a car seat or commercial infant c-spine papoose device. When using a car seat for immobilization, proper c-spine precautions should be taken during application and extraction from car seat. Towel rolls
to sides of the head with tape across forehead and towels filling in any spaces need to be applied. The car seat restraints need to be used as well.

Children with suspected spinal cord injuries at any level are maintained in spinal immobilization until definitive neurologic care occurs.

Remember to assess the child’s motor and sensory function after application of spinal precautions.

**Medication/treatments table**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000</td>
<td>0.01mg/kg Repeat q 3-5 minutes prn</td>
<td>IV/IO</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>(0.1 mg/mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1,000</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn</td>
<td>ETT</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>(1mg/mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order
Submersion Victim

Definition: Submersion injuries can be classified into two categories: Drowning and Near-drowning. Drowning occurs when the patient dies as a result of asphyxiation within the first 24 hours of the submersion event. The term near drowning indicates that the patient has survived past the first 24 hours. Near drowning victims may ultimately die from complications of their submersion.

Clinical Presentation: Submersion injuries can occur in any body of water such as the bathtub, swimming pools, buckets, and open bodies of water such as ponds, rivers, and streams. There can be co-existing conditions depending on the type of submersion injury including trauma, hypothermia, and intoxication. Mental status may range between normal and alert to significant alterations. Patients can be cyanotic, pale, have labored respirations with retractions, or appear well with minimal injury. All patients require some medical assessment beyond the initial scene presentation.

Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Assess and maintain airway patency:
   a. If breathing spontaneously: Oxygen 10-15 LPM via non-rebreather to maintain oxygen saturations >95%
   b. If patient is apneic or agonally breathing: Provide ventilation with BVM and 100% oxygen
3. Initiate CPR for pulseless arrest or symptomatic bradycardia (refer to specific pediatric dysrhythmia protocol)
4. If trauma is suspected or incident unwitnessed, protect the spine. Refer to Spinal Immobilization Protocol
5. Obtain core body temperature
   a. Protect patient from hypothermia and initiate warming measures as indicated (refer to Hypothermia Protocol)
6. Reassess and transport for medical evaluation

Advanced Life Support

1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Intubate if patient is apneic, unresponsive, has severe respiratory distress or depression or if unable to effectively ventilate or oxygenate child
4. Place IV/IO. If patient is hypotensive for age give 20 mL/kg of NS or LR
   i. May repeat once if signs of shock persist after initial bolus
5. Reassess and transport for medical evaluation

Key Points/Considerations

1. Submersion in cold water will often cause severe hypothermia. Notify receiving hospital immediately of transport of hypothermic patient so that appropriate resources can be mobilized.
2. Hypotension is associated with worse outcomes. If in doubt, give fluid.
**Teaching Points:** Higher pressures may be required for ventilation as a result of aspiration and pulmonary edema. To improve chest rise, in such patients, you may need to occlude the pop-off valve on the BVM.
Section IV: Medical Protocols
Altered Mental Status

**Definition:** “Altered Mental Status” refers to any infant or child who displays a change in his or her normal mental state.

**Clinical Presentation:** Patients with altered mental status can often have decreased mental status or bizarre behavior. They can be hypo- or hypertensive, be hypo- or hyperglycemic, and can have alterations in respiratory drive.

### Basic Life Support

1. Refer to General Pediatric Assessment protocol
2. Maintain airway, administer 10-15 lpm of oxygen
   a. If respirations are ineffective, begin BVM ventilation
3. Look for signs of trauma and initiate **Spinal Immobilization Protocol** as indicated
4. Check temperature. Initiate **Fever, Hyperthermia** or **Hypothermia Protocols** as indicated
5. Check blood glucose
   a. If less than 60 mg/dl, and patient is able to maintain airway, call medical control
6. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Consider intubation if necessary
4. Initiate IV or IO access
   a. Initiate NS or LR 20mL/kg for hypotension or shock
5. Check blood glucose, if less than 60 mg/dl
   a. Give D10W 2 mL/kg (200mg/kg) for neonates <30 days
   b. Give D10W 5 mL/kg (500 mg/kg) for all other children
6. If opiates suspected (pinpoint pupils, respiratory depression):
   a. Give Naloxone (0.1 mg/kg IV or IO)
7. After intervention, reassess mental status; if no change, repeat appropriate intervention
8. Transport for medical evaluation

### Recipe for D10W

Draw up 10 mL of D50 and mix with 40 mL of sterile water. NS should be used in place of sterile water for infants and children >30 days.

### Key Points/Considerations

1. It is important to assess and treat any underlying and potential life-threatening conditions (see table below).
2. Obtain complete history and do comprehensive physical exam
3. If poisoning suspected, contact Utah Poison Control at 1-800-222-1222 for guidance.
AEIOUTIPPS: Possible causes of Altered Mental Status

<table>
<thead>
<tr>
<th>A</th>
<th>Alcohol</th>
<th>T</th>
<th>Trauma, Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Electrolytes</td>
<td>I</td>
<td>Infection</td>
</tr>
<tr>
<td>I</td>
<td>Insulin (hypoglycemia)</td>
<td>P</td>
<td>Psychogenic</td>
</tr>
<tr>
<td>O</td>
<td>Opiates</td>
<td>P</td>
<td>Poison</td>
</tr>
<tr>
<td>U</td>
<td>Uremia</td>
<td>S</td>
<td>Shock, Seizure</td>
</tr>
</tbody>
</table>

Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10W (10 ml D50 and 40 ml diluent)</td>
<td>2 mL/kg (neonate) 5ml/kg (children)</td>
<td>IV/IO</td>
<td>Repeat as needed to keep glucose &gt;60</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Oral Glucose</td>
<td>20-30 mL of D5%W (infant)</td>
<td>PO</td>
<td>Repeat as needed to keep glucose &gt;60</td>
<td>DO</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Naloxone</td>
<td>0.1 mg/kg</td>
<td>IV/IO/IM/SQ</td>
<td>2 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order
**Apparent Life Threatening Event (ALTE)**

**Definition:** ALTE is an episode that is frightening to the observer and involves some combination of apnea, color change, marked change in tone, choking, or gagging.

**Important Information:** ALTE usually occurs in infants less than 12 months. It may be a presentation for a variety of different pediatric conditions including seizures, upper airway obstruction, gastroesophageal reflux, metabolic problems, anemia, and cardiac disease.

*Note that often patients with ALTE can be well appearing on presentation.*

### Basic Life Support

1. Refer to Pediatric General Assessment Guidelines
2. Maintain airway, administer 10-15 lpm oxygen via non-rebreather
   - a. Assist with BVM ventilation if ineffective respiratory effort
3. If patient exhibits decreased LOC, initiate **Altered Mental Status Protocol**
4. Complete thorough history and physical
   - a. Specifically assess for history of apnea, decreased tone, pallor or cyanosis
   - b. Obtain history of medications or possible toxic exposures/ingestions
5. Treat any identifiable problems (see [Hypoglycemia, Hypothermia](#) if applicable)
6. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Consider intubation if patient is apneic, unresponsive, or difficult to ventilate/oxygenate
4. Initiate IV/IO
   - a. Administer 20 cc/kg NS or LR if signs of shock
   - b. May repeat second fluid bolus if signs of shock or hypotension persist
5. Treat any identifiable causes ([Shock, Respiratory Failure, Hypoglycemia, Hypothermia, Seizures](#) see specific protocol)
6. Transport for medical evaluation

### Key Points/Considerations

1. Determine severity, duration, and nature of episode.
2. Obtain complete medical history.
3. Do comprehensive physical exam.
4. All patients should be transported for medical evaluation, even the well appearing child.
5. Contact medical control if parent/guardian is refusing medical care and/or transport.
**Fever**

**Definition:** Defined as a core body temperature of 100.4 degrees F or 38 degrees C or greater.

**Clinical Presentation:** Fever results in a faster metabolic rate. Patients often present with tachycardia and tachypnea. Fever can also be associated with seizures, hallucinations, and other forms of altered mental status.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, offer 100% oxygen via NRB
   a. If respirations are ineffective, begin BVM ventilation
3. Obtain history and document temperature (rectal or axillary)
4. Administer acetaminophen 15mg/kg PO if >4 hours since last antipyretic
5. Begin cooling measures if temperature is greater than 103F or 39.5C
   a. Passive cooling: remove excessive clothing
   b. DO NOT USE ICE OR RUBBING ALCOHOL TO COOL
6. If seizing refer to **Seizure Protocol**
7. If core temperature is greater than 106 degrees F or 41 degrees C begin **Pediatric Hyperthermia Protocol**
8. If immunosuppressed, initiate **Immunosuppressed Patient Protocol**
9. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Assess for signs of hypotension, see table below. If present, establish IV/IO and initiate 20 mL/kg of NS or LR
   a. May repeat 20 mL/kg as needed for hypotension up to 60 mL/kg
4. Transport for medical evaluation

### Sepsis Vital Signs

<table>
<thead>
<tr>
<th>Age</th>
<th>T</th>
<th>P</th>
<th>R</th>
<th>Systolic BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0m–3m</td>
<td>&gt;36</td>
<td>&gt;38</td>
<td>&lt;80</td>
<td>&gt;205</td>
</tr>
<tr>
<td>3m–2y</td>
<td>&gt;36</td>
<td>&gt;38.5</td>
<td>&lt;75</td>
<td>&gt;190</td>
</tr>
<tr>
<td>2y–6y</td>
<td>&gt;36</td>
<td>&gt;38.5</td>
<td>&lt;60</td>
<td>&gt;140</td>
</tr>
<tr>
<td>6y–10y</td>
<td>&gt;36</td>
<td>&gt;38.5</td>
<td>&lt;60</td>
<td>&gt;140</td>
</tr>
<tr>
<td>10y–18y</td>
<td>&gt;36</td>
<td>&gt;38.5</td>
<td>&lt;60</td>
<td>&gt;100</td>
</tr>
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</table>
## Temperature Conversion Table

<table>
<thead>
<tr>
<th>Fahrenheit</th>
<th>Celsius</th>
</tr>
</thead>
<tbody>
<tr>
<td>98.6</td>
<td>37</td>
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<tr>
<td>100.4</td>
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<td>102.5</td>
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<tr>
<td>104.0</td>
<td>40</td>
</tr>
<tr>
<td>105.8</td>
<td>41</td>
</tr>
</tbody>
</table>
Hyperglycemia

**Definition:** Hyperglycemia is a condition where blood glucose levels rise excessively. This elevated glucose level may lead to a potential hypovolemia.

