

Utah Pediatric Off-Line Medical Direction Protocol Guidelines



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Utah Emergency Medical Services for Children (EMSC) Program

*Utah EMSC is a collaborative program between the Utah Department of Health
Bureau of EMS and Primary Children's Medical Center*

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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

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

Breathing

Characteristics	Features to Look For
Abnormal Airway Sounds	Snoring, muffled or hoarse speech, Stridor, grunting, wheezing
Abnormal positioning	Sniffing position, tripoding, refusing to lie down
Retractions	Supraclavicular, intercostal, substernal retractions of the chest wall; head bobbing in infants
Flaring	Flaring of the nares on inspiration

Circulation/ Skin Color

Characteristic	Features to look for
Pallor	White or pale skin or mucous membranes
Mottling	Patchy/lacey skin discoloration due to vasoconstriction/ vasodilatation
Cyanosis	Bluish discoloration of skin/mucous membranes

*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

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

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

Category	Stimulus	Response Type	Reaction
Alert	Normal Environment	Appropriate	Normal interactiveness for age
Verbal	Simple command or sound stimulus	Appropriate or Inappropriate	Responds to name. Nonspecific or confused
Painful	Pain	Appropriate, Inappropriate, Pathological	Withdraws from pain. Sound or motion without purpose or localization of pain. Posturing.
Unresponsive			No perceptible response to any stimulus

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

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

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**V**ital Signs that would be abnormal according to age of child:

Age of Patient	HR		RR		Systolic BP	Temp	
0 days – < 1 mo	<80	>205	<30	>60	<60	<36	>38
≥ 1 mo – < 3 mos	<80	>205	<30	>60	<70	<36	>38
≥ 3 mos – < 1 yr	<75	>190	<30	>60	<70	<36	>38.5
≥ 1 yr – < 2 yrs	<75	>190	<24	>40	<70 + (age x 2)	<36	>38.5
≥ 2 yrs – < 4 yrs	<60	>140	<24	>40	<70 + (age x 2)	<36	>38.5
≥ 4 yrs – < 6 yrs	<60	>140	<22	>34	<70 + (age x 2)	<36	>38.5
≥ 6 yrs – < 10 yrs	<60	>140	<18	>30	<70 + (age x 2)	<36	>38.5
≥ 10 yrs – < 13 yrs	<60	>100	<18	>30	<90	<36	>38.5
≥ 13 yrs – < 18 yrs	<60	>100	<12	>16	<90	<36	>38.5

Weight—Average per Age

Estimated Weights	
Newborn	3 kg
3 months	5 kg
6 month	7 kg
12 months	10 kg
2 years	13 kg
3 years	15 kg
4 years	18 kg
5-6 years	20 kg
8 years	25 kg
10 years	35 kg
14 years	50 kg
18 years	65 kg

X-tra Information**Appropriate mask size for Bag/Valve/Mask ventilation:**

Age	Mask #	Mask Name
Preterm neonate	#0	Neonatal
Newborn–1 year	#1	Infant
1–6 years	#2	Toddler
6–12 years	#3	Pediatric
>12 years	#4	Small Adult

Appropriate bag size for Bag/Valve/Mask ventilation:

Age	Bag Size	Bag Volume
Newborn–3 months	Neonatal	400–500 mL
Child <30 kg	Pediatric	750 mL
Child >30 kg	Adult	1000–1200 mL

Endotracheal tube size and depth per length based tape

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

References

Pediatric Education for Prehospital Professionals, 2nd Ed., American Academy of Pediatrics, 2005.

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.

BLS

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



ALS

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 do 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

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

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.

BLS

Basic Life Support

1. Refer to General Pediatric Assessment Guidelines
2. Maintain airway, administer 10-15 lpm of oxygen via NRB
 - a. If respirations are ineffective, begin BVM ventilation
 - b. 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

ALS

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
 - a. < 1 year of age: 1.25 mg
 - b. ≥ 1 year of age: 2.5 mg
6. If patient "responds" (ie: 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

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Paramedic
Epinephrine 1:1000 (1mg-mL)	2mL in 3 mL saline	Neb	Call for additional doses		DO	DO	DO
Albuterol	1.25 mg < 1 year of age 2.5 mg > 1 y.o.	Neb	3 doses		ST*	ST	ST

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

BLS

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

ALS

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, barking cough, sudden onset of choking/gagging, drooling, cyanosis, absent or diminished breath sounds, depressed mental status.

Basic Life Support

BLS

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

ALS

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
9. Transport for medical evaluation.



