

PEDIATRIC MEDICAL EMERGENCIES

Last Revised: October 2016

Reviewed 2023

INITIAL PEDIATRIC CARE

NOTE: The pediatric patient is determined by the weight as well as the age. On the average, patients under 14 years of age and less than 90 pounds may fit criteria for pediatric protocol. Consult with Medical Control to determine if a patient should be treated under pediatric or adult protocols.

FR/BLS TREATMENT:

1. Place the patient in a position of comfort; loosen any tight clothing, reassure and calm the patient. Sit the patient in an upright position if more comfortable and not hypotensive.
2. Administer OXYGEN by appropriate method when indicated and attempt to maintain oxygen saturation at 94-99%.
3. If patient has inadequate ventilation or respiratory effort refer to the UNIVERSAL AIRWAY ALGORITHM.
4. Perform patient assessment and obtain SAMPLE history and vital signs.
5. Repeat and record vital signs every 5 to 15 minutes and relay any significant changes to persons who continue patient care.
6. Consider blood glucose determination.
7. Initiate transport** and maintain warmth; **Consider intercept per INTERCEPT CRITERIA.**
8. Contact Medical Control.
9. If patient arrests, begin CPR. Manage the airway and go to the CARDIOPULMONARY ARREST protocol.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT.**
2. Consider the need for an advanced airway; refer to the UNIVERSAL AIRWAY ALGORITHM.
3. Apply cardiac monitor if needed.
4. Obtain vascular access if needed.
5. If patient becomes pulseless and apneic, apply quick look patches and begin CPR. Refer to appropriate protocol for presenting dysrhythmia.

**** Only if transporting agency.**

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PEDIATRIC COMA SCALE

Indicator	Child	Score	Infant	Score
Eye Opening	Spontaneous	4	Spontaneous	4
	To Verbal Stimuli	3	To Verbal Stimuli	3
	To Pain only	2	To Pain only	2
	No Response	1	No Response	1
Verbal Response	Oriented, appropriate	5	Coos and babbles	5
	Confused	4	Irritable cries	4
	Inappropriate	3	Cries to pain	3
	Incomprehensible	2	Moans to pain	2
	No Response	1	No Response	1
Motor Response	Obeys commands	6	Moves spontaneously	6
	Localizes pain	5	Withdraws to touch	5
	Withdraws from pain	4	Withdraws to pain	4
	Flexion to pain	3	Decorticate posturing	3
	Extension to pain	2	Decerebrate posturing	2
	No response	1	No response	1

Total PCS _____

***If the patient is intubated, unconscious or preverbal, the most important part of this score is motor response. This section should be carefully evaluated.**

AIRWAY OBSTRUCTION

TREATMENT: ALL LEVELS

Conscious patient – able to speak:

1. **INITIAL PEDIATRIC CARE.**
2. Leave patient alone; offer reassurance.
3. Encourage coughing.

Conscious patient – unable to speak:

1. Administer abdominal thrusts or chest compressions/back blows as appropriate to patient age until the foreign body is expelled or the patient becomes unconscious.
2. After the obstruction is relieved, reassess the airway, lung sounds, skin color and vital signs.
3. **INITIAL PEDIATRIC CARE.**

Unconscious patient:

1. Place patient in a supine position and begin chest compressions.
 2. Open the airway and check for FBAO. If object is visible, perform finger sweep to remove.
 3. If object is not visible, continue CPR until object dislodged.
 4. **ILS/ALS only:** Perform advanced airway control measures as available; utilize Magill forceps as necessary.
 5. **ALS only:** If unable to clear obstruction, consider surgical airway placement. Refer to the UNIVERSAL AIRWAY ALGORITHM.
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ALLERGIC REACTION / ANAPHYLAXIS

NOTE: For patients experiencing a possible allergic reaction without serious signs or symptoms, perform Initial Pediatric Care and contact Medical Control.

CRITERIA:

1. Possible exposure to allergen, including:
 - a. Hives (urticaria)
 - b. Itching
 - c. Swelling
 - d. Rash
2. Respiratory difficulty or stridor
3. Signs and symptoms of shock

FR TREATMENT:

1. INITIAL PEDIATRIC CARE.
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BLS TREATMENT:

1. Continue FR TREATMENT.
 2. EPINEPHRINE (1:1000) 0.15 mg IM lateral thigh; maximum 0.3 mg per dose.
 3. DuoNeb nebulizer for wheezing. May repeat x2 if needed for continued symptomatic relief.
 4. Call for intercept per INTERCEPT CRITERIA.
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ILS/ALS TREATMENT:

1. Continue **BLS TREATMENT**.
 2. BENADRYL 1 mg/kg slow IV/IO push. May administer IM if no vascular access. Maximum dose: 50 mg.
 3. METHYLPREDNISOLONE (Solu-Medrol) 2 mg/kg IV. Maximum dose: 125 mg.
 4. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
 5. Reassess need for intubation if respiratory symptoms worsen or do not improve with treatment.
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6. Medical Control may consider additional EPINEPHRINE (1:1,000) 0.3 mg IM.
7. If patient experiences respiratory arrest, or if respiratory arrest is imminent, consider EPINEPHRINE (1:10,000) 0.1-0.3 mg IV over 5 minutes.

