



IDAHO DEPARTMENT OF
HEALTH & WELFARE



Pediatric Prehospital Guidelines

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Idaho Emergency Medical Services for
Children (EMSC) Program



Idaho Emergency Medical Services for Children Pediatric Patient Care Guidelines Manual 2010

*This manual was completed under the direction of the
Idaho Emergency Medical Services Physician Commission*

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Table of Contents

Acknowledgements	1
Position Statement	2
Glossary	3
Icons	3
Acronyms	5
Pediatric General Assessment	7
Cardiac Guidelines	15
Asystole & Pulseless Electrical Activity (PEA)	16
Automatic External Defibrillator (AED)	18
Bradyarrhythmias	20
Tachyarrhythmia with Pulse	22
Ventricular Fibrillation & Pulseless Ventricular Tachycardia	24
Medical Guidelines	26
Altered Mental Status	27
Apparent Life Threatening Event (ALTE)	29
Blood Glucometry	30
Epinephrine Auto-Injector	31
Eye Irrigation	33
Fever	34
Glucagon Administration	36
Hyperglycemia	37
Hyperthermia	38
Hypoglycemia	40
Hypothermia	42
Non-Traumatic Shock/Sepsis	44
Pain Management	46
Seizure	48
Toxic Exposure	50
Respiratory Guidelines	52
Anaphylaxis	53
Bronchospasm	55
Prescribed Inhaler	56
Respiratory Failure & Impending Failure	58
Upper Airway Obstruction	59
Trauma Guidelines	62

Blunt Trauma	63
Burn	65
Closed Head Injury	68
Penetrating Trauma	71
Spinal Immobilization	74
Submersion Victim	76
Children with Special Health Care Needs Guidelines	78
Assessment of a Child With Special Health Care Needs	79
Feeding Tube.....	80
Internal Pacemaker and Defibrillator.....	81
Tracheostomy.....	82
Ventilator/BiPAP	84
Special Care Guidelines	86
Behavioral Emergencies	87
Family-Centered Care.....	88
Immunocompromised Children	90
Assessment & Transport of the Neonate	92
Non-Accidental Trauma	94
Idaho Physician Orders for Scope of Treatment/ Do Not Resuscitate.....	96
Refusal of Care/Consent to Treat.....	98
Safe Haven Act.....	99
Sudden Infant Death Syndrome (SIDS).....	101
Preparedness Guidelines	102
Disaster/Mass Casualty Incident.....	103
Radioactive Agent Exposure	107
Vesicants Chemical Exposure.....	109

Acknowledgements

This document contains pediatric patient care guidelines which were originally developed by the Idaho EMS Bureau in 2003. During 2008-2009, an extensive review and revision to the original pediatric BLS guidelines was undertaken by a task force of the Idaho EMS for Children (EMSC) Subcommittee. The remaining guidelines were originally developed by the Utah Emergency Medical Services for Children Program which is a partnership between the Utah Department of Health and Primary Children's Medical Center. The Idaho EMSC Program has revised the guidelines to make them specific for Idaho EMS providers. Special thanks to the Utah EMSC Program and the following members of the Idaho EMSC Subcommittee for their dedication to the revision of these guidelines.

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Position Statement

Pediatric Patient Care Guidelines

An important key prehospital element in emergency medical service (EMS) systems to facilitate the delivery of quality field care to children includes pediatric-specific treatment protocols. Prehospital treatment protocols for adult patients are frequently used in EMS systems, however, a recent survey conducted by the Idaho EMS for Children (EMSC) Program indicates that not even half of Idaho's BLS agencies and 81% of ILS/ALS agencies have pediatric-specific protocols.

Within Idaho there exists considerable variation in treatment protocols based upon local scope of practice, availability of regional resources, and differences in medical opinion regarding the delivery of care in the prehospital environment. This document began as a revision of the 22 BLS Pediatric Patient Care Guidelines (last revised in 2004) and has finished as a Pediatric Patient Care Guideline Manual with 48 guidelines in seven different sections, including procedures for BLS and ALS providers.

The Idaho EMSC Program strongly endorses the concept of standardized prehospital patient care for the pediatric population at all prehospital provider levels. Even for field interventions which are considered relatively uncomplicated and straightforward, guidelines improve the continuity, quality and consistency of patient care.

Within the context of this federally funded EMSC Program, the pediatric population is defined as inclusive of all patients up to the age of 18 years. Other terms commonly applied to the pediatric population include: "neonate" (birth-28 days) and "infant" (1-12 months).

Drug dosages should be weight-based and given per kilogram. Inconsistencies exist within the prehospital environment secondary to the relatively low volume and exposure to pediatric patients resulting in inaccuracies and possible under- or over-treatment. Therefore, a validated "length-based" or color coded resuscitation tool is highly recommended. Have available pre-calculated drug dosing forms based on drug concentrations carried within the EMS system. In addition, standardized weight charts should be readily available to the prehospital provider identifying age adjusted vital sign parameters and appropriate sizing of endotracheal tubes.

Protocol Recommendations:

The following Pediatric Patient Care Guidelines are intended to be used by licensed Idaho EMS agencies either in their current format, or adapted by the EMS agency medical director for use as protocols. They may also serve as a reference for physicians providing on-line medical direction to EMS personnel. The on-line physician may provide more specific treatment instructions within the provider's scope of practice.

A column labeled "Authorization Method" has been left blank in each "Medication/Treatments" table. The intent is that each EMS agency medical director take the time to fill in how the providers within their individual agency(ies) are authorized to use the listed medications (e.g., standing orders vs. direct orders).

Perform only those steps within the guidelines for which you have trained and are credentialed by your agency medical director. Ultimately, you are responsible for your own actions within your respective scope of practice. Steps beyond the basic scope of practice which need additional training/credentialing are marked with two asterisks (**).

Glossary

Icons



Ask additional questions



Obtain blood pressure



Contact medical control



Provide detailed documentation



Wear protective gloves and mask



Follow **Preparedness** guidelines



Give medication(s)



Be mindful of family-centered care*



Arrange for rotor or fixed wing transport



Provide warming measures



Contact Poison Control



Provide medication(s) 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.



Acronyms

ALTE: apparent life threatening event

BP: blood pressure

BSI: body substance isolation

BVM: bag-valve mask

CSHCN: children with special health care needs

DNR: do not resuscitate

EMSPC: Emergency Medical Services Physician Commission

ET: endotracheal tube

GCS: Glasgow Coma Scale

HR: heart rate

IM: intramuscular

IN: intranasal

LOC: level of consciousness

LR: lactated ringers

L/min: liters per minute

MCI: mass-casualty incident

Neb: nebulized

NPO (nil per os): withhold oral food and fluids

NRB: non-rebreather mask

NS: normal saline

PEA: pulseless electrical activity

PO: by mouth

POST: Physician Orders for Scope of Treatment

prn (pro re nata): as needed

q: every

RR: respiratory rate

SQ: subcutaneous

ST: standing order

SVT: supraventricular tachycardia

TBI: traumatic brain injury

TKO: to keep open

URI: upper respiratory infection

V Fib: ventricular fibrillation

VT: ventricular tachycardia

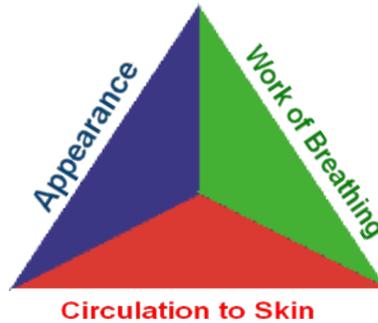
Pediatric General Assessment

1. Scene Size Up
 - Identify possible hazards
 - Assure safety of responder and patient
 - Observe for mechanism of injury/illness
 - Note anything suspicious (e.g., medications, chemicals, other ill persons)
 - Assess any discrepancies between history and presentation (e.g., infant fell on hardwood floor, however, floor is carpeted)
 - Determine number of patients
2. Ensure Body Substance Isolation (BSI)
3. General Approach to the Stable/Conscious Pediatric Patient
 - Smile (when appropriate to the situation)
 - Speak slowly and in a quiet even tone
 - Approach the child at their level (kneel down when possible)
 - Speak slowly; use simple age appropriate terms
 - Use toys or penlights as distracters; make a game of the assessment
 - Keep small children with their caregiver
 - Make as many observations as possible before touching the patient
 - Adolescents may require interviewing without caregiver present to obtain accurate information about drug/alcohol use, sexual activity, child abuse, etc.
 - ✓ Always have two personnel present

Continued on next page

Pediatric General Assessment cont.

4. Use the Pediatric Assessment Triangle to Form an *General Impression* of the Child^{xx}



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

Characteristic	Features to Look For
Abnormal Airway Sounds	Snoring, muffled or hoarse speech, stridor, grunting wheezing
Abnormal positioning	Sniffing position, tripodding, refusing to lie down
Retractions	Superclavicular, intercostals, substernal retractions of the chest wall; head bobbing in infants
Flaring	Flaring of the nares on inspiration

Circulation to Skin

Characteristic	Features to Look For
Pallor	White or pale skin or mucous membranes
Mottling	Patchy/lacey skin discoloration due to vasoconstriction/vasodilation
Cyanosis	Bluish discoloration of skin/mucous membranes

* If patient is in severe distress, expedite transport

Pediatric General Assessment cont.

5. Initial Assessment

- **Airway** – *Ensure* airway is patent; if not, take appropriate action
Maintain with cervical spine control when trauma suspect
Patency, suction secretions as necessary
- **Breathing** – *Count* respiratory rate and rhythm of respirations – compare to normal rate for age and situation
Assist ventilations if as necessary
Look at chest rise and fall (symmetry), check for work of breathing
Listen to breath sounds

Sound ^x	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

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

Initiate *Bradycardia/Neonate* guidelines for pulse rate less than:

Age	Pulse Rate
Newborn	100
Infant (<1 year)	100
Toddler (1-3 years)	90
Preschooler (3-6 years)	80
School-age (6-12 years)	70
Adolescent (12-18 years)	60

Continued on next page

Pediatric General Assessment cont.

- **Disability** – *Evaluate* level of consciousness

AVPU scale

Category	Stimulus	Appropriate	Inappropriate
Alert	Normal environment	Normal interactiveness for age	
Verbal	Simple command or sound stimulus	Responds to name	Nonspecific or confused
Painful	Pain	Withdraws from pain	Sound or motion without purpose or localization of pain; Posturing (pathological)
Unresponsive	Any		No perceptible response to any stimulus

- **Expose and Examine** – *Expose* the child to check for injuries, rashes
Maintain warmth & consider the child's temperature

6. Focused History/Physical Assessment

- Tailor assessment to the needs of the child
- Rapidly examine areas specific to the chief complaint
- SAMPLE history

Step [†]	Description
Signs & 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 does.
Past medical history	Previous illnesses, injuries, or congenital problems; immunizations; history of labor and delivery (infants/toddlers).
Last oral intake	Timing of the child's last food or drink, including bottle or breast feeding.
Events leading to the injuries or illness	Onset, duration & precipitating factors. Key events leading to the current incident. Fever history.

- Determine mechanism of injury or nature of illness
- Perform head to toe exam (or toe to head depending on age of child)

7. Detailed Physical Exam (Trauma)

- Head to toe assessment to check for and treat injuries
- Consider toe to head assessment depending on age of child

Pediatric General Assessment cont.

8. Ongoing Assessment

- Obtain blood pressure, if possible
- Measure oxygen saturation**
- Consider blood glucometry**
 - ✓ Follow **Hypoglycemia** guideline as indicated
- Repeat vital signs (every 5 minutes for unstable patients, every 15 minutes for stable patients)
- Review effectiveness and safety of treatment

9. Transport

- Consider ALS rendezvous
- Consider need for air medical transport as appropriate

10. Extra Information

Vital signs that would be *abnormal* according to the age of the child⁶:

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

Average weight 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

Pediatric General Assessment cont.

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:

(See next page for appropriate EC-Clamp positioning)

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

*Limit intubation attempts as per current EMSPC rules

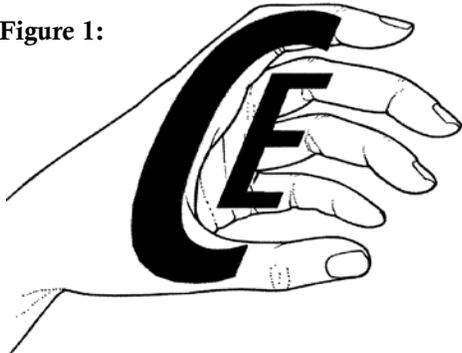
References

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

^e Intermountain Healthcare Primary Children's Medical Center Emergency Department Shock/Sepsis Protocol.

Pediatric General Assessment cont.

