SECTION II

PEDIATRIC PROTOCOLS

PEDIATRIC PROTOCOL

GENERAL CONSIDERATIONS

- **Infants < 6 months old are difficult to evaluate for severity of illness or injury and therefore should rarely be made a Code I or transport by car.**

- **Car seats should NOT be used for transportation in the following scenarios:**
  - **Child who requires or may require airway management.**
  - **After the car seat has been involved in a motor vehicle collision.**
  - **Any children transported code III.**

- **Refer to Broselow pediatric emergency tape or other similar length or weight based guide for medication dosages & equipment sizing.**

- **All recommendations based on AHA, PALS, & PEPP. Please refer to these resources for further information.**

Pediatric conditions which require rapid assessment and cardiopulmonary support:

- **Respiratory rate > 60bpm**

- **Heart rate**
  - If < 8 years old; <80 or >180bpm.
  - If > 8 years old; <60 or >160bpm.

- **Poor perfusion: weak or absent distal pulses, cap refill > 2 sec, altered LOC.**

- **Increased work of breathing: retractions, nasal flaring, grunting.**

- **Cyanosis or pulse ox < 94%.**

- **Altered LOC: irritability, lethargy, or abnormal response to parents or procedures.**

- **Seizures.**

- **Fever with petechiae.**

- **Trauma.**

- **Burns >10% body surface area.**

PEDIATRIC
ALTERED LEVEL OF CONSCIOUSNESS

FIRST RESPONDER

A. ABC's, manually stabilize cervical spine as per Multiple Trauma Protocol if cause of unconsciousness is unknown.

B. If not breathing, assist ventilation via mouth to mouth using barrier device.

C. Administer 100% oxygen by NRB mask.

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

Onset	**A**llergies
Provokes	**M**edication
Quality	**P**ast Medical History - especially, diabetic, seizures, stroke,
Radiates	head injury, drug abuse
Severity	**L**ast Meal
Time	**E**vents leading to present illness
Interventions	

EMT-B

A. Determine blood sugar level by available means.

1. If the blood sugar is less than 70 mg/dl, administer oral glucose if alert. May be repeated in 10 minutes if blood sugar remains below 70 mg/dl.

PATIENT MUST HAVE A GAG REFLEX

2. If the blood sugar is greater than 400 mg/dl, TRANSPORT.

B. If unable to check blood sugar or blood sugar is between 70 mg/dl and 400 mg/dl, establish communications with Medical Control and advise them of the patient's condition.

C. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

EMT-I

A. Assist EMT; obtain patient condition and circumstances.

B. Apply monitor and check rhythm.

C. Start IV 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 push.

PEDIATRIC ALTERED LOC (cont)

D. Determine blood sugar level by available means. Treat accordingly:

1. Blood sugar less than 70, administer IV bolus: See page 23 for age specific dosing.

    a. 2 cc/kg of 25% dextrose (D25) $\leq$ 2 years old.

    b. 1 cc/kg of 50% dextrose (D50) > 2 years old.

    c. May be repeated in 10 minutes if blood sugar remains below 70.

    d. If the patient is greater than 2 years of age and an IV has not been established, may administer 1 mg Glucagon IM/IN.

    e. If the patient is less than 2 years of age and an IV has not been established, may administer 0.5 mg Glucagon IM/IN.

2. Blood sugar greater than 400, administer an IV fluid bolus:

    a. 20cc/kg of saline.

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

E. If blood sugar is normal, respirations are impaired, or patient does not respond to dextrose or fluid bolus, administer Narcan 0.1 mg/kg IV/IN. Refer to the most current version of a length based drug treatment guide (e.g. BROSLOW PEDIATRIC EMERGENCY TAPE or similar guide) when unsure about patient weight, age and / or drug dosage.

   If patient improves somewhat with Narcan but is not fully awake, contact Medical Control for repeat dose.

F. Re-evaluate patient condition, contact Medical Control, and transport to the hospital.

G. In some cases patient may require restraint, and should not be transported until completely restrained.

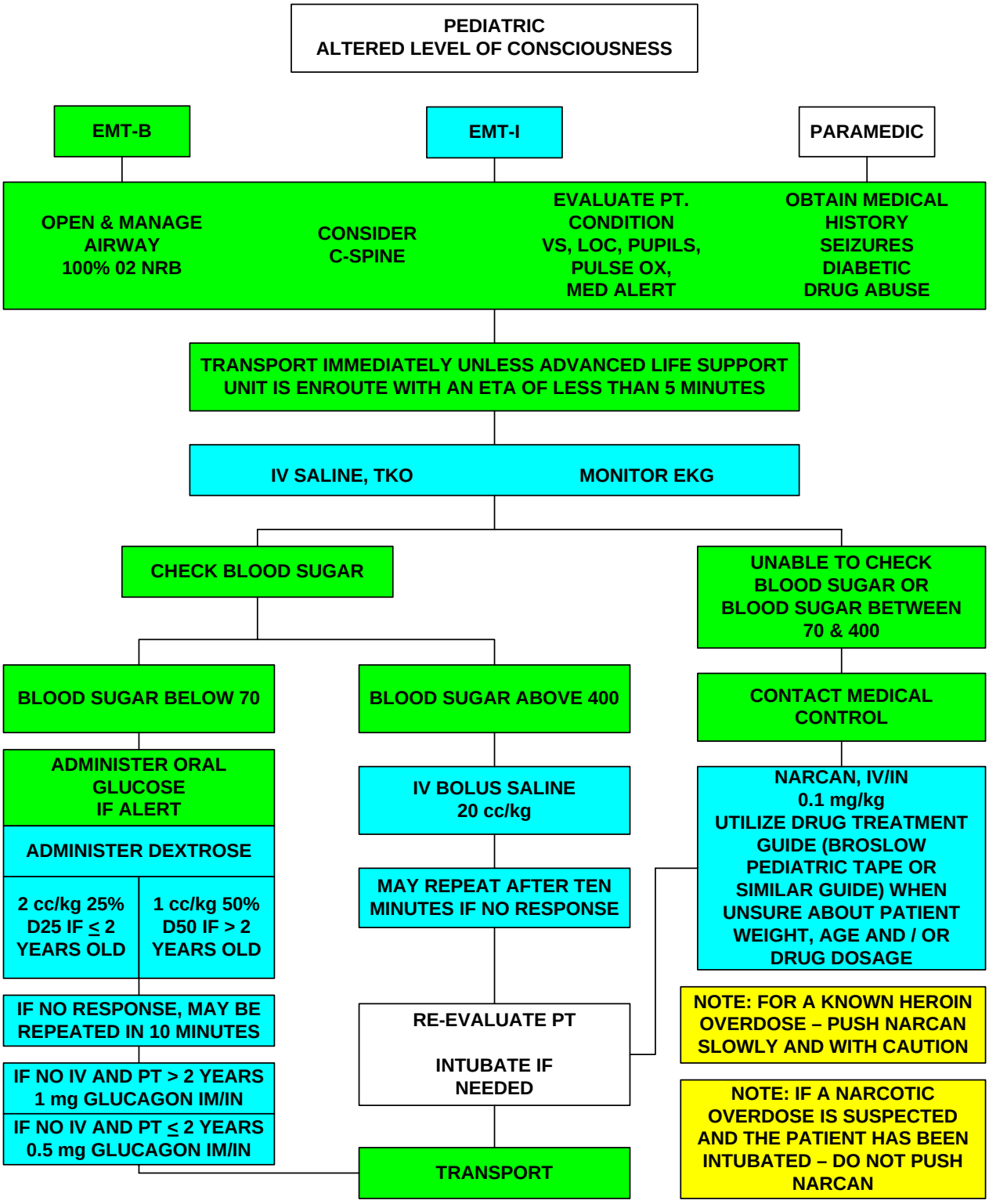
DO NOT DELAY TRANSPORT

PARAMEDIC

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Assess airway adequacy and assist ventilation with bag-valve-mask while administering 100% oxygen. May consider intubation for an unprotected airway.