ALTERED LOC UNCONSCIOUS/UNKNOWN ETIOLOGY

**NOTE: DEXTROSE 50% may be administered at 1 ml/kg for patients over 8 years of age.
DEXTROSE 12.5% should be administered at 4 ml/kg for infants < 1 year.**

NOTE: If narcotic overdose is suspected, administer NARCAN prior to DEXTROSE.

FR/BLS TREATMENT:

1. INITIAL PEDIATRIC CARE.
2. Immobilize cervical spine if suspected spinal injury.
3. If blood glucose < 60 mg/dl (or suspected) **and** patient is conscious with an intact gag reflex, administer one tube of ORAL GLUCOSE.
4. If **airway compromise** or **inadequate respiratory effort** present, administer intranasal NARCAN at 1 mg/ml per nostril via atomizer* (1 ml per nostril maximum; 2 mg total dose). May repeat in 2-3 minutes to a maximum dose of 4 mg if no response.
5. Relay information to incoming ambulance or call for an intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue FR/BLS TREATMENT
2. IV NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
3. If blood glucose < 60 mg/dl, administer DEXTROSE 25% at 2 ml/kg;
4. **Alternative medication:** 10% DEXTROSE in 250 ml of sterile water (D10W). Administer 0.1g/kg (1ml/kg) IV. Repeat blood glucose. Consider repeating the dose if blood glucose is less than 60 with symptoms of hypoglycemia.
5. May administer GLUCAGON 0.03 mg/kg IM up to a maximum dose of 1 mg if IV/IO access is not available.
6. If **airway compromise** or **inadequate respiratory effort** present, administer NARCAN: IV or IM – 0.1 mg/kg; may repeat every 2-3 minutes to a maximum dose of 2 mg, if no response.
IN – 1 mg/ml per nostril via atomizer* (1 ml per nostril maximum; 2 mg total dose). May repeat in 2-3 minutes to a maximum dose of 4 mg if no response.

***Intranasal medications must be administered through an atomizer**

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ASYSTOLE / PEA

ILS TREATMENT:

1. Initiate CPR.
2. Manage airway per UNIVERSAL AIRWAY ALGORITHM, establish vascular access and administer NS WO.
3. EPINEPHRINE (1:10,000) 0.01 mg/kg IV/IO* every 3-5 minutes as long as asystole or PEA persists.
4. Consider possible causes and treatments:
 - a. Hypovolemia (Volume infusion)
 - b. Hypoxia (Ventilation and oxygenation)
 - c. Tension Pneumothorax (Needle decompression)
 - d. Acidosis/Hyperkalemia (Hyperventilation)
 - e. Drug Overdose (Refer to appropriate protocol)
 - f. Hypothermia (Refer to appropriate protocol)
 - g. Pericardial Tamponade (Rapid transport)
6. Initiate transport** Call for intercept per INTERCEPT CRITERIA.
7. Contact Medical Control.

ALS TREATMENT:

1. Continue **ILS TREATMENT**.
2. Consider possible causes and treatments:
 - a. Hypovolemia (Volume infusion)
 - b. Hypoxia (Ventilation and oxygenation)
 - c. Tension Pneumothorax (Needle decompression)
 - d. Acidosis/Hyperkalemia (Hyperventilation, SODIUM BICARBONATE)
 - e. Drug Overdose (Refer to appropriate protocol)
 - f. Hypothermia (Refer to appropriate protocol)
 - g. Pericardial Tamponade (Rapid transport; *Pericardiocentesis as per Pericardiocentesis Care Guideline with Medical Control order only.*)

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3. Medical Control may order SODIUM BICARBONATE 1 mEq/kg IV/IO for:
 - a. Known pre-existing hyperkalemia
 - b. Known overdose of Quinidine, tricyclic antidepressants, phenothiazines, antihistamines, beta blockers, cocaine, Darvocet
 - c. Return of spontaneous circulation after prolonged arrest interval
 4. May repeat SODIUM BICARBONATE every 10 minutes if rhythm persists.

***If no IV/IO access may give ET dose of 0.1 mg/kg EPINEPHRINE 1:1000.**

BRADYCARDIA

CRITERIA:

1. Heart rate slower than normal for the child's age (usually < 60 bpm) **and**
2. Serious signs and symptoms, including:
 - a. Cyanosis despite oxygen administration
 - b. Truncal pallor and coolness
 - c. Respiratory distress
 - d. Hypotension
 - e. Altered LOC
 - f. Weak, thready or absent peripheral pulses

ILS/ALS TREATMENT:

1. INITIAL PEDIATRIC CARE.
2. If patient shows signs of severe cardiopulmonary compromise, despite oxygenation and airway support, perform chest compressions.
3. EPINEPHRINE (1:10,000) 0.01 mg/kg IV/IO*; may repeat every 3-5 minutes as necessary.
4. Consider ATROPINE 0.02 mg/kg IV/IO (minimum dose 0.1 mg; maximum dose 0.5 mg) for increased vagal tone or primary AV block.
5. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.