Figure 1:



a. Hand displaying E-C shape

Figure 25: E-C Clamp



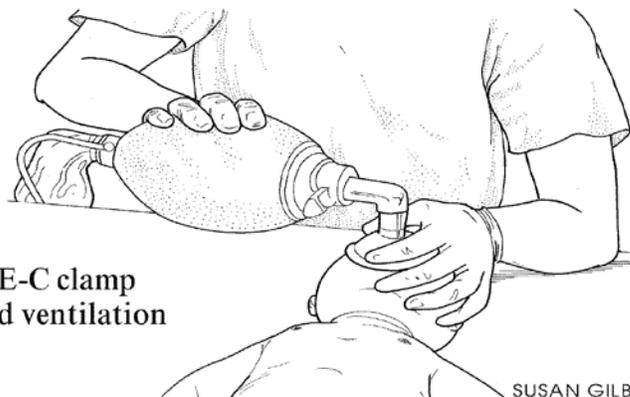
b. E formed with small, ring, and middle fingers; C formed with index finger and thumb



c. E fingers resting on bony ridge of jaw



d. C fingers positioned to hold mask



e. Proper E-C clamp for assisted ventilation

SUSAN GILBERT

Cardiac Guidelines

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.

Cardiac

BLS

Basic Life Support

1. Refer to **Pediatric General Assessment** and **AED** guidelines
2. Begin BVM ventilations with 100% oxygen O₂
 - a. Consider oral-pharyngeal airway
3. Patient should be reassessed for return of vital signs every 5 cycles of CPR
4. Consider possible causes (see table below)
5. Transport for medical evaluation

ALS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
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 guideline
5. Intubate and ventilate with 100% oxygen
 - a. Ventilate at a rate of 1 breath every 6 to 8 seconds (8 to 10 times per minute) without interrupting chest compressions (at least 100 per minute)
6. Establish IV/IO access, start NS infusing wide open up to 60mL/kg
 - a. Consider intraosseous cannulation if unable to rapidly establish venous access
7. Administer epinephrine; may repeat every 3-5 minutes prn
8. Patient should be reassessed for return of vital signs every 10mL/kg of fluid, 5 cycles of CPR and after each intervention
9. When 60mL/kg of volume replacement has been reached, infuse at TKO
10. Transport for medical evaluation



Key Points/Considerations

Possible Causes of PEA	
The 5 “H’s”	The 5 “T’s”
Hypoxia	Tamponade (Cardiac)
Hypovolemia	Tension Pneumothorax
Hypo- or Hyperkalemia	Toxic Overdose
Hypothermia	Thrombosis, Pulmonary – PE
Hydrogen Ion (Acidosis)	Thrombosis, Coronary – ACS

Asystole & Pulseless Electrical Activity (PEA) cont.

Medications/Treatments Table

Medication	Dose	Route	Max Dose	Authorization Method
Epinephrine 1:10,000 (0.1 mg/mL)	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	1 mg	
Epinephrine 1:1,000 (1 mg/mL)	0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn	ET	N/A	

Automatic External Defibrillator (AED)

Clinical Presentation: Witnessed arrest and CPR in progress, and patients who are unresponsive, apneic, and pulseless.

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
 - a. Focus on CPR
2. If CPR is:
 - a. **NOT** already in progress:
 - Establish unresponsiveness
 - Get AED
 - b. **ALREADY** in progress:
 - Go to step #5
3. Open the airway (head tilt-chin lift *or* jaw thrust if c-spine injury suspected) and check breathing
4. If breathing is absent/inadequate (gasps do not count as breathing), check for pulse (brachial in an infant, carotid or femoral in a child)
 - a. If definite pulse, give 1 breath every 3 seconds that cause the chest to rise (if chest doesn't rise, reposition & reattempt)
 - Add compressions if pulse remains <60/min with poor perfusion despite adequate oxygenation and ventilation
 - Recheck pulse every 2 minutes
 - b. If no signs of circulation within 10 seconds, start CPR, beginning with chest compressions
 - **RATIO:**
 - ◊ 15:2 for 2 rescuers
 - ◊ 30:2 for 1 rescuer
 - Use 1 or 2 hands to give chest compressions for a child, press on sternum at the nipple line; for infants, use 2-3 fingers and press on the sternum just below the nipple line
 - Continue CPR for 5 cycles (about 2 minutes)
5. Place the AED next to the patient
 - a. Turn AED on
6. Attach pad to bare, dry skin in proper position
 - a. If **PEDIATRIC** pads available, apply as pictured on each of the AED electrodes with proper contact and no overlap of pads
 - If pads overlap, use anterior (front) and posterior (back) placement
 - b. If only **ADULT** pads available, apply anterior and posterior
7. Press **ANALYZE button** (if present), and stand clear of patient
8. If **SHOCK ADVISED**
 - a. Ensure all are 'clear' of patient and press **SHOCK** button
 - b. After 1 shock, immediately resume CPR, beginning with chest compressions
 - After 5 cycles (about 2 minutes), repeat step #7
9. If **SHOCK NOT ADVISED**
 - a. Check airway, breathing and other signs of circulation
 - b. Continue CPR if needed
 - c. Provide 100% oxygen and ventilate as needed
10. Transport for medical evaluation

Automatic External Defibrillator cont.

Key Points/Considerations

1. An AED with a pediatric attenuator is preferred for children <8 years of age, however, if not available, an AED without a dose attenuator may be used for children of all ages.
2. Minimize time between chest compressions and shock delivery (ie, check rhythm and deliver shocks immediately after compressions rather than after rescue breaths, if possible)
3. Avoid placing pads over pacemakers, internal defibrillators or any other patches.
4. DO NOT touch the patient while the AED is assessing the patient or charging.
5. ENSURE that no one is touching the patient when the shock button is pushed.
6. Avoid defibrillation while moving the patient or when the ambulance is moving.
7. Remove oxygen from patient and place cylinder a safe distance from patient before using AED.
8. DO NOT use AED if patient is conscious.
9. Potential adverse side effects include: burns to skin, injury to patient, self and/or bystander, and deactivation of patient's implanted pacemaker.
10. High-Quality CPR:
 - a. Rate at least 100/min
 - b. Compression depth to at least 1/3 anterior-posterior diameter of chest, about 1½ inches (4 cm) in infants and 2 inches (5 cm) in children
 - c. Allow complete chest recoil after each compression
 - d. Minimize interruptions in chest compressions
 - e. Avoid excessive ventilation

Bradycarrhythmias

Cardiac

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.

Basic Life Support

BLS

1. Follow **Pediatric General Assessment** guideline
2. Identify and treat underlying cause
3. Maintain patent airway; provide 100% oxygen and assisted ventilation if indicated
4. Initiate CPR for signs of shock or collapse and heart rate less than:
 - a. 80 for infants (up to 1 year)
 - b. 60 for children (1-8 years)
5. Reassess after 2 minutes (5 cycles) of CPR
6. Attach AED and follow **AED** guideline
7. Transport for medical evaluation



Advanced Life Support

ALS

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximeter
 - a. Treat any arrhythmias per appropriate guideline
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
 - b. Ventilate at a rate of 1 breath every 6 to 8 seconds (8 to 10 times per minute) without interrupting chest compressions (at least 100 per minute)
4. Establish IV/IO access
 - a. Consider IO cannulation if unable to rapidly establish venous access
5. Give epinephrine if no response to above measures, repeat every 3-5 minutes as needed
6. Intravenous fluid boluses may be infused if indicated (LR or NS 20mL/kg)
7. Transport for medical evaluation



Key Points/Considerations

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

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

Bradyarrhythmias cont.

Medications/Treatments Table

Medication	Dose	Route	Max Dose	Authorization Method
Epinephrine 1:10,000 (0.1 mg/mL)	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	1 mg	
Epinephrine 1:1,000 (1 mg/mL)	0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn	ET	5 mg	

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. Causes of tachycardia in infants and children can include: vomiting, diarrhea, bleeding, hypoxia, pneumothorax, congenital heart disease, elevated temperature, fear/agitation.

Cardiac

BLS

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Identify and treat underlying cause
3. Maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
4. Check pulse, verify heart rate
5. If no pulse, refer to appropriate pulseless guideline
6. Check blood pressure
7. Transport for medical evaluation



ALS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
 - a. Treat any arrhythmias per appropriate guideline
3. If patient has a wide complex tachycardia (QRS > 0.09 sec), and is hypotensive, synchronized cardiovert with .05- 1 J/kg
 - a. May repeat with 2 J/kg
4. If patient has a narrow complex tachycardia (QRS ≤ .09 sec):
 - a. Probable sinus tachycardia: search for and treat cause
 - b. Probable supraventricular tachycardia: consider vagal maneuvers
5. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
6. Establish IV/IO access
 - a. Consider IO cannulation if unable to rapidly establish venous access
 - b. Intravenous fluid boluses may be infused if indicated
7. 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

Tachyarrhythmia with Pulse cont.

Types of Tachyarrhythmias

Narrow Complex	Wide Complex
Sinus tachycardia <ul style="list-style-type: none">• Infants <220/min• Children <180/min	Supraventricular tachycardia (SVT) with aberrant conduction
Atrial flutter	Ventricular tachycardia
SVT <ul style="list-style-type: none">• Infant >220/min• Children >180/min	

Ventricular Fibrillation & 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 **Pediatric General Assessment** guideline
2. Initiate age appropriate CPR
 - a. Perform 2 minutes (5 cycles) of CPR, begin with compressions, before reassessing
3. Maintain airway patency, begin BVM ventilations with 100% O₂
4. Transport for medical evaluation

ALS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
 - a. If rhythm is V Fib or VT, and the patient has no pulse, immediately defibrillate at 2 J/kg
 - b. Treat any other arrhythmias per appropriate guideline
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
 - b. Ventilate at a rate of 1 breath every 6 to 8 seconds (8 to 10 times per minute) without interrupting chest compressions (at least 100 per minute)
4. Establish IV/IO access
 - a. Consider IO if unable to rapidly establish venous access
 - b. Intravenous fluid boluses may be infused if indicated
5. Reassess after 2 minutes (5 cycles) of CPR
6. If rhythm is unchanged, defibrillate at 4 J/kg, and give epinephrine
7. Restart compressions immediately, reassess after 2 minutes of CPR
8. If rhythm is unchanged, defibrillate at 4 J/kg and immediately give Amiodorone or Lidocaine
9. Restart compressions immediately, reassess after 2 minutes of CPR
10. Transport for medical evaluation



Key Points/Considerations

1. Chest compressions: 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.
4. Energy doses higher than 4 J/kg (not to exceed 10 J/kg), especially if delivered with a biphasic defibrillator, may also be safe and effective.

Ventricular Fibrillation & Pulseless Ventricular Tachycardia cont.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorization Method
Epinephrine 1:10,000 (0.1 mg/mL)	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	1 mg	
Epinephrine 1:1,000 (1 mg/mL)	0.1 mg/kg dilute in NS to 3-5 mL Repeat q 3-5 minutes prn	ET	10 mg	
Lidocaine	1mg/kg (Dilute in NS to 3-5 ml) Repeat q 5-10 min prn	IV/IO	3mg/kg	
	2-3 mg/kg (Dilute in NS to 3-5 ml)	ET	3mg/kg	

Medical Guidelines

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, and caregivers may refer to the patient as “not acting normal”. They can be hypo- or hypertensive, be hypo- or hyperglycemic, and can have alterations in respiratory drive.

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
 - a. Consider causes of altered mental status (see chart below)
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilation with 100% O₂
3. Look for signs of trauma, refer to **Spinal Immobilization** guideline and appropriate **Trauma** guidelines as indicated
4. Check temperature, refer to **Fever, Hyperthermia** or **Hypothermia** guidelines as indicated
5. Check blood glucose (refer to **Glucometry** protocol^{**})
 - a. If <60 mg/dl, refer to **Hypoglycemia** guideline
6. Transport for medical evaluation

BLS

Medical

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access, and infuse 20mL/kg NS bolus 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

ALS



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 Poison Control at 1-800-222-1222 for guidance.



Altered Mental Status cont.

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	Authorizing Method
D10W (10 ml D50 and 40 ml diluent)	2 mL/kg (neonate) 5ml/kg (children)	IV/IO	Repeat as needed to keep glucose >60	
Naloxone	0.1 mg/kg	IV/IO/ IM/SQ	2 mg	

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: *Often patients with ALTE can be well appearing on presentation.*

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
3. If patient exhibits decreased LOC, refer to **Altered Mental Status** guideline
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, refer to **Toxic Exposure** guideline as indicated
5. Treat any identifiable problems, refer appropriate guidelines as indicated
6. Transport for medical evaluation



Medical

BLS

Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access, infuse 20 mL/kg NS for signs of hypotension or shock
 - a. May repeat second fluid bolus if signs of shock or hypotension persist
5. Transport for medical evaluation



ALS

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. Refer to the **Refusal of Care** guideline as needed.



Blood Glucometry

Clinical Presentation: Indications include: abnormal mental status; sweating with rapid heart rate; seizures; focal neurological deficit; and/or behavioral changes.