**Clinical Presentation:** Increased thirst, increased urination, fatigue, increased respiratory effort (from an acidotic state), abdominal pain, nausea, vomiting, and any other signs of dehydration or decreased perfusion.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, offer 100% oxygen via NRB
   a. If respirations are ineffective, begin BVM ventilation
3. Check blood glucose (if <60 mg/dL) see Hypoglycemia protocol
4. Contact medical control for glucose >500 mg/dl
5. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardio-respiratory monitor and continuous pulse oximetry
3. Establish IV/IO
4. For the patient with high blood glucose (>300) and signs of decreased perfusion, begin an IV/IO bolus of 20 mL/kg NS
5. Transport for medical evaluation

### Key Points/Considerations

1. Hyperglycemia can result from an inadequate supply of insulin or the body’s resistance to circulating insulin.
2. As the body uses other sources of fuel for metabolism, ketones and acid production occurs. This results in an acidotic state.
Hyperthermia

Definition: Hyperthermia is the decreased ability of a patient’s body to regulate a response to high environmental temperatures. This is often associated with dehydration.

Clinical Presentation: Heat Exhaustion: Moist, cool skin, cramping, slightly elevated or normal temperature or nausea. Heat Stroke: Hot, dry skin, altered mental status, dilated pupils, tachycardia, seizure activity, elevated body temperature, or arrhythmias.

Basic Life Support
1. Remove patient from hot environment
2. Refer to General Pediatric Assessment Guidelines
3. Maintain airway, administer 10-15 lpm of oxygen via NRB
4. Begin BVM ventilation with 100% oxygen for:
   a. Ineffective respiratory effort
   b. Heart rate
      i. < 80 for infants
      ii. < 60 for children
   c. Cyanosis despite 100% oxygen via NRB
   d. Decreased level of consciousness
5. Obtain history and document temperature
6. Passive cooling measures: cool environment, fan, ice packs, remove clothing
7. Oral rehydration with electrolyte solution if mental status is normal
8. Transport for medical evaluation

Advanced Life Support
1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter assess for arrhythmias (see specific Dysrhythmia protocol)
3. Intubate if unable to adequately ventilate or oxygenate child by BVM
4. IV/IO
   a. Initiate IV fluids 20mL/kg
5. Assess for seizure activity and refer to Seizure Protocol
6. Transport for medical evaluation

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<tr>
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<td>41</td>
</tr>
</tbody>
</table>
Key Points/Considerations
1. Move patient from hot environment to shade.
2. Remove excess clothing.
3. Mortality from heat stroke is usually from dysrhythmia. It is important to recognize early and treat..

Teaching Points: Consider creative ways to cool the individual. The head is a good location to administer cooling measures.
Hypoglycemia

**Definition:** Hypoglycemia is defined as a blood glucose concentration of less than 60 mg/dl in a child and less that 40 mg/dl in a term neonate (<30 days of age).

**Clinical Presentation:** Tachycardia, tachypnea, sweating, agitation and tremor. When blood glucose is dangerously low, seizures and altered mental status may be seen.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen via NRB
3. Begin BVM ventilation with 100% oxygen for ineffective respiratory effort
4. Check blood glucose
5. If hypoglycemic notify medical control to obtain order to administer oral glucose
6. Attempt oral glucose replacement, unless vomiting or altered mental status
7. Recheck blood glucose and assess mental status 30 minutes after oral glucose administration
8. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardio-respiratory monitor and continuous pulse oximetry
3. Establish vascular access and:
   a. For infants and children: Administer D10W 5 mL/kg
   b. For term neonates (<30 days of age): Administer D10W 2 mL/kg
4. Repeat blood glucose and assess mental status 30 minutes after IV or oral glucose administration
5. Transport for medical evaluation

### Recipe for D10W

Draw up 10 mL of D50 and mix with 40 mL of sterile water. NS should be used in place of sterile water for infants and children >30 days.

### Medication/Treatments Table

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<td>Repeat as needed to keep glucose &gt;60</td>
<td>ST</td>
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</tr>
<tr>
<td>Oral Glucose</td>
<td>20-30 mL of D5%W (infant)</td>
<td>PO</td>
<td>Repeat as needed to keep glucose &gt;60</td>
<td>DO</td>
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</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control

**ST:** Standing Order
Hypothermia

**Definition:** Environmental cold exposure leading to drop in core body temperature and injury to exposed body parts (frostbite).

- **Mild Hypothermia:** Core temperature 35–32°C (95–89.6°F). Patients have shivering, uncomfortable, red skin, confusion, poor judgment.
- **Moderate Hypothermia:** Core temperature 32–28°C (89.6–82.4°F). Patients present with decreased mental status, arrhythmias including bradycardia, pallor.
- **Severe Hypothermia:** Core temperature <28°C (82.4°F). Patient may be unconscious, have severely decreased mental status, slow respirations, asystole, bradycardia, or other arrhythmias.

**Clinical Presentation:** Frostbite usually affects the area of skin most exposed to the elements. The skin turns reddened then mottled, bluish, white and/or grey with continued exposure. Pain persists during initial phases then numbness ensues. If patient is still conscious, confusion may be present along with decreased mental status and bradycardia.

**Basic Life Support**

1. Remove any wet clothing from patient and **carefully** move to warm environment (do not immerse patient in water)
2. Refer to General Pediatric Assessment Guidelines
3. Maintain airway, administer 10-15 lpm of oxygen via NRB
4. Begin BVM ventilation for **3 minutes*** with 100% oxygen for:
   - Ineffective respiratory effort
   - Heart rate
     - i. < 80 for infants
     - ii. < 60 for children
5. Cyanosis despite 100% oxygen via NRB
6. Decreased level of consciousness
7. Check for pulse, if no pulse begin CPR
8. Begin active rewarming measures (hats, blankets), apply heat packs over chest to warm heart
9. Protect injured (frostbite) areas, **do not rub or place on heated surface**
10. Protect patient from further heat loss
11. If patient awake and alert with intact airway, offer sugar containing solution to drink
12. Transport for medical evaluation

**Advanced Life Support**

1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter
   a. Assess for arrhythmias
3. If unable to effectively perform BMV, consider intubation
4. Initiate IV/IO
   a. **Warm** IV NS or LR 20mL/kg
5. Administer medications as directed by Medical Control
6. Transport for medical evaluation
*Adapted from State of Alaska Guidelines (reference)

Temperature Conversion Table

<table>
<thead>
<tr>
<th>Fahrenheit</th>
<th>Celsius</th>
</tr>
</thead>
<tbody>
<tr>
<td>77</td>
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<td>36</td>
</tr>
<tr>
<td>98.6</td>
<td>37</td>
</tr>
</tbody>
</table>

Key Points/Considerations

1. Do not remove clothing unless immediate active rewarming can be done.
2. Remove wet clothing from the patient before rewarming.
3. Be careful in the transport of unconscious patients, rough movement can precipitate arrhythmias.
4. Keep patient lying flat to reduce cardiac work.
5. In the rewarming phase arrhythmias can develop; recognize and treat.
6. Notify medical control early to activate resources at receiving hospital.
Non-Traumatic Shock/Sepsis

**Definition:** Hypoperfusion or shock is defined as decreased effective circulation, with inadequate delivery of oxygen to tissues. Shock may be present in a compensated state (normal blood pressure) or in a decompensated state (low blood pressure).

*Hypovolemic* shock (cold shock state) is most common cause in pediatrics due to fluid losses from dehydration.

*Distributive* shock (warm shock state) is from inadequate fluid distribution causing hypoperfusion. Examples include septic shock or anaphylaxis.

**Clinical Presentation:** *Cold shock:* increased heart rate, prolonged capillary refill >3 seconds, cool pale, clammy, or mottled skin, weak or absent peripheral pulses and altered mental status. *Warm shock:* increased heart rate, “flash” capillary refill time, warm, flushed skin, bounding peripheral pulses, increased respiratory rate, mental status decreased or confused.

**Basic Life Support**
1. Refer to General Pediatric Assessment Guidelines
2. Obtain vital signs including blood pressure
3. Maintain airway, administer 10-15 lpm of oxygen if signs of respiratory distress
   a. If respirations are ineffective, begin BVM ventilation
   b. Suction as needed
4. Transport for medical evaluation

**Advanced Life Support**
1. Follow BLS procedures
2. Place patient on cardio-respiratory monitor and continuous pulse oximeter
3. Consider intubation if unable to effectively ventilate with BVM
4. Obtain IV/IO and initiate 20 ml/kg of NS or LR
5. Contact medical control as soon as possible to mobilize resources at receiving facility
6. Reassess patient perfusion status including vital signs
   a. If patient is persistently hypotensive or with signs of poor perfusion, repeat 20 ml/kg of NS or LR
7. Transport for medical evaluation

**Key Points/Considerations**
1. Patients who are in a cardiogenic shock state will worsen after fluid resuscitation.
2. Reassessment between fluid boluses is very important component of care.
### Teaching Points:
Perfusion is important, barriers between skin, how to identify frostbite and protect skin, IV fluid warming.