C. Apply monitor and check rhythm.


PEDIATRIC
ALTERED LEVEL OF CONSCIOUSNESS
EMT-B
EMT-I
PARAMEDIC
OPEN & MANAGE AIRWAY
100% 02 NRB
CONSIDER C-SPINE
EVALUATE PT. CONDITION
VS, LOC, PUPILS, PULSE OX, MED ALERT
OBTAIN MEDICAL HISTORY
SEIZURES
DIABETIC
DRUG ABUSE
TRANSPORT IMMEDIATELY UNLESS ADVANCED LIFE SUPPORT UNIT IS ENROUTE WITH AN ETA OF LESS THAN 5 MINUTES
IV SALINE, TKO
MONITOR EKG
CHECK BLOOD SUGAR
UNABLE TO CHECK BLOOD SUGAR OR BLOOD SUGAR BETWEEN 70 & 400
BLOOD SUGAR BELOW 70
BLOOD SUGAR ABOVE 400
CONTACT MEDICAL CONTROL
ADMINISTER ORAL GLUCOSE IF ALERT
ADMINISTER DEXTROSE
2 cc/kg 25% D25 IF ≤ 2 YEARS OLD
1 cc/kg 50% D50 IF > 2 YEARS OLD
IV BOLUS SALINE 20 cc/kg
MAY REPEAT AFTER TEN MINUTES IF NO RESPONSE
NARCAN, IV/IN 0.1 mg/kg
UTILIZE DRUG TREATMENT GUIDE (BROSLOW PEDIATRIC TAPE OR SIMILAR GUIDE) WHEN UNSURE ABOUT PATIENT WEIGHT, AGE AND / OR DRUG DOSAGE
IF NO RESPONSE, MAY BE REPEATED IN 10 MINUTES
RE-EVALUATE PT
INTUBATE IF NEEDED
NOTE: FOR A KNOWN HEROIN OVERDOSE – PUSH NARCAN SLOWLY AND WITH CAUTION
IF NO IV AND PT > 2 YEARS 1 mg GLUCAGON IM/IN
IF NO IV AND PT ≤ 2 YEARS 0.5 mg GLUCAGON IM/IN
NOTE: IF A NARCOTIC OVERDOSE IS SUSPECTED AND THE PATIENT HAS BEEN INTUBATED – DO NOT PUSH NARCAN
TRANSPORT

PEDIATRIC ARRHYTHMIAS

GENERAL CONSIDERATIONS

A. In the treatment of cardiac arrhythmia, current American Heart Association guidelines were referred to for protocol development.

B. Life-threatening cardiac rhythm disturbances in children are more frequently the result rather than the cause of acute cardiovascular emergencies.

C. In infants and children, arrhythmia should be treated as an emergency only if:

1. The arrhythmia compromises cardiac output, or
2. The arrhythmia has the potential for degenerating into a rhythm that compromises cardiac output.

D. Initial therapy in children will consist of proper ventilation and oxygenation, along with the assessment of cardiac output.

E. Transport is essential when advanced cardiac life support is not available within ten minutes of receipt of the call.

F. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage.

FIRST RESPONDER

A. Per current American Heart Association Pediatric Basic Life Support guidelines, establish unresponsiveness, give two quick breaths, assess pulse and begin compressions if indicated. Immobilize cervical spine if indicated.

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

EMT-B

A. Open and manage the airway and provide 100% oxygen by NRB mask.

1. Assist ventilations if rate is below or above normal limits and signs of hypoxia are present.

2. Apply pulse oximeter and obtain reading.

B. If patient show signs of decreased cardiac output (decreased LOC, poor capillary refill, low blood pressure) and a heart rate of less than 60 bpm that does not respond (increase) with oxygenation, start CPR.

C. Evaluate patient's general appearance and determine:

1. Vital signs
2. Level of consciousness
3. Cardiac output

PEDIATRIC ARRYTHMIA (cont)

4. Lung sounds

C. Obtain relevant history of current condition.

D. Establish communications with Medical Control and advise them of the patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

EMT-I

A. During transport, apply monitor and check the rhythm.

B. Start IV of normal saline, TKO using pediatric IV tubing set-up if available.

PARAMEDIC

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Assess airway adequacy and assist ventilation with bag-valve-mask while administering 100 % oxygen. The paramedic may consider intubation.

C. Apply monitor and determine arrhythmia.

D. Treat arrhythmias as follows:

1. Bradycardia. Treat only if:

a. If child's heart rate is less than 60 bpm and the patient has decreased cardiac output.

b. Airway management and 100% oxygenation does not improve patient condition.

i. In rare cases in the infant and young child, it may be necessary to begin chest compressions.

ii. Administer Epinephrine IV every three to five minutes or until cardiac output improves.

(a) When IV or IO routes are available, administer 0.01mg/kg of (0.1cc/kg) 1:10,000.

(b) When administering through ET, tube use 0.1mg/kg of (0.1cc/kg) 1:1,000 ET Epinephrine must be diluted with 3-5cc of NS.

iii. If no response, administer Atropine.

(a) When IV or IO routes are available, 0.02 mg/kg. (Minimum dose is 0.1 mg and maximum dose is 0.5 mg for children and 1.0 mg for adolescents)

(b) When administering through ET tube, administer 0.04 mg/kg.

(c) Atropine may be repeated one time in 3-5 minutes.

PEDIATRIC ARRYTHMIA (cont)

(d) Refer to length based drug treatment guide (e.g. BROSLOW PEDIATRIC EMERGENCY TAPE or similar guide) when unsure about patient weight, age, and/or drug dosage.

iv. Transport and contact Medical Control for possible cardiac pacing.

2. Narrow Complex Tachycardia:

a. If patient is asymptomatic, do not treat. Transport immediately.

b. Consider normal pulse for the age of the patient.

c. Probable Sinus Tachycardia

i. Consider hypovolemia and follow Hypovolemic Shock Protocol.

ii. History of fever, dehydration, trauma, pain, or other known cause.

iii. Heart rate varies with activity.

iv. Search for and treat cause.

d. Probable Supraventricular Tachycardia

i. Request history of Wolfe-Parkinson-White syndrome. If present, transport.

ii. History of SVT

iii. Rate > 220 for infants or >180 for children

iv. Treatment:

(a) Consider vagal maneuver. Success of vagal maneuvers is variable and depends upon the presence of underlying conditions, the patient's level of cooperation, and age. Regardless of what type of vagal maneuver is attempted, obtain an ECG tracing before and during the attempt. The following vagal maneuvers may be attempted in pediatric patients:

- Ice water applied to the face.
- Crushed ice in a plastic bag or glove applied to the face without obstructing ventilation.
- Have the child blow through a straw.

(b) If patient is symptomatic (signs of CHF, poor perfusion, shock, hypotension, respiratory difficulty, SOB, altered LOC) and rate is greater than 220 for infants or 180 for children:

(i) Administer Adenosine, 0.1mg/kg (maximum 6 mg) RAPID IV bolus over 1 to 3 seconds followed IMMEDIATELY with a 5-10cc bolus of saline (within 5 seconds) Adenosine works best if the IV is in a central vein (the closer to the heart the better).

PEDIATRIC ARRYTHMIA (cont)

(ii) If no conversion, repeat Adenosine in 1-2 minutes, 0.2mg/kg (maximum 12 mg) RAPID IV bolus followed IMMEDIATELY with a 5-10cc bolus of saline (within 5 seconds).

MAXIMUM OF 2 DOSES (18 mg) OF ADENOSINE.

(iii) Contact Medical Control.

(iv) Synchronized cardioversion at:

- o 0.5 joules / kg (whether biphasic or monophasic).
- o 1 joule / kg (whether biphasic or monophasic).
- o 2 joules / kg (whether biphasic or monophasic).

3. Wide Complex Tachycardia (with a pulse).

Assess the patient's perfusion. Signs / symptoms of poor perfusion include:

- Shock
- Hypotension
- Respiratory difficulty
- Altered LOC
- CHF / Pulmonary Edema

a. Good Perfusion

i. Administer an antiarrhythmic.