All Providers

1. Refer to **Pediatric General Assessment** guideline
2. Before using the blood glucometer the provider must:
 - a. Be trained and have demonstrated competency with the specific device being used
 - b. Confirm the device is working properly including calibration
 - c. Confirm the test strips are not expired
3. Procedure:
 - a. Prepare the device according to the manufacturer's instructions
 - b. Explain the procedure to the patient
 - c. Obtain verbal consent, if possible, from patient or family
 - d. Use body substance isolation procedures
 - e. Cleanse the puncture site prior to obtaining blood sample
 - f. Obtain a drop of blood
 - g. Apply the blood to the test strip according to the manufacturer's instructions
 - h. Obtain and record the reading from the device
 - i. Apply a dressing to the patient's puncture site
 - j. Properly dispose of test supplies
 - k. Continue your assessment and treatment of the patient



Medical

Key Points/Considerations

1. According to the 2008-1 EMSPC Standards Manual, as of July 1, 2008, automated blood glucometry is an optional skill for the EMT.
2. The EMT must obtain EMS Bureau-specified training prior to skill credentialing.
3. The EMT must perform automated blood glucometry in accordance with this EMSPC protocol.
4. This protocol may not be modified by the medical director except at the AEMT and Paramedic levels.

Epinephrine Auto-Injector

Clinical Presentation: Symptoms similar to previous allergic reaction, OR patient exhibits signs of a severe allergic reaction which may include respiratory distress, irregular heart rate, rapid heart rate, hives, edema of face, mouth, neck and/or tongue, hypoperfusion (shock) and/or loss of consciousness, AND medication is present (either prescribed for this patient by a physician and with the patient, or with the responding EMS personnel).

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
 - a. Establish a transport plan based on general impression
 - b. Consider need for ALS or transport (*if available*)
2. Obtain patient history
 - a. If pre-existing cardiac disease or dysrhythmia is reported, refer to appropriate dysrhythmia guideline and contact medical control for patient specific directions
3. Inspect the prescribed pre-loaded epinephrine auto-injector and document:
 - ✓ **Right Medication and Form:** Check expiration date, medication should be clear and colorless
 - ✓ **Right Route:** Injected into lateral thigh
 - ✓ **Right Dose:** DOSAGE BY WEIGHT >60 pounds - 0.3 mg epinephrine (1 EpiPen Adult)
DOSAGE BY WEIGHT <60 pounds - 0.15 mg epinephrine (1 EpiPen Junior)
4. Describe procedure to patient and obtain consent, if possible
5. Remove clothing covering thigh
6. Administer medication:
 - a. Remove the cap from the auto-injector
 - b. Ask patient to hold leg as still as possible
 - c. Cleanse injection site with alcohol pad
 - d. Place the tip of the auto-injector against the lateral (outside), upper 1/3 of the patient's thigh
 - e. Push the injector firmly against the lateral thigh until the auto-injector activates
 - f. Hold the injector in place until the medication is injected (approximately 10 seconds)
 - *Note:* The majority of the solution will remain in the auto-injector after activation
 - g. Dispose of the auto-injector in a biohazard sharps container
7. Record time of administration, dose administered, site, and patient response
8. Reassess patient every 2 minutes
 - a. Contact medical control if patient does not improve with one dose, additional doses must be cleared through medical direction
9. If bronchospasm/wheezing is present and patient is prescribed an inhaler, refer to the **Prescribed Inhaler** guideline
10. Assist with ventilations or begin chest compressions as needed
11. Transport patient for additional medical evaluation
 - a. Bring any remaining unused auto-injectors with you



Medical

BLS



Epinephrine Auto-Injector

Key Points/Considerations

1. Patients experiencing anaphylaxis may not always respond adequately to one injection of epinephrine.
 - a. Epinephrine has a rapid onset but short duration of action (10-20 minutes).
 - b. Patients may, therefore, not improve sufficiently or may improve and relapse.
2. Document what triggered the anaphylaxis or allergic reaction.
3. Do not inject the epinephrine auto-injector into a vein.
4. Be prepared to start chest compressions and use AED.
5. Infant patients may be more susceptible to potential adverse effects, monitor patient closely.
6. Patients may carry an "Ana-Kit" syringe containing epinephrine, DO NOT use it; use only epinephrine auto-injector.
7. Potential adverse side effects include: increased heart rate, pale skin, dizziness, headache, heart palpitations, chest pain, excitability and anxiousness, nausea and vomiting.
8. Per the EMSPC, this protocol may not be modified by the medical director except at the Paramedic level.



Eye Irrigation

Clinical Presentation: Obvious non-penetrating foreign body or chemical exposure.

All Providers

1. Refer to **Pediatric General Assessment** guideline
2. If possible, have patient describe degree of visual changes
3. Remove contacts lenses if present.
4. Flood the eyes with solution from medial (nasal) corner of the eye to the lateral corner
 - a. Pour water directly from sterile bottle, OR
 - b. Use IV fluid and tubing directing the end of IV tubing to the eye, OR
 - c. Use a nasal cannula to flush both eyes simultaneously
 - Attach cannula to IV tubing
 - Place over the bridge of the nose so the prongs point to the medial corner of the eye
5. Continue flushing the patient's eyes until arrival at hospital or instructed to stop by medical control
6. After washing eye(s), cover both eyes with sterile moistened pads
7. If the patient complains of renewed burning sensation or irritation, continue irrigation
8. Document the process in writing on the patient care report
 - a. Identify the substance in eye(s) or transport the label or container with the patient
9. Transport for medical evaluation



Medical

Key Points/Considerations

1. If single eye is affected avoid contamination of unaffected eye.
2. Protect the patient from becoming wet during the irrigation process.
3. Do not follow guideline if foreign body is penetrating from eye.

Fever

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

Clinical Presentation: Fever results in a faster metabolic rate (body generating heat). 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



BLS

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
3. Obtain history and document temperature (rectal or axillary)
4. Begin cooling measures if temperature is greater than 103°F or 39.5°C
 - a. Passive cooling : removal of excessive clothing
 - b. Active cooling: sponge patients skin with tepid water
 - c. **DO NOT USE RUBBING ALCOHOL OR ICE/COLD WATER TO COOL**, this will cause shivering (generates heat) and constriction of peripheral blood vessels (reduces the transfer of heat)
5. If seizing, refer to **Seizure** guideline
6. If core temperature is greater than 106°F or 41°C, refer **Hyperthermia** guideline
7. If immunosuppressed, refer to **Immunosuppressed Patient** guideline
8. Transport for medical evaluation

Medical

Advanced Life Support



ALS

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximetry
3. Administer acetaminophen 15mg/kg PO if >4 hours since last antipyretic
4. Assess for signs of hypotension (see table below), if present, establish IV/IO access and infuse 20mL/kg of NS or LR
 - a. May repeat 20mL/kg prn for hypotension up to 60mL/kg
5. Transport for medical evaluation

Sepsis Vital Signs

Age	Temp.		Pulse		Resp.		Systolic BP
	>36	>38	<80	>205	<30	>60	
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

Fever cont.

Temperature Conversion Table

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

Medication/Treatments Table

Medication	Route	Dose	Max Dose	Authorization Method
Acetaminophen	PO	15mg/kg	15 mg/kg q 4 hours	

Glucagon Administration

Clinical Presentation: Glucagon is indicated for patients who are known (via blood glucometry or other laboratory method) to be **hypoglycemic** (less than 60) and the patient cannot take glucose by either oral or intravenous methods.

All Providers

1. Refer to **Pediatric General Assessment** guideline
2. Before the administration of glucagon to any patient the provider must:
 - a. Be trained and have demonstrated competency in:
 - b. Pharmacology of the drug
 - c. Indications for the drug
 - d. Contraindications of the use of the drug
 - e. Specific route of administration of the drug
 - f. Specific product and the manufacturer's instructions for administration
3. Procedure:
 - a. Confirm the patient is hypoglycemic** (refer to **Glucometry** protocol)
 - b. Explain the procedure to the patient or family, if able
 - c. Obtain verbal consent, if able
 - d. Confirm the drug is not expired
 - e. Use body substance isolation
 - f. Mix the drug with the supplied diluent according to the manufacturer's instructions
 - g. Draw up the drug in an appropriately sized syringe
 - h. Administer the drug either intramuscularly or subcutaneously consistent with the manufacturer's instruction for the specific product being given
 - i. Continue your assessment and treatment of the patient
 - j. Do not administer additional doses of glucagon to the same patient



Medical

Key Points/Considerations

1. According to the 2008-1 EMSPC Standards Manual, as of July 1, 2008, administration of glucagon IM or SQ is an optional skill for the EMT and a required skill for the AEMT.
2. The EMT and AEMT must obtain EMS Bureau-specified training prior to skill credentialing.
3. EMTs and AEMTs must administer glucagon in accordance with this EMSPC protocol.
4. This protocol may not be modified by the medical director except at the Paramedic level.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
Glucagon	.5 mg (<20 kg) 1 mg (>20 kg)	IM/SQ	One dose	

Hyperglycemia

Definition: Hyperglycemia is a condition where blood glucose levels rise excessively.

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

Basic Life Support

BLS

1. Refer to **Pediatric General Assessment** guideline
1. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
2. Check blood glucose** (refer to **Blood Glucometry** protocol)
 - a. If <60 mg/dL, refer to **Hypoglycemia** guideline
3. Transport for medical evaluation

Advanced Life Support

ALS

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
 - a. Electrolyte imbalance may lead to abnormalities and dysrhythmias, refer to the appropriate dysrhythmia guideline as indicated
3. Establish IV/IO access
 - a. For the patient with high blood glucose (>300) and signs of decreased perfusion, infuse 20mL/kg NS bolus
 - b. Multiple boluses may be needed for the severely ill child
4. Transport for medical evaluation



Medical

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. In heat stroke the body has become so dehydrated that it has lost the ability to sweat or regulate temperature in any fashion, core temperatures may be over 105°F.

Basic Life Support

1. Remove patient from hot environment
2. Refer to **Pediatric General Assessment** guideline
3. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
4. Begin BVM ventilation with 100% O₂ for:
 - a. Ineffective respiratory effort
 - b. Heart rate
 - < 80 for infants (up to 1 year)
 - < 60 for children (1 - 8 years)
 - c. Cyanosis despite 100% O₂ via nonrebreather
 - d. Decreased level of consciousness
5. Obtain history and document temperature
6. **Heat Exhaustion:** Use passive cooling measures (cool environment, fan, ice packs, remove clothing); **Heat Stroke (>104°F or altered mental status):** Use aggressive cooling measures (ice packs in armpits and groin, continually mist the exposed skin with tepid water while fanning the patient)
7. Oral rehydration with electrolyte solution if mental status is normal
8. Assess for seizure activity, refer to **Seizure** guideline as indicated
9. Transport for medical evaluation



BLS

Medical

Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximeter
 - a. Treat for arrhythmias (see specific dysrhythmia guideline)
1. Continue airway maintenance
3. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access and infuse 20mL/kg NS bolus if indicated
5. Transport for medical evaluation

ALS

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.

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

Hyperthermia cont.

Temperature Conversion Table

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

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

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 lpm of O₂ via NRB
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
3. Check blood glucose (refer to **Blood Glucometry** protocol**), if hypoglycemic administer:
 - a. Oral glucose OR
 - b. Glucagon per **Glucagon Administration** protocol**
4. For oral glucose administration:
 - a. Assure patient is conscious, alert enough to swallow, and able to control airway
 - b. Have suction available
5. Administer 1st dose (15 grams) by either of the following methods:
 - a. Put glucose on tongue depressor, place between cheek and gum, OR
 - b. Hold back patient's cheek and squeeze small portions into mouth between cheek and gum
 - c. Lightly massaging the area between cheek and gum may help to induce swallowing
 - d. Administer a second oral glucose dose equal to 15 grams if needed
6. Perform ongoing assessment:
 - a. If patient loses consciousness or seizes, remove tongue depressor from mouth and protect airway (follow **Seizure** guideline as indicated)
 - b. Monitor airway closely to avoid accidental blockage by or aspiration of oral glucose
 - c. It may take up to 20 minutes to see noticeable improvement
7. Recheck blood glucose** and assess mental status 30 minutes after oral glucose administration
8. Transport for medical evaluation



Medical

BLS

Advanced Life Support

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



ALS

Hypoglycemia cont.

