

Pediatric Protocols Altered Level of Consciousness	Lorain County EMS Protocols Pediatric Protocol 1 Revised 3/2006, 7/29/2006
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1. DIVISIONS AFFECTED

1.1. All Public and Private EMS.

2. EMT – BASIC

2.1. ABC's. Manually stabilize cervical spine as per Multiple Trauma Protocol if cause of unconsciousness is unknown.

2.2. Assist ventilation with bag-valve-mask while administering 100% oxygen or provide mouth-to-mouth ventilation using barrier device.

2.3. If breathing, administer 100% oxygen by NRB mask.

2.4. Apply Pulse Oximeter

2.5. Evaluate patient's general appearance, relevant history of condition and determine:

<u>O</u> nset	<u>A</u> llergies
<u>P</u> rovokes	<u>M</u> edication
<u>Q</u> uality	<u>P</u> ast Medical History - especially, diabetic, seizures, stroke, head injury, drug abuse
<u>R</u> adiates	
<u>S</u> everity	<u>L</u> ast Meal
<u>T</u> ime	<u>E</u> vents leading to present illness
<u>I</u> nterventions	

2.6. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes.

2.7. Determine blood sugar level.

2.7.1. If blood sugar is less than 70, administer oral glucose if alert. May be repeated in 10 minute if blood sugar remains below 70.

2.7.2. PATIENT MUST HAVE A GAG REFLEX.

3. EMT – INTERMEDIATE

3.1. Assume charge and confer with EMT's about condition of patient and situation.

3.2. Apply monitor and interpret rhythm.

3.3. Start IV saline, TKO, while enroute to hospital

3.4. Determine blood sugar level.

3.4.1. Blood sugar greater than 400 and signs of hypoperfusion are present, administer an IV fluid bolus:

3.4.1.1. 20cc/kg of saline

3.4.1.2. May be repeated in 10 minutes if no response.

3.5. If unable to check blood sugar or blood sugar is between 70 and 400, establish communications with Medical Control and advise of patient's condition.

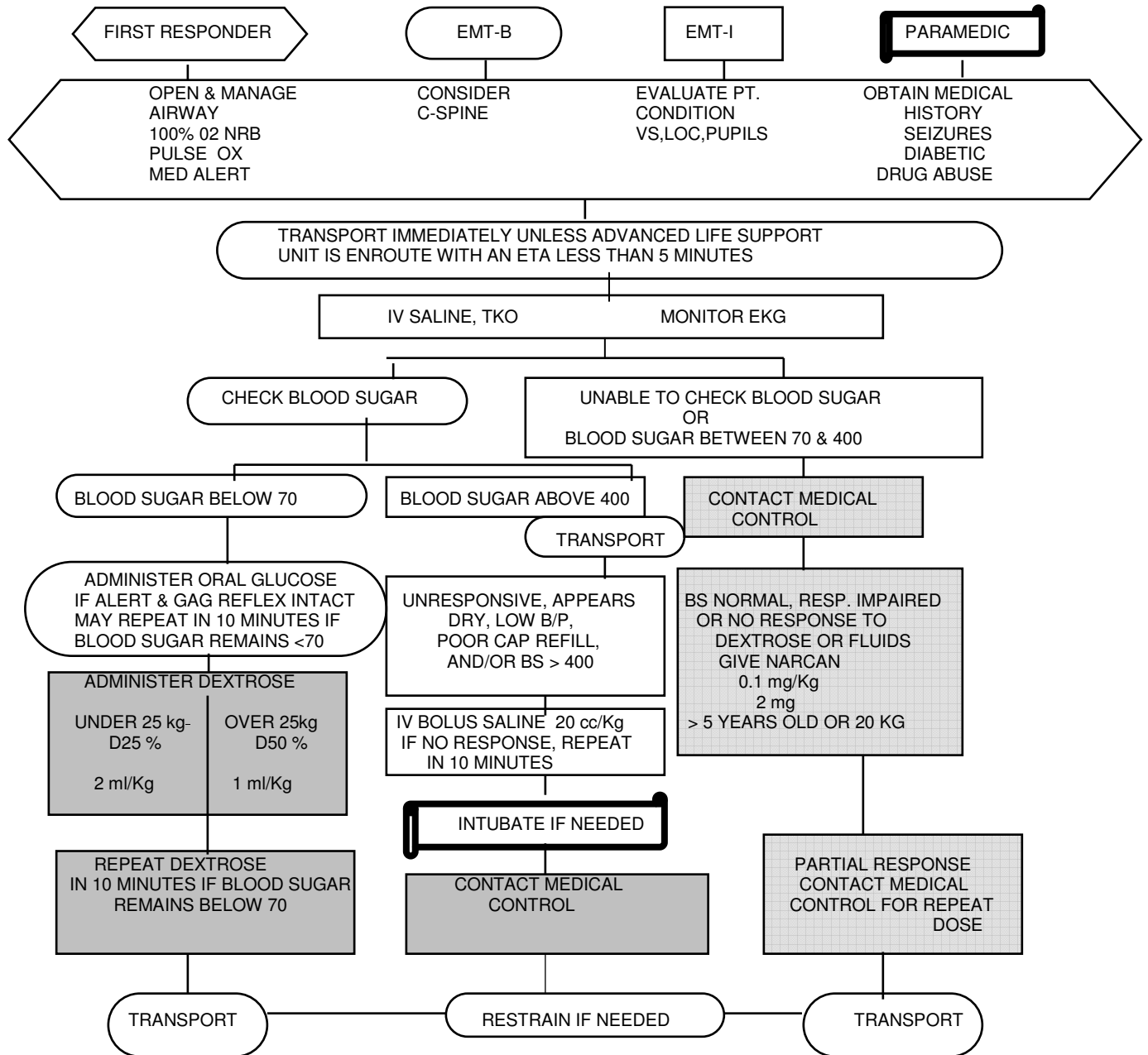
- 3.6. If blood sugar is normal, respirations are impaired, or patient does not respond to fluid bolus, administer Narcan;
 - 3.6.1. Patients \leq 5 years old or 20kg: 0.1 mg/kg IV bolus
 - 3.6.2. Patients $>$ 5 years old or 20kg: 2 mg
 - 3.6.3. If patient improves with Narcan but is not fully awake, contact Medical Control for repeat dose.
- 3.7. If any of the following are present: patient is unresponsive, appears dry, has a low BP, poor capillary refill and/or blood sugar is above 400, IV fluid bolus 20cc/kg of saline. May be repeated in 10 minutes if no response.

DO NOT DELAY TRANSPORT

4. EMT – PARAMEDIC

- 4.1. Assume charge and confer with EMT's about condition of patient and situation.
- 4.2. If patient does not have a secure, protected airway, intubate patient per intubation procedure.
- 4.3. Apply monitor and check rhythm.
- 4.4. Start IV/IO saline. If any of the following are present: patient is unresponsive, appears dry, has a low BP, or poor capillary refill, try a fluid challenge of 20cc/kg saline IV/IO bolus.
- 4.5. Determine blood sugar level.
 - 4.5.1. Blood sugar less than 70, administer IV bolus:
 - 4.5.1.1. 2ml/kg of 25% dextrose (D25) for children under 50 pounds (25 kg). (D50 can be diluted 1:1 with sterile water to create D25)
 - 4.5.1.2. 1ml/kg of 50% dextrose (D50) for children over 50 pounds (25 kg)
 - 4.5.1.3. May be repeated in 10 minutes if blood sugar remains below 70
 - 4.5.2. Blood sugar greater than 400 and signs of hypoperfusion are present, administer an IV fluid bolus:
 - 4.5.2.1. 20cc/kg of saline
 - 4.5.2.2. May be repeated in 10 minutes if no response.
- 4.6. If blood sugar is normal, respirations are impaired, or patient does not respond to dextrose or fluid bolus, administer Narcan;
 - 4.6.1. Patients \leq 5 years old or 20kg: 0.1 mg/kg IV bolus
 - 4.6.2. Patients $>$ 5 years old or 20kg: 2 mg
 - 4.6.3. If patient improves with Narcan but is not fully awake, contact Medical Control for repeat dose.
- 4.7. Re-evaluate patient condition, contact Medical Control, and transport to the hospital.
- 4.8. In some cases patient may require restraint, and should not be transported until completely restrained.

PEDIATRIC
ALTERED LEVEL OF CONSCIOUSNESS



Pediatric Protocols Pediatric Arrhythmias	Lorain County EMS Protocols Pediatric Protocol 2 Revised 3/2006, 8/15/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Current American Heart Association guidelines were referenced for protocol development.
- 1.2. Life-threatening cardiac rhythm disturbances in children are more frequently the result, rather than the cause, of acute emergencies.
- 1.3. In infants and children, arrhythmias should be treated as an emergency only if:
 - 1.3.1. The arrhythmia compromises cardiac output, or
 - 1.3.2. The arrhythmia has the potential for degenerating into a rhythm that compromises cardiac output
- 1.4. Initial therapy in children will consist of proper oxygenation and ventilation, along with assessment of the cardiac output.
- 1.5. Refer to BROSELOW PEDIATRIC EMERGENCY TAPE when unsure about patient weight, age and/or drug dosage.
- 1.6. Normal BP and heart rate ranges in different age groups.

Estimate of Minimum Systolic Blood Pressure	
<i>Age</i>	<i>Minimum systolic blood pressure (5th percentile)</i>
0 to 1 month	60 mm Hg
>1 month to 1 year	70 mm Hg
1 to 10 years of age	70 mm Hg + (2 □ age in years)
>10 years of age	90 mm Hg

TABLE 2. Normal Heart Rates (bpm) in Children*

Age	Awake Rate	Mean	Sleeping Rate
Newborn to 3 mo	85-205	140	80-160
3 mo to 2 y	100-190	130	75-160
2 y to 10 y	60-140	80	60-90
>10 y	60-100	75	50-90

*bpm indicates beats per minute

From Gillette PC, Garson A Jr, Porter CJ, McNamara DG. Dysrhythmias. In: Adams FG, Emmanouilides GC, Reimenschenider TA, eds. *Moss' Heart Disease in Infants, Children and Adolescents*. 4th ed. Baltimore, Md: Williams and Wilkins; 1989:725-741.

- 1.7. Sinus Arrhythmia
 - 1.7.1. A benign condition that is common in children and usually produces no adverse hemodynamic effects.
 - 1.7.2. It is a normal variation in sinus rhythm that is related to the respiratory rate. The heart rate increases with inspiration and decreases with expiration.
2. DIVISIONS AFFECTED
 - 2.1. All Public and Private EMS.
3. EMT – BASIC
 - 3.1. Establish unresponsiveness and begin CPR if needed. Immobilize cervical spine if indicated.
 - 3.2. Assist ventilation with bag-valve-mask while administering 100% oxygen or provide mouth-to-mouth ventilation using barrier device, if needed.
 - 3.3. Apply pulse oximeter.
 - 3.4. Open and manage the airway and provide 100% oxygen by NRB mask.
 - 3.4.1. Assist ventilations with BVM if rate is below or above normal limits and signs of hypoxia are present.
 - 3.4.2. Apply pulse oximeter and treat accordingly.
 - 3.5. If patient shows signs of decreased cardiac output (low blood pressure, decreased LOC, prolonged capillary refill, diminished peripheral pulses) and a slow heart rate (less than 60 in infants and children) that does not respond to oxygenation and ventilation, begin CPR.
 - 3.6. Evaluate patient's general appearance and determine:
 - 3.6.1. Vital signs
 - 3.6.2. Level of consciousness
 - 3.6.3. Cardiac output
 - 3.6.4. Lung sounds
 - 3.7. Obtain relevant history of current condition.
 - 3.8. Establish communications with Medical Control and advise of patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes.
 - 3.9. If cardiac monitor is available, apply and run a strip for interpretation by ED Physician.
4. EMT – INTERMEDIATE
 - 4.1. Assume charge and confer with EMT's about condition of patient and situation.
 - 4.2. Assess airway adequacy and assist EMT-B.
 - 4.3. Apply monitor and determine rhythm.
 - 4.4. Start IV saline, TKO using pediatric IV tubing set-up if available.