<table>
<thead>
<tr>
<th>AGE OF PATIENT</th>
<th>HR</th>
<th>RR</th>
<th>SYSTOLIC BP</th>
<th>TEMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 days - &lt; 1 mo</td>
<td>&lt;80</td>
<td>&gt;205</td>
<td>&lt;60</td>
<td>&lt;36</td>
</tr>
<tr>
<td>≥ 1 mo - &lt; 3 mos</td>
<td>&lt;80</td>
<td>&gt;205</td>
<td>&lt;60</td>
<td>&lt;36</td>
</tr>
<tr>
<td>≥ 3 mos - &lt; 1 yr</td>
<td>&lt;75</td>
<td>&gt;190</td>
<td>&lt;70</td>
<td>&lt;36</td>
</tr>
<tr>
<td>≥ 1 yr - &lt; 2 yrs</td>
<td>&lt;75</td>
<td>&gt;190</td>
<td>&gt;70 + (age x 2)</td>
<td>&lt;36</td>
</tr>
<tr>
<td>≥ 2 yrs - &lt; 4 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
<td>&gt;70 + (age x 2)</td>
<td>&lt;36</td>
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<tr>
<td>≥ 4 yrs - &lt; 6 yrs</td>
<td>&lt;60</td>
<td>&gt;140</td>
<td>&gt;34</td>
<td>&lt;36</td>
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<tr>
<td>≥ 13 yrs - &lt; 18 yrs</td>
<td>&lt;60</td>
<td>&gt;100</td>
<td>&gt;90</td>
<td>&lt;36</td>
</tr>
</tbody>
</table>
Pain Management

**Definition:** Pain is often a result of either trauma or other noxious stimuli and often requires treatment in addition to the underlying cause.

**Clinical Presentation:** Patients in pain can present in significant distress often leading to crying or significant agitation, hyperventilation, and tachycardia.

### Basic Life Support
1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen if signs of respiratory distress
   a. If respirations are ineffective, begin BVM ventilation
3. Immobilize any obvious injuries to alleviate any ongoing pain
4. Place in position of comfort. If there are signs of multi-system trauma, follow Spinal Immobilization protocol as indicated
5. Transport for medical evaluation

### Advanced Life Support
1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximetry
3. Consider intubation if necessary
4. Initiate IV/IO access as needed
5. Initiate treatment for underlying cause of pain
6. Assess patient’s pain using either Wong-Baker Faces scale (ages 3-8 years) or numerical scale (ages 8-18 years)
7. Administer morphine or fentanyl for a pain scale of greater than or equal to 3 on the faces scale or 4 on numerical scale
8. After intervention, reassess mental status and for signs of respiratory depression
9. If respiratory depression, administer nalaxone
   a. Call for medical control if additional doses are required
10. Transport for medical evaluation in position of comfort

### Key Points/Considerations
1. Treatment of pain can lead to an alteration of mental status or respiratory depression so should be limited to those where head trauma is not suspected.
2. Obtain complete history and do comprehensive physical exam.
3. Family-centered care can often assist in alleviating pain and anxiety in a distressed child.
### Wong-Baker FACES Pain Rating Scale

![Wong-Baker FACES Pain Rating Scale](image)

*From Hockenberry MJ, Wilson D: Wong’s essentials of pediatric nursing, ed. 8, St. Louis, 2009, Mosby. Used with permission. Copyright Mosby*

### Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max dose</th>
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<th>EMT-IA</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>0.1 mg/kg</td>
<td>IV/IM/IO</td>
<td>4 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Fentanyl</td>
<td>1 mcg/kg</td>
<td>IV/IO</td>
<td>75 mcg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 mcg/kg</td>
<td>IN</td>
<td>100 mcg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
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<tr>
<td>Naloxone</td>
<td>0.1 mg/kg</td>
<td>IV</td>
<td>2 mg</td>
<td>ST</td>
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</tr>
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</table>

**DO:** Direct order from on line medical control
Seizure

**Definition:** Seizures are a neuromuscular response to an underlying cause such as: epilepsy, hypoxia, hypoglycemia, head injury, recent illness, poisoning, and infection.

**Clinical Presentation:** May include: altered level of consciousness, tonic/clonic muscle movement, eye deviation, tachycardia, tachypnea, bradycardia, bradypnea, twitching, staring episodes.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Protect airway by suctioning or positioning and apply 100% oxygen via NRB
3. Obtain history of seizures, diabetes, fever, ingestion, or trauma
4. Monitor patient, protect from further injury
5. Obtain a blood glucose and if hypoglycemic then refer to **Hypoglycemic Protocol**
6. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Apply cardiac monitor
3. Support breathing by BVM or intubate for respiratory failure or apnea
4. Administer medications if seizure activity is present or for recurrent seizure activity (see table below)
   a. If seizure does not stop within 5 minutes of medication administration, contact medical control
5. Implement protocols as determined by history obtained
6. Transport for medical evaluation

### Key Points/Considerations

1. If a patient has a history of frequent seizures refer to Medical Emergency Health Care Information (Children with Special Healthcare Needs).
2. Medications used to stop seizures often cause transient respiratory depression, monitor patients closely for apnea after seizure is controlled and support breathing as necessary.
3. Be aware that medications to control seizures may potentiate hypotension in patients.
   a. Therefore, if seizures are due to traumatic brain injury, actively monitor for hypotension.
4. Mortality and morbidity increases with duration and frequency of seizures.
   a. Status epilepticus is defined as seizure duration greater than 5 minutes.
   b. Often patients with recurrent seizures may be in non-convulsive status epilepticus in between when they appear post-ictal.
5. A seizure burns glucose, and hypoglycemia can cause additional seizures. Therefore it is important to check glucose and treat hypoglycemia.
<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam</td>
<td>0.1 mg/kg</td>
<td>IV/IO</td>
<td>5 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td></td>
<td>0.2 mg/kg</td>
<td>IN/IM</td>
<td>10 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>0.1 mg/kg</td>
<td>IV/IO</td>
<td>4 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Diazepam</td>
<td>0.05 mg/kg</td>
<td>IV/IO</td>
<td>5 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td></td>
<td>0.3 mg/kg</td>
<td>PR</td>
<td>10 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order
## Toxic Exposure

**Definition:** Pediatric toxic exposure is the ingestion, inhalation, contact or intravenous administration of a potentially toxic substance.

**Clinical Presentation:** Mental status changes, respiratory depression, hypo/hypertension, seizures and arrhythmias (tachycardia/bradycardia).

### Basic Life Support

1. Scene assessment and possible decontamination (i.e. Hazmat protocols)
2. Refer to General Pediatric Assessment Guidelines
3. History:
   - Other potential toxic substances
   - Past Medical History
   - Quantity
   - Route of ingestion (oral, inhaled, contact, intravenous)
   - Substance
   - Time ingested/duration of exposure
4. Check blood glucose for decreased level of consciousness
5. If child appears unstable than transport immediately
6. If stable, notify Poison Control Center: (800) 222–1222 for guidance
7. Contact medical control and consider administration of activated charcoal for if within 1 hour of ingestion, transport time > 30 minutes, and patient is awake and alert. Do NOT administer for any of the following ingestions.
   - Minerals/electrolytes
   - Alcohols
   - Cyanide
   - Caustics (i.e. lye)
   - Solvents (ex. cleaning solution)
   - Heavy Metals (iron, lithium, fluoride, etc.)
   - Hydrocarbons (gasoline)
8. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Cardiac Monitor (assess for arrhythmias, hypotension, and bradycardia)
3. Consider treatment with Naloxone (0.1 mg/kg up to 2mg IV) for respiratory depression and suspected overdose/ingestion of opiate medications (i.e. morphine, oxycodone)
4. Consider intubation for airway protection or respiratory support
5. Consider antidotes (i.e. atropine) in consultation with Poison Center/Medical Control
6. Transport for medical evaluation
Key Points/Considerations
1. It is extremely important to monitor asymptomatic patients for delayed affects.
2. Obtain a thorough history with an emphasis on quantity and timing of all potential substances (medications, illicit drugs, household products, etc.).
3. Contact Medical Control/Poison Control Center for guidance: (800) 222-1222.

Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT – Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated charcoal</td>
<td>1 g/kg</td>
<td>PO</td>
<td>50 g</td>
<td>DO</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Oral Glucose</td>
<td>20-30 mL of D5W</td>
<td>PO</td>
<td>repeat to keep glucose &gt;60</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>D50</td>
<td>2mL/kg (neonates) 5mL/kg (children)</td>
<td>IV/IO</td>
<td>repeat to keep glucose &gt;60</td>
<td>DO</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Naloxone*</td>
<td>0.1 mg/kg</td>
<td>IV</td>
<td>2 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Atropine</td>
<td>.01 mg/kg</td>
<td>IV</td>
<td>1 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control
**ST:** Standing Order
*use with caution as this may cause withdrawal complications in opiate dependent (addicted) patients
Section V: Cardiac Protocols
Asystole & Pulseless Electrical Activity (PEA)

**Definition:** Asystole is a form of cardiac arrest with a complete absence of electrical activity of the heart. Cardiac arrest with PEA indicates the presence of cardiac electrical activity in the absence of a pulse.

**Clinical Presentation:** Asystole and PEA are both forms of cardiac arrest; an absence of vital signs.

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. If patient is 12 months or older, attach AED leads and follow AED instructions
3. If patient is less than 12 months of age, initiate age appropriate CPR
4. Begin bag-mask ventilation with 100% oxygen
5. Consider oral-pharyngeal airway
6. Consider possible causes (See Table below)
7. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximetry
3. Confirm asystole in at least 2 leads or identify PEA
4. If, at any time, a cardiac rhythm other than asystole or PEA is noted on the monitor, treat based on the appropriate protocol
5. Intubate and ventilate with 100% oxygen
6. Establish IV/IO access, start NS infusing wide open up to 60 mL/kg
7. Consider intraosseous cannulation if unable to rapidly establish venous access
8. Administer Epinephrine; may repeat every 3-5 minutes prn
9. Patient should be reassessed for return of vital signs every 10 mL/kg of fluid, 5 cycles of CPR and after each intervention
10. When 60 ml/kg of volume replacement has been reached, infuse at TKO
11. Consider possible causes (See table below)
12. Transport for medical evaluation

### Key Points/Considerations

<table>
<thead>
<tr>
<th>Causes of PEA: The 5 “H’s” and 5 “T’s”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
</tr>
<tr>
<td>Hypovolemia</td>
</tr>
<tr>
<td>Hypo- or Hyperkalemia</td>
</tr>
<tr>
<td>Hypothermia</td>
</tr>
<tr>
<td>Hydrogen ion (Acidosis)</td>
</tr>
</tbody>
</table>
## Medication / Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000 (0.1 mg/mL)</td>
<td>0.01mg/kg Repeat q 3-5 minutes prn</td>
<td>IV/IO</td>
<td>1 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1,000 (1 mg/mL)</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn</td>
<td>ETT</td>
<td>NA</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order
Bradyarrhythmias

**Definition:** A heart rate that is slow compared to normal heart rates for the patient's age. The most common cause of bradycardia in a child is hypoxia. Cardiac rhythm disturbance may be due to abnormal pacemaker or electrical conduction.  