Key Points/Considerations

1. The items listed below each contain approximately 15 grams of glucose and can be used if glucose gel is unavailable
 - 1/2 cup (4 ounces) of any fruit juice
 - 1/2 cup (4 ounces) of a regular (**not diet**) soft drink
 - 1 cup (8 ounces) of milk
 - 1 or 2 teaspoons of sugar
 - 2 or 3 glucose tablets (may be difficult to use if patient is unwilling to chew)

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
D10W (dilute 10mL D50 and 40mL saline)	2mL/kg (neonate) 5mL/kg (children)	IV/IO	Repeat as needed to keep glucose >60	
Glucagon	1 mg (>20 kg) .5 mg (<20 kg)	IM/SQ	One dose	
Oral Glucose	20-30mL of D5%W (infant)	PO	Repeat as needed to keep glucose >60	

Hypothermia

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

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

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

Basic Life Support

1. Remove any wet clothing from patient and *carefully* move to warm environment (do not immerse patient in water)
2. Refer to **Pediatric General Assessment** guideline
3. Maintain airway, administer 10-15 L/min of O₂ via nonrebreather
4. Begin BVM ventilation for **3 minutes*** with 100% O₂ for:
 - a. Ineffective respiratory effort
 - b. Heart rate
 - <80 for infants (up to 1 year)
 - <60 for children (1-8 years)
 - c. Cyanosis despite 100% O₂ via nonrebreather
 - d. Decreased level of consciousness
5. Check for pulse, if no pulse begin CPR
6. Contact medical control
7. Begin active re-warming measures (hats, blankets), apply heat packs over chest to warm heart
8. Protect injured (frostbite) areas, *do not rub or place on heated surface*
9. Protect patient from further heat loss
10. If patient awake and alert with intact airway, offer sugar containing solution to drink
11. Transport for medical evaluation



BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
 - a. Assess for arrhythmias, treat per appropriate guideline
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access
 - a. **Warm** IV NS or LR 20mL/kg
5. Administer medications as directed by medical control
6. Transport for medical evaluation



ALS

*Adapted from State of Alaska Guidelines

Hypothermia cont.

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 re-warming 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): most common cause in pediatrics due to fluid losses from dehydration.
- **Distributive Shock** (warm shock state): from inadequate fluid distribution causing hypoperfusion. Examples include septic shock or anaphylaxis.

Clinical Presentation: **Hypovolemic Shock:** increased heart rate; prolonged capillary refill >3 seconds; cool, pale, clammy, or mottled skin; weak or absent peripheral pulses; altered mental status. **Distributive 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 **Pediatric General Assessment** guideline
2. Obtain vital signs including blood pressure
3. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction as needed
4. Contact medical control as soon as possible to mobilize resources at receiving facility
5. Transport for medical evaluation



Medical

Advanced Life Support

ALS

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access and infuse 20mL/kg of NS
5. Reassess patient perfusion status including vital signs
 - a. If patient is persistently hypotensive or with signs of poor perfusion, repeat 20mL/kg of NS or LR
6. 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 a very important component of care

Non-Traumatic Shock/Sepsis cont.

Vital Signs that would be abnormal according to the age of the 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

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.

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
3. Immobilize any obvious injuries to alleviate ongoing pain
4. Place in position of comfort.
5. If there are signs of multi-system trauma, follow **Spinal Immobilization** guideline as indicated
6. Transport for medical evaluation in position of comfort

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish 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
 - a. If respiratory depression, administer naloxone
9. Transport for medical evaluation in position of comfort



Key Points/Considerations

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



Wong-Baker FACES Pain Rating Scale



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

BLS

ALS

Medical

Pain Management cont.

Medication/Treatments Table

Medication	Dose	Route	Max dose	Authorizing Method
Morphine	0.1 mg/kg	IV/IM/IO	4 mg	
Fentanyl	1 mcg/kg	IV/IO	75 mcg	
	2 mcg/kg	IN	100 mcg	
Naloxone	0.1 mg/kg	IV	2 mg	

Seizure

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

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

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Protect airway by suctioning or positioning and apply 100% O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
3. Obtain history of seizures, diabetes, fever, ingestion, or trauma
 - a. Refer to appropriate guideline as indicated
4. Monitor patient, protect from further injury
5. Obtain a blood glucose (refer to **Blood Glucometry** protocol^{**})
 - a. If hypoglycemic, refer to **Hypoglycemia** guideline
6. Transport for medical evaluation



Medical

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. 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. Transport for medical evaluation



Key Points/Considerations

1. If a patient has a history of frequent seizures, ask if the child has a Medical Emergency Health Care Information form (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 cause hypotension in patients. 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 postictal.
5. Seizures burns glucose and hypoglycemia can cause additional seizures. Therefore, it is important to check glucose and treat hypoglycemia as indicated.

Seizure cont.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
Midazolam	0.1 mg/kg	IV/IO	5 mg	
	0.2 mg/kg	IN/IM	10 mg	
Lorazepam	0.1 mg/kg	IV/IO	4 mg	
Diazepam	0.05 mg/kg	IV/IO	5 mg	
	0.3 mg/kg	PR	10 mg	

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 (**Preparedness** guidelines)
2. Refer to **Pediatric General Assessment** guideline
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 (refer to **Blood Glucometry** protocol)** , refer to **Hypoglycemia** guideline as indicated
5. If child appears unstable, transport immediately
6. If stable, notify Poison Control Center: **(800) 222-1222** for guidance
7. Contact medical control and consider administration of activated charcoal if within 1 hour of ingestion, transport time >30 minutes, and patient is awake and alert.
 - a. Do **NOT** administer for any of the following ingestions:
 - Minerals/electrolytes
 - Alcohols
 - Cyanide
 - Caustics (e.g. lye)
 - Solvents (e.g. cleaning solution)
 - Heavy Metals (iron, lithium, fluoride, etc.)
 - Hydrocarbons (gasoline)
8. Transport for medical evaluation



Medical

BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
 - a. Treat any arrhythmias per appropriate guideline
3. Consider treatment with Naloxone (0.1 mg/kg up to 2mg IV) for respiratory depression and suspected overdose/ingestion of opiate medications (e.g. morphine, oxycodone)
 - a. Use with caution as this may cause withdrawal complications in opiate dependent (addicted) patients
4. Consider intubation for airway protection or respiratory support
5. Consider antidotes (e.g. atropine) in consultation with Poison Center/ medical control
6. Transport for medical evaluation



ALS

Toxic Exposure cont.

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	Authorizing Method
Activated Charcoal	1 g/kg	PO	50 g	
Oral Glucose	20-30mL of D5W	PO	repeat to keep glucose >60	
D50	2mL/kg (neonates) 5mL/kg (children)	IV/IO	repeat to keep glucose >60	
Naloxone	0.1 mg/kg	IV	2 mg	
Atropine	.01 mg/kg	IV	1 mg	

Respiratory Guidelines

Anaphylaxis

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

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

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
3. Check blood pressure, assess for signs of shock
4. Initiate CPR for **Pulseless Arrest** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmia guideline)
5. Use epinephrine auto-injector, refer to **Epinephrine Auto Injector** protocol
6. Document time of administration, dose administered, site, patient response
7. Reassess patient every 2 minutes
8. If bronchospasm/wheezing is present, and patient is prescribed an inhaler, refer to the **Prescribed Inhaler** guideline
9. Transport for medical evaluation



BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance, intubate if patient is apneic, has a significantly depressed LOC, or if the patient has severe respiratory distress or depression
 - a. If the patient is unconscious and has significant oral edema, place an oral airway while preparing to intubate
4. Administer epinephrine (1:1,000) .01 mg/kg, maximum 0.3 mg, IM (lateral-superior thigh)
 - a. Repeat every 5-15 minutes prn for persistent symptoms
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. Administer nebulized epinephrine if patient has significant stridor
7. Establish IV/IO access and infuse 20mL/kg NS bolus
 - a. Repeat 2x for persistent hypotension
 - b. If hypotension persists, consult medical control
8. **Following stabilization of the patient**, administer diphenhydramine IV 1.25mg/kg, maximum 50 mg
9. Transport for medical evaluation



ALS

Respiratory

Anaphylaxis cont.

Key Points/Considerations

4. It is extremely important to give IM epinephrine as soon as the diagnosis of anaphylaxis has been established.
5. Place an IV as quickly as possible but do not delay epinephrine administration.
6. Patients experiencing anaphylaxis may not always respond adequately to one injection of epinephrine.
 - a. Epinephrine has a rapid onset but short duration of action, (10-20 minutes).
 - b. Patients may, therefore, not improve sufficiently or may improve and relapse.
 - c. Contact medical control if patient does not improve with one dose, additional doses must be cleared through medical direction.
7. 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	Authorizing Method
Epinephrine auto-injector	0.15 mg (15–25 kg) 0.3 mg (>25 kg)	IM	Call for additional doses	
Epinephrine 1:1000 (1mg/mL)	2mL in 3mL saline	Neb	Call for additional doses	
Epinephrine 1:1000 (1mg/mL)	0.01 mg/kg Repeat q 5-15min prn persistent symptoms	IM	0.3mg	
Albuterol	1.25 mg <1 year 2.5 mg for >1 year	Neb	One dose	
Diphenhydramine	1.25 mg/kg	IV	50 mg	

Teaching Points:

- Epinephrine solution for nebulization is made by mixing 2mL of epinephrine 1:1000 with 3mL NS.

Bronchospasm

Definition: Bronchospasm is an acute process that affects the upper and lower airways in infants and children. Bronchospasm is also associated with respiratory distress, hypoxemia, respiratory arrest, and apnea in infants.

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

Basic Life Support

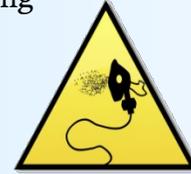
BLS

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
3. If patient is prescribed an inhaler, refer to the **Prescribed Inhaler** guideline
4. Initiate CPR for **Pulseless Arrest** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmias guideline)
5. Transport for medical evaluation

Advanced Life Support

ALS

2. Follow BLS procedures
3. Place patient on cardiorespiratory monitor and continuous pulse oximeter
4. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
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” (e.g., has decreased work of breathing, decreased wheezing or oxygen need), may repeat the treatment every 30-60 minutes prn
7. If no response to albuterol, consider nebulized epinephrine if patient has severe respiratory distress
8. Transport for medical evaluation



Respiratory

Key Points/Considerations

1. NPO if patient has any respiratory distress or has a respiratory rate >60

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorized Method
Epinephrine 1:1000 (1mg/mL)	2mL in 3mL saline	Neb	Call for additional doses	
Albuterol	1.25 mg <1 year 2.5 mg >1 year	Neb	3 doses	

Teaching Points:

- Recognize seasonal nature of this very common pediatric illness.
- Epinephrine solution for nebulization is made by mixing 2 mL of epinephrine 1:1000 with 3mL NS.

Prescribed Inhaler

Clinical Presentation: Exhibits signs and symptoms of: respiratory distress, decreased breath sounds, wheezing **AND** has a prescription for a bronchodilator inhaler

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer supplemental O₂ by face mask or nasal cannula
3. Obtain a baseline set of vital signs
4. Inspect the prescribed inhaler and note:
 - a. Medication name
 - b. Prescribed dose
 - c. Expiration date
 - d. Is medication prescribed for your patient?
 - e. Inhaler is room temperature or warmer?
 - f. Does the patient have a spacer? (*see #8*)
 - g. Is it a type of inhaler that cannot be shaken?
5. If the patient is prescribed a bronchodilator inhaler but the prescribed inhaler is not present, you may substitute an albuterol inhaler carried by on-scene EMS
6. Check to see if the patient has already taken any doses
7. Typical bronchodilator is 2 puffs
 - a. Dose may be repeated one time in 20 minutes if criteria above still met
8. Shake the inhaler vigorously several times if appropriate
9. Remove oxygen mask from the patient, a nasal cannula may be left in place
10. If spacer is available:
 - a. Shake inhaler well before each inhalation unless it states, "Do not shake"
 - b. Remove cap from mouth piece or use mask
 - c. Insert inhaler into spacer
 - d. Have patient close lips around spacer mouth piece
 - e. Have patient actuate inhaler once
 - f. Have patient breathe in medicine through spacer slowly over 6 seconds
 - Children will often not be able to inhale this slowly so just let them breathe through spacer for about 10 seconds
 - g. If whistle sounds, have patient slow down rate of inhalation
 - h. Have patient try to hold breath for 10 seconds after inhalation
 - i. Repeat previous three steps one or two more times for each inhalation given
 - j. Wait at least 1 minute between end of cycle and giving an additional burst of medication
11. If no spacer is available:
 - a. Shake inhaler well before each inhalation unless it states, "Do not shake"
 - b. Remove cap from mouth piece
 - c. Put mouth piece in mouth with lips closed around it
 - d. Have patient fully exhale
 - e. Have patient actuate inhaler as patient inhales deeply and slowly
 - f. Have patient hold breath up to 10 seconds
 - g. If additional inhalations are to be given, wait one minute then repeat all steps
12. Replace O₂ mask
13. Contact medical control if breathing difficulty is not relieved
 - a. Additional doses may be recommended



BLS

Respiratory



Prescribed Inhaler cont.