Common Causes of Upper Airway Obstruction in Children	
Croup	Usually < 5 years old Hoarse “barky” cough URI symptoms; often worse at night
Epiglottitis	Usually > 2 years old High fever; very ill appearing Drooling; leaning forward
Anaphylaxis (refer to Anaphylaxis Protocol)	+/- history exposure to allergen Facial/lips/tongue swollen; stridor Absent or diminished breath sounds
Foreign Body Aspiration	Sudden onset of choking/gagging +/- witnessed with object in mouth

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

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-medical
Epinephrine 1:1000 (1mg-mL)	2mL in 3mL saline	Neb	Call for additional doses		ST	ST	ST

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.

BLS

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

ALS

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

BLS

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

ALS

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.

BLS

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

ALS

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

BLS

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 Srrrest** 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

ALS

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.

Medication/Treatments table

Medication	Dose	Route	Maximum Dose	EMT Basic	EMT I	EMT IA	Para-medical
Epinephrine 1:1000 (1mg-mL)	2mL in 3mL saline	Neb	Call for additional doses		ST/DO	ST/DO	ST/DO

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.



BLS

ALS

CSHCN

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
 - a. If respirations are ineffective, begin BVM ventilation with 100% oxygen
 - b. 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
 - a. 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



BLS

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
 - a. Repeat bolus if needed for shock (see table below)
 - b. 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



ALS

Trauma

AVPU TABLE	Stimulus	Response type	Reaction
Alert	Normal environment	Appropriate	Normal interactiveness for age
Verbal	Simple command or sound stimulus	Appropriate or Inappropriate	Responds to name Nonspecific or confused
Painful	Pain	Appropriate Inappropriate Pathological	Withdraws from pain Nonpurposeful Response Posturing
Unresponsive	Above stimuli	No perceptible response to any stimulus	No perceptible response to any stimulus

Glasgow Coma Scale

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

Age of Patient	HR		Systolic BP
0 days - < 1 mo	<80	>205	<60
≥ 1 mo - < 3 mos	<80	>205	<70
≥ 3 mos - < 1 yr	<75	>190	<70
≥ 1 yr - < 2 yrs	<75	>190	<70 + (age x 2)
≥ 2 yrs - < 4 yrs	<60	>140	<70 + (age x 2)
≥ 4 yrs - < 6 yrs	<60	>140	<70 + (age x 2)
≥ 6 yrs - < 10 yrs	<60	>140	<70 + (age x 2)
≥ 10 yrs - < 13 yrs	<60	>100	<90
≥ 13 yrs - < 18 yrs	<60	>100	<90

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

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

DO: Direct order from on line 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.

Smoke inhalation	Stridor
Deposits in upper airway	Inability to swallow
Carbonaceous sputum	Respiratory distress
Edema	Large body surface area burned
Facial burn	Singed eyebrows or nasal hairs

5. Establish IV/IO access preferably through non-burned tissue, if no choice may use burn area

BLS

ALS

Trauma

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

Medication/Treatments Table

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

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 gases 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.