- Amiodarone 5 mg/kg IV over 20-60 minutes. Dilute resulting volume of Amiodarone with an equal volume of normal saline. (1:1 mixture)

- Lidocaine 1 mg/kg IVP.

  - o If no response in five minutes, repeat Lidocaine 0.5 mg/kg IV every 5 minutes to a 3 mg/kg maximum.

  - o If at any time during treatment the rhythm converts, continue Lidocaine, 0.5 mg/kg IV every 20 minutes.

NOTE: IF AT ANY TIME THE PATIENT BECOMES UNSTABLE WITH POOR PERFUSION, GO DIRECTLY TO SYNCHRONUS CARDIOVERSION.

NOTE: DO NOT ADMINISTER MORE THAN ONE TYPE OF ANTIARRHYTHMIC TO A PATIENT.

ii. Consider sedation: versed 0.2 mg/kg IV.

iii. Synchronized cardioversion at:

(a) 0.5 joules / kg (whether biphasic or monophasic).
(b) 1 joule / kg (whether biphasic or monophasic).
(c) 2 joules / kg (whether biphasic or monophasic).

PEDIATRIC ARRYTHMIA (cont)

b. Poor Perfusion (with a pulse)

i. Prepare for immediate cardioversion.

ii. May attempt Adenosine, 0.1mg/kg (maximum 6 mg) RAPID IV bolus over 1 to 3 seconds followed IMMEDIATELY with a 5-10cc bolus of saline (within 5 seconds) if it does not delay electrical cardioversion.

iii. Consider sedation: Versed 0.2 mg/kg IV

iv. Synchronized cardioversion at:

(a) 0.5 joules / kg (whether biphasic or monophasic).
(b) 1 joule / kg (whether biphasic or monophasic).
(c) 2 joules / kg (whether biphasic or monophasic).

v. Administer an antiarrhythmic.

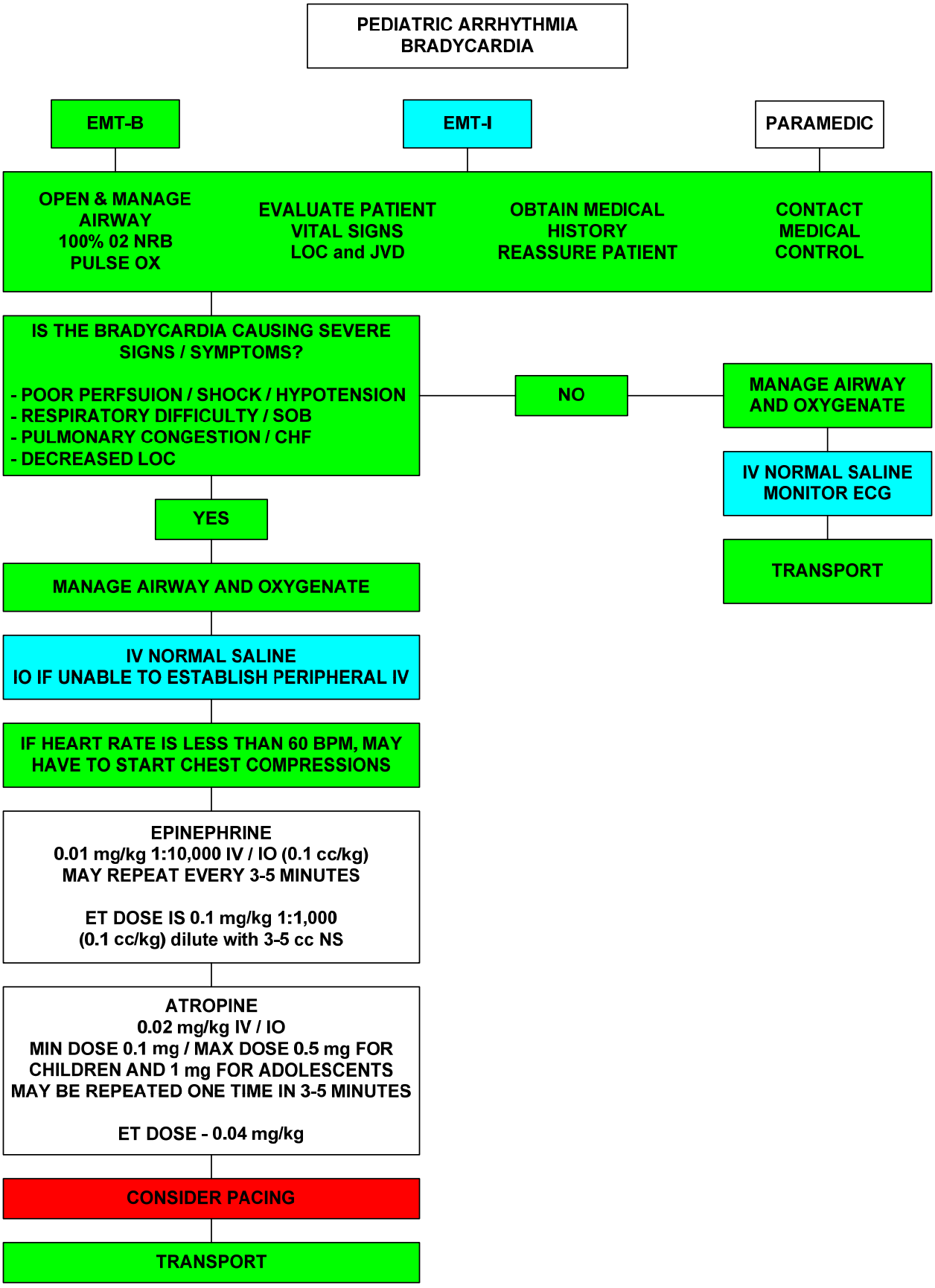
- Amiodarone 5 mg/kg IV over 20-60 minutes (diluted 1:1 with Normal Saline).

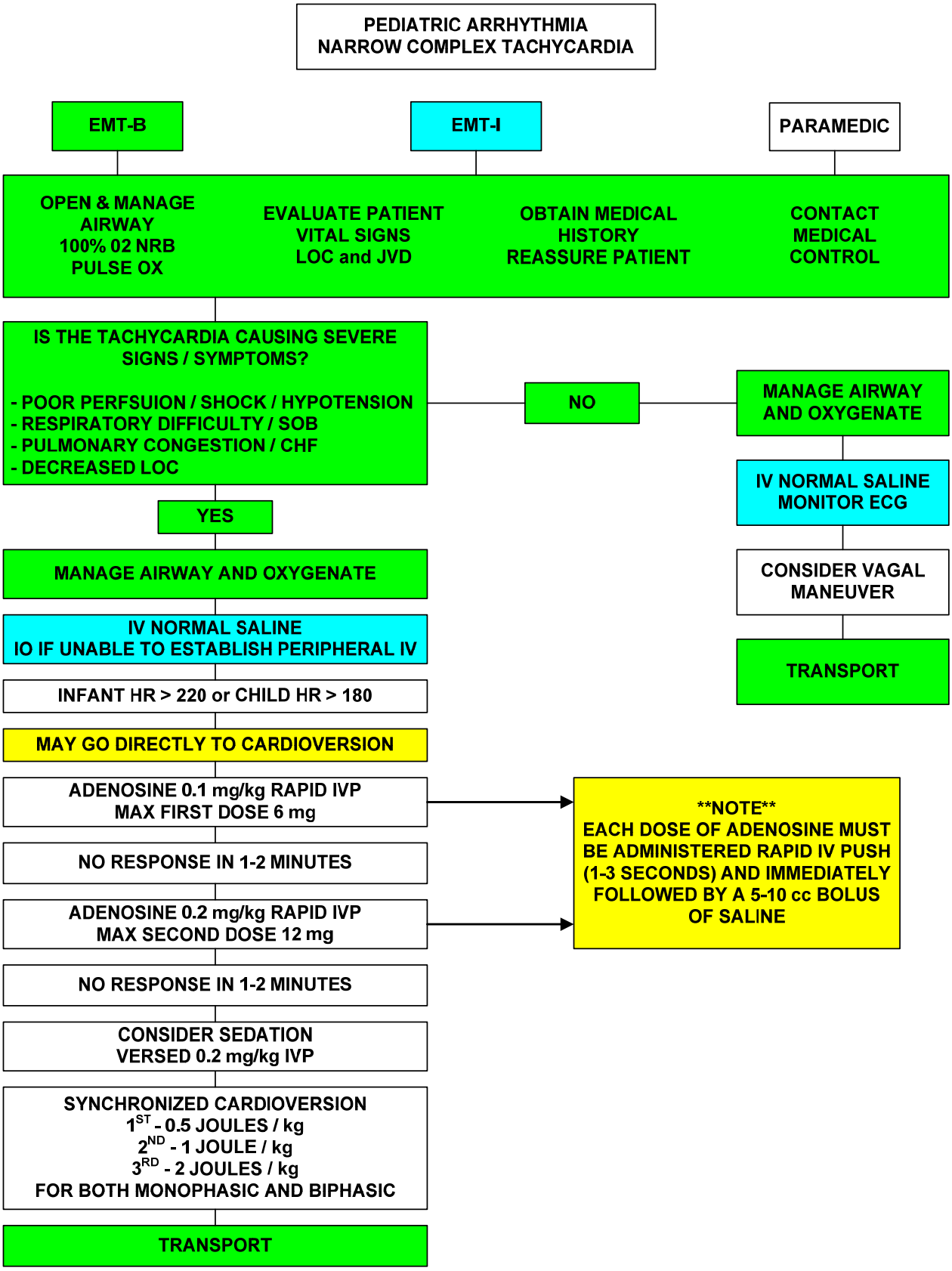
- Lidocaine 1 mg/kg IVP.