5. EMT – PARAMEDIC

- 5.1. Assume charge and confer with EMT's about condition of patient and situation.
- 5.2. Assess airway adequacy and intubate if indicated.
- 5.3. Apply monitor and determine rhythm.
- 5.4. Start IV saline, TKO using pediatric IV tubing set-up if available.
- 5.5. Treat arrhythmias as follows:
 - 5.5.1. Bradycardia.
 - 5.5.1.1. Treat only if infant or child's heart rate remains < 60/min with signs of decreased cardiac output despite airway management and 100% oxygenation and ventilation.
 - 5.5.1.1.1. Begin CPR
 - 5.5.1.1.2. Administer Epinephrine IV, IO, or ET every 3 to 5 minutes or until cardiac output improves.
 - 5.5.1.1.2.1. When IV or IO routes are available, administer 0.01mg/kg (0.1mL/kg) of 1:10,000
 - 5.5.1.1.2.2. When administering through ET tube use 0.1mg/kg (0.1 ml/kg) of 1:1,000. ET Epinephrine must be diluted to a volume of 3-5 mL with NS.
 - 5.5.1.1.2.3. If no response, administer Atropine.
 - 5.5.1.1.2.3.1. When IV or IO, administer 0.02 mg/kg.
 - 5.5.1.1.2.3.2. When ET, administer 0.04 mg/kg.
 - 5.5.1.1.2.3.3. Minimum dose: 0.1 mg.
 - 5.5.1.1.2.3.4. Maximum single dose: 0.5 mg in a child 1 mg in an adolescent.
 - 5.5.1.1.2.3.5. May repeat 1 time in 5 minutes at double dose.
 - 5.5.1.1.2.4. If no response, transport.
 - 5.5.1.1.2.5. Contact Medical Control for possible cardiac pacing.
 - 5.5.2. **Narrow Complex Tachycardia (SVT):**
 - 5.5.2.1. If patient is asymptomatic, do not treat. Transport immediately.
 - 5.5.2.2. Consider normal pulse for age of patient.
 - 5.5.2.3. Consider hypovolemia and follow Hypovolemic Shock Protocol.
 - 5.5.2.4. Request history of WPW Syndrome. If present, transport.
 - 5.5.2.5. Consider Vagal Maneuvers. (Obtain an ECG tracing before and during)
 - 5.5.2.5.1. Ice water applied to the face.
 - 5.5.2.5.2. Crushed ice in a plastic bag/glove applied to the face. Do not obstruct ventilation.
 - 5.5.2.5.3. Have child blow through an occluded straw.
 - 5.5.2.6. If patient is symptomatic (signs of CHF, poor capillary refill, hypotension, poor perfusion, shock, respiratory difficulty, SOB or altered LOC) and heart rate is greater than 220 in an infant or 180 in a child:

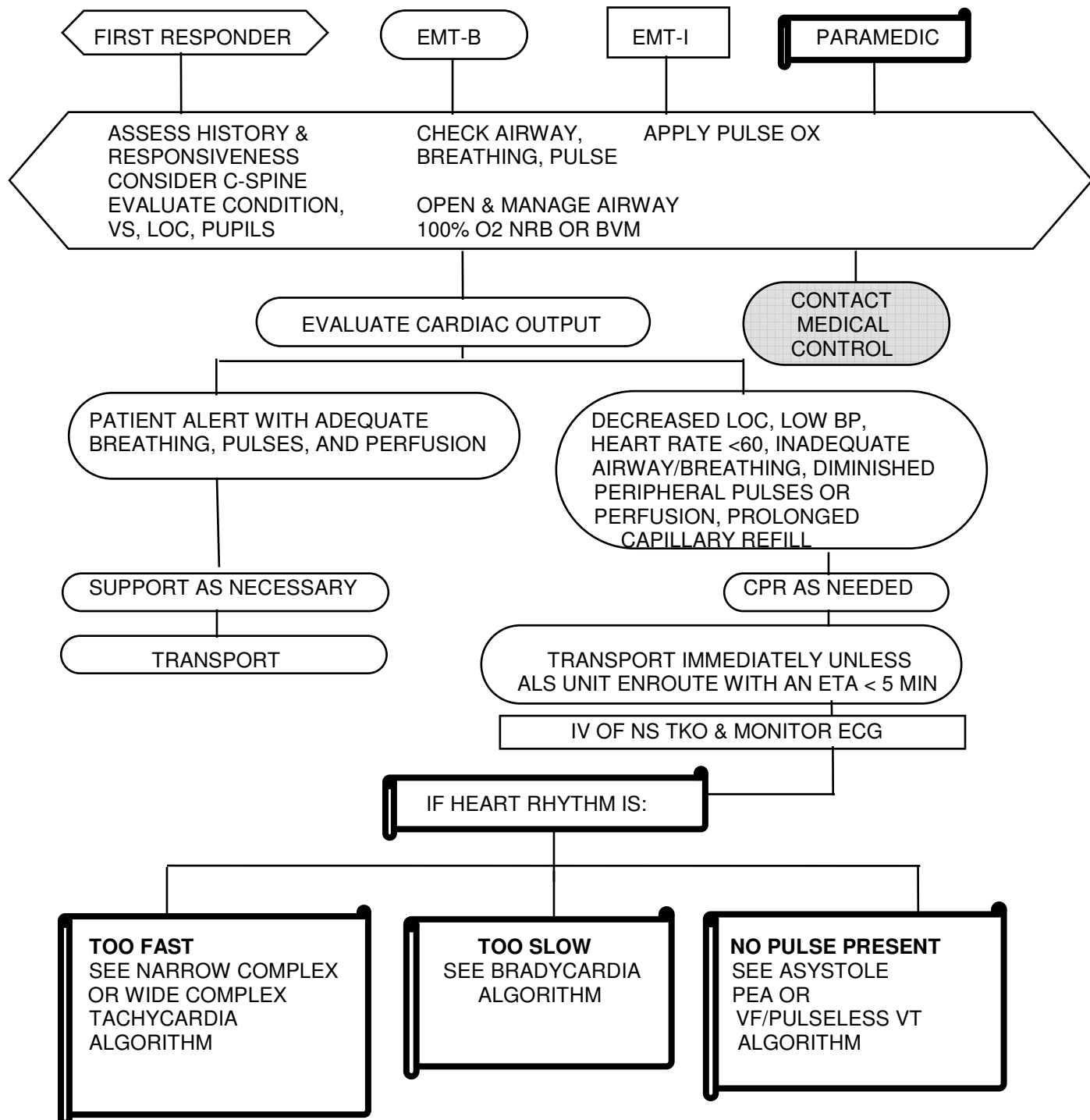
- 5.5.2.6.1. NOTE: If the patient is unstable with poor perfusion, may move directly to cardioversion and skip Adenosine administration.
- 5.5.2.6.2. Administer adenosine, 0.1mg/kg (maximum 6mg) RAPID IV bolus over 1 to 3 seconds followed IMMEDIATELY with a 2 to 5cc bolus of saline.
- 5.5.2.6.3. If no conversion, repeat adenosine in 1-2 minutes, 0.2mg/kg (maximum 12mg) RAPID IV bolus followed IMMEDIATELY with a 2 to 5cc bolus of saline.
- 5.5.2.6.4. Contact Medical Control for possible synchronized cardioversion at 0.5 to 1 joule per kg.

5.5.2.7. Transport

5.5.3. Wide Complex Tachycardia (with a pulse and poor perfusion)

- 5.5.3.1. Assess perfusion.
- 5.5.3.2. Signs/Symptoms of poor perfusion include:
 - 5.5.3.2.1. Shock
 - 5.5.3.2.2. Hypotension
 - 5.5.3.2.3. Respiratory difficulty.
 - 5.5.3.2.4. Altered LOC.
 - 5.5.3.2.5. CHF/Pulmonary Edema
 - 5.5.3.2.6. Poor capillary refill.
 - 5.5.3.2.7. Vagal Maneuvers
 - 5.5.3.2.8. Contact medical control for possible synchronized cardioversion at 0.5 to 1 joule per kg. or administration of an anti-arrhythmic medication
 - 5.5.3.2.9. May attempt Adenosine 0.1 mg/kg Max dose of 6mg/kg) by rapid IV bolus
 - 5.5.3.2.10. Transport
 - 5.5.3.2.11. TREAT CAUSE: consider hypovolemia, hypothermia, hypoxia, hypo/hyperkalemia, hypoglycemia, hydrogen ions (acidosis), cardiac tamponade, tension pneumothorax, tablets/toxins (overdose), thrombosis (pulmonary embolism, MI), trauma.

PEDIATRIC ARRHYTHMIA



PEDIATRIC BRADYCARDIA (UNSTABLE PATIENT)

SUPPORT ABCs AS NECESSARY

START CHEST COMPRESSIONS IF
DESPITE OXYGENATION AND VENTILATION HR < 60
IN INFANT AND CHILD AND POOR PERFUSION

IV/IO EPINEPHRINE 0.01 MG/KG
(0.1 ML/KG 1:10,000)

ET EPINEPHRINE 0.1 MG/KG
(0.1 ML/KG 1:1,000 DILUTED)

MAY REPEAT SAME DOSE EVERY
3 TO 5 MINUTES AS NECESSARY

IV/IO ATROPINE 0.02 MG/KG

ET ATROPINE 0.04 MG/KG

MINIMUM DOSE 0.1 MG

MAXIMUM SINGLE DOSE 0.5 MG IN A
CHILD AND 1 MG IN AN ADOLESCENT

MAY BE REPEATED ONCE IN
5 MINUTES AT DOUBLE DOSE

CONTACT MEDICAL CONTROL

TRANSPORT

PEDIATRIC NARROW COMPLEX TACHYCARDIA (SVT)

SUPPORT ABCs AS NECESSARY

ASYMPTOMATIC

TRANSPORT

**SYMPTOMATIC &
HEART RATE > 220 IN AN
INFANT AND 180 IN A CHILD**

CONSIDER VAGAL MANEUVERS

ADENOSINE 0.1 MG/KG
MAX DOSE 6 MG

IF NO RESPONSE 1-2 MIN
ADENOSINE 0.2 MG/KG
MAX DOSE 12 MG

CONTACT MED CONTROL
FOR POSSIBLE
SYNCHRONIZED
CARDIOVERSION
0.5 TO 1 J/KG

TRANSPORT

PEDIATRIC WIDE COMPLEX TACHYCARDIA WITH A PULSE AND POOR PERFUSION

SUPPORT ABCs AS NECESSARY

ASSESS PERFUSION

PERFORM VAGAL MANEUVERS

CONTACT MEDICAL CONTROL
FOR POSSIBLE ADMINISTRATION
OF AN ANTI-ARRHYTHMIC MEDICATION

TRANSPORT

CONTACT MEDICAL CONTROL
FOR POSSIBLE SYNCHRONIZED
CARDIOVERSION AT 0.5 TO 1 J/KG

OR

ADMINISTRATION OF AN
ANTI-ARRHYTHMIC MEDICATION

TRANSPORT

Pediatric Protocols Pediatric Cardiopulmonary Arrest	Lorain County EMS Protocols Pediatric Protocol 3 Revised 3/2006, 8/15/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Cardiac arrest in children is primarily due to the lack of an adequate airway, resulting in hypoxia.
- 1.2. All EMT personnel must concentrate on opening and maintaining the airway and providing 100% oxygenation.
- 1.3. When using BVM ventilation, cricoid pressure can be applied to occlude the esophagus and prevent gastric distention. Cricoid pressure can be applied until an ET tube can be inserted.
- 1.4. Transport immediately when excessive hemorrhage or hypothermia is present. Advanced life support measures should be carried out during transportation.
- 1.5. If peripheral IV's cannot be rapidly established, venous access may be obtained by Intraosseous route (IO) in an unresponsive patient.
- 1.6. If IV or IO access cannot be established, administer appropriate medications through the endotracheal tube.
- 1.7. If Sudden Infant Death Syndrome (SIDS) is suspected:
 - 1.7.1. Initiate basic and advanced life support, unless apparent rigor mortis or signs of lividity are present.
 - 1.7.2. Reassure parents they are not at fault.
 - 1.7.3. Encourage family to have friends or neighbors accompany them to the hospital.
- 1.8. Refer to BROSELOW PEDIATRIC EMERGENCY TAPE when unsure about patient weight, age and/or drug dosage.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC

- 3.1. Open and maintain airway with sniffing position.
- 3.2. Ventilate with 100% oxygen, via bag valve mask with oxygen reservoir.
- 3.3. Initiate cardiac compressions.
- 3.4. Apply AED if child is at least 1 years old or greater than 10 kg.
- 3.5. Establish communications with Medical Control and advise of patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes.