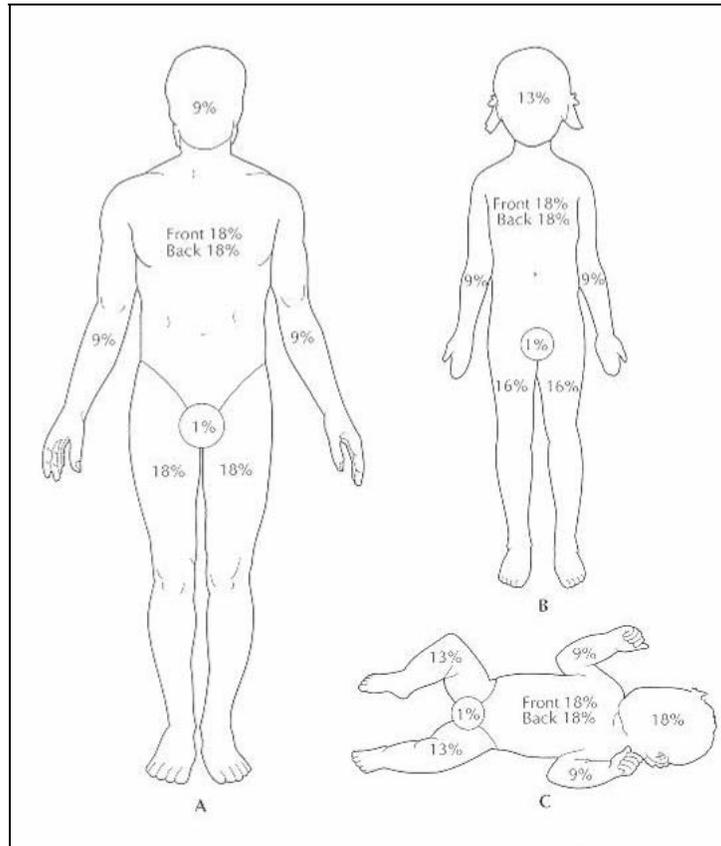
2. Airway Injury

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

Diagram adapted from: Eichelberger, M.R., et al. Brady pediatric emergencies: a manual for prehospital care providers. 2nd ed. p. 187. Prentice-Hall, Inc. Upper Saddle River, New Jersey, 1998.

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 \leq 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



BLS

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 \pm 5
3. Initiate IV or IO access if GCS \leq 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



ALS

Trauma

- 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

Age	Normal	↑'d by 10%
0 days – < 2 mo	30	33
≥ 2 mo – < 12 mos	25	28
≥ 1 yr – 3 yrs	20	22
≥ 4 yr – < 6 yrs	15	17
≥ 6 yrs – 15 yrs	12	14

Lowest Acceptable Systolic BP for Age

Age	Systolic BP
0 days – < 1 mo	<60
≥ 1 mo – < 3 mos	<70
≥ 3 mos – < 1 yr	<70
≥ 1 yr – < 10 yrs	<70 + (age x 2)
≥ 10 yrs	90

Medication/Treatments Table

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-medical
Midazolam	0.1 mg/kg	IV/IO	5 mg		ST	ST	ST
	0.2 mg/kg	IN/IM	10 mg		ST	ST	ST
Lorazepam	0.1 mg/kg	IV/IO	4 mg		ST	ST	ST
Diazepam	0.05 mg/kg	IV/IO	5 mg		ST	ST	ST
	0.3 mg/kg	PR	10 mg		ST	ST	ST

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 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

BLS

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

ALS



Trauma

AVPU TABLE	Stimulus	Response type	Reaction
Alert	Normal environment	Appropriate	Normal interactiveness for age
Verbal	Simple command or sound stimulus	Appropriate or Inappropriate	Responds to name Nonspecific or confused
Painful	Pain	Appropriate Inappropriate Pathological	Withdraws from pain Nonpurposeful Response Posturing
Unresponsive	Above stimuli	No perceptible response to any stimulus	No perceptible response to any stimulus

Glasgow Coma Scale

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

Vital Signs that would be abnormal according to age of child

AGE OF PATIENT	HR		SYSTOLIC BP
0 days - < 1 mo	<80	>205	<60
≥ 1 mo - < 3 mos	<80	>205	<70
≥ 3 mos - < 1 yr	<75	>190	<70
≥ 1 yr - < 2 yrs	<75	>190	<70 + (age x 2)
≥ 2 yrs - < 4 yrs	<60	>140	<70 + (age x 2)
≥ 4 yrs - < 6 yrs	<60	>140	<70 + (age x 2)
≥ 6 yrs - < 10 yrs	<60	>140	<70 + (age x 2)
≥ 10 yrs - < 13 yrs	<60	>100	<90
≥ 13 yrs - < 18 yrs	<60	>100	<90

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

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-medical
Epinephrine 1:10,000 (0.1 mg/mL)	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	NA		ST	ST	ST
Epinephrine 1:1,000 (1 mg/mL)	0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn	ETT	NA		ST	ST	ST

DO: Direct order from on line 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.

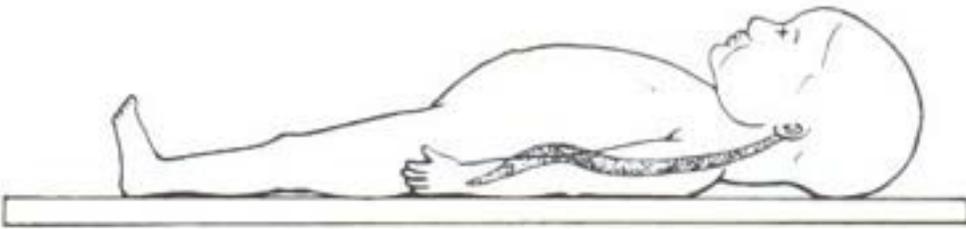
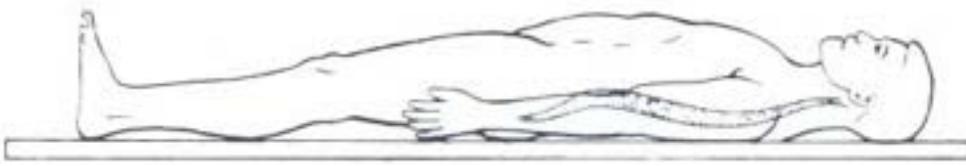
Remember to assess the child's motor and sensory function after application of spinal precautions.