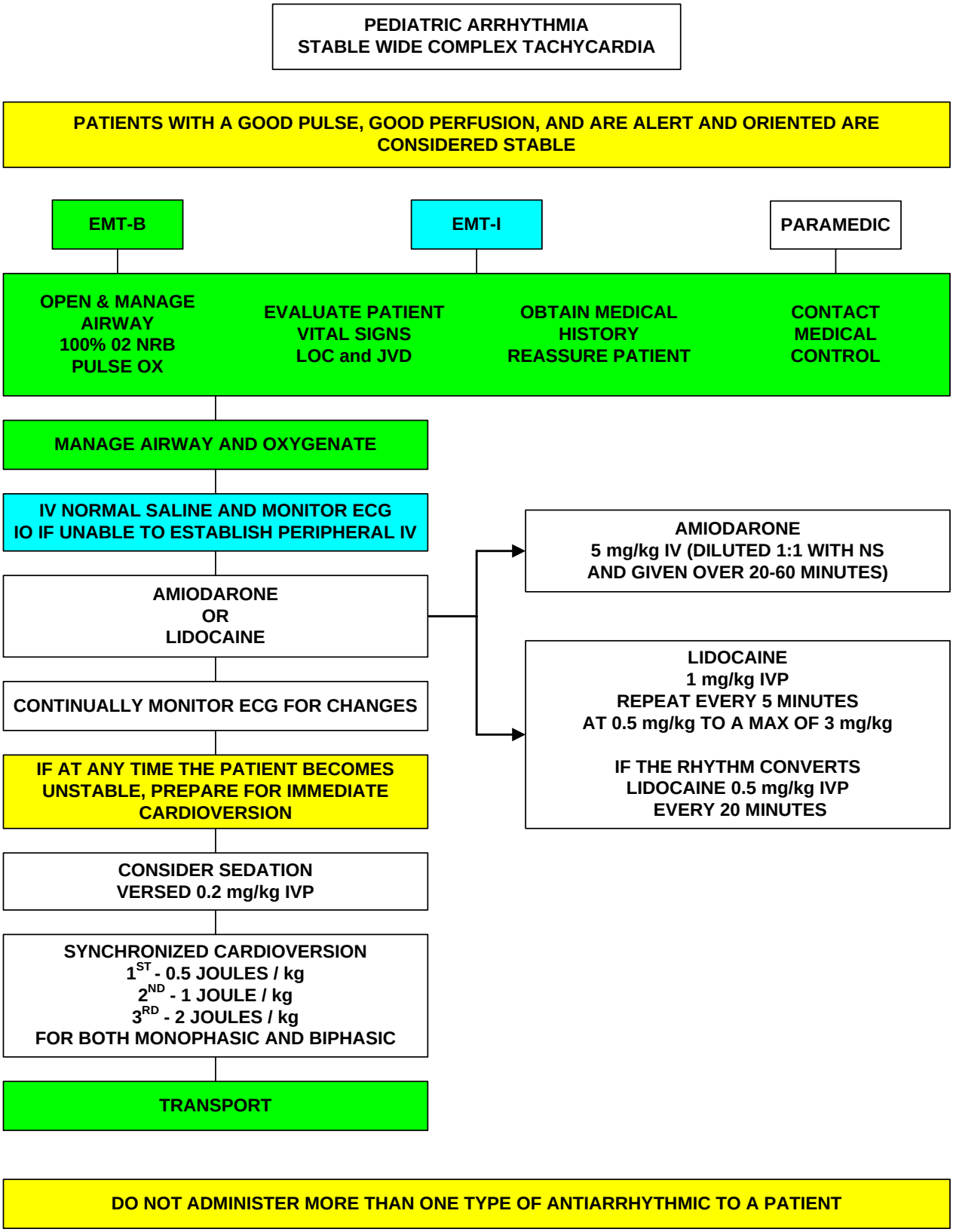
  - If no response in five minutes, repeat Lidocaine 0.5 mg/kg IV every 5 minutes to a 3 mg/kg maximum.

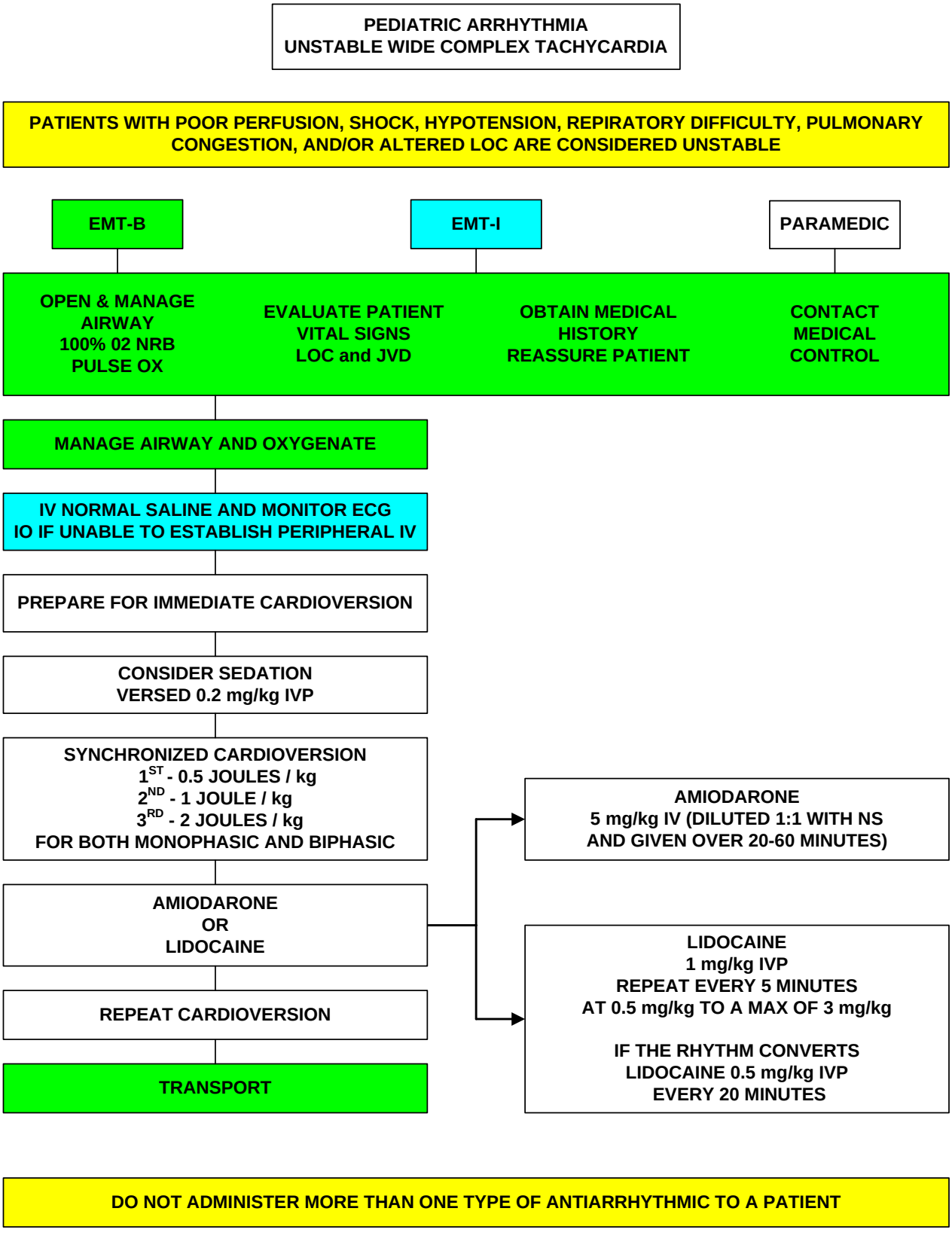
  - If at any time during treatment the rhythm converts, continue Lidocaine, 0.5 mg/kg IV every 20 minutes.