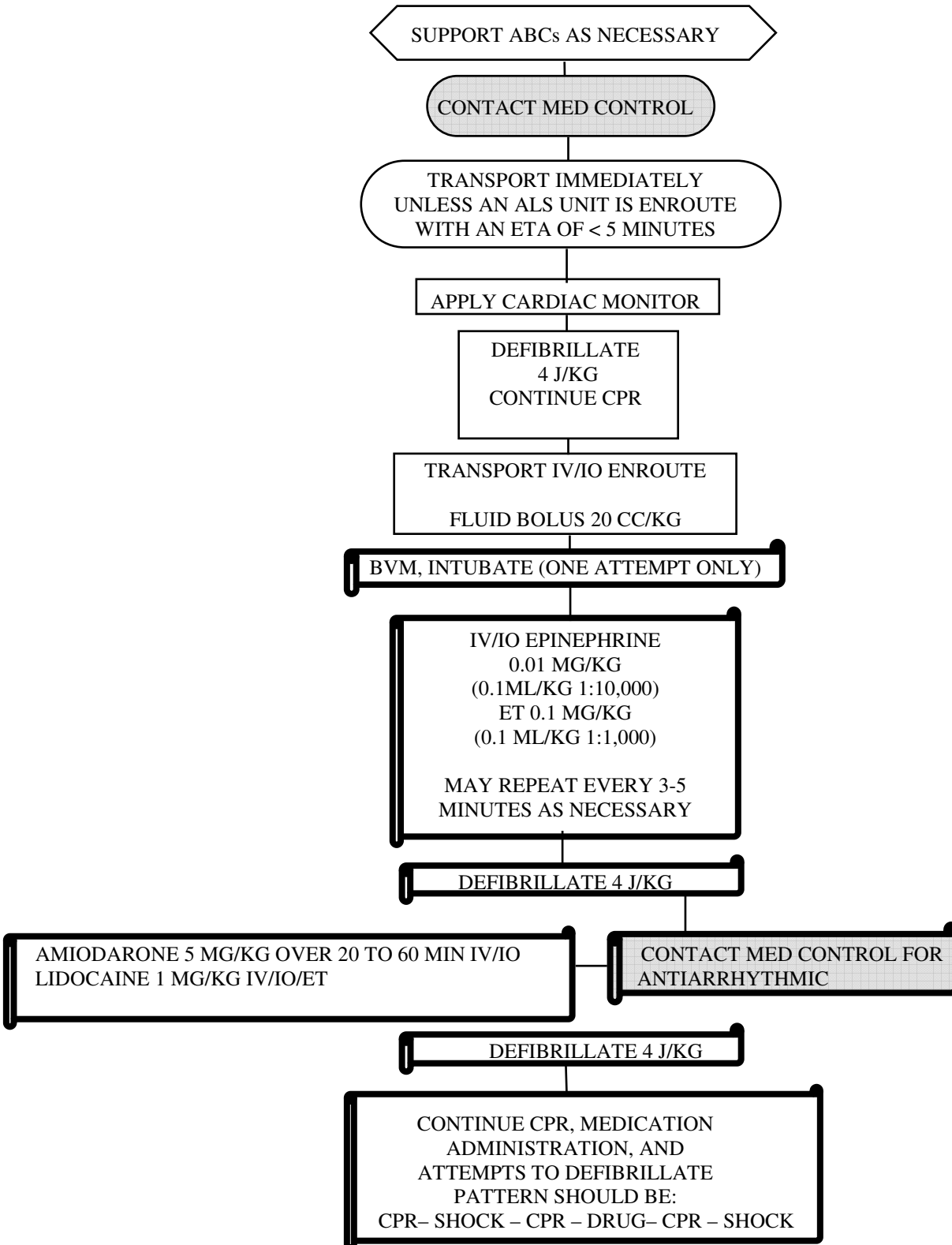
4. EMT – INTERMEDIATE

- 4.1. Assume charge and confer with EMT as to patient's condition and circumstances.
- 4.2. Apply cardiac monitor and interpret rhythm.

- 4.3. If monitor shows ventricular fibrillation or pulseless ventricular tachycardia:
 - 4.3.1. Defibrillate 4 joules/kg
 - 4.3.2. CPR per AHA Guidelines
 - 4.3.3. If no change, defibrillate 4 joules/kg
 - 4.3.4. If no change, continue CPR and transport
 - 4.4. TRANSPORT IMMEDIATELY and continue the following resuscitative efforts enroute to the hospital.
 - 4.5. Start IV or IO of saline with pediatric IV tubing set-up, if available, and give fluid bolus of 20cc/kg. IV should be accomplished enroute to hospital.
 - 4.6. Asystole / pulseless electrical activity (PEA)
 - 4.6.1. Check Asystole in two different leads to confirm arrhythmia is not fine VF.
 - 4.6.2. TREAT CAUSE: consider hypovolemia, hypothermia, hypoxia, hypo/hyperkalemia, hypoglycemia, hydrogen ions (acidosis), cardiac tamponade, tension pneumothorax, tablets/toxins (overdose), thrombosis (pulmonary embolism, MI), trauma.
 - 4.7. IV fluid bolus, 20 cc/kg of saline.
5. EMT – PARAMEDIC
- 5.1. Assume charge and confer with EMT's as to patient's condition and circumstances.
 - 5.2. If EMT-I is in a cycle of defibrillation, complete cycle before continuing.
 - 5.3. Assess airway and intubate patient if needed.
 - 5.4. Establish IV or IO, whichever is quickest.
 - 5.5. Apply monitor. If one of the following conditions exists, treat as follows:
 - 5.5.1. Ventricular fibrillation or pulseless ventricular tachycardia:
 - 5.5.1.1. Defibrillate 4 joules/kg
 - 5.5.1.2. CPR per AHA Guidelines
 - 5.5.1.3. If no change, defibrillate 4 joules/kg
 - 5.5.1.4. If no change, continue CPR
 - 5.5.1.5. Administer Epinephrine IV, IO, or ET every 3-5 minutes
 - 5.5.1.5.1. When IV or IO routes are available, administer 0.01mg/kg (0.1 ml/kg) of 1:10,000.
 - 5.5.1.5.2. When administering through ET tube, use 0.1mg/kg (0.1mL/kg) of 1:1,000. ET Epinephrine must be diluted to a volume of 3-5 mL with normal saline.
 - 5.5.1.6. If no change, defibrillate 4 joules/kg
 - 5.5.1.7. If no change, continue CPR and transport.
 - 5.5.1.8. If no change, contact medical control for administration of an anti-arrhythmic.
 - Amiodarone 5 mg/kg IV/IO over 20-60 minutes
 - Lidocaine 1 mg/kg IV/IO/ET
 - 5.5.1.9. If no change, defibrillate 4 joules/kg
 - 5.5.1.10. If no change:

- 5.5.1.10.1. CPR
- 5.5.1.10.2. Continue medication administration and attempts at defibrillation.
- 5.5.1.10.3. Pattern should be: CPR – SHOCK – CPR – DRUG – CPR – SHOCK.
- 5.5.2. Asystole / pulseless electrical activity (PEA)
 - 5.5.2.1. Check Asystole in two different leads to confirm arrhythmia is not fine VF.
- 5.5.3. TREAT CAUSE: consider hypovolemia, hypothermia, hypoxia, hypo/hyperkalemia, hypoglycemia, hydrogen ions (acidosis), cardiac tamponade, tension pneumothorax, tablets/toxins (overdose), thrombosis (pulmonary embolism, MI), trauma.
 - 5.5.3.1. CPR and administer epinephrine IV, IO, or ET every 3-5 minutes.
 - 5.5.3.1.1. When IV or IO routes are available, administer 0.01mg/kg (0.1 mL/kg) of 1:10,000.
 - 5.5.3.1.2. When administering through ET tube, use 0.1mg/kg (0.1 mL/kg) of 1:1,000. ET epinephrine must be diluted to a volume of 3-5 mL with normal saline.
 - 5.5.3.2. If no change, IV fluid bolus, 20 cc/kg of saline.
 - 5.5.3.3. Check blood sugar and if less than 70 administer:
 - 5.5.3.3.1. 2 ml/kg 25% dextrose for children under 25 kg (50 lbs) (D50 can be diluted 1:1 with sterile water to create D25).
 - 5.5.3.3.2. 1 ml/kg 50% dextrose for children over 25 kg (50 lbs).
 - 5.5.3.4. If no change, CPR and TRANSPORT.

PEDIATRIC VF/PULSELESS VT



**PEDIATRIC
ASYSTOLE/PEA**

SUPPORT ABCs AS NECESSARY

CONTACT MED CONTROL

TRANSPORT IMMEDIATELY
UNLESS AN ALS UNIT IS ENROUTE
WITH AN ETA OF < 5 MINUTES

APPLY CARDIAC MONITOR
CONFIRM ASYSTOLE IN 2 LEADS
ESTABLISH IV/IO ENROUTE

ATTEMPT TO FIND AND
CORRECT ANY OF THE
FOLLOWING:
hypovolemia, hypothermia, hypoxia,
hypo/hyperkalemia, hypoglycemia, hydrogen
ions (acidosis), cardiac tamponade, tension
pneumothorax, tablets/toxins (overdose),
thrombosis (pulmonary embolism, MI), trauma.

EPINEPHRINE

IV/IO 0.01 MG/KG
(0.1 ML/KG 1:10,000)

ET 0.1MG/KG
(0.1 ML/KG 1:1,000)

REPEAT EVERY 3-5 MINUTES

IV FLUID BOLUS

20 CC/KG NS

MAY REPEAT AS NECESSARY

BLOOD SUGAR < 70

2 ML/KG OF D25
LESS THAN 25 KG (50 LBS)

1 ML/KG OF D50
GREATER THAN 25 KG (50 LBS)

Pediatric Protocols
Child Abuse/Neglect

Lorain County EMS Protocols
Pediatric Protocol 4
Revised 3/17/2006
Reviewed 7/29/2006

1. GENERAL CONSIDERATIONS

- 1.1. Child abuse/neglect is widespread enough that nearly all EMT's and Paramedics will see these problems at some time. The first step in recognizing abuse or neglect is to accept that they exist.
- 1.2. Initiate treatment as necessary for situation using established protocols.
- 1.3. If possible remove child from scene, transporting to hospital even if there is no medical reason for transport.
- 1.4. If parents refuse permission to transport, notify law enforcement for appropriate disposition. If patient is in immediate danger, let law enforcement handle scene.
- 1.5. Advise parents to go to hospital. **AVOID ACCUSATIONS** as this may delay transport. Adult with child may not be the abuser.
- 1.6. Carefully document findings and report to physician at the hospital. An EMT must also report or assure that actual or suspected child abuse/neglect is reported to the local law enforcement agency or the Children's Services Board.