Medication/treatments table

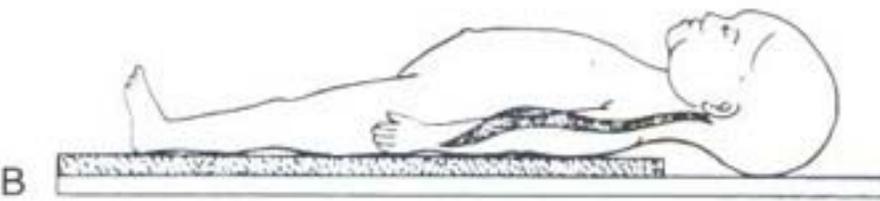
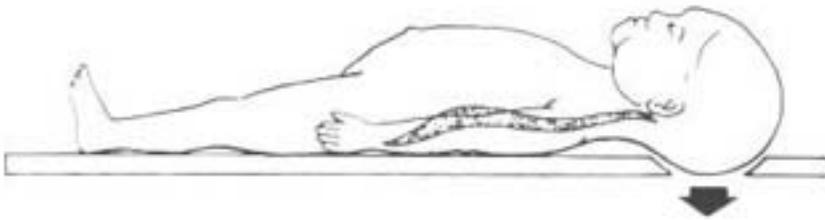
Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-med
Epinephrine 1:10,000 (0.1 mg/mL)	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	NA		ST	ST	ST
Epinephrine 1:1,000 (1mg/mL)	0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn	ETT	NA		ST	ST	ST

DO: Direct order from on line medical control

ST: Standing Order



A



B

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.

BLS

ALS

Trauma

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.

BLS

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

ALS

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

A —Alcohol	T —Trauma, Temperature
E —Electrolytes	I —Infection
I —Insulin (hypoglycemia)	P —Psychogenic
O —Opiates	P —Poison
U —Uremia	S —Shock, Seizure

Medication/Treatments Table

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

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



BLS

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



ALS

Sepsis Vital Signs

Age	T		P		R		Systolic BP
0m–3m	>36	>38	<80	>205	<30	>60	<60
3m–2y	>36	>38.5	<75	>190	<30	>60	<70
2y–6y	>36	>38.5	<60	>140	<22	>35	<70
6y–10y	>36	>38.5	<60	>140	<18	>30	<70
10y–18y	>36	>38.5	<60	>100	<12	>16	<90

Medical

Temperature Conversion Table

Fahrenheit	Celsius
98.6	37
100.4	38
102.5	39
104.0	40
105.8	41

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.

BLS

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



ALS

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

BLS

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

ALS

Temperature Conversion Table

Fahrenheit	Celsius
98.6	37
100.4	38
102.5	39
104.0	40
105.8	41

Medical

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 than 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

- BLS**
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

- ALS**
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

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-med
D10W (10 mL D50 and 40 mL diluent)	2 mL/kg (neonate) 5mL/kg (children)	IV/IO	Repeat as needed to keep glucose >60		ST	ST	ST
Oral Glucose	20-30 mL of D5%W (infant)	PO	Repeat as needed to keep glucose >60	DO	ST	ST	ST

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 (95–89.6F). 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:
5. Ineffective respiratory effort
6. Heart rate
 - i. < 80 for infants
 - ii. < 60 for children
7. Cyanosis despite 100% oxygen via NRB
8. Decreased level of consciousness
9. Check for pulse, if no pulse begin CPR
10. Begin active rewarming measures (hats, blankets), apply heat packs over chest to warm heart
11. Protect injured (frostbite) areas, *do not rub or place on heated surface*
12. Protect patient from further heat loss
13. If patient awake and alert with intact airway, offer sugar containing solution to drink
14. Transport for medical evaluation



BLS

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

ALS

Medical

*Adapted from State of Alaska Guidelines (reference)

Temperature Conversion Table

Fahrenheit	Celsius
77	25
78.8	26
80.6	27
82.4	28
84.2	29
86	30
87.8	31
89.6	32
91.4	33
93.2	34
95	35
96.8	36
98.6	37

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

BLS

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

ALS

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.