NOTE: DO NOT ADMINISTER MORE THAN ONE TYPE OF ANTIARRHYTHMIC TO A PATIENT


PEDIATRIC ARRHYTHMIA
BRADYCARDIA
EMT-B
EMT-I
PARAMEDIC
OPEN & MANAGE AIRWAY
100% 02 NRB
PULSE OX
EVALUATE PATIENT
VITAL SIGNS
LOC and JVD
OBTAIN MEDICAL HISTORY
REASSURE PATIENT
CONTACT MEDICAL CONTROL
IS THE BRADYCARDIA CAUSING SEVERE SIGNS / SYMPTOMS?
- POOR PERFSUION / SHOCK / HYPOTENSION
- RESPIRATORY DIFFICULTY / SOB
- PULMONARY CONGESTION / CHF
- DECREASED LOC
NO
MANAGE AIRWAY AND OXYGENATE
IV NORMAL SALINE
MONITOR ECG
TRANSPORT
YES
MANAGE AIRWAY AND OXYGENATE
IV NORMAL SALINE
IO IF UNABLE TO ESTABLISH PERIPHERAL IV
IF HEART RATE IS LESS THAN 60 BPM, MAY HAVE TO START CHEST COMPRESSIONS
EPINEPHRINE
0.01 mg/kg 1:10,000 IV / IO (0.1 cc/kg)
MAY REPEAT EVERY 3-5 MINUTES
ET DOSE IS 0.1 mg/kg 1:1,000
(0.1 cc/kg) dilute with 3-5 cc NS
ATROPINE
0.02 mg/kg IV / IO
MIN DOSE 0.1 mg / MAX DOSE 0.5 mg FOR CHILDREN AND 1 mg FOR ADOLESCENTS
MAY BE REPEATED ONE TIME IN 3-5 MINUTES
ET DOSE - 0.04 mg/kg
CONSIDER PACING
TRANSPORT


PEDIATRIC ARRHYTHMIA
NARROW COMPLEX TACHYCARDIA
EMT-B
EMT-I
PARAMEDIC
OPEN & MANAGE AIRWAY
100% 02 NRB
PULSE OX
EVALUATE PATIENT
VITAL SIGNS
LOC and JVD
OBTAIN MEDICAL HISTORY
REASSURE PATIENT
CONTACT MEDICAL CONTROL
IS THE TACHYCARDIA CAUSING SEVERE SIGNS / SYMPTOMS?
- POOR PERFSUION / SHOCK / HYPOTENSION
- RESPIRATORY DIFFICULTY / SOB
- PULMONARY CONGESTION / CHF
- DECREASED LOC
NO
MANAGE AIRWAY AND OXYGENATE
IV NORMAL SALINE MONITOR ECG
CONSIDER VAGAL MANEUVER
TRANSPORT
YES
MANAGE AIRWAY AND OXYGENATE
IV NORMAL SALINE
IO IF UNABLE TO ESTABLISH PERIPHERAL IV
INFANT HR > 220 or CHILD HR > 180
MAY GO DIRECTLY TO CARDIOVERSION
ADENOSINE 0.1 mg/kg RAPID IVP
MAX FIRST DOSE 6 mg
NO RESPONSE IN 1-2 MINUTES
ADENOSINE 0.2 mg/kg RAPID IVP
MAX SECOND DOSE 12 mg
NO RESPONSE IN 1-2 MINUTES
CONSIDER SEDATION
VERSED 0.2 mg/kg IVP
SYNCHRONIZED CARDIOVERSION
1ST - 0.5 JOULES / kg
2ND - 1 JOULE / kg
3RD - 2 JOULES / kg
FOR BOTH MONOPHASIC AND BIPHASIC
TRANSPORT
NOTE
EACH DOSE OF ADENOSINE MUST BE ADMINISTERED RAPID IV PUSH (1-3 SECONDS) AND IMMEDIATELY FOLLOWED BY A 5-10 cc BOLUS OF SALINE


PEDIATRIC ARRHYTHMIA
STABLE WIDE COMPLEX TACHYCARDIA
PATIENTS WITH A GOOD PULSE, GOOD PERFUSION, AND ARE ALERT AND ORIENTED ARE CONSIDERED STABLE
EMT-B
EMT-I
PARAMEDIC
OPEN & MANAGE AIRWAY
100% 02 NRB
PULSE OX
EVALUATE PATIENT
VITAL SIGNS
LOC and JVD
OBTAIN MEDICAL HISTORY
REASSURE PATIENT
CONTACT MEDICAL CONTROL
MANAGE AIRWAY AND OXYGENATE
IV NORMAL SALINE AND MONITOR ECG
IO IF UNABLE TO ESTABLISH PERIPHERAL IV
AMIODARONE
OR
LIDOCAINE
AMIODARONE
5 mg/kg IV (DILUTED 1:1 WITH NS
AND GIVEN OVER 20-60 MINUTES)
LIDOCAINE
1 mg/kg IVP
REPEAT EVERY 5 MINUTES
AT 0.5 mg/kg TO A MAX OF 3 mg/kg
IF THE RHYTHM CONVERTS
LIDOCAINE 0.5 mg/kg IVP
EVERY 20 MINUTES
CONTINUALLY MONITOR ECG FOR CHANGES
IF AT ANY TIME THE PATIENT BECOMES UNSTABLE, PREPARE FOR IMMEDIATE CARDIOVERSION
CONSIDER SEDATION
VERSED 0.2 mg/kg IVP
SYNCHRONIZED CARDIOVERSION
1ST - 0.5 JOULES / kg
2ND - 1 JOULE / kg
3RD - 2 JOULES / kg
FOR BOTH MONOPHASIC AND BIPHASIC
TRANSPORT
DO NOT ADMINISTER MORE THAN ONE TYPE OF ANTIARRHYTHMIC TO A PATIENT