***If no IV/IO access may give ET dose of 0.1 mg/kg EPINEPHRINE 1:1000.**

BRIEF RESOLVED UNEXPLAINED EVENT (BRUE)

Definition: **Brief Resolved Unexplained Event:** An event in an infant less than one (1) year reported by a bystander as a sudden, brief (less than 1 minute), completely resolved upon EMS arrival that includes one of the following:

1. Absent, decreased or irregular breathing.
2. Color change (central cyanosis or pallor)
3. Marked change in muscle tone (hyper- or hypotonia)
4. Altered level of responsiveness.

FR/BLS TREATMENT:

1. INITIAL MEDICAL CARE
 - a. Maintain and support airway
 - b. Continuous pulse oximetry
 - c. Check blood glucose level.
 2. if hypoglycemic (glucose < 60mg/dl) refer to Altered LOC?Unconscious/Unknown Etiology Protocol.
 3. Call for intercept per INTERCEPT CRITERIA
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ILS/ALS TREATMENT:

1. Continue FR/BLS Treatment
2. Place on Cardiac Monitor and observe for any arrhythmias.

CARDIOPULMONARY ARREST

FR TREATMENT:

1. Check airway, breathing and circulation.
2. Start CPR and apply AED.
3. Manage airway with appropriate adjunct.
4. Follow current AHA BLS guidelines for resuscitation.
5. Relay information to incoming ambulance.

BLS TREATMENT:

1. Continue **FR TREATMENT**.
2. Consider the need for an advanced airway per the UNIVERSAL AIRWAY ALGORITHM.
3. Call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

See appropriate dysrhythmia protocol.

ENVIRONMENTAL HYPERTHERMIA

CRITERIA:

1. Signs and symptoms of environmental hyperthermia, including:
 - a. Hot, dry, flushed or ashen skin
 - b. Tachycardia or tachypnea
 - c. Diaphoresis
 - d. Decreasing LOC
 - e. Profound weakness and fatigue
 - f. Vomiting and diarrhea
 - g. Hypoperfusion
 - h. Muscle cramps

FR/BLS TREATMENT:

1. INITIAL PEDIATRIC CARE.
2. Place patient in cool environment and remove clothing as necessary.
3. If normal level of consciousness, diaphoresis and no signs of shock:
 - a. Administer cool liquids PO.
4. If decreased LOC, dry skin or signs of shock initiate active cooling:
 - i. Apply cold packs to head, neck, axillae and groin.
 - ii. Apply water or saline soaked sheets to patient's body.
 - iii. Manually fan patient to promote evaporation.
 - iv. Stop cooling if shivering occurs.
5. Call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
 2. If decreased LOC, dry skin or signs of shock, administer 20 ml/kg NS fluid bolus. May repeat fluid bolus as needed to a total of 60 ml/kg.
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EPIGLOTTITIS

NOTE: Epiglottitis is a serious medical emergency in children, and can be life-threatening. The signs and symptoms of epiglottitis are similar to partial airway obstruction. Do not insert anything into the child's mouth. Stimulation of the epiglottis can cause complete airway obstruction. If the patient stops breathing, ventilate with BVM, and use oral airways only as a LAST RESORT.

CRITERIA:

1. Signs and symptoms of epiglottitis, including:
 - a. Acute onset with high fever
 - b. Shallow, difficult breathing
 - c. Inspiratory stridor and wheezing
 - d. Drooling, hoarseness and choking

FR/BLS TREATMENT:

1. INITIAL PEDIATRIC CARE.
2. Position patient upright; avoid over-stimulation.
3. Administer OXYGEN at 8-15 lpm blow-by; do not use airway adjuncts unless serious airway compromise exists.
4. Call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
 2. Consider the need for an advanced airway per the UNIVERSAL AIRWAY ALGORITHM. Airway adjuncts should be used as a last resort.
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FROSTBITE

NOTE: Do not massage frostbitten extremities.

CRITERIA:

1. Cold exposure
2. Signs and symptoms of frostbite, including:
 - a. Red, inflamed tissue
 - b. Gray or mottled tissue
 - c. Waxy tissue that is firm upon palpation.

TREATMENT: ALL LEVELS

1. Remove from cold.
2. INITIAL PEDIATRIC CARE.
3. Cover frostbitten nose or ears with a warm hand.
4. Have patient place frostbitten hand in his/her armpit.
5. Call for intercept per INTERCEPT CRITERIA.

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6. If ETA is greater than 60 minutes, begin active rewarming:
 - a. Immerse extremity in water maintained at a temperature of 100-105 F.
 - b. Rewarming should take 30-60 minutes.
 - c. Rewarming is complete when frozen area is warm to touch and deep red or bluish in color.
 - d. After rewarming, dry gently and cover part with dry sterile dressing and elevate on pillow.