AGE OF PATIENT	HR		RR		SYSTOLIC BP	TEMP	
0 days - < 1 mo	<80	>205	<30	>60	<60	<36	>38
≥ 1 mo - < 3 mos	<80	>205	<30	>60	<70	<36	>38
≥ 3 mos - < 1 yr	<75	>190	<30	>60	<70	<36	>38.5
≥ 1 yr - < 2 yrs	<75	>190	<24	>40	<70 + (age x 2)	<36	>38.5
≥ 2 yrs - < 4 yrs	<60	>140	<24	>40	<70 + (age x 2)	<36	>38.5
≥ 4 yrs - < 6 yrs	<60	>140	<22	>34	<70 + (age x 2)	<36	>38.5
≥ 6 yrs - < 10 yrs	<60	>140	<18	>30	<70 + (age x 2)	<36	>38.5
≥ 10 yrs - < 13 yrs	<60	>100	<18	>30	<90	<36	>38.5
≥ 13 yrs - < 18 yrs	<60	>100	<12	>16	<90	<36	>38.5

Teaching Points: Perfusion is important, barriers between skin, how to identify frostbite and protect skin, IV fluid warming.

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.

BLS

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

ALS

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.



Medical

Wong-Baker FACES Pain Rating Scale



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

Medication	Dose	Route	Max dose	EMT-Basic	EMT-I	EMT-IA	Paramedic
Morphine	0.1 mg/kg	IV/IM/IO	4 mg		ST	ST	ST
Fentanyl	1 mcg/kg	IV/IO	75 mcg		ST	ST	ST
	2 mcg/kg	IN	100 mcg		ST	ST	ST
Naloxone	0.1 mg/kg	IV	2 mg		ST	ST	ST

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.

BLS

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

ALS

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.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-medical
Midazolam	0.1 mg/kg	IV/IO	5 mg		ST	ST	ST
	0.2 mg/kg	IN/IM	10 mg		ST	ST	ST
Lorazepam	0.1 mg/kg	IV/IO	4 mg		ST	ST	ST
Diazepam	0.05 mg/kg	IV/IO	5 mg		ST	ST	ST
	0.3 mg/kg	PR	10 mg		ST	ST	ST

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



BLS

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



ALS

Medical

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

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

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.

BLS

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

ALS

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

Causes of PEA: The 5 "H's" and 5 "T's"	
Hypoxia	Tamponade (Cardiac)
Hypovolemia	Tension Pneumothorax
Hypo- or Hyperkalemia	Toxic Overdose
Hypothermia	Thrombosis, Pulmonary – PE
Hydrogen ion (Acidosis)	Thrombosis, Coronary – ACS

Medication / Treatments Table

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

DO: Direct order from on line medical control

ST: Standing Order

Bradycarrhythmias

Definition: A heart rate that is slow compared to normal heart rates for the patients 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.

BLS

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

Age	Awake	Asleep	Mean
0-3 mo	85-205	80-160	140
2 mo-2 yr	100-190	75-160	130
2-10 yr	60-140	60-90	80
> 10 yr	60-100	50-90	75

ALS

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.

Possible contributing factors: The 5 "H's" and 5 "T's"	
Hypoxia	Tamponade (Cardiac)
Hypovolemia	Tension Pneumothorax
Hypo- or Hyperkalemia	Toxic Overdose
Hypothermia	Thrombosis, Pulmonary - PE
Hydrogen ion (Acidosis)	Thrombosis, Coronary - ACS

Medication/ treatments table

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

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 algorithm
6. Transport for medical evaluation

Normal Heart Rates in Children

Age	Awake	Asleep	Mean
0-3 mo	85-205	80-160	140
2 mo-2 yr	100-190	75-160	130
2-10 yr	60-140	60-90	80
> 10 yr	60-100	50-90	75

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

BLS

ALS

Key Points/Considerations

Possible contributing factors: The 5 “H’s” and 5 “T’s”	
Hypoxia	Tamponade (Cardiac)
Hypovolemia	Tension Pneumothorax
Hypo- or Hyperkalemia	Toxic Overdose
Hypothermia	Thrombosis, Pulmonary - PE
Hydrogen ion (Acidosis)	Thrombosis, Coronary - ACS

Classification of Tachyarrhythmias	
Narrow Complex	Wide Complex
Sinus tachycardia Infants <220/min Children <180/min	Supraventricular tachycardia (SVT) with aberrant conduction
Atrial flutter	Ventricular tachycardia
SVT Infant >220/min Children >180/min	

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.

BLS

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

ALS

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

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

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

BLS

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

ALS

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

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

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.