**Clinical Presentation:** Nonspecific symptoms such as lightheadedness, dizziness, syncope, and fatigue. Or patient may have shock, hypotension, altered level of consciousness (ALOC), slow or absent breathing, or sudden collapse.

---

### Basic Life Support

1. Follow General Pediatric Assessment Protocol  
2. Provide 100% oxygen and assisted ventilation if indicated  
3. Initiate CPR if HR <60 and signs of shock or collapse  
4. Attach AED, if patient is 12 months or older, and follow AED instructions  
5. Transport for medical evaluation

---

### Normal Heart Rates in Children

<table>
<thead>
<tr>
<th>Age</th>
<th>Awake</th>
<th>Asleep</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 mo</td>
<td>85-205</td>
<td>80-160</td>
<td>140</td>
</tr>
<tr>
<td>2 mo-2 yr</td>
<td>100-190</td>
<td>75-160</td>
<td>130</td>
</tr>
<tr>
<td>2-10 yr</td>
<td>60-140</td>
<td>60-90</td>
<td>80</td>
</tr>
<tr>
<td>&gt; 10 yr</td>
<td>60-100</td>
<td>50-90</td>
<td>75</td>
</tr>
</tbody>
</table>

---

### Advanced Life Support

1. Follow BLS procedures  
2. Place on cardio-respiratory monitor and continuous pulse oximeter  
3. Intubate and ventilate with 100% oxygen if indicated  
4. Perform CPR if despite oxygenation and ventilation, HR is <60 and poor perfusion  
5. Establish IV/IO access  
6. Consider intraosseous cannulation if unable to rapidly establish venous access  
7. Give Epinephrine if no response to above measures, repeat every 3-5 minutes as needed  
8. Reassess after 2 minutes (5 cycles) of CPR  
9. Intravenous fluid boluses may be infused if indicated (LR or NS 20 mL/kg)  
10. If at any time a cardiac rhythm other than bradycardia is noted, treat based on the appropriate protocol  
11. Transport for medical evaluation
Key Points/Considerations

1. CPR should be performed with as few interruptions as possible.

<table>
<thead>
<tr>
<th>Possible contributing factors: The 5 “H’s” and 5 “T’s”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxia</td>
</tr>
<tr>
<td>Hypovolemia</td>
</tr>
<tr>
<td>Hypo- or Hyperkalemia</td>
</tr>
<tr>
<td>Hypothermia</td>
</tr>
<tr>
<td>Hydrogen ion (Acidosis)</td>
</tr>
</tbody>
</table>

Medication/ treatments table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000 (0.1 mg/mL)</td>
<td>0.01mg/kg Repeat q 3-5 minutes prn</td>
<td>IV/IO</td>
<td>1 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1,000 (1 mg/mL)</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn</td>
<td>ETT</td>
<td>5 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
</tbody>
</table>
Tachyarrhythmia with Pulse

**Definition:** A heart rate that is fast compared to normal for the patient’s age; and too fast for the child’s level of activity and clinical condition.

**Clinical Presentation:** Nonspecific symptoms such as lightheadedness, dizziness, syncope, and fatigue. Or patient may have shock, hypotension, altered mental status, respiratory distress, or sudden collapse.

**Basic Life Support**
1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen via NRB
3. Begin BVM ventilation with 100% oxygen for ineffective or insufficient respiratory effort
4. Check pulse, verify heart rate
5. If no pulse move to appropriate pulseless algorhythm
6. Transport for medical evaluation

**Normal Heart Rates in Children**

<table>
<thead>
<tr>
<th>Age</th>
<th>Awake</th>
<th>Asleep</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 mo</td>
<td>85-205</td>
<td>80-160</td>
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<td>2 mo-2 yr</td>
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</tr>
<tr>
<td>&gt; 10 yr</td>
<td>60-100</td>
<td>50-90</td>
<td>75</td>
</tr>
</tbody>
</table>

**Advanced Life Support**
1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Check a blood pressure
4. If patient has a wide complex tachycardia (QRS > 0.08 sec), and is hypotensive—synchronized cardiovert with 1 J/kg; may repeat with 2 J/kg
5. Intubate and ventilate with 100% oxygen if indicated
6. Establish IV/IO access
   a. Consider intraosseous cannulation if unable to rapidly establish venous access
   b. Intravenous fluid boluses may be infused if indicated
7. If at any time a cardiac rhythm other than tachycardia is noted, treat based on the appropriate protocol
8. Transport for medical evaluation
### Key Points/Considerations

#### Possible contributing factors: The 5 “H’s” and 5 “T’s”

<table>
<thead>
<tr>
<th>Hypoxia</th>
<th>Tamponade (Cardiac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
<td>Tension Pneumothorax</td>
</tr>
<tr>
<td>Hypo- or Hyperkalemia</td>
<td>Toxic Overdose</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Thrombosis, Pulmonary - PE</td>
</tr>
<tr>
<td>Hydrogen ion (Acidosis)</td>
<td>Thrombosis, Coronary - ACS</td>
</tr>
</tbody>
</table>

#### Classification of Tachyarrhythmias

<table>
<thead>
<tr>
<th>Narrow Complex</th>
<th>Wide Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinus tachycardia Infants &lt;220/min Children &lt;180/min</td>
<td>Supraventricular tachycardia (SVT) with aberrant conduction</td>
</tr>
<tr>
<td>Atrial flutter</td>
<td>Ventricular tachycardia</td>
</tr>
<tr>
<td>SVT Infant &gt;220/min Children &gt;180/min</td>
<td></td>
</tr>
</tbody>
</table>
# Ventricular Fibrillation and Pulseless Ventricular Tachycardia

**Definition:** Patient with no pulse, absent vital signs and ventricular fibrillation (V Fib) or ventricular tachycardia (VT) on the cardiac monitor.

**Clinical Presentation:** Pediatric cardiac arrest usually represents the terminal event of progressive shock, hypotension, or respiratory failure.

## Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Initiate age appropriate CPR
3. Maintain airway, bag-mask ventilate with 100% oxygen
4. Perform 2 minutes (5 cycles) of CPR before reassessing, avoid interruption of compressions
5. Transport for medical evaluation

## Advanced Life Support

1. Follow BLS procedures
2. Attach patient to cardiorespiratory monitor and continuous pulse oximetry
3. If rhythm is V Fib or VT, and the patient has no pulse, immediately defibrillate at 2 J/kg
4. If at any time, a rhythm other than V Fib or pulseless VT appears, treat as per that protocol
5. Intubate and ventilate with 100% oxygen
6. Establish IV/IO access
7. Consider intraosseous cannulation if unable to rapidly establish venous access
8. Intravenous fluid boluses may be infused if indicated
9. Reassess after 2 minutes (5 cycles) of CPR
10. If rhythm is unchanged, defibrillate at 4 J/kg, and give Epinephrine
11. Restart compressions immediately, reassess after 2 minutes of CPR
12. If rhythm is unchanged, defibrillate at 4 J/kg and immediately give Amiodorone or Lidocaine
13. Restart compressions immediately, reassess after 2 minutes of CPR
14. Transport for medical evaluation

## Key Points/Considerations

1. Push hard, push fast, allow complete chest recoil.
2. Manual defibrillation at set doses is preferred, however if manual defibrillation equipment not available, may use AED to provide shocks as indicated.
3. CPR should be performed with as few interruptions as possible.
# Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:10,000</td>
<td>0.01mg/kg</td>
<td>IV/IO</td>
<td>1 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>(0.1 mg/mL)</td>
<td>Repeat q 3-5 minutes prn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1,000</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL</td>
<td>ETT</td>
<td>10 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>(1 mg/mL)</td>
<td>Repeat q 3-5 minutes prn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lidocaine</td>
<td>1mg/kg (Dilute in NS to 3-5 ml)</td>
<td>IV/IO</td>
<td>3mg/kg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat q 5-10 min prn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lidocaine</td>
<td>2-3 mg/kg (Dilute in NS to 3-5 ml)</td>
<td>ETT</td>
<td>3mg/kg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order
Section VI: Special Care Protocols
Assessment and Transport of the Neonate

**Definition:** Neonate refers to a newly born child. Appropriate transport of a neonate requires knowledge of common post-natal complications and continual assessment of the clinical status of the newborn child.

**Clinical Presentation:** Most neonates transition to post-natal life without difficulty, although 10% of infants will require some medical assistance. Respiratory insufficiency is the most common complication observed in the newborn. Infants born precipitously may exhibit additional signs of stress (apnea, grunting respirations, lethargy, poor tone).

### Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Provide warmth, bulb suction nose and mouth, and dry the newborn infant
3. Evaluate respirations, heart rate, and activity:
   a. If breathing spontaneously, HR > 100, and vigorous, continue to monitor
   b. If apneic, cyanotic, lethargic or HR < 100, provide BVM ventilation at a rate of 30-40 breaths/minute with 100% oxygen
   c. If HR < 60, begin CPR
4. Continue warming measures and protect from hypothermia
5. Transport for medical evaluation

### Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Consider intubation for:
   a. Persistent apnea
   b. Central cyanosis
   c. Bradycardia (HR < 100)
4. If HR persistently < 60:
   a. Continue CPR
   b. Ensure that optimal ventilation is being provided with 100% oxygen
   c. Place IV/IO
   d. For persistent HR < 60, administer epinephrine IV or via ETT 3-5 minutes as needed
5. Obtain blood glucose level and if < 60 then administer D10W. *Never give a higher concentration than D10W to newborns*
6. If newborn continues without improvement despite adequate ventilation, chest compressions, and epinephrine, consider hypovolemia and administer 10mL/kg normal saline over 5-10 minutes
7. Transport for medical evaluation

### Key Points/Consideration

1. Newborn babies are at high risk for hypothermia. Dry the baby and provide early warming measures. Keep covered as much as possible, especially the head. Increase the temperature in the ambulance.
2. Most complications seen during transition to post-natal life are due to respiratory insufficiency. Provide effective and early ventilation for the neonate who does not transition normally.
3. Frequent reassessment of the effectiveness and quality of assisted ventilation is paramount in the newborn not responding well.
4. Acrocyanosis (cyanosis of only the hands and feet) is normal in newborns and does not require intervention.
5. If child is vigorous and not requiring intervention, allow mom to hold the baby and breastfeed if desired.
6. Obtain pregnancy history, if possible, noting the gestational age of the infant, any complications to the pregnancy, illicit drug abuse during pregnancy, etc.
   a. Children born to mothers who abused narcotic medications will exhibit poor tone, poor respirations, and possible seizure activity.

**Recipe for D10W**
Draw up 10 mL of D50 and mix with 40 mL of sterile water. NS should be used in place of sterile water for infants and children >30 days.

### Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
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<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10W</td>
<td>2 mL/kg</td>
<td>IV</td>
<td>Repeat as needed to keep glucose &gt;60</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:10,000</td>
<td>0.01mg/kg</td>
<td>IV/IO</td>
<td>1 mg</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>(Repeat q 3-5 minutes prn)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epinephrine 1:1,000 (1 mg/mL)</td>
<td>0.1 mg/kg dilute in NS to 3-5 mL</td>
<td>ETT</td>
<td>Repeat q 3-5 minutes as needed</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td></td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order
Behavioral Emergencies

**Definition:** Behavioral emergencies are situations involving patients who require a medical and/or psychiatric evaluation.

**Clinical Presentation:** They may have intentions to harm themselves or others. Self-harm behaviors may include cutting of arms or ingestions. They may display aggressive, destructive or violent behaviors.

### Basic Life Support

1. Law enforcement should be contacted if patient is deemed a threat to self or others present
2. Determine if patient is a threat to self or others at present. Ask patient if they are thinking of hurting themselves or others
3. Ensure safety of the patient and yourself
   - a. Remove any possible weapons (lighters, matches, medications, knives, pens/pencils, and glasses)
   - b. Use restraints if necessary
   - c. Wear a mask to protect yourself from patient spitting
4. Assess and maintain airway patency, oxygen 10-15 lpm via non-rebreather
   - a. If respirations are ineffective, begin BVM ventilation with 100% oxygen
   - b. Suction airway as needed
5. Examine patient and treat any injuries with appropriate dressings or splints
6. Transport for medical or psychological evaluation

### Advanced Life Support

1. Follow BLS Procedures
2. Apply cardio-respiratory monitor and continuous pulse oximetry
3. Maintain airway
4. If there is a history of ingestion or signs and symptoms of a toxidromal state. Follow **Toxic Exposure** protocol
   - a. Administer medications as indicated. Contact Medical Control if necessary
5. Transport for medical or psychological evaluation

### Key Points/Considerations

1. Be aware that parents may help keep patient calm or may be a source of anxiety for the patient and possibly escalate the situation.
2. Clearly state and explain your actions while providing care to the patient:
   - b. Behaviors you expect (no injuring self/others).
3. Do not make promises or bargains that you will not be able to fulfill.
Do Not Resuscitate

Some children may have advanced directives expressing preferences for emergency medical care. In 2008, the Utah Legislature passed the “Life with Dignity” law, which allows parents or guardians of children with terminal or serious medical conditions to express their wishes regarding resuscitation of their child in the event of a cardiac or respiratory arrest. These laws are commonly known as “Do not resuscitate” or “DNR.”

There are strict rules regarding resuscitation of children. The regulation passed by the Utah legislature allows EMS personnel to respect the wishes of parents or guardians to avoid resuscitative efforts of their children under the following conditions:

1. The child has a Life with Dignity order present (or a valid “Life with Dignity” bracelet or necklace) specifying “Do not attempt resuscitation”.
2. The Life with Dignity order must be completed, signed by the parents or guardians, and also by TWO physicians.
3. A copy of the order must be kept with the child, or a valid Life with Dignity bracelet or necklace must be worn.
4. The Utah Life with Dignity bracelet or necklace is a legal and valid substitute for the actual form.
5. All prior valid POLST or DNR orders remain valid and should be honored by EMS and other medical personnel. However, they should be converted to Life with Dignity orders as soon as possible to avoid confusion.

Protocol

1. Upon arrival to the scene of a critically ill child, the presumption is that the child will be resuscitated.
2. If the parents or guardians inform you that the child should not be resuscitated, ask to examine the Life with Dignity (DNR) order and ascertain that it is signed by the parent/guardian and two physicians. A copy of the form is valid.
3. If the child is wearing a valid Utah Life with Dignity bracelet or necklace, this may substitute for the paper form.
4. If a valid Life with Dignity (DNR) form, bracelet or necklace is present, resuscitative efforts may be withheld.
5. If a valid Life with Dignity (DNR) form, bracelet or necklace is not available, resuscitative efforts should be begun and continued until the order is produced, care is completed according to the usual protocol, or care is transferred to the Emergency Department personnel.
Family Centered Care

**Definition:** Family Centered Care is a mutually collaborative health care effort between family, patient and provider and has proved essential in providing effective patient care. It is an art as well as a skill and therefore it requires practice.

**Demonstration:** Demonstration of family centered care is in one’s actions and behaviors when caring for patients. These actions and behaviors include: Attention to human needs, Respect, Patient accountability, Inclusiveness, Communication with families, Collaboration with families and Cultural and Developmental Competency.

*Family centered care is demonstrated in practice, not just policy development.*

**Attention to Human Needs:** Treat patients and families as individuals and people with problems just like yourself. Use a person’s name. It is okay to ask a parent their first name so that you can call them by name. Let them know what to expect in advance (if you can). Treat families and their relatives with respect and consider the needs of the entire family. Include families in the decision making process.

**Respect:** Treat others with the same respect that you want to receive yourself. This starts with your patient and their family and it shows in your interaction with your partner, colleagues, hospital staff and the public.

**Patient Accountability:** At the end of a call, can you say: “I did my very best for my patient. I considered their needs and the needs of the entire family.”

**Inclusive:** Provide direct, honest and open communication. Use a calm and nonjudgmental tone of voice. Engage the child and family, treat both with respect. Include a family member in resuscitation and decision making as they desire and are capable. If possible, designate a crew member to be a liaison to the family in order to facilitate communication and continuity.

**Communicate with Families:** Identify yourself to the child and the family.

Identify a team member that would interact with the family and keep them updated. Ask them how they would like to be addressed and how the patient likes to be addressed. Watch for ways to distract the child i.e. a story, toy, blanket, humor, pen light, etc. Watch for verbal and non-verbal cues as to whether they seem to understand the information that is being presented. Speak simply about what you are doing.

Tell the family what you are about to do and what they can expect.

Pay attention to your tone of voice. Allow and encourage conversation between the parent and the child. Ask open ended questions i.e. (tell me about your pain).
Touch the child in a non-invasive way as well as allow the family to touch and nurture their child if at all possible.

**Collaboration with Families:** Empower the patient and the family by involving them in the care as well as the decision making process. Family Centered care is a skill requiring competency and caring. Like any other fine tuned skill it requires practice. Gather staff and develop language on how to describe the situation so information is consistent. Family Centered Care = compassion.

**Cultural Competency:** Respect, sensitivity, and an understanding of the unique cultural and religious differences. Be aware of any language barriers.

If at all possible engage an interpreter that is able to understand some of the emotional issues as well as medical terminology associated with a trauma.

An understanding of the hierarchy of the family is key to a positive outcome.

**Developmental Competency:** Use appropriate language for the age.

When in pain or hurt children often regress to childhood issues or more infantile responses. They may still need attachment items late in life. Describe what you will be doing. Use eye contact and touch when appropriate. Be respectful at all times.

- **Infants:** General calming measures (Soft voices, gentle pats, pacifiers or rocking) Allow parents to stay close and bonded with the child and help them to anticipate the situation if possible
- **Toddlers:** toys, teddy bear, blanket Parents or family members are often a great source of comfort and nurturing. Allow them to be present
- **School Age:** attachment objects, honesty about procedures, “no owies until I tell you,” imaginary thinking (I made the car crash, I told a lie and that is why mom is hurt) Refrain from conversations about a child’s treatment unless you are including them
- **Adolescents:** Physician and provider honesty is key as well as paying attention to pain. Help them to participate in their own care and take their views seriously. Focus on giving them some sense of control. Pain management is key. Adolescents as well as adults are afraid of pain. The anticipation of pain can be worse that the pain itself. Some transitional objects/toys/stuffed animals can also be useful. Respect their privacy and modesty as much as possible. Allow them to discuss what is happening both with and without caregivers around.

**Teaching Points**

*The “art of family-centered-care” requires practice and thoughtfulness.*
Family Centered Care is an art as well as a skill and therefore it requires practice. Are we willing to join hands in order to practice our skills? As a parent I need you. As a provider you need me. We all want to make a difference in our own lives, in our communities, and in the lives of our children. It is never going to be “ok” for a parent or a child to be where we are in this event. As parents or patients our wish would be to never need this type of help. Family centered care is looking into the eyes of a parent or child and seeing the hurt as well as the hope. The hope is the easy part. Listen before you speak and help us to understand. As a parent I most likely have had little practice in what I am about to do in this emergency situation. You, as a provider have an awareness of the possibilities before me. We are all standing in one of the most intimate and vulnerable experiences of any human being. “I will most likely not remember all the medical information you communicate to me. What I will remember is how you made me feel, even when you delivered bad news.”
Immunocompromised Children

Definition: An immunocompromised person is someone whose immune system is weakened and as a result, their ability to fight infection is poor or absent. Most immune deficiencies are acquired although some can be congenital. An immuno compromised state can result from chemotherapy for cancer, immunosuppression after organ or bone marrow transplant, or treatment for an auto-immune disease.