DOCUMENT THIS NOTIFICATION

DO NOT JEOPARDIZE YOUR SAFETY

Pediatric Protocols Fever	Lorain County EMS Protocols Pediatric Protocol 5 Revised 3/17/2006 Reviewed 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. If febrile, remove excess clothing, but take great care to avoid shivering. Consider environment and temperature of vehicle.
- 1.2. Suggest transport or urgent medical attention for all infants < 8 weeks of age with a reported temperature > 100.4F (38C) or < 96F(35.5C).
- 1.3. Obtain history:
 - 1.3.1. Feeding
 - 1.3.2. Previous Illnesses
 - 1.3.3. Degree of Temperature
 - 1.3.4. Medications or Therapies Administered
 - 1.3.5. Immunizations

Pediatric Protocols Fluid and Drug Administration	Lorain County EMS Protocols Pediatric Protocol 6 Revised 3/2006, 7/29/2006
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1. EMT – INTERMEDIATE

- 1.1. Peripheral venous access lines will be the first route for fluid and drug administration for any life or limb threatening emergency situation.
- 1.2. Unless there are compelling factors, no more than two attempts at peripheral access should be made in the pediatric patient.
- 1.3. In **life threatening situations with an unresponsive patient** where venous access appears futile, immediately establish intraosseous access.
- 1.4. Intraosseous access.
 - 1.4.1. The following are guidelines for the UNSTABLE child requiring alternative vascular access AFTER ensuring airway and ventilation are established:
 - 1.4.1.1. **Indications:** Route of choice for fluid and/or drug administration when peripheral IV access cannot be rapidly obtained and child is unstable (severely altered vital signs, markedly decreased level of consciousness, shock, status epilepticus, and cardiopulmonary arrest).
 - 1.4.1.2. **Contra-indications:** Recently fractured bone, known bone disorder, unsuccessful prior attempt, cellulitis or infected burn at site
 - 1.4.1.3. **Equipment:** Intraosseous needle, and alcohol preps, 10cc syringe, extension tubing, 3-way stop cock.
 - 1.4.2. **Procedure:**
 - 1.4.2.1. Select site (Tibia preferred)
 - 1.4.2.1.1. **Tibia** - flat, anterior/medial aspect of proximal tibial shaft, approximately 1-3 cm below the proximal tibial tuberosity.
 - 1.4.2.1.2. **Femur** - distal 1/3 of femur, anterior midline, approximately 3 cm (2 finger widths) above the top of the patella.
 - 1.4.2.2. Prep skin with alcohol.
 - 1.4.2.3. After penetration of the skin, direct the needle at 90-degree angle OR at a slight 10-15 degree vertical angle towards the toes, while applying gentle pressure, using a twisting drilling motion.
 - 1.4.2.4. After penetration through the cortex, as bone marrow cavity is entered, operator may feel a 'pop' or less resistance. Remove the inner stylette and attach 10cc syringe.
 - 1.4.2.5. Placement usually confirmed by successful fluid administration without edema or swelling.
 - 1.4.2.6. Connect to conventional IV tubing and infuse fluids, blood or drugs as per protocol. If infusion fails to run or runs slowly, flush needle with 5 ml's of isotonic solution.

- 1.4.2.7. Secure needle.
- 1.4.2.8. Immobilize extremity and observe site frequently for extravasation of fluid.
- 1.4.2.9. Infusion may require pressure bag to maintain patency or 60 cc syringe to provide bolus dosing.
- 1.4.2.10. Document procedure and child's response.
- 1.4.2.11. Fluid of choice is Normal Saline, utilizing a macrodrip administration set.

2. EMT – PARAMEDIC

2.1. When peripheral or IO access is not available for administering medications:

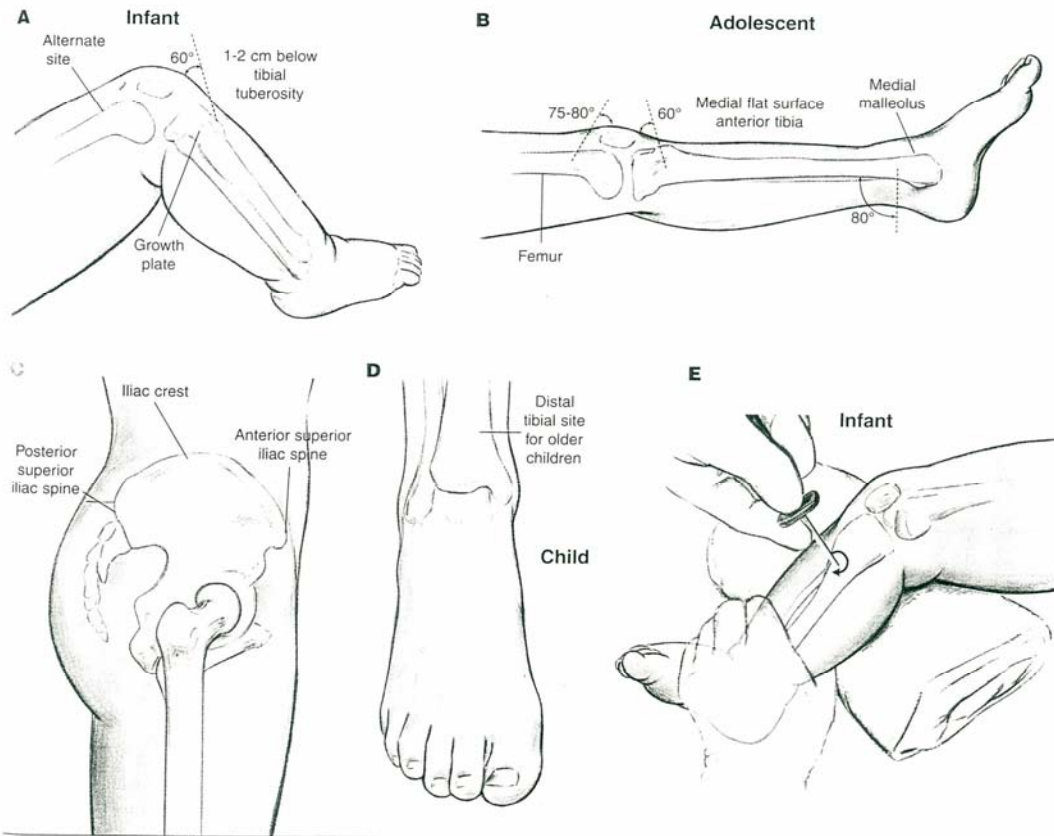
2.1.1. If an ET tube is in place, the ET tube should be the route of administration for

- Lidocaine
- Atropine
- Narcan
- Epinephrine

2.1.2. Intramuscular (IM) route may be used for morphine.

2.1.3. Rectal route may be used for Valium (diazepam).

FIGURE 1. A, Locations for intraosseous infusion (IOI) in an infant. B, Locations for IOI in the distal tibia and the femur in older children. C, Location for IOI in the iliac crest. D, Location for IOI in the distal tibia. E, Technique for IOI infusion needle.



Pediatric Protocols Multi-Trauma	Lorain County EMS Protocols Pediatric Protocol 7 Revised 3/17/2006 Reviewed 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Pediatric Trauma care should primarily follow the Adult Protocol.
- 1.2. Areas where special focus should occur:
 - 1.2.1. May involve both respiratory failure and shock.
 - 1.2.2. Assessment and support of cardiopulmonary function is fundamental.
- 1.3. Common errors of pediatric trauma resuscitation are:
 - 1.3.1. Failure to open and maintain the airway.
 - 1.3.2. Failure to provide appropriate fluid resuscitation to children with head injury.
 - 1.3.3. Failure to recognize and treat internal hemorrhage.
- 1.4. IO infusion is indicated in the trauma setting when shock needs to be treated and rapid venous access is unobtainable.
- 1.5. The Proper size equipment is very important to resuscitation care. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage and when choosing equipment size.
- 1.6. If a MAST device is available, it may be useful in children with pelvic hemorrhage.

Pediatric Protocols
Newborn Resuscitation

Lorain County EMS Protocols
Pediatric Protocol 8
Revised 3/2006, 7/29/2006

1. GENERAL CONSIDERATIONS

- 1.1. Body heat must always be maintained. When the baby is born, wipe the baby dry and place in a warm environment. The following are ways to maintain body heat:
 - 1.1.1. Cover infant's head, place infant against mother's skin, and cover both.
 - 1.1.2. If child separated from mother, use child seat with heat packs under and beside infant. Be sure to place towels between heat packs and infant.
 - 1.1.3. Use indirect, heated, humidified oxygen if available.
- 1.2. Always position infant in the sniffing position (1" towel under shoulders). This will allow for an adequate open airway and drainage of secretions.
- 1.3. Intermittently suction infant until airway is clear of all secretions. Prolonged deep suction may cause bradycardia.
 - 1.3.1. Meconium aspiration is a major cause of death and morbidity among infants. If thick Meconium is present and not removed adequately a high percentage (60%) of these infant will aspirate the Meconium.
 - 1.3.2. If Meconium is present, suction the mouth then nose thoroughly. It may also be necessary to visualize the trachea and suction the lower airway. Lower airway suction is achieved by intubating the infant and suctioning directly through the ET tube. This lower airway suction is only done when thick Meconium is present; watery or thin Meconium does not require routine endotracheal intubation.
 - 1.3.2.1. Mechanical suction may be used on infant but only if the suction pressure does not exceed -100 mmHg or -136 cmH₂O. Bulb suctioning is preferred.
- 1.4. If drying and suction has not provided enough tactile stimulation, try flicking the infant's feet and/or rubbing the infant's back. If this stimulation does not improve the infant's breathing, then BVM may be necessary.
- 1.5. Avoid direct application of cool oxygen to infant's facial area as this may cause respiratory depression due to a strong mammalian dive reflex immediately after birth
- 1.6. American Heart Association standards will be used as a guideline for both Basic and Advanced Life Support procedures.
- 1.7. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage.

2. DIVISIONS AFFECTED

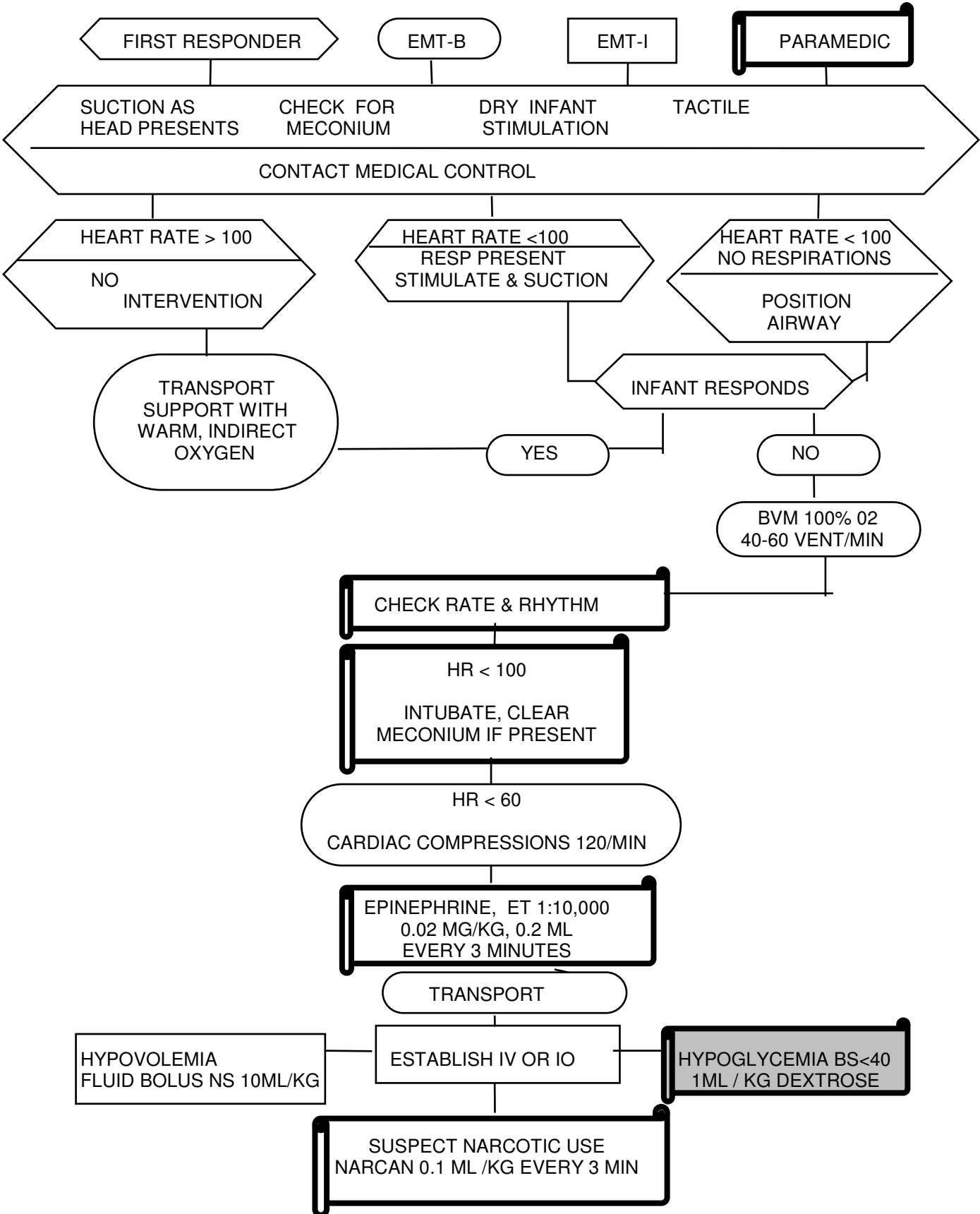
- 2.1. All Public and Private EMS.