14. Record time of administration, dose given and patient response, including any side effects
15. Reassess patient
 - a. Be prepared to suction or assist with ventilations as needed
16. Transport for medical evaluation
 - a. Do not delay transport to assist the patient with self-administration



Key Points/Considerations

1. Encourage the parents to hold and assist the child as much as possible
2. Determine how the child usually has this medication given
3. Whenever possible, allow older children to follow their usual patterns of administration



Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
Albuterol	2 puffs	PO	2 puffs	

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

BLS

1. Follow **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. Consider placing an OPA or NPA adjunct if the airway cannot be maintained with positioning and the patient is unconscious
3. Begin BVM ventilations with 100% O₂ for:
 - a. Ineffective respiratory effort
 - b. Heart rate:
 - <80 for infants (up to 1 year)
 - <60 for children (1 - 8 years)
 - c. Cyanosis despite 100% O₂ via nonrebreather
 - d. Decreased level of consciousness
4. If patient does not respond to BVM, start chest compressions
5. Suction airway as needed
6. Immobilize cervical spine for suspected trauma
7. Refer to appropriate guideline for suspected **Upper Airway Obstruction, Anaphylaxis, or Bronchospasm**
8. Transport for medical evaluation

Advanced Life Support

ALS

1. Follow to BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access, infuse 20mL/kg NS bolus, if indicated
5. Consider NG or OG for gastric decompression
6. Transport for medical evaluation

Key Points/Considerations

1. Confirm and document ETT position by auscultation and secondary device.
2. Limit intubation attempts as per current EMSPC rules.

Respiratory

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 **Pediatric General Assessment** guideline
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
 - a. Use nonrebreather or blow by as tolerated
4. If patient is not breathing, position airway and begin BVM ventilations with high flow, 100% O₂ (refer to **Respiratory Failure** guideline)
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
6. If patient is or becomes unconscious, start chest compressions
7. Continue to attempt BVM ventilations after efforts to remove obstruction
8. Transport for medical evaluation

Advanced Life Support

ALS

1. Follow BLS procedures
2. Place patient on cardiorespiratory 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 2mL 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** guideline)
8. Establish IV/IO access, infuse 20mL/kg NS bolus, if indicated
9. Transport for medical evaluation



Respiratory

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.



Upper Airway Obstruction cont.

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 guideline)	+/- history exposure to allergen Face/lips/tongue swollen Stridor Absent or diminished breath sounds
Foreign Body Aspiration	Sudden onset of choking/gagging +/- witnessed with object in mouth

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
Epinephrine 1:1000 (1mg/mL)	2mL in 3mL saline	Neb	Call for additional doses	

Teaching Point:

- Epinephrine solution for nebulization is made by mixing 2 mL of epinephrine 1:1000 with 3mL NS.

Trauma Guidelines

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

BLS

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
3. Refer to **Spinal Immobilization** guideline 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 transport and every 15 minutes during transport (AVPU/GCS scales – see tables below)
 - a. Refer to **Closed Head Injury** guideline as indicated
7. Continue to reassess vital signs
8. Transport for medical evaluation



Advanced Life Support

ALS

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. If unable to effectively perform BVM ventilations, consider intubation
4. Establish IV/IO access and infuse NS or LR 20mL/kg
 - a. Repeat bolus as needed for shock (see table below)
5. Assess pain, refer to **Pain** guideline as indicated
6. Continue to reassess mental status, vital signs and pain score
7. Transport for medical evaluation



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.
4. Kids don't always verbalize pain, so the need for pain assessment is greater in kids than adults.
5. Spinal shock occurs with catastrophic spinal cord injuries. This involves a loss of sympathetic tone to the blood vessels resulting in hypotension without tachycardia. Epinephrine may be indicated.

Trauma

Blunt Trauma cont.

AVPU Scale

Category	Stimulus	Appropriate	Inappropriate
A lert	Normal environment	Normal interactiveness for age	
V erbal	Simple command or sound stimulus	Responds to name	Nonspecific or confused
P ainful	Pain	Withdraws from pain	Sound or motion without purpose or localization of pain; Posturing (pathological)
U nresponsive	Any		No perceptible response to any stimulus

Glasgow Coma Scale[‡]

Activity	Score	Pre-Verbal Response	Verbal Response
E ye O pening	4	Spontaneous	Spontaneous
	3	To speech or sound	To speech
	2	To painful stimuli	To pain
	1	No Response	No response
V erbal	5	Coos, babbles, social smile	Oriented
	4	Irritable cry	Disoriented/Confused
	3	Cries only to pain	Inappropriate words
	2	Moans to pain	Incomprehensible sounds
	1	No response	No response
M otor	6	Spontaneous movement	Obeys commands
	5	Withdraws from touch	Localizes pain
	4	Withdraws from pain	Withdraws to pain
	3	Abnormal flexion (decorticate)	Abnormal flexion (decorticate)
	2	Abnormal extension (decerebrate)	Abnormal extension (decerebrate)
	1	No response	No response

Abnormal Vital Signs

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

References

[‡]Mosby's Comprehensive Pediatric Emergency Care, Revised Edition, Elsevier, 2007.

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
 - d. Refer to **Eye Irrigation** guideline as indicated
2. Refer to **Pediatric General Assessment** guideline
3. Maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
 - c. Indicators of potential airway compromise, rapid airway decompensation or swelling:

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

4. If trauma suspected, refer to **Spinal Immobilization** guideline
5. Remove clothing and jewelry from any affected area
6. Place clean, dry dressings or sheets on burn area
7. 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
8. Calculate body surface area involved using attached chart or may be estimated using the patient's palm size as approximately 1% of their body surface area (see chart below)
9. Rapid transport or consider air medical transport for early airway intervention



Trauma

Advanced Life Support

1. Follow BLS procedures
1. Place patient on cardiorespiratory monitor and continuous pulse oximeter
2. **AIRWAY SWELLING**
 - a. If unconscious, intubate (may require smaller ETT size related to swelling of airway)
 - b. If patient conscious, nebulized epinephrine 2mL of 1:1,000 epinephrine in 3mL of saline



BLS

ALS

Burn cont.

ALS

3. Establish IV/IO access (preferably through non-burned tissue, if no choice may use burned area), infuse 20mL/kg NS or LR bolus
 - a. Repeat bolus(es) if needed for shock
 - b. Carefully monitor total fluid administered
4. Place NG/OG for intubated patients
5. Assess for pain, refer to **Pain** guideline as indicated
6. Rapid transport or consider air medical transport



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 potential 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.
3. 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.
4. 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.
5. Superficial burns may be very painful. Consider treatment for pain.

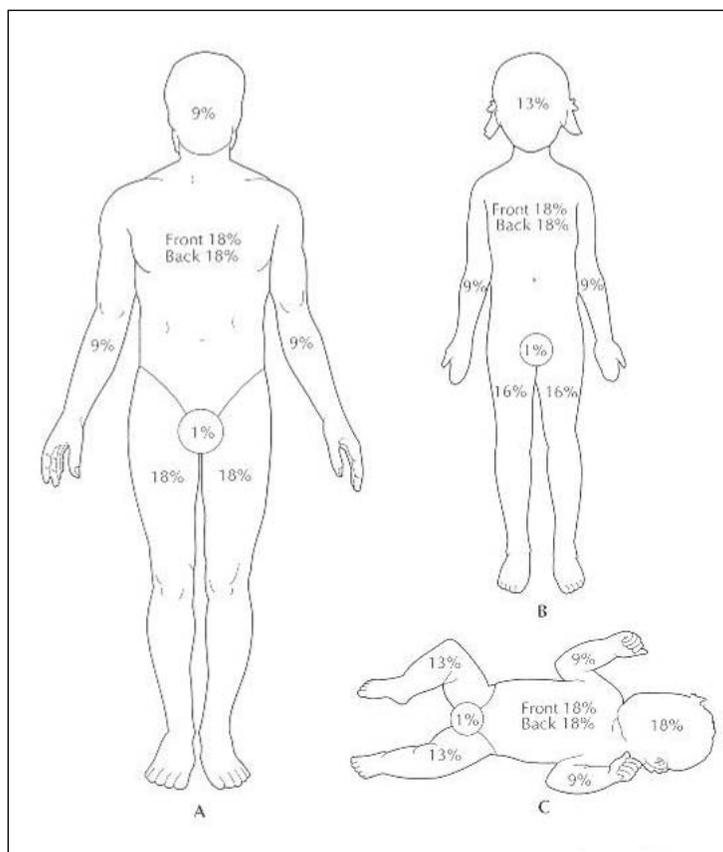
Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorization Method
Morphine Sulfate	0.1 mg/kg	IV/IO/IM	4mg; Call for additional doses prn	
Epinephrine 1:1000 (1 mg/mL)	2mL in 3mL of saline	Neb	Call for additional doses	
Fentanyl	1mcg/kg	IV/IO	75 mcg	
	2 mcg/kg	IM	100mcg	

Burn cont.

Characteristics of Burns	
First Degree – Superficial	<ul style="list-style-type: none"> ✓ Dry, red, slight swelling ✓ Very painful, involves only the epidermis or most superficial layer
Second Degree – Partial Thickness	<ul style="list-style-type: none"> ✓ Blistered mottled pink or red; may be deep red/tan, moist ✓ Very painful; sensitive to air; involves the epidermis and the dermis
Third Degree – Full Thickness	<ul style="list-style-type: none"> ✓ May still have blistered areas; leathery surface charred black, white or deep red ✓ Usually painless and involves the epidermis, dermis and the cells responsible for regeneration ✓ May involve both muscle and bone

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

Burn Estimate 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. “Moderate to severe closed head injury” applies to children with a GCS \leq 12.

Clinical Presentation: Children with a 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 **Pediatric General Assessment** guideline
2. Maintain c-spine precautions at all times
3. Use pulse oximeter**
 - a. Administer supplemental oxygen for any saturation $<90\%$, or if unable to obtain a reliable pulse oximeter reading
 - b. If respirations are ineffective, begin BVM ventilation with 100% O₂
 - Target a normal respiratory rate for age (see chart below)
4. Monitor patient for hypotension
 - a. If blood pressure unattainable, document mental status, quality of peripheral pulses, and capillary refill
5. Check blood pressure and pupils every 5 minutes
 - a. If patient has posturing, elevated blood pressure with bradycardia, or new pupil asymmetry, consider hyperventilation (see chart below)
6. Assess for other traumatic injuries, apply pressure to stop any obvious bleeding
7. Assess level of consciousness
 - a. For patients with GCS >12 and concern for other trauma, refer to **Blunt Trauma** guideline
8. Check blood glucose**, follow **Hypoglycemia** guideline as indicated
9. If the child exhibits seizure activity, assure sufficient space to prevent contact injury, support the airway with jaw thrust, avoiding any neck extension
 - a. Follow **Seizure** guideline as indicated
10. Transport for medical evaluation



BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
 - a. Treat any arrhythmias per appropriate guideline
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
 - b. 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 5mmHg
 - For ‘blown’ pupils, increase respiratory rate in order to obtain a target reading that is 5-10mmHg lower than the baseline reading

ALS

Trauma

Closed Head Injury cont.

ALS

4. Establish IV/IO access if GCS ≤ 12 or concern for poor perfusion or hypotension
 - a. Infuse 20 mL/kg NS for hypotension (see chart below) or if unable to obtain blood pressure
 - b. If a hypotensive patient shows no improvement with initial treatment, may repeat 20mL/kg up to a total of 60mL/kg (improvement may be assessed by a more appropriate blood pressure or palpation of strong distal pulses)
5. 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.
 - a. Follow **Seizure** guideline as indicated
6. Transport for medical evaluation



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.
5. Consider the possibility of child abuse in all pediatric trauma victims, follow **Non Accidental Trauma** guideline as indicated

Hyperventilation Rates by Age

Age	Breaths/min
<1 yr	30
≥ 1 yr - <13 yrs	25
≥ 13 yrs	20

Lowest Acceptable Systolic BP for Age

Age of Patient	Systolic BP
0 days - <1 mo	<60 or strong central pulse
≥ 1 mo - <3 mos	<70 or strong central pulse
≥ 3 mos - <1 yr	<70 or strong central pulse
≥ 1 yr - <2 yrs	<70 + (age x 2)
≥ 2 yrs - <10 yrs	<70 + (age x 2)
≥ 10 yrs	<90

Closed Head Injury cont.