Clinical Presentation: Due to the patient’s inability to fight infections, he or she may become very ill in a short period of time. These patients may present in overwhelming sepsis or shock (please see clinical presentation of cold shock and warm shock in the non-traumatic shock protocol), or respiratory distress. Additionally, they may have suppression of their bone marrow, often leading to thrombocytopenia or anemia. These patients may also have pallor or easy bruising and bleeding.

Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Obtain vital signs including blood pressure
3. Assess and maintain airway patency, oxygen 10-15 lpm via non-rebreather
   a. If respirations are ineffective, begin BVM ventilation with 100% oxygen
   b. Suction airway as needed
4. If febrile (Temperature >100.4 F or 38.0 C) and has no signs of altered mental status give acetaminophen orally
5. Apply protective face mask to patient if not receiving oxygen by face mask
6. Transport for medical evaluation

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximetry
3. Intubate patient if unable to maintain airway and BVM ventilations are ineffective
4. For febrile patients, assess for shock (see table below) and initiate Non-Traumatic Shock protocol if indicated
5. Assess patient perfusion status including vital signs every five minutes
6. Transport for medical evaluation

Key Points/Considerations

1. Patients need protection from infectious exposures during transport.
2. EMS providers who are ill should also wear mask.
3. All EMS providers should observe strict hand washing techniques during care of the immunocompromised patient.
4. All EMS providers should use universal precautions when caring for the patient.
5. Immunocompromised patients should never receive rectal medications or have a core temperature checked rectally.
## Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Route</th>
<th>Dose</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen</td>
<td>PO</td>
<td>15mg/kg</td>
<td>15 mg/kg q 4 hours</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>
Non-Accidental Trauma

Definition: Non-accidental Trauma is an act of commission or failure to protect by a caregiver that results in harm to a child’s physical, developmental and/or emotional state. This has become a serious problem that has finally been recognized and great efforts are being made to prevent and/or report such trauma.

Responsibilities

1. **Suspect:** Look for suspicious circumstances or actions, either from child or caregiver. Listen to and document circumstances of the event. Evaluate the environment in which you find the child. Is the room hot? Is the room cold? Is the environment clean or dirty? Are there indications of illicit substances present? Note unusual living conditions that might lead to child abuse or neglect.

2. **Protect:** Be the child advocate. Administer appropriate medical care for injuries found. Recognize that you need to make all efforts to remove child from situation. Control emotions; remember that the child needs you to help protect them from further injury.

3. **Respect:** Communicate appropriately with family.
   a. Avoid confrontation with caregivers. Confrontation may lead to caregiver’s refusal to allow you to take the child.
   b. Be nonjudgmental and avoid accusations.
   c. Consider law enforcement assistance. Identify how you and your partners will share the need to get law enforcement involved. Identify how you will let the others know that you think there might be child abuse or neglect.
   d. Transport to ensure patient safety. Follow all transport safety rules and regulations for your agency.

4. **Collect:** Provide good documentation of incident. Record statements from caregivers. Document actual words in quotation marks when possible. All statements may be used in court. Be careful what you write and say.

5. **Report:** You have the responsibility to report suspected child abuse and neglect to the ED and also to law enforcement or the Division of Child and Family Services (Utah Law 62A-4a-403).

When any person including persons licensed under Title58, Chapter 67, Utah Medical Practice Act, or Title 58, Chapter 31b, Nurse Practice Act, has reason to believe that a child has been subjected to incest, molestation, sexual exploitation, sexual abuse, physical abuse, or neglect, or who observes a child being subjected to conditions or circumstances which would reasonably result in sexual abuse, physical abuse, or neglect, he shall immediately notify the nearest peace officer, law enforcement agency, or office of the division” (Division of Child and Family Services, or DCFS).
Key Points/Considerations
1. Child maltreatment occurs in all ethnic and socio-economic groups.
2. Risk Factors: Children under age of 5, drug or alcohol Abuse, Domestic Violence.
3. There are four types of abuse: Physical, Emotional, Sexual, and Neglect.
4. In children under the age of two the most common form of child abuse is Shaken Baby Syndrome. Mortality of Shaken Baby Syndrome is 25%. For those that live, there is significant morbidity, usually associated with traumatic brain injury.
5. Of all abused kids, 50% will be abused again. Of those with recurrent abuse, mortality is 5%. 
**Safe Infants Act**

**Definition:** Under Utah state law, a mother or her designee may safely relinquish care and custody of a newborn child under the age of 72 hours to hospital personnel at a hospital or with EMS services. The mother may retain anonymity as long as the newborn has not been neglected or abused. This protocol refers to any abandoned infant.

**Clinical Presentation:** It may be difficult to determine age of infant; this protocol should be used for any abandoned infant. The infant may have symptoms of hypothermia, hypoglycemia, and dehydration.

**Basic Life Support**

1. Refer to General Pediatric Assessment Guidelines
2. Obtain vital signs
3. Assure newborn is warm and dry
4. Maintain airway, administer 10-15 lpm of oxygen if signs of respiratory distress
   a. If respirations are ineffective, begin BVM ventilation
   b. Suction as needed
5. Check glucose, offer infant oral glucose if <60 mg/dl
6. Transport for medical evaluation

**Advanced Life Support**

1. Follow BLS procedures
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Intubate if unable to effectively ventilate with BVM
4. Assess for signs of shock and obtain IV/IO if necessary
   a. Give NS or LR 10 mL/kg
   b. Give D10W, if glucose <60 mg/dL
5. Refer to **Assessment of the Neonate** protocol as needed
6. Contact medical control
7. Transport for medical evaluation.

**Key Points/Considerations**

1. Law enforcement does not need to be notified.
3. Acrocyanosis may be normal in the infant.
4. Notify Division of Child and Family Services (DCFS).
5. If the newborn has evidence of neglect or abuse, ask the mother to stay, but do not make an attempt to detain or restrain her.

**Recipe for D10W**

Draw up 10 mL of D50 and mix with 40 mL of sterile water. NS should be used in place of sterile water for infants and children >30 days.
# Medication/Treatments Table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
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<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10W</td>
<td>2ml/kg</td>
<td>IV/IO</td>
<td>Call for repeated doses</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Oral Glucose</td>
<td>30 mL</td>
<td>PO</td>
<td>Call for repeated doses</td>
<td>DO</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**DO**: Direct order from online medical control

**ST**: Standing order
Sudden Infant Death Syndrome (SIDS)

Definition: Sudden Infant Death Syndrome is the unexpected death of an infant under one year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history.

Important Information: In a typical situation, parents check on their supposedly sleeping infant to find him or her dead. This is the worst tragedy parents can face, and leaves them with sadness and a feeling of vulnerability lasting throughout their lives. Since medicine is unable to tell them why their baby died, they often blame themselves.

1. Refer to Pediatric General Assessment Guidelines.
2. Assess airway and breathing, confirm apnea.
3. Assess circulation and perfusion, confirm absent pulse
   a. If ALS provider, place on cardiac monitor and confirm absence of cardiac electrical activity.
4. Determine whether to perform further resuscitation measures.
   a. If infant does not exhibit lividity or rigor, proceed with cardiopulmonary resuscitation, following protocol for Asystole/PEA and transport.
   b. If infant exhibits lividity and rigor, do not resuscitate as permitted by medical direction.
5. Observe, assess, and document accurately and objectively.
   a. Document time of arrival, initial assessment and basis for resuscitation decision, and time of resuscitation decision.
6. Maintain scene integrity for investigative purposes.
7. Await for law enforcement to assist with scene and family.
8. Provide supportive measures for parents and siblings.
   a. Explain the resuscitation process, transport decision, and further actions to be taken by hospital personnel and or medical examiner.
   b. Reassure parents there was nothing they could have done to prevent the death.
   c. Allow the parents to see the child and say goodbye.
   d. Maintain a supportive, professional attitude no matter how the parents react.
   e. Whenever possible, be responsive to parental requests. Be sensitive to ethnic and religious needs or responses and make allowances for them.

Key Points/Considerations
1. There is no normal parental reaction to the death of a child or SIDS.
2. It is important for rescuers to not make any assumptions or judgments.
3. Take comprehensive history and perform physical exam and thorough scene assessment.
4. Do not restrain parents or request that they be restrained unless scene safety and integrity is clearly threatened.
5. Contact medical control for consultation on initiation of resuscitation measures as needed.
Section VII: Preparedness
Disaster/Mass Casualty Incident

**Definition:** Mass Casualty Incidents are events incurring casualties large enough to disrupt the normal deployment of the emergency healthcare services of the affected community. A disaster event includes natural occurrences such as tornados, earthquakes, floods and man-made occurrences such as intentional harm or destruction inflicted on a group of people.

**Incident Management System:** It is imperative that first responders set up an incident management system. EMS responders will likely be assigned to a medical group that will be responsible for triage, treatment or transport of victims.

**Decontamination**

First responders to incidents involving toxic substances will likely be responsible for decontamination of all victims.

**Special considerations for pediatric victims:**
- Avoid separating children from their families
- Older children may have fear, peer pressure or modesty issues
If water temperature is below 98 degrees it may cause hypothermia as children get younger and smaller.

Airway management is still a priority through decontamination process.

Families will need assistance for both adults and their children to be decontaminated.

Use large volume low pressure water systems “child friendly”

The smaller the child the bigger these problems may become:

Hypothermia, airway management, separation of families, effective decontamination.

**General guidelines for decontamination of Pediatric victims**

All clothing, diapers, items to be removed from all children.

Items should be bagged and labeled.

Decontamination personnel should accompany and assist or advise child’s caregiver in decontamination process to ensure complete decontamination.