HYPOTHERMIA (MODERATE)

CRITERIA:

1. Exposure to cold environment
2. Signs and symptoms of moderate hypothermia, including:
 - a. Patient conscious - may be lethargic
 - b. Shivering
 - c. Pale, cold skin

FR/BLS TREATMENT:

1. INITIAL PEDIATRIC CARE.
2. Handle patient gently; DO NOT massage cold extremities.
3. Replace any wet clothing with dry sheets and blankets.
4. If no cardiorespiratory compromise, heat packs may be applied to axillae, groin and abdominal areas.
5. Assess and treat for other injuries as necessary.
6. Call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
 2. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg. Use warmed fluid (102-106° F) if available.
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HYPOTHERMIA (SEVERE)

CRITERIA:

1. Exposure to cold environment
2. Signs and symptoms of severe hypothermia, including:
 - a. Decreased LOC
 - b. Cold skin
 - c. Inaudible heart tones
 - d. Unreactive pupils
 - e. Slow respirations

FR/BLS TREATMENT:

1. Load and go situation; limit scene time to 10 minutes.
2. INITIAL PEDIATRIC CARE.
3. Cautiously assess pulse for one full minute; unnecessary CPR could precipitate ventricular fibrillation.
4. If patient is pulseless and apneic after one full minute, refer to HYPOTHERMIC CARDIAC ARREST protocol.
5. Establish airway **WITHOUT** using mechanical adjuncts; assist ventilations with BVM but **DO NOT HYPERVENTILATE.**
6. Handle patient gently; **DO NOT** massage cold extremities.
7. Passive external warming:
 - a. Remove patient to warm environment.
 - b. Remove wet clothing.
 - c. Cover patient with warm, dry blankets.
 - d. Administer warmed, humidified OXYGEN if available.
 - e. Place heat packs to axillae and groin; avoid direct skin contact.
 - f. Increase ambient air temperature by increasing cabin heat.
8. Call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT.**
 2. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg. Use warmed fluid (102°-106°F) if available.
 3. Treat presenting dysrhythmias with appropriate protocol.
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HYPOTHERMIC CARDIAC ARREST

NOTE: Pulses may be very weak or non-palpable in a severely hypothermic patient. Pulses should be assessed for one full minute to assure pulselessness. Unnecessary CPR could precipitate V-Fib.

NOTE: Once CPR has been initiated on a hypothermic patient, it should be continued until patient regains adequate circulation, or patient is evaluated by a qualified Emergency Department physician.

CRITERIA:

1. Prolonged cold exposure
- 2.ulseless, apneic patient

FR/BLS TREATMENT:

1. Assess pulse for one full minute.
2. Begin CPR and apply the AED. Follow current AHA BLS guidelines for resuscitation.
3. Airway control by BVM with OXYGEN at 15 lpm. **DO NOT USE AIRWAY ADJUNCT UNLESS YOU ARE UNABLE TO VENTILATE THE PATIENT.**
4. Initiate transport *
5. Passive external warming:
 - a. Remove patient to warm environment.
 - b. Remove wet clothing.
 - c. Cover patient with warm, dry blankets.
 - d. Administer warmed, humidified OXYGEN if available.
 - e. Place heat packs to axillae and groin; avoid direct skin contact.
 - f. Increase ambient air temperature by increasing cabin heat.
6. Call for an intercept per INTERCEPT CRITERIA.
7. Contact Medical Control.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
2. Follow appropriate dysrhythmia protocol.
 - a. **Defibrillation and cardioversion should be limited to a total of 3 attempts.**
 - b. **Administer EPINEPHRINE 1:10,000 0.01mg/kg IV and a single dose of any applicable anti-dysrhythmic.**
3. Administer 20 ml/kg NS fluid bolus to maximum of 60 ml/kg; use warm solution (102°-106°F) if available.

* Only if transporting agency.

NAUSEA/VOMITING

CRITERIA:

1. Any patient presenting with significant nausea/vomiting.

FR/BLS TREATMENT:

1. INITIAL MEDICAL CARE.
 2. Call for intercept per INTERCEPT CRITERIA.
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ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
 2. IV NS KVO or saline lock.
 3. Administer ZOFRAN 0.15 mg/kg IV or IM (maximum dose 4 mg). May administer ZOFRAN ODT 4 mg PO in patients >26kg.
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NEAR DROWNING

NOTE: A high potential for associated injury (hypothermia or spinal injury) exists in the near drowning patient. All pediatric patients who experience near drowning must be transported for evaluation and monitoring to prevent Secondary Drowning Syndrome. Aggressive airway management is important. All patients with low core body temperatures should be resuscitated.

FR/BLS TREATMENT:

1. Assure rescuer safety; remove patient from water with cervical spine immobilization.
 2. INITIAL PEDIATRIC CARE.
 3. Remove wet clothing; protect from further heat loss; place heat packs to axillae and groin.
 4. Call for intercept per INTERCEPT CRITERIA.
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ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
 2. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
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PEDIATRIC NERVE AGENT/ORGANOPHOSPHATE

ANTIDOTE GUIDELINE

FR/BLS TREATMENT:

1. Assure the scene is safe and the patient has been decontaminated if needed.
 2. INITIAL MEDICAL CARE
 3. Save all bottles, containers or labels for information. **DO NOT EXPOSE RESCUERS TO ORGANOPHOSPHATES.**
 4. Cal for intercept per the INTERCEPT CRITERIA.
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ILS/ALS TREATMENT:

1. Continue FR/BLS TREATMENT
 2. Establish IV. Consider 20 ml/kg NORMAL SALINE fluid bolus to maintain age appropriate SBP. May repeat fluid bolus as needed to maintain age appropriate SBP.
 3. If symptomatic, administer ATROPINE per dosing chart below.
 4. Repeat ATROPINE every 5-10 minutes until symptoms of SLUDGE subside.
 5. If seizures occur, refer to SEIZURE Protocol.
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ATROPINE DOSE		
AGE	MILD / MODERATE (0.05 mg/kg IM)	SEVERE (0.1 mg/kg IM)
<u>INFANT</u> 0 - 6 months(< 7 kg)	0.25 mg IM	0.5mg IM
<u>INFANT</u> 7 mo – 2 yrs (7-13 kg)	0.5 mg IM	1 mg IM
<u>CHILD</u> 3 - 7 yrs (14-25kg)	1 mg IM	2 mg IM
<u>CHILD</u> 8 - 14 yrs (26-50 kg)	2mg IM	4 mg IM

POISONING AND OVERDOSE

NOTE: Anticipate vomiting, seizure, respiratory arrest and dysrhythmias. Refer to appropriate protocol as needed. Do not induce vomiting, especially in cases of ingested caustic materials.

NOTE: DEXTROSE 50% may be administered at 1 ml/kg for patients over 8 years of age
DEXTROSE 12.5% should be administered at 4 ml/kg for infants < 1 year.

CRITERIA:

1. Suspected exposure to toxic substance, including:
 - a. Ingestion
 - b. Inhalation
 - c. Absorption through eyes, skin or mucous membranes
 - d. Injection – accidental or intentional
2. Signs and symptoms of overdose / poison exposure.

FR/BLS TREATMENT:

1. Assure scene is safe and the patient has been decontaminated if needed.
2. INITIAL PEDIATRIC CARE.
3. Save all bottles, containers and labels for information. DO NOT EXPOSE RESCUERS TO POISONOUS SUBSTANCES.
4. If blood glucose < 60 mg/dl (or suspected) and patient is conscious with an intact gag reflex, administer one tube of ORAL GLUCOSE.
5. If airway compromise or inadequate respiratory effort present, administer intranasal NARCAN at 1 mg/ml per nostril via atomizer* (1 ml per nostril maximum; 2 mg total dose). May repeat in 2-3 minutes to a maximum dose of 4 mg if no response.
6. relay information to incoming ambulance or call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
2. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
3. If **airway compromise** or **inadequate respiratory effort** present, administer NARCAN: IV or IM – 0.1 mg/kg; may repeat every 2-3 minutes to a maximum dose of 2 mg, if no response.
IN – 1 mg/ml per nostril via atomizer* (1 ml per nostril maximum; 2 mg total dose). May repeat every 2-3 minutes to a maximum dose of 4 mg if no response.
4. If blood glucose < 60 mg/dl, administer DEXTROSE 25% at 2 ml/kg.
5. **Alternative medication:** 10% DEXTROSE in 250 ml of sterile water (D10W). Administer 0.1g/kg (1ml/kg) IV. Repeat blood glucose. Consider repeating the dose if blood glucose is less than 60 with symptoms of hypoglycemia.
6. If IV/IO access is not available, administer GLUCAGON 0.03 mg/kg IM up to a maximum dose of 1 mg.

***Intranasal medications must be administered through an atomizer**

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RESPIRATORY ARREST/DISTRESS

CRITERIA: Any may be present:

1. Patient apneic **with** a pulse
2. Severe dyspnea, may include tachycardia and use of accessory muscles
3. Abnormal physical exam findings, such as:
 - a. Wheezing or grunting
 - b. Inspiratory rales or rhonchi
 - c. Decreased breath sounds or air exchange
4. Respiratory history, including:
 - a. Recent respiratory trauma
 - b. Asthma
 - c. Epiglottitis or bronchitis
 - d. Recent pneumonia
 - e. Foreign body airway obstruction

FR TREATMENT:

1. INITIAL PEDIATRIC CARE.
 2. Manage airway per UNIVERSAL AIRWAY ALGORITHM.
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BLS TREATMENT:

1. Continue **FR TREATMENT**.
 2. For suspected reactive airway disease, administer DuoNeb per nebulizer if needed. May repeat x 2 for continued symptomatic relief.
 3. Call for intercept per INTERCEPT CRITERIA.
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ILS TREATMENT:

1. Continue **BLS TREATMENT**.
 2. METHYLPREDNISOLONE (Solu-Medrol) 2 mg/kg IV. Maximum dose: 125 mg.
 3. Assist ventilations with in-line nebulizer kit and BVM if necessary.
 4. Reassess need for intubation if respiratory symptoms worsen or do not improve with treatment.
 5. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
 6. Call for intercept per INTERCEPT CRITERIA.
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ALS TREATMENT:

1. Continue **ILS TREATMENT**
 2. Continue to monitor need for intubation if respiratory symptoms worsen or do not improve with treatment.
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3. In patients with persistent respiratory distress consider MAGNESIUM SULFATE 50 mg/kg IV in 100 ml 0.9% NaCl (normal saline) IV over 10-15 minutes. Maximum dose: 2 gm