BLS

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



Special Care

ALS

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:
 - a. Vital signs and monitoring.
 - 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 than 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 immunocompromised 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.

BLS

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



ALS

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. Reassess 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

Medication	Route	Dose	Max Dose	EMT-Basic	EMT-I	EMT-IA	Paramedic
Acetaminophen	PO	15mg/kg	15 mg/kg q 4 hours	ST	ST	ST	ST

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 Title 58, 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.

BLS

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



ALS

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.
2. Offer mother medical care and treatment.
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.

Special Care

Medication/Treatments Table

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Paramedic
D10W	2ml/kg	IV/IO	Call for repeated doses		ST	ST	ST
Oral Glucose D5W	30 mL	PO	Call for repeated doses	DO	ST	ST	ST

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.



Special Care

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.

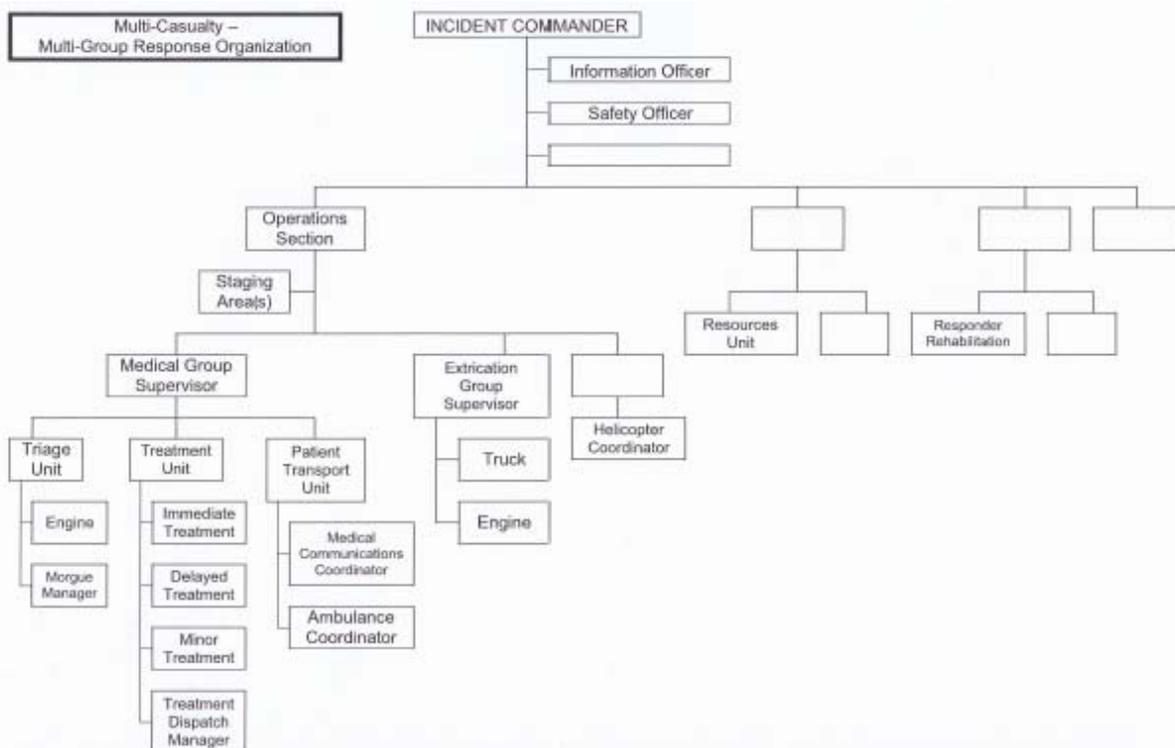


Section VII: Preparedness

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.



Multi-Casualty Multi-Group Response Organization (example): The Medical Group supervisor is managing the treatment and transportation of the injured. In most cases triage would be winding down and those personnel can be assigned to treatment area. A Helicopter Coordinator is assigned to work with the Patient Transport Unit in coordinating air transportation of patients to distant facilities. The Operations Section Chief has now turned attention to those victims who may be entangled or entombed by establishing an Extrication Group. Other elements of the Command Staff are activated as well as elected elements of the Planning and Logistics Sections.

MULTI-CASUALTY

14-5

MULTI-CASUALTY

Preparedness

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.