Child and caregiver will proceed to “cold zone”, personnel will assist caregiver and child in drying off and child and caregiver will then be given clothing and blankets/sheets.

All persons leaving decontamination and into cold zone will be checked with appropriate monitoring equipment for thoroughness of decontamination.

Child will then be given an identifying wristband indicating they have been decontaminated.

Patient will be triaged if not already done so and will be taken to appropriate area for medical evaluation.

In general soap and water should be used to decontaminate children.

**Non-Ambulatory Children of all ages**

Placed on a stretcher by “hot zone” personnel and disrobed.

All clothing is removed.

Special attention should be paid to child’s airway during decontamination process.

Decontamination personnel to assist child’s caregiver with moving child to ensure all areas of child are decontaminated.

Decontamination personnel will assist child’s caregiver in drying child and providing covering and blankets for warmth.

Place a blue arm band on the patient indicating they have been decontaminated.

For more information/training consult Utah Bureau of EMS Pediatric Disaster Module Part 1 and ARHQ video “The Decontamination of Children.”
Triage
First responders will be responsible for immediate triage of all patients. For Pediatric patients it is recommended that the Jump START triage system is used.

JumpSTART Pediatric MCI Triage

For more information and practice CD refer to: Utah Bureau of EMS—Jump Start Triage. Additional website: www.jumpstarttriage.com

Treatment
Consider type of injury and exposure and refer to appropriate treatment protocol:
- Nerve Agent
- Vesicants
- Radiological/Nuclear
- Toxic Exposures
- Burn
- Blunt Trauma
- Penetrating Trauma
- Traumatic Brain Injury
Transport

Transport of pediatric victims may require additional personnel than that of adult patients. Adults may be reluctant to leave their child(ren) and may be injured as well. Every effort should be made to transport parents with children. During a MCI the Transport Officer will determine which facility patients are transported to. Transport Officer should utilize hospital communication system and Utah Department of Health Surge Capacity System. Transporting pediatric patients to pediatric facilities is preferred if those facilities are able to accept patients.

References

Nerve Agents

Definition: Nerve agents are very toxic relatives of some commonly used insecticides and drugs. They cause biological effects by disrupting the way nerves communicate with muscles, glands, and other nerves. This causes hyperactivity of muscles, glands and nerves resulting in: Salivation, Lacrimation, Urination, Defecation, Gastrointestinal distress, Emesis (SLUDGE), before they fatigue and stop functioning. Often the nerve agents work so quickly, these symptoms may not be present and therefore their absence cannot exclude nerve agent exposure. Important nerve agents are: GA (Tabun), GB (Sarin), GD (Soman), GF, and VX.

Clinical presentation:
Mild Symptoms:
• blurred vision, pupil constriction
• excessive teary eyes
• excessive runny nose
• increased salivation, drooling
• chest tightness or difficulty breathing
• tremors or muscular twitching
• nausea and/or vomiting, stomach cramps
• wheezing or coughing
• tachycardia or bradycardia

Severe Symptoms:
• strange or confused behavior
• severe difficulty breathing or severe secretions form lungs/airway
• severe muscle twitching and general weakness
• Involuntary urination and defecation
• convulsions
• unconsciousness

Basic Life Support
1. Secure scene, ensure safety of responders
2. Initiate Mass Casualty guidelines if a disaster situation
3. AABC
   a. Antidote
   b. Airway
   c. Breathing
   d. Circulation
4. Administer Atropine auto-injector (Atropen®) if available for mild to severe symptoms
   a. Atropine auto-injector is available in various pediatric doses

See chart for proper dose with color coding below:
### BLS

- **Atropen® Size/Dose**

<table>
<thead>
<tr>
<th>Weight</th>
<th>Atropen® Size/Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – 5 kg</td>
<td>0.25 mg</td>
</tr>
<tr>
<td>6 – 9 kg</td>
<td>0.5 mg</td>
</tr>
<tr>
<td>10 – 11 kg</td>
<td>0.5 mg</td>
</tr>
<tr>
<td>12 – 14 kg</td>
<td>0.5 mg</td>
</tr>
<tr>
<td>15 – 18 kg</td>
<td>0.5 mg</td>
</tr>
<tr>
<td>19 – 23 kg</td>
<td>1 mg</td>
</tr>
<tr>
<td>24 – 29 kg</td>
<td>1 mg</td>
</tr>
<tr>
<td>30 – 36 kg</td>
<td>1 mg</td>
</tr>
<tr>
<td>&gt; 36 kg</td>
<td>2 mg</td>
</tr>
</tbody>
</table>

5. Administer Pralidoxime Chloride (2PAM) Auto-Injector
   a. Auto injector only available in one dose-600mg see chart for dosing

<table>
<thead>
<tr>
<th>Weight</th>
<th>2Pam Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – 5 kg</td>
<td>1 *</td>
</tr>
<tr>
<td>6 – 9 kg</td>
<td>1 *</td>
</tr>
<tr>
<td>10 – 11 kg</td>
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<tr>
<td>24 – 29 kg</td>
<td>1 – 2</td>
</tr>
<tr>
<td>30 – 36 kg</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 36 kg</td>
<td>2</td>
</tr>
</tbody>
</table>

*Use only for the severely symptomatic child and only when no other treatment options are available.

6. Administer entire Duodote or Mark 1 kit (Atropine 2mg and Pralidoxime 600mg) if auto-injector available and if patient is over 10 years old or weighs more than 50 pounds

7. Apply orange wrist band indicating patient has been given an antidote
8. Remove patient from area of exposure
9. Remove patient’s clothing, decontaminate patient if liquid exposure, and apply blue arm band indicating patient has been decontaminated
10. Follow General Pediatric Assessment Guidelines
11. Assess and maintain airway patency, oxygen 10-15 lpm via non-rebreather
   a. If respirations are ineffective, begin BVM ventilation with 100% oxygen
   b. Suction airway as needed
12. Two additional doses of the Atropen and or Duodote/Mark 1 kit may be administered every 2-5 minutes if symptoms persist
13. Transport for medical evaluation

**Advanced Life Support**

1. Follow BLS guidelines
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Administer Antidotes: see chart for dosage, -may use auto-injectors consider previous doses that may have been given by BLS personnel
4. Atropine IV/IM
   a. 0.05mg/kg may repeat every 2-5 minutes up to 3 doses
   b. Look for decrease in secretions, decreased airway resistance

<table>
<thead>
<tr>
<th>Weight</th>
<th>IV 50mg/ml</th>
<th>IM 300mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – 5 kg</td>
<td>2 ml</td>
<td>0.33 ml</td>
</tr>
<tr>
<td>6 – 9 kg</td>
<td>3.8 ml</td>
<td>0.63 ml</td>
</tr>
<tr>
<td>10 – 11 kg</td>
<td>5.3 ml</td>
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<td>12 – 14 kg</td>
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<tr>
<td>15 – 18 kg</td>
<td>8.3 ml</td>
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<tr>
<td>19 – 23 kg</td>
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<td>1.8 ml</td>
</tr>
<tr>
<td>24 – 29 kg</td>
<td>13.3 ml</td>
<td>2.2 ml</td>
</tr>
<tr>
<td>30 – 36 kg</td>
<td>16.5 ml</td>
<td>2.8 ml</td>
</tr>
</tbody>
</table>

5. Pralidoxmie Chloride (2-PAM) IV/IM
   i. 25mg/kg should be given along with Atropine in severe cases
6. Benzodiazepines give Lorazepam OR Midazolam
   a. Give to children with severe symptoms whether convulsing or not

<table>
<thead>
<tr>
<th>Weight</th>
<th>Lorazepam IV/IM 0.1mg/kg (1)</th>
<th>2mg/ml</th>
<th>4mg/ml</th>
</tr>
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<tbody>
<tr>
<td>3 – 5 kg</td>
<td>0.2 ml</td>
<td>0.1 ml</td>
<td></td>
</tr>
<tr>
<td>6 – 9 kg</td>
<td>0.38 ml</td>
<td>0.19 ml</td>
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<tr>
<td>10 – 11 kg</td>
<td>0.5 ml</td>
<td>0.25 ml</td>
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</tr>
<tr>
<td>12 – 14 kg</td>
<td>0.65 ml</td>
<td>0.32 ml</td>
<td></td>
</tr>
<tr>
<td>15 – 18 kg</td>
<td>0.8 ml</td>
<td>0.4 ml</td>
<td></td>
</tr>
<tr>
<td>19 – 23 kg</td>
<td>1 ml</td>
<td>0.5 ml</td>
<td></td>
</tr>
<tr>
<td>24 – 29 kg</td>
<td>1.3 ml</td>
<td>0.66 ml</td>
<td></td>
</tr>
<tr>
<td>30 – 36 kg</td>
<td>1.7 ml</td>
<td>0.83 ml</td>
<td></td>
</tr>
</tbody>
</table>

7. Midazolam IV 0.1mg/kg

<table>
<thead>
<tr>
<th>Weight</th>
<th>Midazolam IV—0.1mg/kg</th>
<th>1mg/ml</th>
<th>5mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – 5 kg</td>
<td>0.4 ml</td>
<td>0.08 ml</td>
<td></td>
</tr>
<tr>
<td>6 – 9 kg</td>
<td>0.75 ml</td>
<td>0.15 ml</td>
<td></td>
</tr>
<tr>
<td>10 – 11 kg</td>
<td>1 ml</td>
<td>0.2 ml</td>
<td></td>
</tr>
<tr>
<td>12 – 14 kg</td>
<td>1.3 ml</td>
<td>0.26 ml</td>
<td></td>
</tr>
<tr>
<td>15 – 18 kg</td>
<td>1.6 ml</td>
<td>0.33 ml</td>
<td></td>
</tr>
<tr>
<td>19 – 23 kg</td>
<td>2 ml</td>
<td>0.4 ml</td>
<td></td>
</tr>
<tr>
<td>24 – 29 kg</td>
<td>2.6 ml</td>
<td>0.52 ml</td>
<td></td>
</tr>
<tr>
<td>30 – 36 kg</td>
<td>3.3 ml</td>
<td>0.66 ml</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight</th>
<th>Midazolam IM/IN—0.2mg/kg</th>
<th>5mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – 5 kg</td>
<td>0.16 ml</td>
<td></td>
</tr>
<tr>
<td>6 – 9 kg</td>
<td>0.3 ml</td>
<td></td>
</tr>
<tr>
<td>10 – 11 kg</td>
<td>0.4 ml</td>
<td></td>
</tr>
<tr>
<td>12 – 14 kg</td>
<td>0.52 ml</td>
<td></td>
</tr>
<tr>
<td>15 – 18 kg</td>
<td>0.66 ml</td>
<td></td>
</tr>
<tr>
<td>19 – 23 kg</td>
<td>0.84 ml</td>
<td></td>
</tr>
<tr>
<td>24 – 29 kg</td>
<td>1.1 ml</td>
<td></td>
</tr>
<tr>
<td>30 – 36 kg</td>
<td>1.3 ml</td>
<td></td>
</tr>
</tbody>
</table>