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RESPIRATORY DISTRESS WITH A TRACHEOSTOMY TUBE **/ VENTILATOR**

FR/BLS TREATMENT:

1. Initial Medical Care.
2. Place patient in position of comfort.
3. Administer 100% OXYGEN per tracheostomy collar.
4. If tracheostomy tube is obstructed with secretions, suction tracheostomy tube.
 - a. Remove inner catheter of tracheostomy and re-suction.
 - b. Suction for no more that 10-15 seconds while withdrawing the suction catheter
 - c. 2-3 ml of saline may be used to loosen secretions.
5. If tracheostomy tube still remains obstructed, have caregiver / family assist in changing the tracheostomy tube if there is a spare tube available.
6. If tracheostomy tube still remains obstructed, ventilate with 100% OXYGEN via Bag Valve Mask (BVM).
7. Relay information to incoming ambulance and / or call for intercept per INTERCEPT CRITERIA

ILS/ALS TREATMENT:

1. Continue FR?BLS TREATMENT
 2. Reassess patency of tracheostomy tube. If needed replace tracheostomy tube with spare tracheostomy tube or appropriately sized ET tube into stoma.
 3. Consider DUONEB by nebulizer. May repeat X2 if needed for continued symptomatic relief.
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SEIZURE/STATUS EPILEPTICUS

**NOTE: DEXTROSE 50% may be administered at 1 ml/kg for patients over 8 years of age.
DEXTROSE 12.5% should be administered at 4 ml/kg for infants < 1 year.**

FR/BLS TREATMENT:

1. Initial **PEDIATRIC CARE**.
2. Assessment; include neurological exam and past seizure history.
3. Immobilize cervical spine if indicated.
4. Position patient to prevent injury.
5. If blood glucose < 60 mg/dl (or suspected) **and** patient is conscious with an intact gag reflex, administer one tube of ORAL GLUCOSE.
6. If febrile seizure is suspected, in addition to above:
 - a. Attempt to cool patient by removing excess clothing layers.
 - b. May use towels moistened with cool water.
7. Call for intercept per INTERCEPT CRITERIA.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
 2. IV NS KVO or saline lock, if able.
 3. If seizure persists longer than three minutes, administer VERSED:
IV: 0.1 mg/kg IV over 2 minutes (maximum dose 5 mg)
IM: 0.2 mg/kg IM (maximum dose 7 mg)
IN: 0.2 mg/kg IN (max. 1 ml per nostril; maximum total dose 7 mg)
 4. If blood glucose < 60 mg/dl, administer DEXTROSE 25% at 2 ml/kg.
 5. **Alternative medication:** 10% DEXTROSE in 250 ml of sterile water (D10W). Administer 0.1g/kg (1ml/kg) IV. Repeat blood glucose. Consider repeating the dose if blood glucose is less than 60 with symptoms of hypoglycemia.
 6. If IV/IO access is not available, administer GLUCAGON 0.03 mg/kg IM up to a maximum of 1 mg.
-
7. If seizure persists, contact Medical Control for additional VERSED.

SEPSIS

Upper Limit of Pediatric HR

CRITERIA (Must meet the following):

1. Suspected infection - YES
2. Temperature < 36°C (96°F) or > 38°C (100.4°F)
3. Heart Rate greater than normal limit for age (HR may not be elevated in septic hypothermic patients) **AND** at least one (1) of the following

AGE	HEART RATE
0d – 3m	≥ 205
3m – 2 yr	≥ 190
2yr – 10yr	≥ 140
10yr – 13yr	≥ 100

dysfunction:

- a. Altered mental status
- b. Capillary refill time < 1 second (flash) or > 3 seconds
- c. Cool, mottled extremities
- d. EtCO₂ < 25mmHg (if available)

indications of organ

FR/BLS TREATMENT:

1. INITIAL MEDICAL CARE
2. Administer OXYGEN to maintain oxygen saturations ≥ 94%.
3. Call for intercept per INTERCEPT CRITERIA.
4. Reassess patient and vital signs every 5 minutes.

ILS/ALS TREATMENT:

1. Continue **FR/BLS TREATMENT**.
2. If blood glucose < 60 mg/dl, give Dextrose 10% 1ml/kg IV or IO. Recheck glucose in 10 minutes, and retreat if < 60mg/dl.
3. Notify receiving hospital of **“SEPSIS ALERT.”**
4. Establish at least one large bore IV.
 - a. Administer 20ml/kg NS fluid bolus (**Document TOTAL amount of IVF given**)
 - b. Reassess immediately after each 20 mL/kg increment and STOP fluids if signs of pulmonary edema (increasing shortness of breath or rales/crackles on lung exam)
 - c. Total amount of IVF should not exceed 60 mL/kg.
5. Continue to reassess patient including vital signs (manual BP), breath sounds, capnography (< 25 mmHg may be indicative of septic shock), cardiac monitor.

-
6. Medical Control may consider DOPAMINE infusion if no response after fluid adequate fluid therapy.

SHOCK (NOT FROM TRAUMA)

NOTE: Smaller body mass in children results in hypoperfusion quickly due to vomiting and diarrhea.