Glasgow Coma Scale

Activity	Score	Pre-Verbal Response	Verbal Response
Eye Opening	4	Spontaneous	Spontaneous
	3	To speech or sound	To speech
	2	To painful stimuli	To pain
	1	No Response	No response
Verbal	5	Coos, babbles, social smile	Oriented
	4	Irritable cry	Disoriented/Confused
	3	Cries only to pain	Inappropriate words
	2	Moans to pain	Incomprehensible sounds
	1	No response	No response
Motor	6	Spontaneous movement	Obeys commands
	5	Withdraws from touch	Localizes pain
	4	Withdraws from pain	Withdraws to pain
	3	Abnormal flexion (decorticate)	Abnormal flexion (decorticate)
	2	Abnormal extension (decerebrate)	Abnormal extension (decerebrate)
	1	No response	No response

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorization Method
Midazolam	0.1 mg/kg	IV/IO	5 mg	
	0.2 mg/kg	IN/IM	10 mg	
Lorazepam	0.1 mg/kg	IV/IO	4 mg	
Diazepam	0.05 mg/kg	IV/IO	5 mg	
	0.3 mg/kg	PR	10 mg	

Teaching Points

- Discuss anoxic brain injury; abnormal neurological exam

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 **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
3. Refer to **Spinal Immobilization** guideline 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 transport and every 15 minutes during transport (GCS/AVPU scales, see below)
 - a. Refer to **Closed Head Injury** guideline as indicated
7. Continue to reassess vital signs
8. Transport for medical evaluation



BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access and infuse 20mL/kg NS bolus
 - a. Repeat bolus if needed for shock (see table below)
5. Assess pain, refer to **Pain** guideline as indicated
6. Continue to reassess mental status, vital signs, and pain score
7. Transport for medical evaluation



ALS

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 it's 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.
4. Spinal shock occurs with catastrophic spinal cord injuries. This involves a loss of sympathetic tone to the blood vessels resulting in hypotension without tachycardia. Epinephrine may be indicated.



Trauma

Penetrating Trauma cont.

AVPU Scale

Category	Stimulus	Appropriate	Inappropriate
Alert	Normal environment	Normal interactiveness for age	
Verbal	Simple command or sound stimulus	Responds to name	Nonspecific or confused
Painful	Pain	Withdraws from pain	Sound or motion without purpose or localization of pain; Posturing (pathological)
Unresponsive	Any		No perceptible response to any stimulus

Glasgow Coma Scale

Activity	Score	Pre-Verbal Response	Verbal Response
Eye Opening	4	Spontaneous	Spontaneous
	3	To speech or sound	To speech
	2	To painful stimuli	To pain
	1	No Response	No response
Verbal	5	Coos, babbles, social smile	Oriented
	4	Irritable cry	Disoriented/Confused
	3	Cries only to pain	Inappropriate words
	2	Moans to pain	Incomprehensible sounds
	1	No response	No response
Motor	6	Spontaneous movement	Obeys commands
	5	Withdraws from touch	Localizes pain
	4	Withdraws from pain	Withdraws to pain
	3	Abnormal flexion (decorticate)	Abnormal flexion (decorticate)
	2	Abnormal extension (decerebrate)	Abnormal extension (decerebrate)
	1	No response	No response

Abnormal Vital Signs

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

Penetrating Trauma cont.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorization Method
Epinephrine 1:10,000 (0.1 mg/mL)	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	N/A	
Epinephrine 1:1,000 (1 mg/mL)	0.1 mg/kg dilute in NS to 3-5mL Repeat q 3-5 minutes prn	ETT	N/A	

Teaching Point:

- Epinephrine solution for nebulization is made by mixing 2mL 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 not limited to the following:

- Neck muscle spasm
- Numbness/tingling
- Bowel/bladder incontinence
- Altered gait
- Hypotension with bradycardia (spinal shock)
- Pain on neck palpation
- Limitation of motion
- Muscle weakness/flaccidity
- Priapism

Mechanisms of injury indicating need for spinal immobilization are:

- Head trauma
- Fall
- Axial loading injury
- Motorized sports vehicle event
- Facial trauma
- Auto-pedestrian event
- MVC

Symptoms of neurogenic shock:

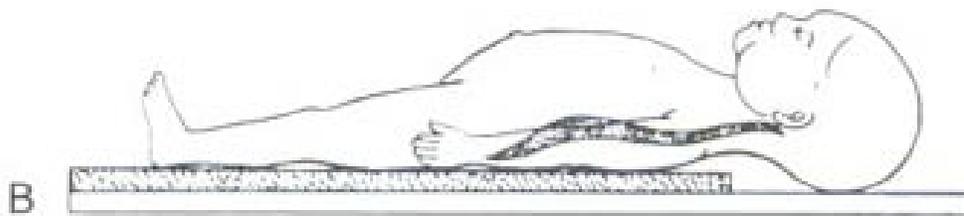
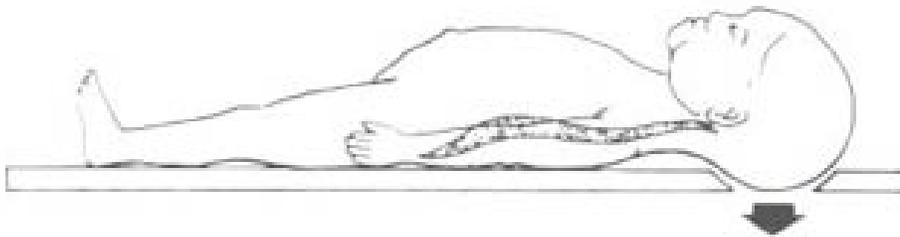
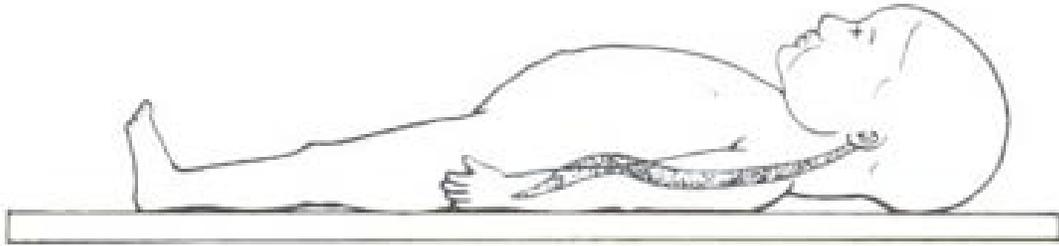
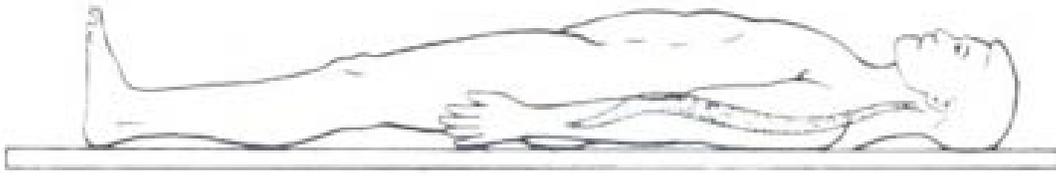
- Bounding pulses
- Warm extremities
- Hypotension despite adequate fluid resuscitation
- Bradycardia
- Flaccid paralysis

Key Points/Considerations

1. The head is larger in proportion to the rest of the body in children thus making the cervical spine vulnerable to injury.
2. 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).
3. 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.
4. Children with suspected spinal cord injuries at any level are maintained in spinal immobilization until definitive neurologic care occurs.
5. Remember to assess the child's motor and sensory function after application of spinal precautions.
6. Do not force if there is resistance to movement or indication of increased pain, stabilize in position found
7. Explain procedure to the child and, if present, parent/caregiver



Spinal Immobilization cont.



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 **Pediatric General Assessment** guideline
2. Assess and maintain airway patency
 - a. If breathing spontaneously: administer 10-15 L/min of O₂ via nonrebreather
 - b. Place on pulse oximeter** and maintain oxygen saturations >95%
 - c. If patient is apnea or agonally breathing, begin BVM ventilations with 100% O₂
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** guideline
5. Obtain core body temperature (if appropriate thermometer available)
 - a. Protect patient from hypothermia and initiate warming measures
 - b. Refer to **Hypothermia** guideline as indicated
6. Transport for medical evaluation



BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access
 - a. If patient is hypotensive for age, infuse 20mL/kg of NS
 - b. May repeat once if signs of shock persist after initial bolus
5. Transport for medical evaluation

ALS

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.
3. 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.

Trauma

Children with Special Health Care Needs Guidelines

Assessment of a Child With Special Health Care Needs

CSHCN

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), uncommon or complex medical conditions, chronically ill, and technology dependent children.

Basic Life Support

BLS

1. Refer to **Pediatric General Assessment** guideline
2. Ask if child has special health care needs
3. Ask if the family has a Emergency Health Information Sheet (and, if appropriate, Physician Orders for Scope of Practice (POST) or Do Not Resuscitate (DNR) Order)
4. Assess ABCs, know that interventions may vary according to age but also to patients size and medical condition
5. Refer to specific guideline for **Tracheostomy, Ventilator, Feeding Tube, Internal Pacemaker, Seizures, Behavioral Issues, POST/DNR** as indicated
6. Explain interventions to children and family members, when appropriate
7. Transport in position of comfort for medical evaluation

Advanced Life Support

ALS

1. Follow BLS procedures
2. Place cardiorespiratory monitor and continuous pulse oximetry
3. Transport in position of comfort for medical evaluation

Key Points/Considerations

1. 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. Family members are many times the best resource for patient care.
2. Do not become overwhelmed by equipment.
3. Staying focused on ABCs will help you succeed with care of the special needs patient.



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.

BLS

Basic Life Support

1. Refer to **Pediatric General Assessment/Assessment of a CSHSN** guidelines
2. Obtain accurate history
 - a. 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 (refer to **Non-Traumatic Shock** guideline as indicated)
5. If stoma is bleeding, apply sterile dressing and use pressure to stop bleeding
6. Withhold food/fluids, both orally and through feeding tube
7. Transport in position of comfort for medical evaluation



ALS

Advanced Life Support

1. Follow BLS procedures
2. If feeding tube is percutaneous and has come out, place an 8F suction catheter in the stoma 2-3 inches to prevent it closing
3. If patient has a 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
 - a. Wrap end with diaper (a G-tube button needs access adapter to do this)
 - b. 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: tube has come out, is falling apart, is leaking, blocked or the stoma site has unusual drainage or bleeding.

Internal Pacemaker and Defibrillator

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

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

Basic Life Support

BLS

2. Refer to **General Pediatric Assessment / Assessment of a CSHSN** guidelines
3. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
4. Initiate CPR for **Pulseless Arrest** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmia guideline)
5. Attach AED if patient is 12 months or older and follow **AED** guideline
6. Treat shock as indicated
7. Transport for medical evaluation



Advanced Life Support

ALS

1. Follow BLS procedures
2. Place on cardiorespiratory monitor and continuous pulse oximeter
 - a. Treat any arrhythmias per appropriate guideline
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. Establish IV/IO access, infuse 20mL/kg NS bolus, if indicated
5. 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.
4. Obtain history: Heart problems? Underlying rhythm? Has the child felt shocks? Symptoms?
5. 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.
6. Defibrillation or cardioversion, when indicated, is appropriate in a patient with an internal pacemaker or defibrillator.

Teaching Points:

- Discuss reasons for pacemaker/defibrillator placement.

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.

CSHCN

BLS

Basic Life Support

1. Refer to **Pediatric General Assessment/Assessment of a CSHSN** guidelines
2. Position child to open and assess airway (placing a towel roll under the shoulders)
3. If patient is apneic, unresponsive, or if the patient has severe respiratory distress or depression, begin BVM ventilations with 100% O₂
4. If unable to ventilate, suction tracheostomy, then reattempt ventilatory efforts
5. If still unable to ventilate, may need to place gloved finger over tracheostomy
6. Initiate CPR for **Pulseless Arrest** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmia guideline)
7. Perform tracheal, oral and nasal suctioning for secretions
 - a. Oxygenate between passes with the suction catheter
8. Continue to reassess airway with suctioning, positioning and ventilation
9. Transport for medical evaluation

ALS

Advanced Life Support

1. Follow BLS procedures
2. Place on cardiorespiratory 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
 - a. 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. For abdominal distension, place NG tube or open gastric tube to decompress stomach
8. Transport for medical evaluation



Key Points/Considerations

1. Withhold foods/liquids, both orally and through 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.



Tracheostomy cont.

Medications/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
Epinephrine 1:1000 (1mg/mL)	2mL in 3mL saline	Neb	Call for additional doses	

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 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.

BLS

Basic Life Support

1. Refer to **Pediatric General Assessment/Assessment of a CSHSN** guidelines
2. For patients with tracheostomy, refer to **Tracheostomy** guideline as indicated
3. For patients without tracheostomy, assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
4. Assess ventilator
 - 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, begin BVM ventilations with 100% O₂ as needed
 - c. Suction airway as needed
5. Initiate CPR for **Pulseless Arrest** or symptomatic **Bradycardia** (refer to specific pediatric dysrhythmia guideline)
6. If patient is being transported for other medical condition, refer to appropriate guideline as indicated
7. Transport for medical evaluation

ALS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue BVM ventilations with 100% O₂
 - a. Intubate if unable to adequately ventilate or oxygenate child by BVM
4. 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. Ask them for assistance; most are adept at suctioning, bagging, changing tracheostomy tubes, and troubleshooting medical devices.
2. Local EMS agencies may 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.
3. 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.