3. EMT – BASIC & INTERMEDIATE

- 3.1. After delivery of the newborn's head, but prior to delivery of the body, quickly and thoroughly suction mouth, oropharynx, and then nose with a bulb syringe.

- 3.2. After delivery of the infant, assess airway and breathing while drying and positioning head down. If amniotic fluid NOT clear, continue to suction PRIOR to ventilating and stimulating.
 - 3.3. If infant not breathing, assist ventilations via mouth-to-mouth using barrier device.
 - 3.4. If no pulse or pulse below 60, begin CPR.
 - 3.5. Keep infant warm. Wrap in dry blankets.
 - 3.6. If heart rate is < 100, BVM ventilation is necessary to increase heart rate.
 - 3.7. If heart rate is < 60 despite adequate ventilation, cardiac compressions should be initiated.
 - 3.8. BVM ventilation is also indicated for apnea and persistent central cyanosis.
 - 3.9. BVM ventilation rate should be between 40 and 60 breaths per minute. Cardiac compression rate should be at a rate of 120 times per minute. (COMPRESSION TO BREATH RATIO OF 3:1)
 - 3.10. Establish communications with Medical Control and advise of patient condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.
4. EMT – PARAMEDIC
- 4.1. Assume charge and confer with EMT's about condition of patient and situation.
 - 4.2. Intubate patient if thick Meconium is present in lower airway; suction through ET tube using a Meconium aspirator ONCE and then re-intubate with new tube if newborn shows no vigorous activity.
 - 4.3. Apply monitor and check rhythm.
 - 4.4. If Asystole or spontaneous heart rate is less than 60 despite adequate ventilation:
 - 4.4.1. Administer epinephrine 0.01-0.03 mg/kg (0.1-0.3 ml/kg) of 1:10,000 via IV or ET 0.01-0.03 mg/kg of 1:1,000.
 - 4.4.2. If no response, repeat every 3-5 minutes.
 - 4.5. Establish IV or IO.
 - 4.6. If infant shows signs of hypovolemia, administer saline 10 cc/kg over 5 minutes
 - 4.7. Consider Narcan administration if respirations are depressed and narcotic dependence is suspected
 - 4.7.1. 0.1mg/kg repeated every 3 minutes until respirations improve.
 - 4.8. Check blood sugar level and administer 1cc/kg of 10% Dextrose if level is below 40
 - 4.9. Transport to hospital.

NEWBORN RESUSCITATION



FIRST RESPONDER

EMT-B

EMT-I

PARAMEDIC

SUCTION AS HEAD PRESENTS CHECK FOR MECONIUM DRY INFANT STIMULATION TACTILE

CONTACT MEDICAL CONTROL

HEART RATE > 100
NO INTERVENTION

TRANSPORT SUPPORT WITH WARM, INDIRECT OXYGEN

HEART RATE < 100
RESP PRESENT
STIMULATE & SUCTION

HEART RATE < 100
NO RESPIRATIONS
POSITION AIRWAY

INFANT RESPONDS

YES

NO

BVM 100% O2
40-60 VENT/MIN

CHECK RATE & RHYTHM

**HR < 100
INTUBATE, CLEAR MECONIUM IF PRESENT**

HR < 60
CARDIAC COMPRESSIONS 120/MIN

**EPINEPHRINE, ET 1:10,000
0.02 MG/KG, 0.2 ML EVERY 3 MINUTES**

TRANSPORT

HYPOVOLEMIA
FLUID BOLUS NS 10ML/KG

ESTABLISH IV OR IO

**HYPOGLYCEMIA BS<40
1ML / KG DEXTROSE**

**SUSPECT NARCOTIC USE
NARCAN 0.1 ML /KG EVERY 3 MIN**

Pediatric Protocols Pediatric Respiratory Distress Upper Airway Obstruction	Lorain County EMS Protocols Pediatric Protocol 9 Revised 3/17/2006 Reviewed 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. In children, open airway by using the sniffing position.
- 1.2. In suspected cases of upper airway obstructions, DO NOT attempt to visualize the airway; unless a foreign body is suspected. Keep patient calm and transport upright.
- 1.3. If BVM ventilation is necessary, cricoid pressure can be applied to minimize gastric distention until airway is secured.
- 1.4. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage.
- 1.5. Evaluate patient's general appearance, relevant history of condition and determine:

- | | |
|---|--|
| <u>O</u> nset
<u>P</u> rovokes
<u>Q</u> uality
<u>R</u> adiates
<u>S</u> everity
<u>T</u> ime
<u>I</u> nterventions | <u>A</u> llergies
<u>M</u> edication
<u>P</u> ast Medical History – especially RESPIRATORY
<u>L</u> ast Meal
<u>E</u> vents leading to present illness |
|---|--|

**UPPER AIRWAY
OBSTRUCTION**

- 1.6. Stridor, gagging or choking in the breathing patient with respiratory distress may indicate upper airway obstruction.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC

- 3.1. Quickly obtain history and non-invasive respiratory assessment.
 - 3.1.1. History of foreign body airway.
 - 3.1.1.1. Manual clearing only if foreign body is visible - NO BLIND FINGER SWEEP
 - 3.1.1.2. Back blows and chest thrust in children less than 1 yr.
 - 3.1.1.3. Abdominal and/or chest thrusts in children over 1 yr.
 - 3.1.1.4. If airway cannot be cleared in 60 seconds:
 - 3.1.1.4.1. Transport immediately to nearest hospital.
 - 3.1.1.4.2. Do not take history.
 - 3.1.1.4.3. Do not make further physical assessment.

- 3.2. Other cause of upper airway obstruction.
 - 3.2.1. DO NOT AGITATE CHILD, DO NOT EXAMINE THROAT.
 - 3.2.2. Administer oxygen by NRB if tolerated or by “blow-by”.
- 3.3. Allow the child to assume a position of comfort. The child may assume the tripod position. Encourage parent to hold the child upright. Keep child and parent (or caregiver) CALM. Do not agitate child.
- 3.4. Transport in an upright position immediately to the nearest appropriate hospital.
4. EMT – INTERMEDIATE
 - 4.1. Assume charge and confer with EMT’s about condition of patient and situation.
 - 4.2. Reassess breath sounds and treat as follows:
 - 4.2.1. Do not establish IV access unless child is in arrest. DO NOT agitate child.
 - 4.2.2. If foreign body in airway is suspected in unconscious patient with complete obstruction and basic procedures are unsuccessful, try to visualize obstruction with laryngoscope, if obstruction visualized, use Magill Forceps for removal.
5. EMT – PARAMEDIC
 - 5.1. Assume charge and confer with EMT’s about condition of patient and situation
 - 5.2. Reassess breath sounds and treat as follows:
 - 5.2.1. If cause of upper airway obstruction is unknown and child is calm, a normal saline aerosol may be administered. DO NOT further agitate child.
 - 5.2.2. Do not attempt invasive airway unless child has respiratory arrest. Bag-valve mask ventilation is acceptable.
 - 5.2.3. If foreign body in airway is suspected in unconscious patient with complete obstruction, and basic procedures are unsuccessful, try to visualize obstruction with laryngoscope and remove with Magill forceps.
 - 5.2.4. If airway is completely obstructed a needle, or surgical cricothyrotomy may be life saving. Contact medical control. A Pedi trach may be used if available.

Pediatric Protocols Pediatric Respiratory Distress Lower Airway Obstruction	Lorain County EMS Protocols Pediatric Protocol 10 Revised 3/2006, 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Wheezing in the breathing patient with respiratory distress indicates lower airway disease, which may come from a variety of causes. The patient with severe lower airway disease may have altered LOC, be unable to talk, may have absent or markedly decreased breath sounds and severe retractions with accessory muscle use.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC

- 3.1. Place child in position of comfort, encourage parent to hold child upright. Keep child and parent CALM.
- 3.2. Quickly obtain history and non-invasive respiratory assessment.
- 3.3. Administer 100% Oxygen in the least threatening manner.
- 3.4. If respiratory effort is insufficient or patient is becoming unconscious, assist ventilations with bag-valve-mask.
 - 3.4.1. If allergic reaction is suspected:
 - 3.4.1.1. Secure airway and support with oxygen.
 - 3.4.1.2. Ask patient or bystanders if epinephrine by auto-injector has been prescribed for these situations, administer medication as per protocol, then transport patient immediately.
 - 3.4.2. For other causes of wheezing:
 - 3.4.2.1. Ask patient or bystanders if a bronchial dilator by inhaler has been prescribed for these situations. If they have the medication with them, administer medication as per protocol, then transport patient.
- 3.5. IF MEDICATION IS NOT AVAILABLE- Transport immediately, unless ALS unit is enroute and has an ETA of less than 5 minutes

4. EMT – INTERMEDIATE

- 4.1. Assume charge of situation.
- 4.2. Reassess breath sounds.
- 4.3. DO NOT establish IV access unless child is in arrest. Do not agitate child.
- 4.4. Reassess breath sounds and treat as follows
 - 4.4.1. If allergic reaction is suspected.
 - 4.4.1.1. Give 0.01 mg/kg (0.01 MI/kg) of 1:1,000 epinephrine by subcutaneous injections MAX Dose 0.3mg (0.3mL)
 - 4.4.2. For other causes of wheezing:

4.4.2.1. Administer 2.5 mg Albuterol aerosol with 6 L/min oxygen over 10-15 minutes. Observe and document child's response. If no improvement, notify receiving facility or Medical Control.