CRITERIA:

1. Signs and symptoms of shock including:
 - a. Increased respiratory effort
 - b. Cyanosis despite oxygen administration
 - c. Truncal pallor and coolness
 - d. Hypotension and bradycardia
 - e. Weak, thready or absent peripheral pulses
 - f. Delayed capillary refill in patients < 6 years old
 - g. Decreased LOC

FR/BLS TREATMENT:

1. Initial **PEDIATRIC CARE**.
2. Maintain warmth and elevate feet if possible.
3. Call for intercept per **INTERCEPT CRITERIA**.

ILS TREATMENT

1. Continue **FR/BLS TREATMENT**.
2. Administer 20 ml/kg fluid bolus; repeat fluid bolus as needed to a total of 60 ml/kg.

ALS TREATMENT:

1. Continue **ILS TREATMENT**.

-
2. Consider **DOPAMINE** at 1 gtt/5 kg/minute.
 - a. Titrate to maintain SBP of 80 if < 3 years old.
 - b. Titrate to maintain SBP of 90-100 if ≥ 3 years old
-

SUPRAVENTRICULAR TACHYCARDIA

CRITERIA:

1. Narrow complex tachycardia for given age
2. Serious signs and symptoms, including:
 - a. Cyanosis despite oxygen administration
 - b. Truncal pallor and coolness
 - c. Respiratory difficulty
 - d. Hypotension
 - e. Decreased LOC
 - f. Weak or absent peripheral pulses

ILS/ALS TREATMENT:

1. INITIAL PEDIATRIC CARE.
 2. If serious signs and symptoms:
 - a. Perform SYNCHRONIZED CARDIOVERSION at 0.5 J/kg.
 - b. Repeat SYNCHRONIZED CARDIOVERSION at 1 J/kg, then 2 J/kg if needed.
 3. Refer to CARDIOPULMONARY ARREST protocol as needed.
 4. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
 5. If mild or moderate signs of cardiorespiratory compromise:
 - a. Administer ADENOSINE 0.1 mg/kg (maximum 6 mg) rapid IV push, followed by immediate 10 mL NS flush.
 - b. Repeat ADENOSINE as needed at 0.2 mg/kg (maximum 12 mg) rapid IV push, followed by 10 mL NS flush.
 6. If patient remains in persistent SVT, despite ADENOSINE, consider SYNCHRONIZED CARDIOVERSION as above.
-

V-FIB / PULSELESS V-TACH

ILS/ALS TREATMENT:

1. Begin CPR.
2. Apply AED/cardiac monitor.
3. If utilizing an AED, defibrillate as directed by AED.
4. If using a manual cardiac monitor, defibrillate at 2 J/kg.
5. Continue CPR, manage airway per UNIVERSAL AIRWAY ALGORITHM, establish vascular access and administer NS WO.
6. After 2 minutes of CPR, defibrillate at 4 J/kg or as directed by AED.
7. CPR for 2 minutes.
8. EPINEPHRINE (1:10,000) 0.01mg/kg IV/IO q 3-5 minutes as long as patient remains pulseless.*
9. Defibrillate at 4 J/kg or as directed by AED.
10. CPR for 2 minutes.
11. AMIODARONE 5 mg/kg IV/IO; may repeat q 3-5 minutes x 2 as needed.
12. Defibrillate at 4 J/kg or as directed by AED
13. Continue cycles of 2 minutes of CPR followed by defibrillation as needed.
14. Initiate transport.**
15. Contact Medical Control.

-
16. **ALS only:** Consider SODIUM BICARBONATE 1 mEq/kg IV/IO for unwitnessed arrest or resuscitations longer than 10 minutes.

***If no IV/IO access may give ET dose of 0.1 mg/kg EPINEPHRINE 1:1000.**

****Only if transporting agency.**

V-TACH WITH PULSE

NOTE: For pediatric patients with ventricular tachycardia and no serious signs or symptoms, perform Initial Pediatric Care, transport and contact Medical Control. Synchronized cardioversion is normally reserved for children with HR > 220 with signs of shock.

CRITERIA:

1. Serious signs and symptoms, including:
 - a. Cyanosis despite oxygen administration
 - b. Truncal pallor and coolness
 - c. Respiratory difficulty
 - d. Hypotension
 - e. Decreased LOC
 - f. Weak or absent peripheral pulses

ILS/ALS TREATMENT:

1. INITIAL PEDIATRIC CARE.
2. If signs and symptoms of severe cardiorespiratory compromise:
 - a. Perform SYNCHRONIZED CARDIOVERSION at 0.5 - 1 J/kg.
 - b. Repeat SYNCHRONIZED CARDIOVERSION at 2 J/kg.
3. NS at KVO; consider 20 ml/kg fluid bolus as needed to a total of 60 ml/kg.
4. If mild to moderate cardiorespiratory compromise, administer AMIODARONE 5 mg/kg IVP.
5. If persistent V-tach despite AMIODARONE, perform SYNCHRONIZED CARDIOVERSION as above.

Revised: January 2015

PEDIATRIC (≤ 8 years of age)

Universal Airway Management Algorithm

Note: This algorithm is intended for use when faced with a need to secure a patent airway in a child < 8 years of age.