PEDIATRIC ARRHYTHMIA
UNSTABLE WIDE COMPLEX TACHYCARDIA
PATIENTS WITH POOR PERFUSION, SHOCK, HYPOTENSION, REPIRATORY DIFFICULTY, PULMONARY CONGESTION, AND/OR ALTERED LOC ARE CONSIDERED UNSTABLE
EMT-B
EMT-I
PARAMEDIC
OPEN & MANAGE AIRWAY
100% 02 NRB
PULSE OX
EVALUATE PATIENT
VITAL SIGNS
LOC and JVD
OBTAIN MEDICAL HISTORY
REASSURE PATIENT
CONTACT MEDICAL CONTROL
MANAGE AIRWAY AND OXYGENATE
IV NORMAL SALINE AND MONITOR ECG
IO IF UNABLE TO ESTABLISH PERIPHERAL IV
PREPARE FOR IMMEDIATE CARDIOVERSION
CONSIDER SEDATION
VERSED 0.2 mg/kg IVP
SYNCHRONIZED CARDIOVERSION
1ST - 0.5 JOULES / kg
2ND - 1 JOULE / kg
3RD - 2 JOULES / kg
FOR BOTH MONOPHASIC AND BIPHASIC
AMIODARONE
OR
LIDOCAINE
REPEAT CARDIOVERSION
TRANSPORT
AMIODARONE
5 mg/kg IV (DILUTED 1:1 WITH NS
AND GIVEN OVER 20-60 MINUTES)
LIDOCAINE
1 mg/kg IVP
REPEAT EVERY 5 MINUTES
AT 0.5 mg/kg TO A MAX OF 3 mg/kg
IF THE RHYTHM CONVERTS
LIDOCAINE 0.5 mg/kg IVP
EVERY 20 MINUTES
DO NOT ADMINISTER MORE THAN ONE TYPE OF ANTIARRHYTHMIC TO A PATIENT

PEDIATRIC
CARDIAC ARREST

GENERAL CONSIDERATIONS

A. Cardiac arrest in children is primarily due to the lack of an adequate airway, resulting in hypoxia.

B. All EMT personnel must concentrate on opening and maintaining the airway and providing 100% oxygenation.

C. 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.

D. Transport immediately when excessive hemorrhage or hypothermia is present. Advanced life support measures should be carried out during transportation.

E. Initiate CPR. If available use Pediatric sized defibrillation pads with the AED for children under age 8.

F. If peripheral IV's cannot be established, venous access should be obtained by Intraosseous route (IO).

G. If IV or IO access cannot be established, administer appropriate medications through the endotracheal tube.

H. If Sudden Infant Death Syndrome (SIDS) is suspected:

1. Initiate basic and advanced life support, unless apparent rigor mortis or signs of lividity are present.
2. Notify local law enforcement while on-scene.
3. Refer to DOA protocol.
4. Encourage family to have friends or neighbors accompany them to the hospital.
5. If infant is not resuscitated, refer parents to Social Services at the Emergency Department to initiate counseling.

I. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage.

FIRST RESPONDER / EMT-B

A. Open and maintain airway with sniffing position.

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

C. Initiate CPR in accordance with AHA guidelines (15:2 compression to ventilation ratio) at a rate of 100 compressions per minute.

D. Establish communications with Medical Control and advise them of the patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

PEDIATRIC CARDIAC ARREST (cont)

D. If an Automated External Defibrillator (AED) is available:

1. Asses the patient for respirations and cardiac arrest.

2. Turn the power on and apply the AED pads.

   NOTE: AEDs should not be used on patients under one year of age. Pediatric AED pads are preferred for patients between 1 and 8 years of age. Adult AED pads should be used for patients greater than 8 years of age.

3. Start verbal documentation that must include:
   - EMS unit delivering care and ID of EMT
   - Initial call information (i.e. accidental ingestion, drowning, etc.)
   - Initial patient assessment, findings and impression
   - Care given to this point
   - Ongoing outcomes of care delivered to patient

   a. "No Shock Advised"

      i. Continue CPR (15:2) at 100 compressions per minute

      ii. Continue ventilation with 100% oxygen via BVM with reservoir

      iii. Contact medical control and transport immediately

   b. "Shock Advised"

      i. Deliver a single shock

      ii. Resume CPR (15:2) at 100 compressions per minute and administer 5 cycles of CPR

      iii. Contact Medical Control, advise of cardiac arrest, and transport immediately

      iv. After five cycles of CPR, activate AED to assess rhythm and deliver a single shock if indicated

      v. Resume CPR (15:2) at 100 compressions per minute

TURN OFF AED DURING MOVEMENT OF PATIENT

EMT-I

A. Assume charge and confer with EMT as to patient condition and circumstances.

B. Apply cardiac monitor and check rhythm.

C. If monitor shows ventricular fibrillation or pulseless ventricular tachycardia:

1. Defibrillate 2 joules/kg for both monophasic and biphasic.

PEDIATRIC CARDIAC ARREST (cont)

2. Resume CPR immediately. Complete 5 cycles of CPR.

3. Check rhythm and pulse.

4. If a pulse is present, begin post-resuscitation care.

5. If the rhythm is not shockable, treat it as Asystole / PEA

6. If the rhythm is shockable (VF/VT) continue CPR while the defibrillator charges and administer one defibrillation at 4 joules/kg for both monophasic and biphasic.

7. Continue CPR and transport.

D. Start IV or IO of saline with pediatric IV tubing set-up, if available, and give fluid bolus of 20 cc/kg. IV should be accomplished enroute to hospital.

DO NOT DELAY TRANSPORT

PARAMEDIC

A. Assume charge and confer with EMTs as to patient condition and circumstances.

B. If EMT-I is in a cycle of defibrillation, allow them to complete the cycle.

C. Assess airway and intubate patient if needed.

D. Immediately establish IV or IO.

E. Apply monitor. If one of the following conditions exists, treat as follows:

1. Ventricular fibrillation or pulseless ventricular tachycardia:

   a. Defibrillate 2 joules/kg for both monophasic and biphasic.

   b. Resume CPR immediately. Complete 5 cycles of CPR.

   c. Check rhythm and pulse.

   d. If a pulse is present, begin post-resuscitation care.

   e. If the rhythm is not shockable, treat it as Asystole / PEA

   f. If the rhythm is shockable (VF/VT) continue CPR while the defibrillator charges and administer one defibrillation at 4 joules/kg for both monophasic and biphasic.

   g. Continue CPR immediately.

   h. Administer Epinephrine IV, IO, or ET every 3 minutes.

      i. When IV or IO routes are available, administer 0.01 mg/kg (0.1 cc/kg) of 1:10,000

PEDIATRIC CARDIAC ARREST (cont)

ii. When administering through ET tube use 0.1mg/kg (0.1 cc/kg) of 1:1,000. ET Epinephrine must be diluted with 3-5 cc of saline.

i. Vasopressin 40 units may be given for a child > 12 years old in place of the first or second dose of Epi. Vasopressin is a one time dose. If additional adrenergic agents are required after 10 minutes, resume Epinephrine every 3 minutes.

j. Repeat 5 cycles of CPR.

k. Check rhythm & pulse.

l. If pulse present, begin post resuscitation care.

m. If rhythm not shockable, treat as asystole/PEA.

n. If shockable continue CPR while defibrillator is charging. Give 1 shock 4 J/kg

o. Resume CPR immediately.

p. If no response, administer an Antiarrhythmic.

- Amiodarone 5 mg/kg (diluted 1:1 with Normal Saline) IV.
  - If after ten minutes the patient either remains in VF/VT or converts to a perfusing rhythm, a second dose of Amiodarone of 2.5 mg/kg IVP can be administered by medical control order only OVER 2-3 MINUTES.

- Lidocaine 1 mg/kg.
  - If no response in five minutes, repeat Lidocaine 0.5 mg/kg IVP every 5 minutes to a 3 mg/kg maximum.
  - If at any time during treatment the rhythm converts, continue Lidocaine 0.5 mg/kg IVP every 20 minutes.

- Magnesium (for Torsades de pointes) 25-50 mg/kg IV/IO (diluted to a 10% solution) with a maximum dose of 2 grams

q. If no response, CPR and TRANSPORT. Continue medication administration and attempts at defibrillation.

2. Asystole / pulseless electrical activity (PEA)

a. Confirm asystole in two different lead positions.

b. If rhythm is unclear and possibly ventricular fibrillation, follow Pediatric Ventricular Fibrillation Protocol.

c. Consider treatable causes:
   - Hypovolemia, give fluid boluses (20 cc/kg).
   - Hypoxia, perform and maintain adequate airway management.
   - Hyperkalemia, consider sodium bicarbonate.
   - Hypothermia, aggressively warm the patient.
   - Tension pneumothorax, perform chest decompression.