4.4.2.2. DO NOT attempt invasive airway unless child has respiratory arrest.

5. EMT – PARAMEDIC

5.1. Assume charge and confer with EMT's about condition of patient and situations.

5.2. Reassess breath sounds and treat as follows

5.2.1. If allergic reaction is suspected:

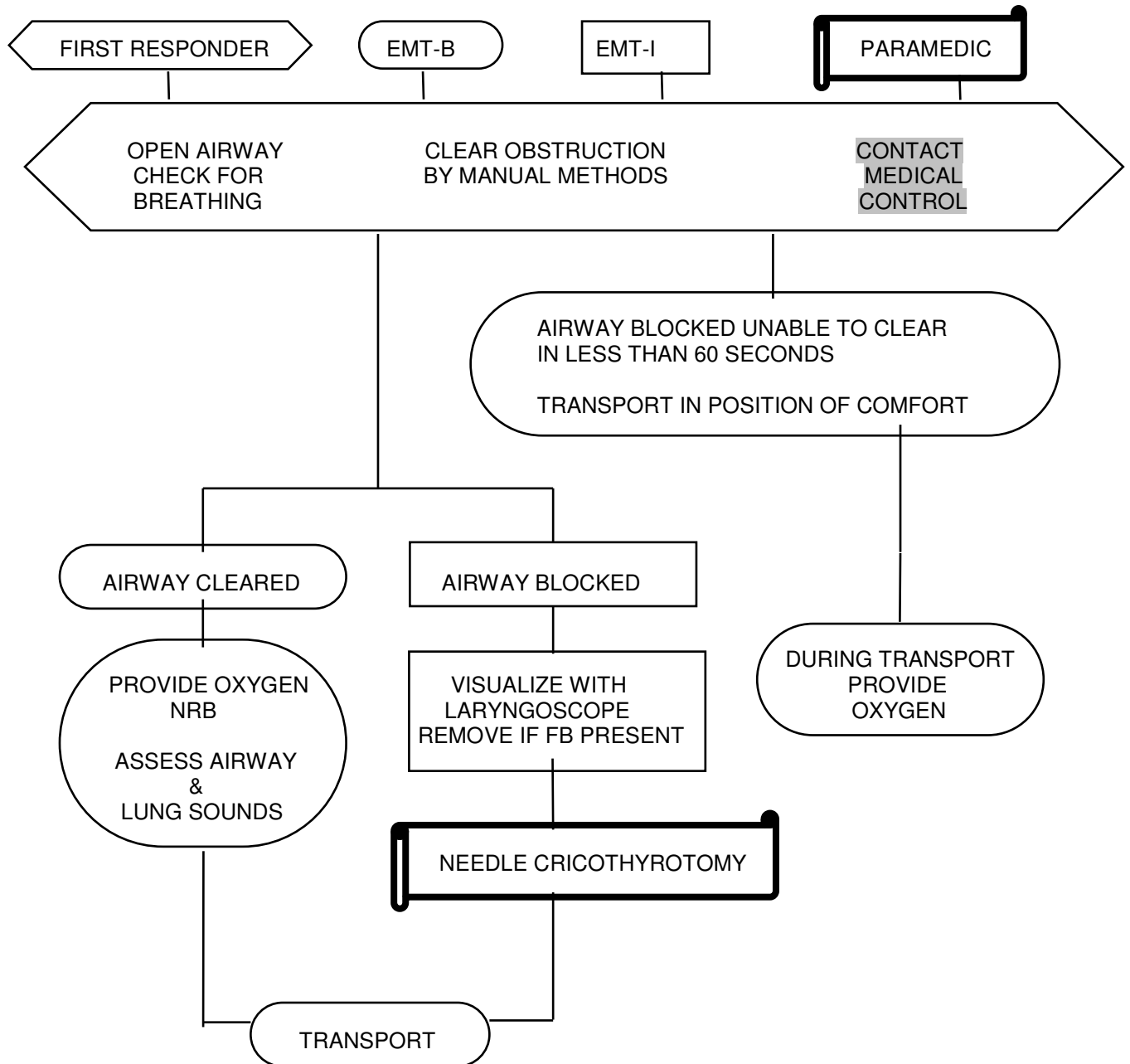
5.2.1.1. Give 0.01 mg/kg (0.01 ml/kg) of 1:1000 epinephrine by subcutaneous injection. MAX dose 0.3mg (0.3mL)

5.2.2. For other causes of wheezing:

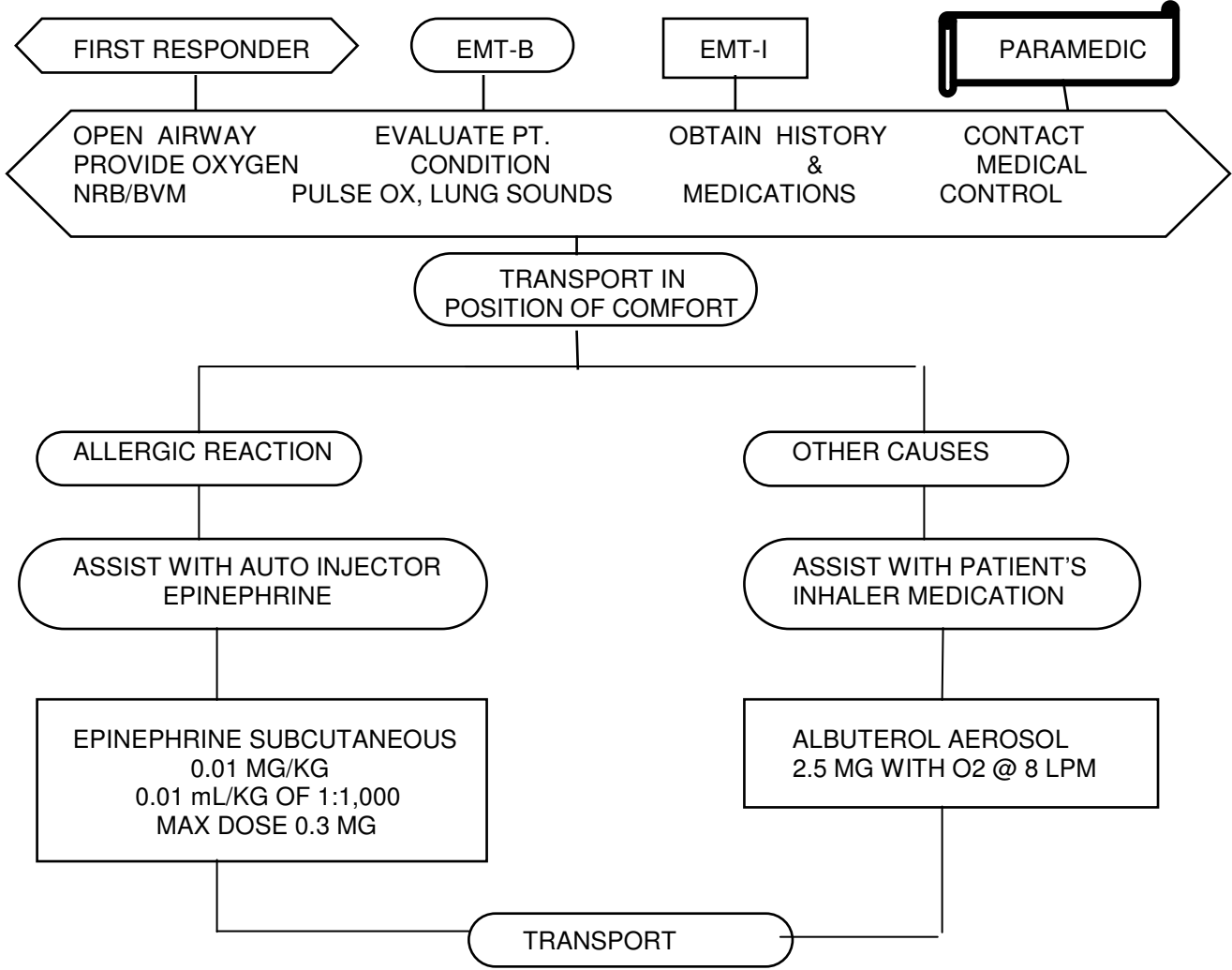
5.2.2.1. Administer 2.5 mg Albuterol aerosol with 6 L/min oxygen over 10-15 minutes. Observe and document child's response. If no improvement, notify receiving facility or Medical Control.

5.2.3. DO NOT attempt invasive airway unless child has respiratory arrest.

PEDIATRIC RESPIRATORY DISTRESS
UPPER AIRWAY OBSTRUCTION



PEDIATRIC RESPIRATORY DISTRESS
LOWER AIRWAY DISEASE



FIRST RESPONDER

EMT-B

EMT-I

PARAMEDIC

OPEN AIRWAY
PROVIDE OXYGEN
NRB/BVM

EVALUATE PT.
CONDITION
PULSE OX, LUNG SOUNDS

OBTAIN HISTORY
&
MEDICATIONS

CONTACT
MEDICAL
CONTROL

TRANSPORT IN
POSITION OF COMFORT

ALLERGIC REACTION

OTHER CAUSES

ASSIST WITH AUTO INJECTOR
EPINEPHRINE

ASSIST WITH PATIENT'S
INHALER MEDICATION

EPINEPHRINE SUBCUTANEOUS
0.01 MG/KG
0.01 mL/KG OF 1:1,000
MAX DOSE 0.3 MG

ALBUTEROL AEROSOL
2.5 MG WITH O2 @ 8 LPM

TRANSPORT

Pediatric Protocols
Pediatric Seizure

Lorain County EMS Protocols
Pediatric Protocol 11
Revised 3/2006, 7/29/2006

1. GENERAL CONSIDERATIONS

- 1.1. The seizure has usually stopped by the time the EMS personnel arrive. The patient will normally be in the post-ictal state.
- 1.2. The basic rule with seizures is to "protect and support" the patient.
- 1.3. Aspiration precautions should include:
 - 1.3.1. Recovery position: a left lateral recumbent position with the head lowered 15 to 30 degrees.
 - 1.3.2. Suction readily available.
 - 1.3.3. Clear mouth of foreign bodies (food, gum, etc.)
- 1.4. Febrile Seizures (seizures with fever) are common in children and should be treated like other seizures.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC

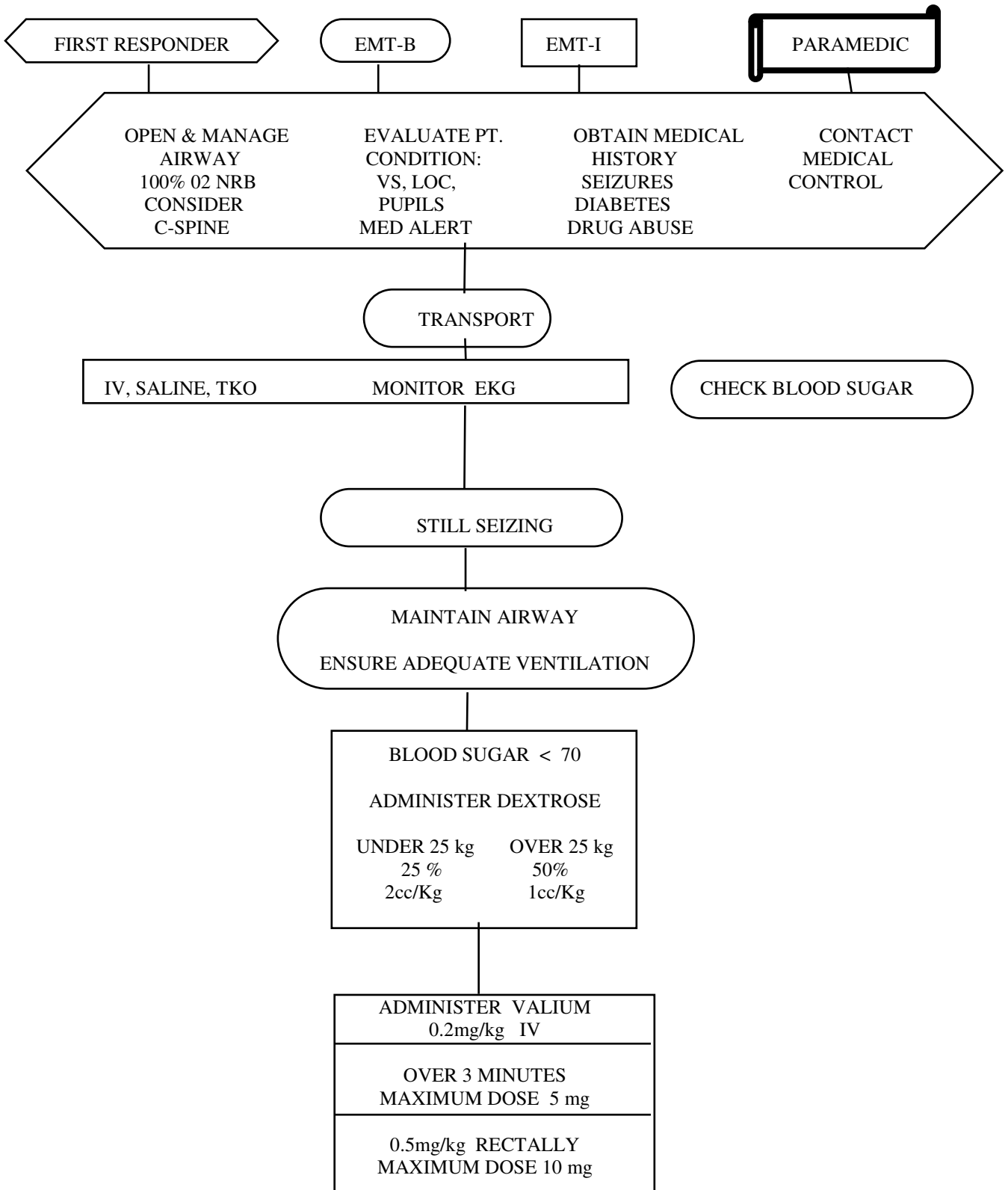
- 3.1. Place patient away from objects on which they might injure themselves; protect but do not restrain them.
- 3.2. Clear and maintain airway; consider C-spine injury.
- 3.3. Administer 100% oxygen with NRB as needed for ventilation.
- 3.4. Obtain history from family and/or bystanders:
 - 3.4.1. Seizure history
 - 3.4.2. Description of onset of seizure
 - 3.4.3. Medication
 - 3.4.4. Other known medical history, especially fever, head trauma, diabetes, drugs
- 3.5. Evaluate any evidence of injury, especially head trauma.
- 3.6. Bring any medications with child to the hospital.
- 3.7. Establish communications with Medical Control and advise of patient condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

4. EMT – INTERMEDIATE

- 4.1. Assist EMT's, obtain patient condition and circumstances.
- 4.2. Apply monitor and interpret rhythm.
- 4.3. If seizure activity persists establish airway

- 4.4. If seizure activity persists:
 - 4.4.1. Administer valium, 0.2 mg/kg, slow IV push over three minutes, to a maximum dosage of 5 mg.
 - 4.4.2. If no IV is available, administer valium rectally, 0.5 mg/kg, to a maximum dose of 10 mg.
5. EMT – PARAMEDIC
 - 5.1. Assume charge and confer with EMT's about patient and situation
 - 5.2. Make sure patient has good airway. In some cases intubation may be necessary.
 - 5.3. If seizure activity persists:
 - 5.3.1. Establish airway
 - 5.3.2. Start IV per Fluid and Medication Procedure
 - 5.4. If seizure activity persists, determine blood sugar level and treat accordingly
 - 5.4.1. Blood sugar less than 70, administer IV bolus:
 - 5.4.1.1. 2ml/kg of 25% Dextrose for children under 50 pounds (25 kg)
 - 5.4.1.2. 1ml/kg of 50% Dextrose for children over 50 pounds (25 kg)
 - 5.4.2. Administer valium, 0.2 mg/kg, slow IV push over three minutes, to a maximum dosage of 5 mg.
 - 5.4.2.1. If no IV is available, administer valium rectally, 0.5 mg/kg, to a maximum dose of 10 mg.