1. Begin by positioning the patient to achieve proper head placement. Sniffing position (head tilt-chin lift) for non- trauma patients and in-line neutral position (modified jaw thrust) for trauma patients. Pad underneath the shoulders to ensure appropriate positioning of the airway. Pediatric patients have a proportionally larger head which leads to neck flexion that will occlude the airway.
2. **BVM IS THE PREFERRED METHOD OF VENTILATION IN ALL PEDIATRIC PATIENTS < 8 YEARS OF AGE.**
3. Ventilate with 100% oxygen via a bag-valve-mask and maintain SP02 > 94%.
4. If unable to maintain SP02 > 94% with BVM, insert a correctly sized oral pharyngeal airway (OPA). A nasal pharyngeal airway (NPA) may be used if the patient has intact gag reflex. **An NPA is contraindicated in patients with known or suspected head injuries.** Have suction equipment immediately available.
5. Consider the need for a supraglottic airway.
 - a. Patient needs to have airway protected from vomit, blood, etc.
 - b. Provider cannot achieve/maintain proper head alignment.
 - c. Cannot ventilate with an adequate tidal volume.
 - d. Unable to maintain SP02 > 94%
 - e. Cannot achieve/maintain an adequate mask seal.
 - f. Too much air is entering the stomach.

BLS, ILS, and ALS providers

6. Utilize an appropriately sized, and EMS system approved, Blind Insertion Airway Device (BIAD) to achieve a patent airway. Follow manufacturer's recommendations for insertion procedure. Make sure suction equipment is immediately available.
7. Confirm BIAD placement
 - a. Waveform capnography should always be used for confirmation if available.
 - b. Auscultation bilaterally over lungs and epigastrium.
 - c. Equal chest rise and fall
 - d. SP02 increase
8. Secure the BIAD
 - a. Use commercial tube holder if available
 - b. Consider application of C-Collar and CID to inhibit flexion or extension which may dislodge
9. Reconfirm BIAD placement after securing in place.
10. Ventilate at age appropriate rate and depth.

ILS and ALS providers:

Prehospital endotracheal intubation of children \leq 8 years old has not shown benefit, and may cause harm. Intubation should **ONLY be considered if you are still unable to oxygenate or ventilate utilizing BVM, OPA, NPA, or BID.**

ETCO2 waveform capnography for E.T.T. is strongly encouraged. If available, ETCO2 waveform capnography must be utilized for E.T.T. placement verification and continuous monitoring. If ETCO2 is not available, providers must verify tube placement by alternate methods and ensure continuous correct placement throughout transport and transfer of care.

11. Any intubation attempts in a pediatric patient should be considered a “probable difficult intubation”. The attempt should be made by the most experienced appropriately licensed provider. Rescue airways and suction need to be readily available.
12. Consider anatomical differences in children vs adults including:
 - a. Proportionally larger head leading to neck flexion – pad under the shoulders
 - b. The pediatric larynx is much more superiorly positioned than an adult
 - c. “More floppy” epiglottis – straight blade may be needed to control epiglottis
 - d. Shorter, more narrow, and funnel shaped trachea with narrowest portion at the cricoid ring.
13. Optimize pre-oxygenation before and during intubation by applying nasal cannula at >15 LPM and elevate patient’s head 10-20 degrees during intubation.
14. If successful, perform post-intubation management procedures:
 - a. Confirmation by EtCO2 waveform capnography, if available.
 - b. Secure using commercial securing device and / or tape
 - c. Note the centimeter marking at the teeth
 - d. Consider application of C-Collar and CID to inhibit flexion or extension which may dislodge the airway.
 - e. Continuous monitoring of EtCO2 waveform capnography
15. If unsuccessful, resume attempts to ventilate utilizing BVM with OPA or NPA, and utilize supraglottic airway as needed.

PEDIATRIC VITAL SIGN REFERENCE

Source: *Pediatric Advanced Life Support Manual*. American Heart Association, 2006.

Pulse Rate

Age	Pulse Rate
Newborn to 3 months	85 - 205
3 months to 2 years	100 -190
2 years to 10 years	60 - 140
> 10 years	60 - 100

Respiratory Rate

Age	Respiratory Rate
Infant (< 1 yr)	30 - 60
Toddler (1 – 3)	24 - -40
Preschooler (4 – 5)	22 - 34
School age (6 – 12)	18 - 30
Adolescent (13 – 18)	12 - 16

Blood Pressure

AGE	Normal Systolic	Normal Diastolic
1 day	60 - 76	30 - 45
4 days	67 - 84	35 - 53
1 month	73 - 94	36 - 56
3 months	78 - 103	44 - 65
6 months	82 - 105	46 - 68
1 year	67 - 104	20 - 60
2 years	70 - 106	25 - 65
7 years	79 - 115	38 - 78
15 years	93 -131	45 - 85

Age	Definition of Systolic Hypotension
0 – 28 days	< 60
1 – 12 months	< 70
1 – 10 years	< 70 + (age in years x 2)
> 10 years	< 90

THIS REFERENCE IS NOT PART OF THE PROTOCOLS. IT IS PROVIDED AS A COURTESY