Special Care Guidelines

Behavioral Emergencies

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

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

Basic Life Support

1. Determine if patient is a threat to self or others at present – ask patient if they are thinking of hurting themselves or others
 - a. Law enforcement should be contacted if patient is deemed a threat to self or others present
2. 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
3. Assess and maintain airway patency, administer 10-15 L/min of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilation with 100% O₂
 - b. Suction airway as needed
4. Examine patient and treat any injuries with appropriate dressings or splints
5. If there is a history of ingestion or signs and symptoms of a toxidromal state, refer to **Toxic Exposure** guideline
 - a. Contact medical control if necessary
6. Transport for medical and/or psychological evaluation



BLS

Special Care

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
4. Transport for medical or psychological evaluation

ALS

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.
3. Vital signs and monitoring.
4. Behaviors you expect (no injuring self/others).
5. Do not make promises or bargains that you will not be able to fulfill.



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 and 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 people's names. 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 (e.g., 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 (e.g., 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.

Family-Centered Care cont.

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 a translator that is able to understand some of the emotional issues as well as medical terminology associated the event.

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

Developmental Competency: Use appropriate language for the developmental age of the child.

When in pain or hurting, 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 infant and help them to anticipate the situation if possible.

Toddlers: Favorite toy, teddy bear, blanket, etc.

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: 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 crucial; adolescents 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.

Special Considerations

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** guideline), 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.

Special Care

BLS

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Assess and maintain airway patency, administer 10-15 lpm of O₂ via nonrebreather
 - a. If respirations are ineffective, begin BVM ventilation with 100% O₂
 - b. Suction airway as needed
3. Obtain vital signs **including blood pressure**
4. For febrile patients, assess for shock (see table below), refer to **Non-Traumatic Shock** guideline if indicated
5. Assess patient perfusion status including vital signs every five minutes
6. Apply protective face mask to patient if not receiving O₂ by face mask
7. Transport for medical evaluation



ALS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
4. If febrile (temperature >100.4°F or 38.0°C) and has no signs of altered mental status give acetaminophen *orally*
5. 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.



Immunocompromised Children cont.

Vital signs that would be abnormal according to the age of the 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

Medication/Treatments Table

Medication	Route	Dose	Max Dose	Authorizing Method
Acetaminophen	PO	15mg/kg	15 mg/kg q 4 hours	

Assessment & 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 **Pediatric General Assessment** guideline
2. Provide warmth, bulb suction nose and mouth, and dry the newborn infant
3. Stimulate by gently rubbing the back
4. 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 ventilations at a rate of 30-40 breaths/minute with 100% O₂
 - c. If after 30 seconds of BVM ventilations, the HR is <60, begin chest compressions (3:1 ratio of chest compressions to ventilations)
5. Continue warming measures and protect from hypothermia
6. Transport for medical evaluation



Advanced Life Support

ALS

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
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% O₂
 - c. Establish IV/IO access and infuse
 - d. For persistent HR <60, administer epinephrine IV or via ETT every 3-5 minutes as needed
5. Obtain blood glucose level and if <60 then administer D10W at a dose of 2mL/kg (*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. Focus should be on newborn appearance, not the presence of meconium; however, document if present.

Assessment & Transport of the Neonate cont.

3. 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.
4. Frequent reassessment of the effectiveness and quality of assisted ventilation is paramount in the newborn not responding well.
5. Acrocyanosis (cyanosis of only the hands and feet) is normal in newborns and does not require intervention.
6. Consider APGAR at 1 minute, repeat every 5 minutes. Do not interrupt resuscitation efforts to obtain APGAR.
7. If child is vigorous and not requiring intervention, allow mom to hold the baby and breastfeed if desired.
8. Obtain pregnancy history, if possible, noting the gestational age of the infant, any complications to the pregnancy, illicit drug use during pregnancy, etc.
 - a. Children born to mothers who abused narcotic medications will exhibit poor tone, poor respirations, and possible seizure activity.

APGAR Scoring

Sign	0 Points	1 Point	2 Points
A ctivity (Muscle Tone)	Absent	Arms and Legs Flexed	Active Movement
P ulse	Absent	<100	>100
G rimace (Reflex Irritability)	No Response	Grimace	Sneeze, cough, pulls away
A ppearance (Skin Color)	Blue-gray, pale all over	Normal, except for extremities	Normal over entire body
R espiration	Absent	Slow, irregular	Good, crying

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
D10W (dilute 10mL D50 and 40mL NS)	2mL/kg	IV	Repeat prn to keep glucose >60	
Epinephrine 1:10,000	0.01mg/kg Repeat q 3-5 minutes prn	IV/IO	1 mg	
Epinephrine 1:1,000 (1 mg/mL)	0.1 mg/kg dilute in NS to 3-5mL	ETT	Repeat q 3-5 minutes as needed	

Non-Accidental Trauma

Definition: Non-accidental trauma is an act of commission or failure to protect by a caregiver which 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. Document findings objectively. 
 - a. Body location of the injury
 - b. Severity of the injury
 - c. Patterns of similar injury over time
 - d. Include verbatim statements offered by the child
 - e. Note verbatim statements from the parent/caregiver
5. **Report:** You are required by law (Idaho Code §16.1605) to report suspected child abuse and neglect to the proper law enforcement agency or the Department of Health and Welfare (DHW).
 - a. *Nontransport Agency:* Law enforcement or DHW
 - b. *Transport Agency:* Law enforcement and/or DHW AND to the hospital staff (nurse or physician taking over care)

Special Care

Continued on next page

Non-Accidental Trauma cont.

Key Points/Considerations

1. All health care providers are obligated by law (Idaho Code §16.1605) to report cases of suspected child abuse or neglect to either the local law enforcement agency or the DHW within 24 hours of discovery. The report to law enforcement or DHW should be made in a manner that does not aggravate the situation or compromise the safety of the patient or the responders on scene.
2. Don't rely on others to report the suspected abuse. It is acceptable for there to be more than one report; it is unacceptable for the suspected abuse to not be reported by anyone.
3. Each agency should have a policy for how to report the suspected abuse.
4. Child maltreatment occurs in all ethnic and socio-economic groups.
5. Risk Factors: Children under age of 5, drug or alcohol abuse, domestic violence.
6. There are four types of abuse: Physical, Emotional, Sexual, and Neglect.
7. In children under the age of 2, a 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.
8. Of all abused kids, 50% will be abused again. Of those with recurrent abuse, mortality is 5%.
9. Suspect battered or abused child if any of the following is found:
 - a. A discrepancy exists between history of injury and physical exam
 - b. Caregiver provides a changing or inconsistent history
 - c. There is a prolonged interval between injury and the seeking of medical help
 - d. Child has a history of repeated trauma
 - e. Caregiver responds inappropriately or does not comply with medical advice
 - f. Suspicious injuries are present, such as:
 - injuries of soft tissue areas, including the face, neck and abdomen
 - injuries of body areas that are normally shielded, including the back and chest
 - fractures of long bones in children under three (3) years of age
 - old scars, or injuries in different stages of healing
 - bizarre injuries, such as bites, cigarette burns, rope marks, imprint of belt or other object
 - trauma of genital or perianal areas
 - sharply demarcated burns in unusual areas, and/or
 - scalds that suggest child was dipped into hot water
10. COMMON FORMS OF NEGLECT:
 - a. Environment is dangerous to the child (e.g., weapons within reach, playing near open windows without screen/guards, perilously unsanitary conditions, etc.).
 - b. Caretaker has not provided, or refuses to permit medical treatment of child's acute or chronic life-threatening illness, or of chronic illness, or fails to seek necessary and timely medical care.
 - c. Abandonment.
 - d. Caretaker appears to be incapacitated (e.g., extreme drug/alcohol intoxication, disabling psychiatric symptoms, severe illness) and cannot meet child's care requirements.
 - e. Child appears inadequately fed (e.g., seriously underweight, emaciated, or dehydrated) inadequately clothed, or inadequately sheltered.
 - Child is found to be intoxicated or under the influence of an illicit substance(s).

Idaho Physician Orders for Scope of Treatment/ Do Not Resuscitate

Definition: Some children may have advance directives such as Do Not Resuscitate (DNR) orders expressing preferences for emergency medical care. In 2007, the Idaho legislature passed the “Physician Orders for Scope of Treatment (POST)” law (Idaho Code §39.4512A-39-4514), which allows parents or guardians to express their wishes regarding resuscitation of their child in the event of a cardiac or respiratory arrest.

The law allows EMS personnel to withhold resuscitative efforts under the following conditions:

1. The child has:
 - a. An Idaho POST, Comfort ONE/DNR order (Comfort ONE form must be dated prior to July 1, 2007), or valid DNR form from another state. The form must be signed by the patient’s legal guardian, parent or surrogate and the attending physician; or
 - b. A valid POST/DNR or Comfort ONE/DNR bracelet, anklet, or necklace (see below for pictures)

Special Care

All Providers

1. You should presume that all critically ill children are to be resuscitated; you should therefore perform a routine assessment, resuscitation and/or other medical interventions as appropriate
2. If valid DNR order or DNR identification jewelry is found, obtain reasonable assurance that the patient is the person for whom the order was written
3. If the child is in respiratory or cardiac arrest and DNR status is confirmed,
 - a. DO NOT:
 - Initiate CPR
 - Provide ventilator assistance
 - Initiate cardiac monitoring (unless to confirm death)
 - Defibrillate
 - Administer resuscitative medications
 - b. DO:
 - Provide comfort care
 - Provide emotional support (to the patient and family)
4. If the child is not in respiratory or cardiac arrest, DO:
 - Attempt to determine if the patient has a POST form
 - Follow the patient’s treatment choices listed in sections B and C of the child’s POST form
5. If resuscitative efforts have been started before learning of a **valid DNR order**, stop those resuscitative efforts
6. Contact medical control if questions exist
7. If it is determined the patient does not have a **valid DNR order**, proceed with all resuscitative efforts within scope of practice, unless directed otherwise by a parent, guardian, relative, or medical control
8. A POST/DNR form may be revoked by the person who signed the form (Section E of the POST form) or attending physician[¶]
 - a. Revoking the form can occur verbally, by removing the identification jewelry, or by destroying the form
 - b. You should perform full resuscitation if the POST is revoked



Idaho Physician Orders for Scope of Treatment/ Do Not Resuscitate cont.

9. If the patient has severe trauma, is involved in a mass casualty incident, or there is evidence of homicide or suicide, you are not required to attempt to locate a POST form or jewelry
10. You may disregard a POST/DNR order only if you have a good faith belief that:
 - a. The order has been revoked, or
 - b. To avoid confrontation, or
 - c. If ordered to do so by the attending physician
11. Complete the Idaho EMS Patient Care Report; state in the narrative how the patient was identified, events occurring during the EMS run, any verbal attending physician orders and patient outcome

[¶]*An attending physician is a physician licensed in Idaho who is selected by, or assigned to, the patient and who has primary responsibility for the treatment and care of the patient; the attending physician can be an EMS on-line medical control physician*

Examples of POST/DNR Identification Jewelry



Example of Comfort One/DNR Identification Jewelry



Refusal of Care/Consent to Treat

Definition: A minor is a person under the age of 18 who has never been married or otherwise emancipated, and is currently under the care of a parent or guardian.

Emancipated minor means any minor who has been married (if divorced the child is still emancipated) or is in active military service.

All Providers

1. Except in an emergency, a parent or guardian must give consent for treatment/transport of minors
 - a. If a parent/guardian is unavailable, a competent adult relative may provide consent for the minor
 - b. In the absence of a parent/guardian, transport non-emancipated minors
2. In the case of a self reported infectious, contagious or communicable disease, a person over the age of 14 may seek treatment without parent/guardian consent (*IDAPA 16.02.10.015.11*)
3. Refusal of care is valid if the parent/guardian refusing for the minor is sufficiently aware of:
 - a. pertinent facts regarding the need for treatment and/or transport
 - b. the nature of the treatment and transport
 - c. the significant risks of refusing the treatment and/or transport
4. Patient care reports/run reports:
 - a. Consent to treat and release does not have to be in writing
 - b. Refusal of treatment/transport should be documented
 - If possible, obtain the name of the person refusing care



Special Care

Key Points/Considerations

8. In the event of an emergency, when life and/or health of the patient are endangered, treat and transport.
9. Refer to **Non-Accidental Trauma** guideline as indicated.

Safe Haven Act

Definition: Under Idaho law, a mother or her designee may safely relinquish care and custody of a newborn child under the age of 30 days to medical personnel, including EMS providers. The mother may retain anonymity, but may volunteer medical or other information. Mothers using Safe Haven will not be prosecuted for child abandonment. This protocol refers to any abandoned infant.