PEDIATRIC SEIZURES



Pediatric Protocols
Pediatric Shock

Lorain County EMS Protocols
Pediatric Protocol 12
Revised 3/2006, 7/29/2006

1. GENERAL CONSIDERATIONS

- 1.1. Shock is not only caused by blood loss. The EMT must evaluate for fluid loss from other causes such as excessive vomiting and/or diarrhea, heat exposure, severe infection, severe allergic reaction (anaphylaxis), spinal trauma, and heart failure.
- 1.2. Early evaluation of blood pressure is essential. **Tachycardia is often the first sign of shock.** A patient's blood pressure that is low differentiates between compensated and decompensated shock. Look for other signs of shock, such as lower body temperature, poor capillary refill, and decreased level of consciousness, increased heart rate, and/or poor skin color or turgor.
- 1.3. Transport should not be delayed. The airway must be secured and then transport immediately. It is preferable IVs and/or IO's be done during transportation.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC

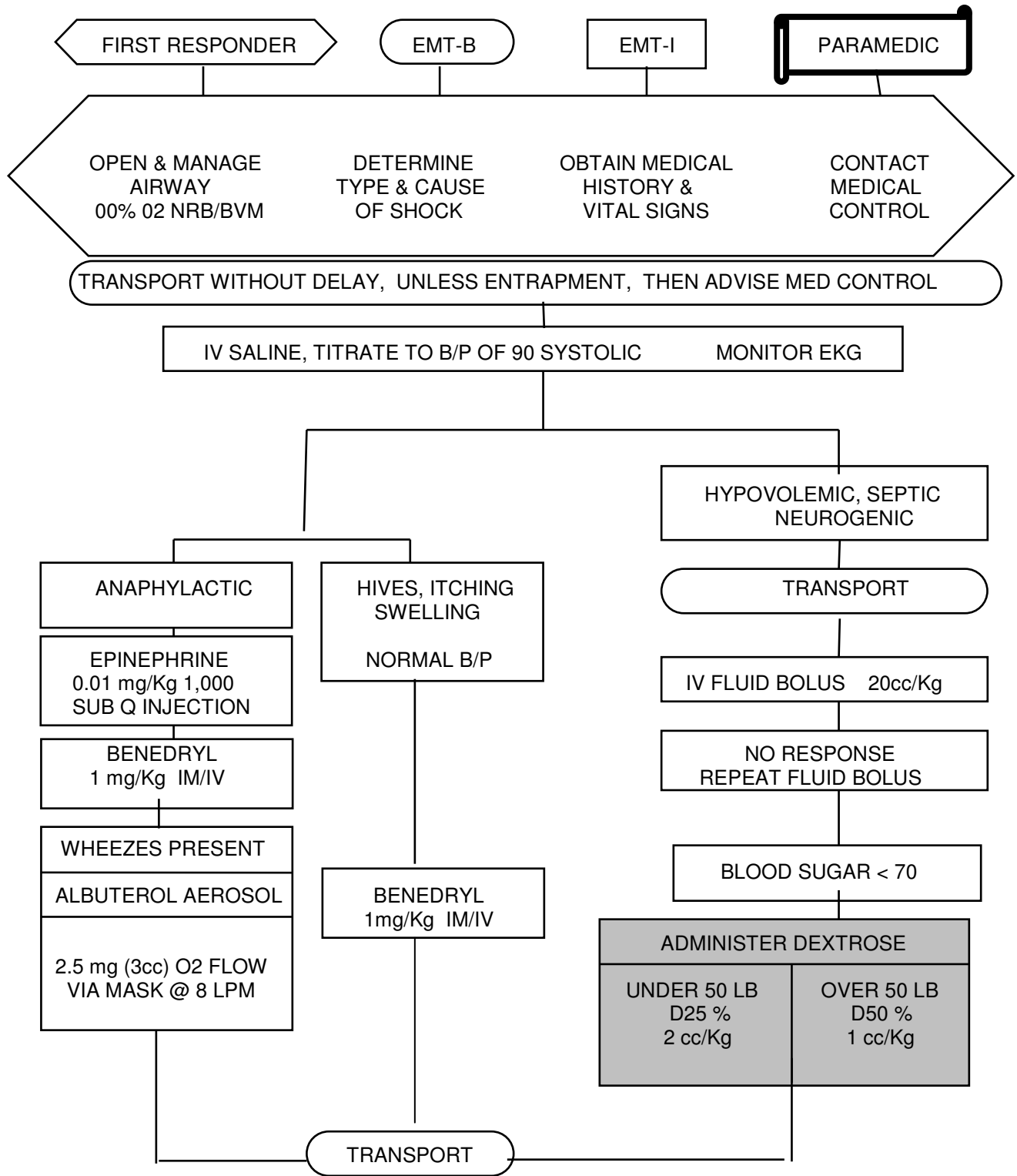
- 3.1. Open and maintain the airway with sniffing position and the use of an oral airway if needed.
- 3.2. Control all external bleeding and evaluate for internal hemorrhage and/or dehydration.
- 3.3. Provide 100% oxygen through NRB mask, and if needed assist ventilations with a BVM.
- 3.4. Obtain vital signs: pulse and respirations.
- 3.5. Establish communications with Medical Control and advise of patient condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

4. EMT – INTERMEDIATE

- 4.1. Assist EMT, obtain patient condition and circumstance.
- 4.2. Hypovolemic, Neurogenic or Septic Shock:
 - 4.2.1. Start IV saline during transport to the hospital.
 - 4.2.1.1. DO NOT DELAY TRANSPORT FOR IV
 - 4.2.2. Administer IV fluid bolus of 20cc/kg of saline if signs of hypoperfusion or dehydration are present
 - 4.2.3. Transport. Repeat bolus during transport if patient does not respond to first bolus.
- 4.3. Anaphylactic:
 - 4.3.1. Give 0.01cc/kg (1:1,000) epinephrine by injection subcutaneous. Maximum dose 0.3mg.

- 4.3.2. Administer Benadryl (Diphenhydramine) to be administered 1mg/kg IM or IV
NOTE: This is especially indicated when drug reactions are suspected.
 - 4.3.3. When wheezes are present and not cleared by epinephrine, provide Albuterol breathing treatment: 1 unit dose, 2.5mg (3cc), by child aerosol mask over 10-15 min.
 - 4.4. Hives, itching, and/or swelling with normal B/P:
 - 4.4.1. Administer Benadryl (Diphenhydramine) to be administered 1mg/kg IM or IV
 - 4.4.1.1. NOTE: This is especially indicated when drug reactions are suspected.
 - 4.5. Apply monitor and interpret rhythm.
5. EMT – PARAMEDIC
- 5.1. Assume charge and confer with EMT's about condition of patient and situation.
 - 5.2. Apply monitor and follow protocol for Arrhythmias.
 - 5.3. Identify type of shock and treat as follows:
 - 5.3.1. Hypovolemic, Neurogenic, Septic:
 - 5.3.1.1. Start IV or IO saline and administer fluid bolus of 20cc/kg if sign of hypoperfusion or dehydration are present (low BP, poor capillary refill, poor skin turgor)
 - 5.3.1.2. Repeat bolus during transport
 - 5.3.1.3. Check blood sugar; if less than 70, administer IV bolus:
 - 5.3.1.3.1. 2ml/kg of 25% Dextrose for children under 25 kg.
 - 5.3.1.3.2. 1ml/kg of 50% Dextrose for children over 25 kg.
 - 5.3.2. Anaphylactic:
 - 5.3.2.1. Give 0.01cc/kg (1:1000) epinephrine by injection subcutaneous. Maximum dose 0.3mg.
 - 5.3.2.2. Administer Benadryl (Diphenhydramine) to be administered 1mg/kg IM or IV
NOTE: This is especially indicated when drug reactions are suspected.
 - 5.3.2.3. When wheezes are present and not cleared by epinephrine, provide Albuterol breathing treatment: 1 unit dose, 2.5mg (3cc), by child aerosol mask over 10-15 min.
 - 5.3.3. Hives, itching, and/or swelling with normal B/P:
 - 5.3.3.1. Administer Benadryl (Diphenhydramine) to be administered 1mg/kg IM or IV.
NOTE: This is especially indicated when drug reactions are suspected.

PEDIATRIC SHOCK



Pediatric Protocols Children with Special Needs Tracheostomies	Lorain County EMS Protocols Pediatric Protocol 13 Revised 3/17/2006 Reviewed 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Children formerly cared for in hospitals or chronic care facilities are often cared for in homes by parents or other caretakers. These children may have self-limiting or chronic diseases. Many are often unstable and may frequently involve the EMS system for evaluation, stabilization, and transport.
- 1.2. Knowing which children in a given area have special needs and keeping a logbook can be very useful.
- 1.3. Parents and caretakers are usually trained in emergency management and can be of assistance to EMS personnel.
- 1.4. Special needs children include children with tracheotomy tubes with or without assisted ventilation, children with gastrostomy tubes, and children with indwelling central lines. Most serious complications of these devices are related to tracheotomy problems.
- 1.5. Remember to use the “**DOPE**” mnemonic for children who are tracheally intubated to assist you in identifying complications
 - D** – Displaced tube (esophagus or right main bronchus)
 - O** – Obstruction (kinked ET tube or pass a suction catheter through the ET tube)
 - P** – Pneumothorax (need to needle decompress)
 - E** – Equipment Failure (check O2 tank and connections, check for disconnects on BMV, remove patient for mechanical ventilator, ect.)

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC & INTERMEDIATE

- 3.1. Examine the child quickly for possible causes of distress, which may be easily correctable, such as a detached oxygen source.
- 3.2. Try to establish the child’s baseline: the child may never look normal.
- 3.3. If on a ventilator, remove the child from the ventilator and bag the child with a secure oxygen source; there may be a problem with the ventilator or oxygen source.
- 3.4. Suction the child as accumulation of debris is a common cause of obstruction; if the tracheotomy tube has a cannula, remove it; if it is the cause of obstruction there should be immediate improvement.
- 3.5. If still no improvement immediately transport to the nearest medical facility; initiate appropriate resuscitation as needed.

4. EMT – PARAMEDIC

- 4.1. If there is no improvement and the child is in severe respiratory distress, the tube should be removed, attempt a bag-valve mask ventilation; if another tube is available, insert into the stoma and resume ventilation (a standard properly sized endotracheal tube may be used or the used tracheotomy tube after being cleaned.)

- 4.2. If there is still no improvement see the respiratory distress protocol.
- 4.3. If there **is** improvement, contact med control and follow No Treat, No Transport Protocol if so desired.