PEDIATRIC CARDIAC ARREST (cont)

- Tricyclic overdose, consider sodium bicarbonate.
- Hypoglycemia, administer dextrose.
- Hydrogen ion (acidosis), consider sodium bicarbonate administration

d. CPR and administer epinephrine IV, IO, or ET every 3 minutes.

   i. When IV or IO routes are available, administer 0.01mg/kg (0.1cc/kg) of 1:10,000

   ii. When administering through ET tube use 0.1mg/kg of 1,000. ET epinephrine must be diluted with 3-5cc of saline.

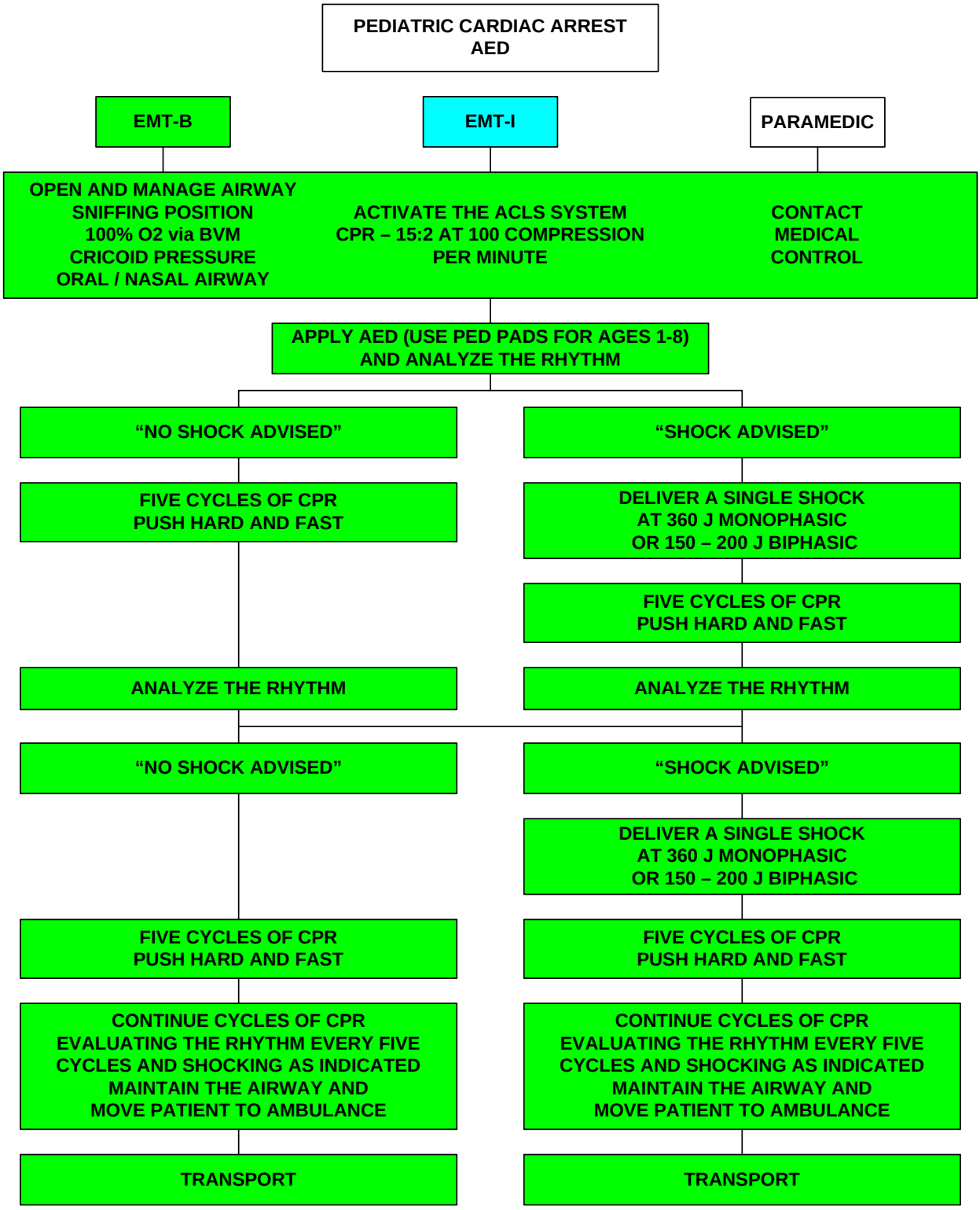
e. If no response, continue CPR and administer an IV fluid bolus, 20 cc/kg of saline.

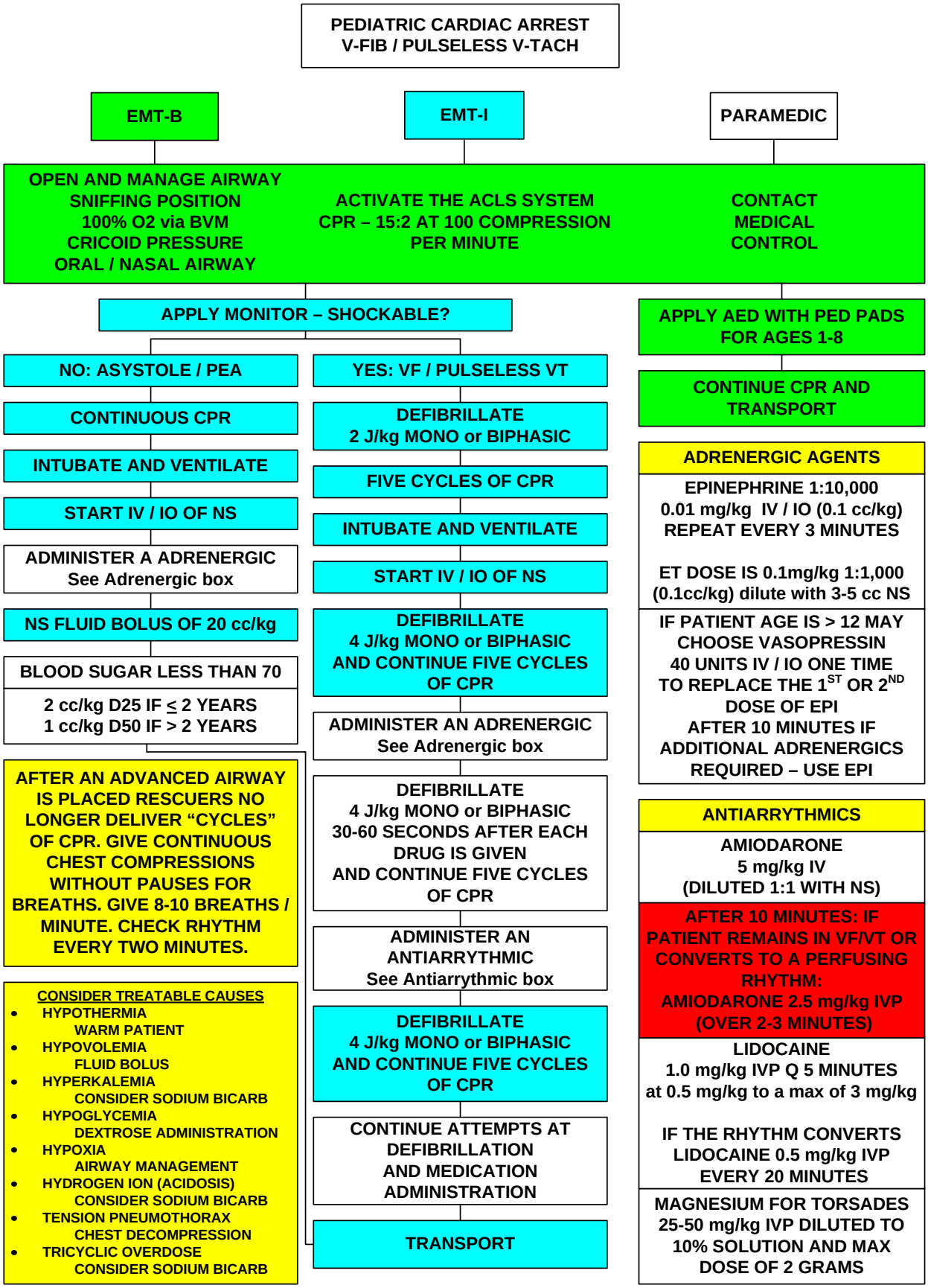
f. Check blood sugar and if less than 70 administer:

   i 2 cc/kg 25% dextrose (D25) IV $\leq$ 2 years old.

   ii. 1 cc/kg 50% dextrose (D50) IV > 2 years old.

g. If no response, CPR and TRANSPORT.