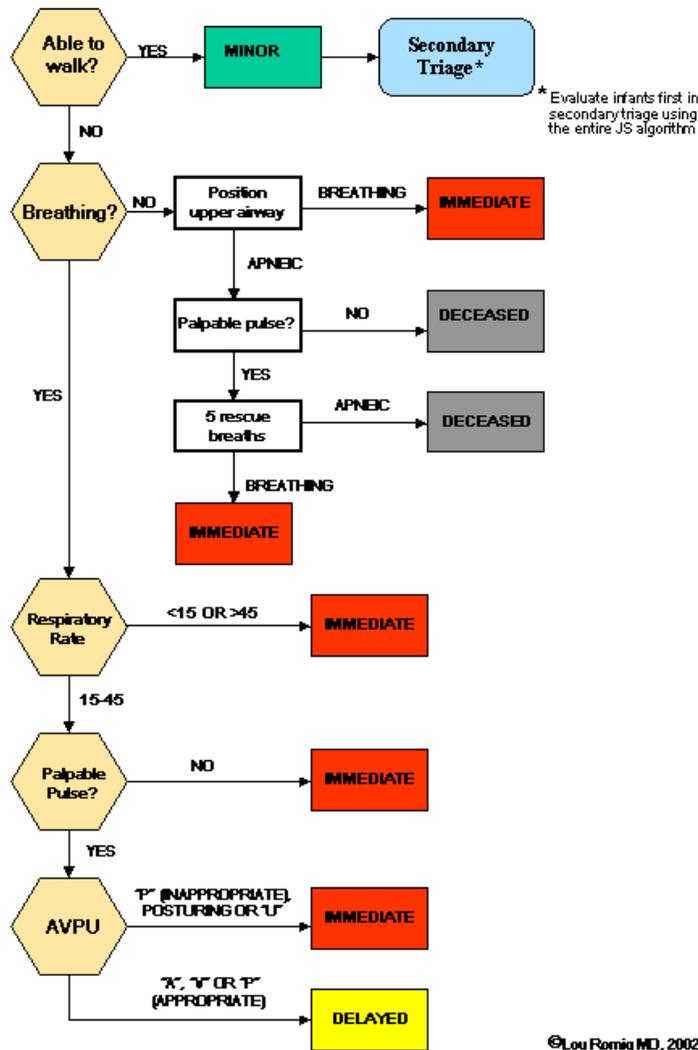
Place a blue arm band on the patient indicating they have been decontaminated.

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

FIRESCOPE California, Field Operations Guide, Incident Command System Publication-ICS-1, June 2004, Page 14-5.
JumpSTART MCI Pediatric Triage. www.jumpstarttriage.com.

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: **S**alivation, **L**acrimation, **U**rination, **D**efecation, **G**astrointestinal distress, **E**mesis (SLUDGE), before they fatigue and stop functioning. Often the nerve agents work so quickly, these symptoms may not be present and therefore their absence can not 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

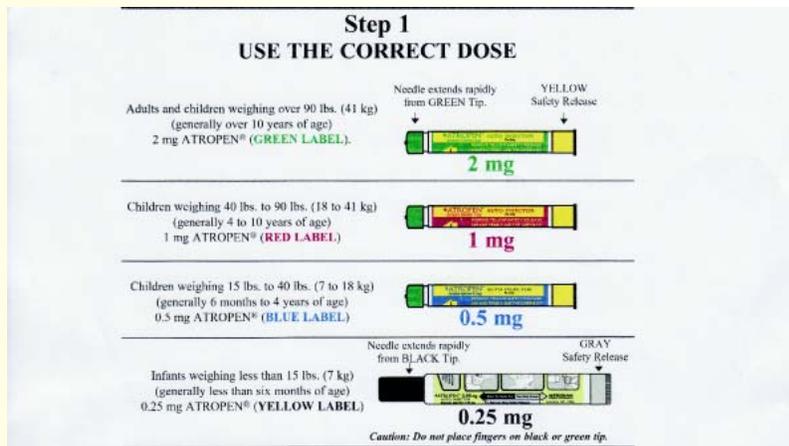
1. Secure scene, ensure safety of responders
2. Initiate Mass Casualty guidelines if a disaster situation
3. **AABC**
 - a. **Antidote**
 - b. **Airway**
 - c. **Breathing**
 - d. **Circulation**
4. Administer Atropine auto-injector (Atropen®) if available for mild to severe symptoms
 - a. Atropine auto-injector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

See chart for proper dose with color coding below:

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Preparedness

Weight	Atropen® Size/Dose
3 – 5 kg	0.25 mg
6 – 9kg	0.5 mg
10 – 11 kg	0.5 mg
12 – 14 kg	0.5 mg
15 – 18 kg	0.5 mg
19 – 23 kg	1 mg
24 – 29 kg	1 mg
30 – 36 kg	1 mg
> 36 kg	2mg