Pediatric Protocols Children with Special Needs Dwelling Central Lines	Lorain County EMS Protocols Pediatric Protocol 14 Revised 3/17/2006 Reviewed 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Children may have central lines in several locations and some complications are due to location; some central lines are located under the skin and can be felt but not seen.
- 1.2. The most common emergencies with central lines include, blockage of the line, complete or partial accidental removal, or complete or partial laceration of the line.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC, INTERMEDIATE & PARAMEDIC

- 3.1. Always evaluate child for cardiovascular stability as some complications may be life threatening.
- 3.2. Children may be experiencing complications from their underlying medical condition; ask caretakers about the child's condition.
- 3.3. If line is blocked, do not attempt to force the catheter open, transport to most appropriate facility.
- 3.4. For incomplete removal, do not attempt to reinsert; transport to the nearest emergency department.
 - 3.4.1. Infections are a common complication; don't try to push a line back in, even if it is only slightly out.
- 3.5. For complete removal, maintain pressure on site until bleeding has stopped; transport child and catheter to nearest emergency department (part of the catheter may have broken off.)
 - 3.5.1. Always bring the line with you to the hospital.
- 3.6. For partial or complete cut in the line or damage to the catheter, clamp proximally to laceration and transport child and catheter to nearest emergency department. If suspected air embolus, place in left lateral recumbent position
- 3.7. For children with sudden deterioration begin basic resuscitation and transport to nearest emergency facility (child may have pneumothorax or internal bleeding.)

<p>Pediatric Protocols Children with Special Needs Gastrostomy Tubes</p>	<p>Lorain County EMS Protocols Pediatric Protocol 15 Revised 3/17/2006 Reviewed 7/29/2006</p>
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1. GENERAL CONSIDERATIONS

- 1.1. Children with gastrostomy tubes may have complications of obstruction or dislodgment; obstruction is usually not an emergency but the child may require transport; dislodgment is not life threatening but the tube should be replaced as soon as possible. Both conditions are easily recognized.
- 1.2. The child should be examined for any other possible problems.

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

3. EMT – BASIC, INTERMEDIATE & PARAMEDIC

- 3.1. Children who have problems with their tubes may have problems with regurgitation or aspiration.
- 3.2. Be aware of and address any other possible problems from their underlying medical condition.
- 3.3. Transport the child and the tube to the nearest facility capable of replacing the tube; this is not an emergency transport.
- 3.4. Do not attempt to replace the tube; it is not as easy as it seems and there may be other complications.

Pediatric Protocols Children with Special Needs Ventilators	Lorain County EMS Protocols Pediatric Protocol 16 Revised 3/17/2006 Reviewed 7/29/2006
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1. GENERAL CONSIDERATIONS

- 1.1. Children on mechanical ventilation may exhibit sudden or gradual deterioration, cardiac arrest, increased oxygen demand, increased respiratory rate, retractions, and change in mental status.
- 1.2. Examine the child quickly for possible causes of distress which may be easily correctable (e.g. detached oxygen source) the caretakers will often have done this but double check.
- 1.3. Medications the child is presently taking may be the cause of deterioration.
- 1.4. Try to establish the child's baseline; the child may never look normal.
- 1.5. Remember to use the "**DOPE**" mnemonic for children who are tracheally intubated to assist you in identifying complications
 - D** – Displaced tube (esophagus or right main bronchus)
 - O** – Obstruction (kinked ET tube or pass a suction catheter through the ET tube)
 - P** – Pneumothorax (need to needle decompress)
 - E** – Equipment Failure (check O2 tank and connections, check for disconnects on BMV, remove patient for mechanical ventilator, ect.)

2. DIVISIONS AFFECTED

- 2.1. All Public and Private EMS.

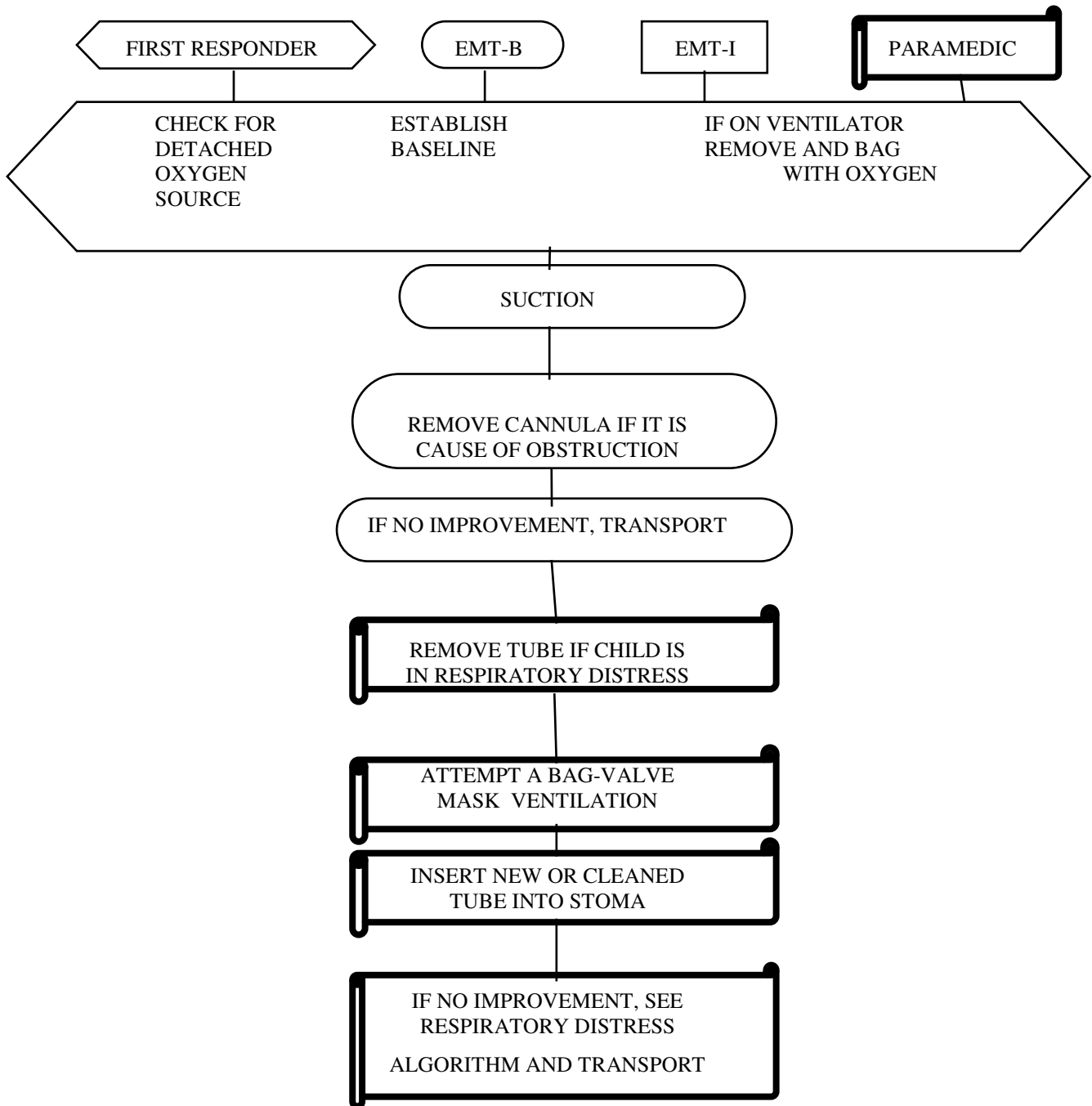
3. EMT – BASIC & INTERMEDIATE

- 3.1. Remove the child from the ventilator and bag the child with a secure oxygen source; if the child improves there may be a problem with the ventilator or oxygen source.
- 3.2. Suction the child as accumulation of debris is a common cause of obstruction; if the tracheotomy tube has a cannula, remove it; if it is the cause of obstruction, there should be immediate improvement.

4. EMT – PARAMEDIC

- 4.1. If there is no improvement the tube should be removed; attempt bag-valve mask ventilation; if another tube is available insert into the stoma and resume ventilation (a standard endotracheal tube may be used or the used tracheotomy tube after being cleaned.)
- 4.2. If there is no improvement immediately transport to the nearest medical facility; initiate appropriate resuscitation as needed.

CHILDREN WITH TRACHEOSTOMIES



Normal Pediatric Vital Signs¹

<u>Age</u>	<u>Pulse</u>	<u>Respiration</u>	<u>Blood Pressure</u>
Newborn	120-160	30-60	Systolic = 60-70
<1 year	120-140	30-50	systolic = 70+(2 x age) diastolic = 2/3 systolic
1-2 years	100-140	30-40	
3-5 years	100-120	20-30	
6-10 years	80-100	16-20	

Pediatric Coma Scoring²

	<u>Child</u>	<u>Infant</u>	
Eye opening	Spontaneous	Spontaneous	4
	To voice	To voice	3
	To pain	To pain	2
	None	None	1
Verbal response	Oriented	Coos, babbles	5
	Confused	Irritable cry, inconsolable	4
	Inappropriate	Cries to pain,	3
	Garbled speech	Moans to pain	2
	None	None	1
Motor response	Obeys commands	Normal movements	6
	Localizes pain	Withdraws to touch	5
	Withdraws to pain	Withdraws to pain	4
	Flexion	Flexion	3
	Extension	Extension	2
	Flaccid	Flaccid	1

¹ Reference: Children's Hospital Pediatric Reference Code Card, Columbus, Ohio, 1996

² A score of < 8 generally is an indication to hyperventilate the child.

PEDIATRIC PREHOSPITAL MEDICATIONS

<u>Medication</u>	<u>Dose</u>	<u>Route</u>	<u>Remarks</u>
• Activated charcoal	1 gm/kg	PO	Do not give to child with altered level of consciousness
• Adenosine	0.1 mg/kg	IV, IO	Indicated for SVT. May double second dose; max. dose 6 mg
• Albuterol	2.5 mg	Aerosol	Indicated for wheezing as per protocol
• Atropine	0.02 mg/kg	IV, IO, ET	Minimum dose 0.1 mg; max dose for child 0.5 mg; max dose for adolescent 1.0 mg; may repeat x1; Also useful before intubating children < 5 years old, blocks bradycardia due to Vagal nerve stimulation
• Amiodarone	5 mg/kg	IV	VF/Pulseless VT
• Dextrose 25%	2 ml/kg	IV, IO	Try to obtain bedside glucose level before administering ----administer if blood glucose < 60; dilute 50% 1:1 with sterile water; consult Medical Control if infant < 1 month as solution may need to be further diluted.
• Diazepam (Valium)	0.2-0.3 mg/kg	IV	Indicated for uncontrolled seizure activity; anticipate respiratory depression. Max. dose 10 mg.
• Diazepam (Valium)	0.5 mg/kg	Rectal	Indicated for uncontrolled seizure activity; anticipate respiratory depression. Max. dose 10 mg.
• Diphenhydramine (Benadryl)	1 mg/kg	IV	Useful in allergic reactions and anaphylaxis
• Epinephrine (1:10,000)	0.1 ml/kg (0.01 mg/kg)	IV, IO	Commonly used in cardiac arrest rhythms as first dose. Increase second dose 10 X (may use 1:1,000 solution).
• Epinephrine (1:1,000)	0.1 ml/kg (0.1 mg/kg)	ET,IV, IO	Commonly used in cardiac arrest rhythms. Use for all ET doses, and second and subsequent IV/IO doses. *The ET route has limited absorption, use IV/IO route whenever possible
	0.01ml/kg	SubQ	Used for anaphylaxis. Max dose is 0.3ml
• Lidocaine	1 mg/kg	IV, IO, ET	Can repeat once. If successful start continuous infusion at 20-50 mcg/kg/min. Also useful before intubating for cerebral protection and decreases airway reactivity.
• Morphine	0.1 mg/kg	IV/IM	Useful for moderate pain, may cause respiratory depression. Hypotension and reflex bradycardia may develop from histamine release
• Naloxone (Narcan)	0.1 mg/kg	IV, IO, ET	Useful for unknown unconscious, known narcotic overdoses

IV = Intravenous

ET = endotracheal

IO = Intra-osseous