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

Basic Life Support

BLS

1. Refer to **Pediatric General Assessment** guideline
2. Obtain vital signs
3. Assure newborn is warm and dry
4. Assess and maintain airway patency, administer 10-15 lpm of O₂ via NRB
 - a. If respirations are ineffective, begin BVM ventilations with 100% O₂
 - b. Suction airway as needed
5. Check glucose (refer to **Blood Glucometry** protocol**)
 - a. Refer to **Hypoglycemia** guideline as indicated
6. Refer to **Assessment of the Neonate** protocol as needed
7. Transport for medical evaluation

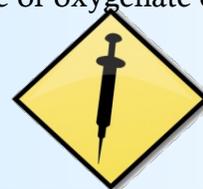


Special Care

Advanced Life Support

ALS

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. Consider intubation if unable to adequately ventilate or oxygenate child
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. Transport for medical evaluation.



Key Points/Considerations

1. Offer mother medical care and treatment.
2. Acrocyanosis may be normal in the infant.
3. Determine if parent is requesting *Safe Haven* and expresses intent not to reclaim the child.
4. If law enforcement is not en route or present at scene, notify dispatch to send law enforcement to place child in protective custody.
5. Per Idaho Statute (Title 39, Chapter 82), do not ask for identity of the parent and, if known, keep confidential.
 - a. You may ask if they wish to provide medical or other information about the baby.
 - b. If transporting the child to a hospital, report any voluntary information to the hospital personnel
6. For additional information:
 - a. Call the **Idaho CareLine** at 211 or 1-800-926-2588, or
 - b. Log onto www.idahoems.org, click the 'Safe Haven' link on the left-hand side

Safe Haven Act cont.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorizing Method
D10W	2ml/kg	IV/IO	Call for repeated doses	
Oral Glucose D5W	30 mL	PO	Call for repeated doses	

Sudden Infant Death Syndrome (SIDS)

Definition: SIDS 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.

Basic Life Support

1. Refer to **Pediatric General Assessment** guideline
2. Assess airway and breathing, confirm apnea
3. Assess circulation and perfusion, confirm absent pulse
4. Determine whether to perform further resuscitation measures
 - a. If infant does not exhibit lividity or rigor, proceed with CPR, refer to **Asystole/PEA** guideline 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.

BLS



Special Care

Advanced Life Support

1. Follow BLS procedures
2. Place on cardiac monitor and confirm absence of cardiac electrical activity.

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. Note the position and condition of the patient and surroundings and preserve the scene.
5. Do not restrain parents or request that they be restrained unless scene safety and integrity is **clearly** threatened.
6. Contact medical control for consultation on initiation of resuscitation measures as needed.

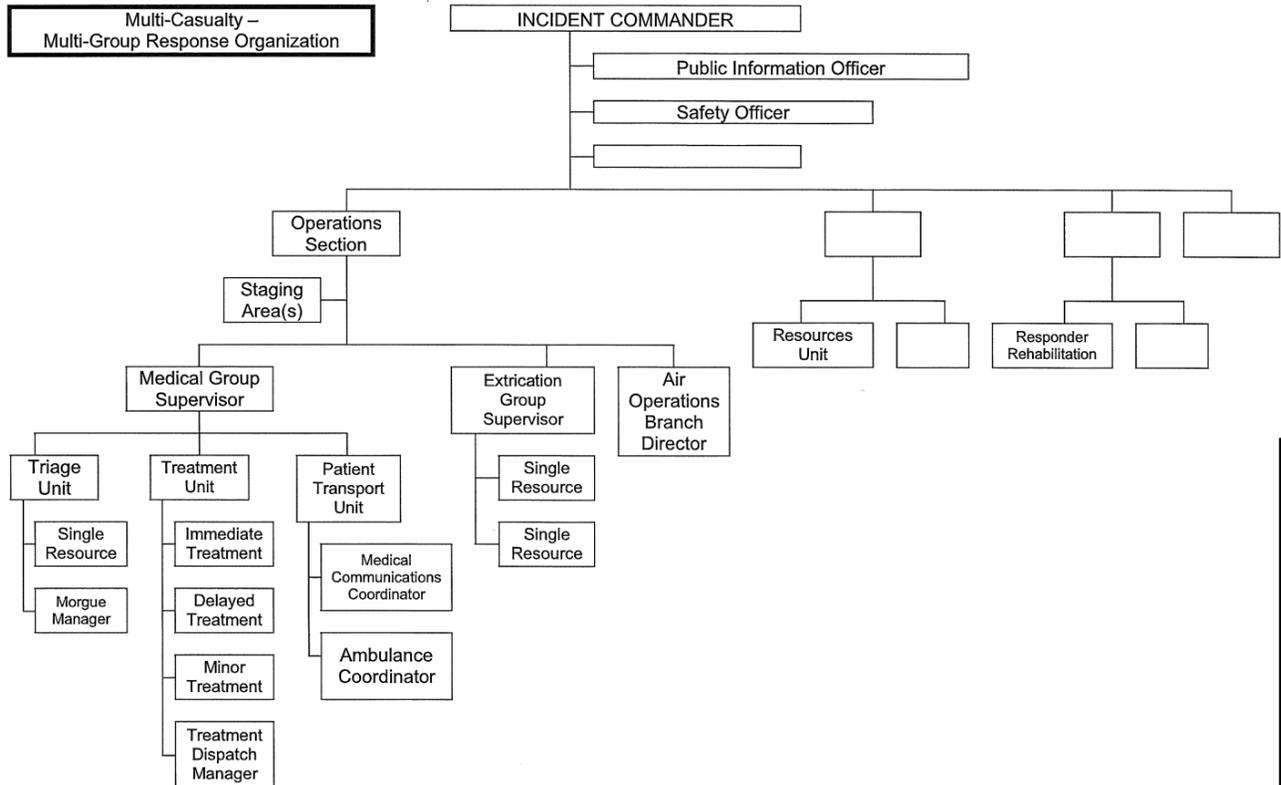


Preparedness Guidelines

Disaster/Mass Casualty Incident

Definition: Mass Casualty Incidents (MCIs) 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 a treatment area. An Air Operations Branch Director 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 selected elements of the Planning and Logistics Sections.

Preparedness

Continued on next page

Disaster/Mass Casualty Incident cont.

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
- 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 entering the “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

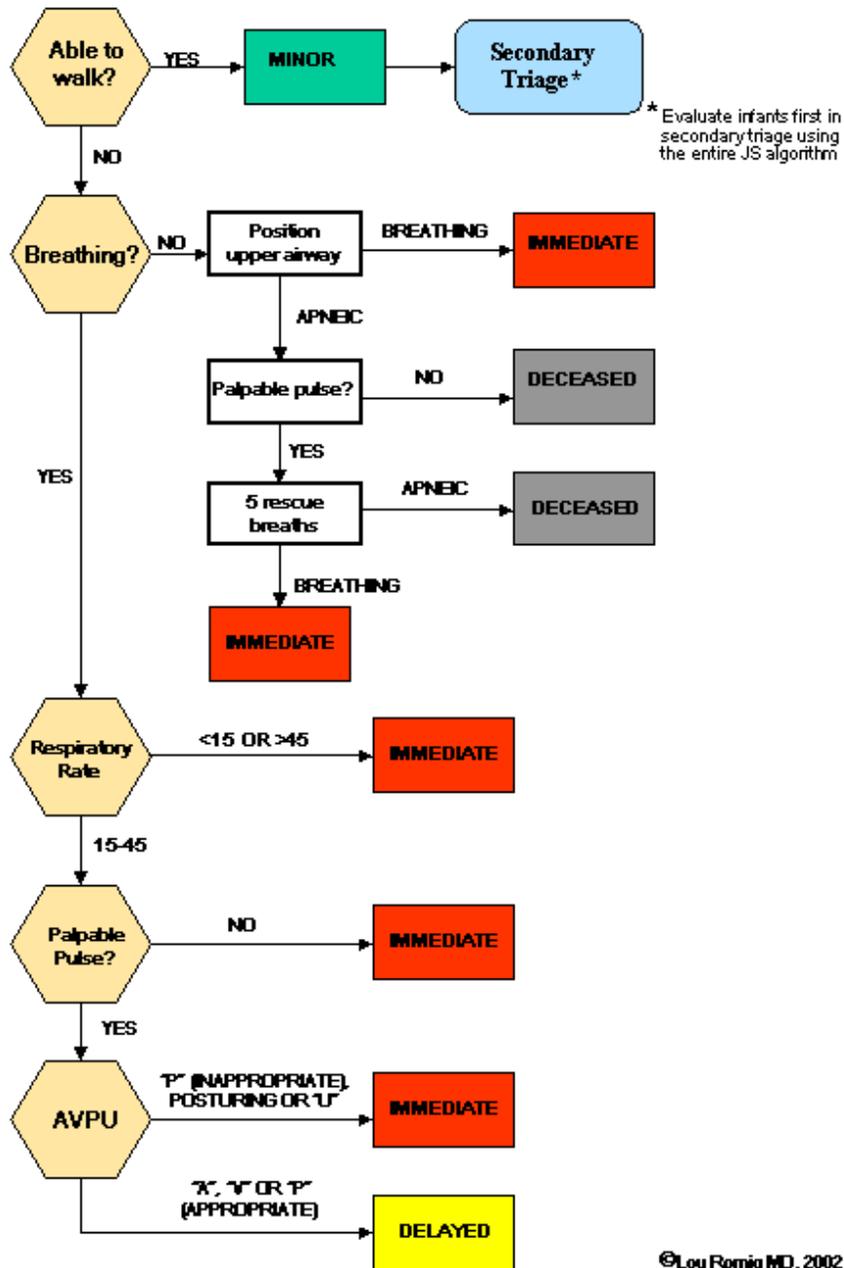
- Placed on a stretcher by “hot zone” personnel and disrobed.
- All clothing is removed.
- Special attention should be paid to child’s airway during decontamination process.
- Decontamination personnel to assist child’s caregiver with moving child to ensure all areas of child are decontaminated.
- Decontamination 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.

Disaster/Mass Casualty Incident cont.

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®



Additional information at www.jumpstarttriage.com.

Disaster/Mass Casualty Incident cont.

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 notify StateComm (1-800-632-8000) and request hospital bed status of surrounding hospitals (e.g. district/county).
- Transporting pediatric patients to pediatric facilities is preferred if those facilities are able to accept patients.

References/Resources

Multi-Casualty chart from: FIRESCOPE California, Field Operations Guide, Incident Command System Publication-ICS-420-1, July 2007, Page 15-5.

JumpSTART MCI Pediatric Triage. www.jumpstarttriage.com.

For more information/training, consult the ARHQ video “The Decontamination of Children.”

Radioactive Agent Exposure

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:**
 - Treat life threatening injuries before decontaminating patients.
 - Pediatric Advanced Life Support Protocols take precedence over radiation issues.
 - Normal body substance isolation-gloves, mask, gown; protect medical providers.
- Patients may also have traumatic injuries; consult **Blunt Trauma, Penetrating Trauma, Closed Head Injury, and Burn** guidelines 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[¶].

Basic Life Support

1. Secure scene; ensure safety of responders, appropriate protective BSI required
2. Initiate **Disaster/Mass Casualty Incident** guideline if a disaster situation
3. Remove patient(s) from area of exposure
4. Remove patient’s clothing, this removes 90% of the contamination[¶]
5. Wearing respirators, or N95 mask and goggles with Tyvek™ suit and gloves is sufficient for decontamination BSI
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. Assure that the patient is labeled
 - a. Idaho HazMat decon trailers are equipped with blue armbands labeled ‘decon
 - b. Attach blue armband after decontamination complete
11. Follow **Pediatric General Assessment** guideline
12. Treat patient’s injuries per pertinent guidelines
13. Reassess frequently and transport patient for medical evaluation



Preparedness

BLS

Radioactive Agent Exposure cont.

ALS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. 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
4. 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) or “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 to this 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[¥].
7. Patients who have been decontaminated need to be banded with a blue arm band.
8. Poison Control Center can also be used as a resource: **(800) 222-1222**.



References

[¥]Disaster Nursing and Emergency Preparedness for Chemical, Biological and Radiological Terrorism and Other Hazards. Page 531 & 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 or 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 BSI required
2. Refer to **Disaster/Mass Casualty Incident** guideline 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, refer to **Eye Irrigation** guideline
6. Follow **Pediatric General Assessment** guideline
7. Assess and maintain airway patency, administer 100% O₂ via nonrebreather
 - a. Begin BVM ventilation with 100% O₂ for ineffective respiratory effort
 - b. Suction for nasal and/or oral secretions as needed
8. Reassess frequently and transport patient for medical evaluation



BLS

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardiorespiratory monitor and continuous pulse oximeter
3. Continue airway maintenance
 - a. 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 infuse 20mL/kg NS if indicated
8. Reassess frequently and transport patient for medical evaluation



ALS

Preparedness

Key Points/Considerations

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



Vesicants Chemical Exposure cont.

Medication/Treatments Table

Medication	Dose	Route	Max Dose	Authorized Method
Epinephrine 1:1000 (1mg/mL)	2mL in 3mL saline	Neb	Call for additional doses	

Teaching Points:

- Epinephrine solution for nebulization is made by mixing 2 mL of epinephrine 1:1000 with 3mL NS.