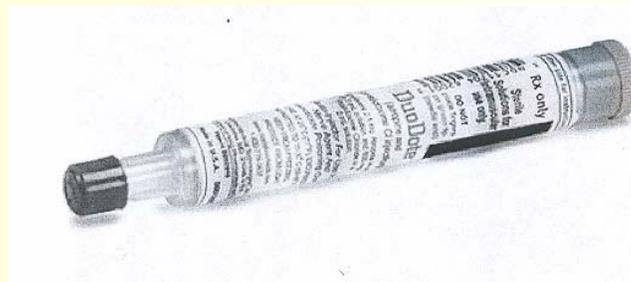


5. Administer Pralidoxime Chloride (2PAM) Auto-Injector
 - a. Auto injector only available in one dose-600mg see chart for dosing

Weight	2Pam Dose
3 – 5 kg	1 *
6 – 9kg	1 *
10 – 11 kg	1 *
12 – 14 kg	1
15 – 18 kg	1
19 -23 kg	1
24 – 29 kg	1 – 2
30 – 36 kg	2
> 36 kg	2

*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

BLS

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

Atropine IV/IM

Weight	0.1mg/ml
3 – 5 kg	0.2 ml
6 – 9 kg	0.35 ml
10 – 11 kg	0.5 ml
12 – 14 kg	0.65 ml
15 – 18 kg	0.8 ml
19 – 23 kg	1 ml
24 – 29 kg	1.3 ml
30 – 36 kg	1.6 ml

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5. Pralidoxmie Chloride (2-PAM) IV/IM
 - i. 25mg/kg should be given along with Atropine in severe cases

Weight	IV 50mg/ml	IM 300mg/ml
3 – 5 kg	2 ml	0.33 ml
6 – 9 kg	3.8 ml	0.63 ml
10 – 11 kg	5.3 ml	0.9 ml
12 – 14 kg	6.5 ml	1.1 ml
15 – 18 kg	8.3 ml	1.4 ml
19 – 23 kg	10.5 ml	1.8 ml
24 – 29 kg	13.3 ml	2.2 ml
30 – 36 kg	16.5 ml	2.8 ml

6. Benzodiazepines give Lorazepam OR Midazolam
 a. Give to children with severe symptoms whether convulsing or not

Lorazepam IV/IM 0.1mg/kg (1)

Weight	2mg/ml	4mg/ml
3 – 5 kg	0.2 ml	0.1 ml
6 – 9 kg	0.38 ml	0.19 ml
10 – 11 kg	0.5 ml	0.25 ml
12 – 14 kg	0.65 ml	0.32 ml
15 – 18 kg	0.8 ml	0.4 ml
19 – 23 kg	1 ml	0.5 ml
24 – 29 kg	1.3 ml	0.66 ml
30 – 36 kg	1.7 ml	0.83 ml

7. Midazolam IV 0.1mg/kg

Midazolam IV—0.1mg/kg

Weight	1mg/ml	5mg/ml
3 – 5 kg	0.4 ml	0.08 ml
6 – 9 kg	0.75 ml	0.15 ml
10 – 11 kg	1 ml	0.2 ml
12 – 14 kg	1.3 ml	0.26 ml
15 – 18 kg	1.6 ml	0.33 ml
19 – 23 kg	2 ml	0.4 ml
24 – 29 kg	2.6 ml	0.52 ml
30 – 36 kg	3.3 ml	0.66 ml

Midazolam IM/IN—0.2mg/kg

Weight	5mg/ml
3 – 5 kg	0.16 ml
6 – 9 kg	0.3 ml
10 – 11 kg	0.4 ml
12 – 14 kg	0.52 ml
15 – 18 kg	0.66 ml
19 – 23 kg	0.84 ml
24 – 29 kg	1.1 ml
30 – 36 kg	1.3 ml

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

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

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.
 - ii. Pediatric Advanced Life Support Protocols take precedence over radiation issues.
 - 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).

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**.
9. State of Utah Department of Health Disaster Hotline-1-866-364-8824.



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
 BROSELOW Pediatric Antidotes for Chemical Warfare Tape, 2006 Edition.

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

BLS

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



ALS

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.

Preparedness

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

Medication	Dose	Route	Max Dose	EMT-Basic	EMT-I	EMT-IA	Para-med
Epinephrine 1:1000	2mL in 3 mL saline	Neb	Call for additional doses		ST	ST	ST

ST: Standing Order

DO: Direct order from on line medical control