8. Monitor airway, may improve after antidote administration
   a. Suction secretions
   b. If BVM ventilation is not effective, intubation may be required
9. Start IV/IO if not already in place for antidote administration
10. Reassess frequently for effects of antidotes, request to administer additional doses of antidote through medical control if needed
11. Transport for medical evaluation
**Key Points/Considerations**

1. Multiple patients with similar symptoms will require mass casualty response and decision making and may have resulted from an act of terror.
2. Patients who have been decontaminated need to have a blue arm band placed on their wrist.
3. Patients who have received antidotes need to have an orange arm band placed on their wrist for each antidote administered.
4. Atropine- antagonizes nerve agent effects, reverses bronchoconstriction and excessive secretions. The half life of Atropine varies with the age of the patient, but can be expected to be between 1 and 7 hours.
5. Pralidoxime Chloride (2 PAM)- decreases the effect of the nerve agent at the neuromuscular junction reducing muscle twitching and allows the patient to breathe easier. The half-life of 2PAM is 1-1½ hours.
6. Benzodiazepines (Ativan and Versed)-Decrease seizure activity, reduce seizure induced brain injury, and are given to patients with severe symptoms whether convulsing or not.
7. Antidotes are available in Chemical Stockpile Emergency Preparedness Program (CSEPP) areas, State of Utah CHEMPACK containers and through the Strategic National Stockpile (SNS) program to access contact DOH hotline-1-866-364-8824.
8. Poison Control Center can also be used as a resource: *(800) 222-1222.*

**Medication/Treatments Table**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT – Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duodote/Mark 1 Auto-Injector</td>
<td>Standard injection every 15 minutes</td>
<td>IM</td>
<td>3 doses</td>
<td>*ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Atropen Auto Injector</td>
<td>Standard injection every 15 minutes</td>
<td>IM</td>
<td>3 doses</td>
<td>*ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Pralidoxime (2PAM)</td>
<td>25 mg/kg every 15 minutes</td>
<td>IV/IM</td>
<td>3 doses</td>
<td>-</td>
<td>ST*</td>
<td>ST*</td>
<td>ST*</td>
</tr>
<tr>
<td>Midazolam</td>
<td>0.1 mg/kg</td>
<td>IV/IO</td>
<td>5mg</td>
<td>-</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td></td>
<td>0.2 mg/kg</td>
<td>IM/IN</td>
<td>10 mg</td>
<td>-</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>0.1 mg/kg</td>
<td>IV/IM</td>
<td>4 mg</td>
<td>-</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**DO:** Direct order from on line medical control  
**ST:** Standing Order *In some areas

**References**

BROSELOW Pediatric Antidotes for Chemical Warfare Tape, 2006 Edition
Pediatric Exposure: Radioactive Agents

**Definition:** Exposure to radiologic agents can occur in the case of release from an explosive combined with radioactive agents, a “dirty bomb.” Exposure to nuclear agents could occur in the case of a nuclear plant problem or a nuclear attack.

- External contamination by radioactive debris can be removed through the decontamination process.
- Internal contamination is when a patient inhales, ingests or absorbs radioactive debris through open wounds.
- Patients contaminated, even at very high levels pose no threat to emergency response or medical personnel.(1) therefore:
  i. Treat life threatening injuries before decontaminating patients.
  iii. Normal body substance isolation-gloves, mask, gown; protect medical providers.

- Patients may also have traumatic injuries; consult Blunt Trauma, Penetrating Trauma, Traumatic Brain Injury, and Burn protocols if needed.
- Radioactive contamination can be detected with Geiger counters or dose-rate meters.
- If unable to decontaminate a patient before medical treatment wrap patient in a blanket to contain contamination.
- Other than burn injuries, signs and symptoms of radiation injuries occur hours to days later. If a patient has nausea and vomiting shortly after the exposure, they have probably received a lethal dose (1).

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### Basic Life Support

1. Secure scene; ensure safety of responders, appropriate protective PPE required
2. Initiate Mass Casualty guidelines if a disaster situation
3. Remove patient(s) from area of exposure
4. Remove patient’s clothing, this removes 90% of the contamination (2)
5. EMS Personnel wearing Respirators, or N95 mask and goggles with Tyvek™ suit and gloves is sufficient for decontamination PPE
6. Decontaminate patient by showering with soap and water, avoid letting water from contaminated areas run into mouth, eyes, ears, or open wounds
7. Use sponges or washcloths to wash patient, especially contaminated areas-dispose of these as radioactive waste
8. Flush open wounds with saline solution
9. Reassess patient for contamination with Geiger counter or dose rate meter, if still contaminated and patient is stable decontaminate patient again
10. Attach blue armband after decontamination
11. Follow General Pediatric Assessment Guidelines and other protocols as they apply
12. Transport patient for medical evaluation
Advanced Life Support

1. Follow BLS guidelines
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Treat patient’s injuries per pertinent protocols if traumatic injuries or burns are sustained
4. If it is necessary to start an IV on a patient ensure the area of the IV start has been cleaned and rinsed in order to not introduce contamination under the skin
5. Reassess frequently and transport patient for medical evaluation

Key Points/Considerations

1. Multiple patients with similar symptoms will require mass casualty response and decision making and may have resulted from an act of terror.
2. Triage patients based on injuries, not contamination.
3. Time, Distance, and Shielding are the best protection from radioactive exposures.
4. A Radiological Dispersal Device (RDD) “dirty bomb” can lead to widespread contamination, medical response should focus on injuries related to the explosion.
5. Another possible scenario for terrorists would be a high dose irradiator, patients that have been exposed are not radioactive themselves, therefore posing no threat to responders.
6. The release of radioactive iodine (power plant accident or nuclear explosion) can be treated with Potassium iodide which binds to the receptor sites in the thyroid preventing it from being absorbed by the thyroid. This is usually recommended for children and young adults and will be recommended by state or federal government if appropriate (3).
7. Patients who have been decontaminated need to be banded with a blue arm band.
8. Poison Control Center can also be used as a resource: (800) 222-1222.

References
Disaster Nursing and Emergency Preparedness for Chemical, Biological and Radiological Terrorism and Other Hazards. (1) page 531, (2) page 532, (3) page 532
Advanced Disaster Medical Response Manual for Providers. Page 87
Vesicants Chemical Exposure

**Definition:** Substances that cause redness and blisters (vesicles) on the skin as well as injury to the eyes, airways or other organs. Examples: sulfur mustard, Lewisite:

**Sulfur Mustard:** a yellow/brown oily liquid, enters the cells of skin or mucous membranes and causes damage within seconds to minutes. Contact with mustard does not immediately cause pain or other noticeable effects. Redness and blistering may not be seen for up to 8 hours after exposure. Clinical Presentation includes: red and blistering skin, irritation and other damage to eyes, damage to the lining of the airways causing airway edema, and vomiting and diarrhea.

**Lewisite:** An oily colorless liquid with the scent of geraniums that causes damage to skin, eyes and airways by direct contact. Causes pain on contact. Clinical presentation includes damage and blistering of skin in minutes, eye irritation and lid edema, airway damage with airway edema, and non-cardiogenic pulmonary edema.

### Basic Life Support

1. Secure scene; ensure safety of responders, chemical protective PPE required
2. Initiate Mass Casualty guidelines if a disaster situation
3. Remove patient(s) from area of exposure
4. Remove patient’s clothing, decontaminate patient with soap and water, keep patient warm
5. Rinse eyes with large amounts of water or normal saline for 5-10 minutes
6. Follow General Pediatric Assessment Guidelines
7. Maintain airway; administer 100% oxygen with NRB
8. Begin BVM ventilation with 100% oxygen for ineffective respiratory effort
9. Suctioning for nasal and/or oral secretions as needed
10. Transport patient for medical evaluation

### Advanced Life Support

1. Follow BLS guidelines
2. Place on cardio-respiratory monitor and continuous pulse oximeter
3. Monitor airway, watch for signs of airway edema
4. Administer nebulized saline for minor throat irritation and cough
5. Administer nebulized epinephrine as indicated for airway edema
6. Intubate patient if BVM ventilations are not effective, if patient is unconscious or not responding to nebulized epinephrine treatment
7. Establish IV / IO access and give 20mL/kg NS if indicated
8. Reassess frequently and transport patient for medical evaluation

### Key Points/Considerations

1. Multiple patients with similar symptoms will require mass casualty response and decision making.
2. May have resulted from an act of terror.
3. Patients who have been decontaminated need to be banded with a blue arm band.
4. There is an antidote for Lewisite; British-Anti-Lewisite that is usually administered in a hospital setting.
5. Poison Control Center can also be used as a resource: (800) 222-1222.

### Medication / treatments table

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Max Dose</th>
<th>EMT-Basic</th>
<th>EMT-I</th>
<th>EMT-IA</th>
<th>Paramedic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:1000</td>
<td>2mL in 3 mL saline</td>
<td>Neb</td>
<td>Call for additional doses</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
<td>ST</td>
</tr>
</tbody>
</table>

**ST:** Standing Order  
**DO:** Direct order from online medical control