PEDIATRIC CARDIAC ARREST
AED
EMT-B
EMT-I
PARAMEDIC
OPEN AND MANAGE AIRWAY
SNIFFING POSITION
100% O2 via BVM
CRICOID PRESSURE
ORAL / NASAL AIRWAY
ACTIVATE THE ACLS SYSTEM
CPR – 15:2 AT 100 COMPRESSION
PER MINUTE
CONTACT
MEDICAL
CONTROL
APPLY AED (USE PED PADS FOR AGES 1-8)
AND ANALYZE THE RHYTHM
"NO SHOCK ADVISED"
"SHOCK ADVISED"
FIVE CYCLES OF CPR
PUSH HARD AND FAST
DELIVER A SINGLE SHOCK
AT 360 J MONOPHASIC
OR 150 – 200 J BIPHASIC
FIVE CYCLES OF CPR
PUSH HARD AND FAST
ANALYZE THE RHYTHM
ANALYZE THE RHYTHM
"NO SHOCK ADVISED"
"SHOCK ADVISED"
DELIVER A SINGLE SHOCK
AT 360 J MONOPHASIC
OR 150 – 200 J BIPHASIC
FIVE CYCLES OF CPR
PUSH HARD AND FAST
FIVE CYCLES OF CPR
PUSH HARD AND FAST
CONTINUE CYCLES OF CPR
EVALUATING THE RHYTHM EVERY FIVE
CYCLES AND SHOCKING AS INDICATED
MAINTAIN THE AIRWAY AND
MOVE PATIENT TO AMBULANCE
CONTINUE CYCLES OF CPR
EVALUATING THE RHYTHM EVERY FIVE
CYCLES AND SHOCKING AS INDICATED
MAINTAIN THE AIRWAY AND
MOVE PATIENT TO AMBULANCE
TRANSPORT
TRANSPORT


PEDIATRIC CARDIAC ARREST
V-FIB / PULSELESS V-TACH
EMT-B
EMT-I
PARAMEDIC
OPEN AND MANAGE AIRWAY
SNIFFING POSITION
100% O2 via BVM
CRICOID PRESSURE
ORAL / NASAL AIRWAY
ACTIVATE THE ACLS SYSTEM
CPR – 15:2 AT 100 COMPRESSION PER MINUTE
CONTACT MEDICAL CONTROL
APPLY MONITOR – SHOCKABLE?
NO: ASYSTOLE / PEA
CONTINUOUS CPR
INTUBATE AND VENTILATE
START IV / IO OF NS
ADMINISTER A ADRENERGIC
See Adrenergic box
NS FLUID BOLUS OF 20 cc/kg
BLOOD SUGAR LESS THAN 70
2 cc/kg D25 IF ≤ 2 YEARS
1 cc/kg D50 IF > 2 YEARS
AFTER AN ADVANCED AIRWAY IS PLACED RESCUERS NO LONGER DELIVER "CYCLES" OF CPR. GIVE CONTINUOUS CHEST COMPRESSIONS WITHOUT PAUSES FOR BREATHS. GIVE 8-10 BREATHS / MINUTE. CHECK RHYTHM EVERY TWO MINUTES.
CONSIDER TREATABLE CAUSES
HYPOTHERMIA
WARM PATIENT
HYPOVOLEMIA
FLUID BOLUS
HYPERKALEMIA
CONSIDER SODIUM BICARB
HYPOGLYCEMIA
DEXTROSE ADMINISTRATION
HYPOXIA
AIRWAY MANAGEMENT
HYDROGEN ION (ACIDOSIS)
CONSIDER SODIUM BICARB
TENSION PNEUMOTHORAX
CHEST DECOMPRESSION
TRICYCLIC OVERDOSE
CONSIDER SODIUM BICARB
YES: VF / PULSELESS VT
DEFIBRILLATE
2 J/kg MONO or BIPHASIC
FIVE CYCLES OF CPR
INTUBATE AND VENTILATE
START IV / IO OF NS
DEFIBRILLATE
4 J/kg MONO or BIPHASIC
AND CONTINUE FIVE CYCLES OF CPR
ADMINISTER AN ADRENERGIC
See Adrenergic box
DEFIBRILLATE
4 J/kg MONO or BIPHASIC
30-60 SECONDS AFTER EACH DRUG IS GIVEN
AND CONTINUE FIVE CYCLES OF CPR
ADMINISTER AN ANTIARRYTHMIC
See Antiarrythmic box
DEFIBRILLATE
4 J/kg MONO or BIPHASIC
AND CONTINUE FIVE CYCLES OF CPR
CONTINUE ATTEMPTS AT DEFIBRILLATION AND MEDICATION ADMINISTRATION
TRANSPORT
APPLY AED WITH PED PADS FOR AGES 1-8
CONTINUE CPR AND TRANSPORT
ADRENERGIC AGENTS
EPINEPHRINE 1:10,000
0.01 mg/kg IV / IO (0.1 cc/kg)
REPEAT EVERY 3 MINUTES
ET DOSE IS 0.1mg/kg 1:1,000
(0.1cc/kg) dilute with 3-5 cc NS
IF PATIENT AGE IS > 12 MAY CHOOSE VASOPRESSIN
40 UNITS IV / IO ONE TIME
TO REPLACE THE 1ST OR 2ND DOSE OF EPI
AFTER 10 MINUTES IF ADDITIONAL ADRENERGICS REQUIRED – USE EPI
ANTIARRYTHMICS
AMIODARONE
5 mg/kg IV
(DILUTED 1:1 WITH NS)
AFTER 10 MINUTES: IF PATIENT REMAINS IN VF/VT OR CONVERTS TO A PERFUSING RHYTHM:
AMIODARONE 2.5 mg/kg IVP
(OVER 2-3 MINUTES)
LIDOCAINE
1.0 mg/kg IVP Q 5 MINUTES
at 0.5 mg/kg to a max of 3 mg/kg
IF THE RHYTHM CONVERTS
LIDOCAINE 0.5 mg/kg IVP
EVERY 20 MINUTES
MAGNESIUM FOR TORSADES
25-50 mg/kg IVP DILUTED TO 10% SOLUTION AND MAX DOSE OF 2 GRAMS

CHILD ABUSE / NEGLECT

GENERAL CONSIDERATIONS

A. Child abuse/neglect is widespread enough that nearly all EMTs and Paramedics will see these problems at some time. The first step in recognizing abuse or neglect is to accept that they exist and to learn the signs and symptoms.

B. Initiate treatment as necessary for situation using established protocols.

C. If possible remove child from scene, transporting to hospital even if there is no medical reason for transport.

D. If parents refuse permission to transport, notify law enforcement for appropriate disposition. If patient is in immediate danger, let law enforcement handle scene.

E. Advise parents to go to hospital. **AVOID ACCUSATIONS,** as this may delay transport. The adult with the child may not be the abuser.

F. Carefully document findings and report to physicians 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 (330-379-1880).

DOCUMENT THIS NOTIFICATION

Include:

- Victim/child's name, DOB, and age
- Parent/legal guardian's name, DOB or age, SS#
- The alleged perpetrator's name, age or DOB
- Other people and children in the home
- Address & Phone number
- Reason for referral
- Referent's name, address, and phone number.

G. If police are on scene or at the hospital, the yellow copy of the report is given to them.

H. If abuse is known or suspected, but the child or children are not the patients we were called to treat:

1. Make a run report for the child or children.

2. Report to CSB or local law enforcement following the above procedure.

DO NOT JEOPARDIZE YOUR SAFETY

FEVER

GENERAL CONSIDERATIONS

A. If febrile, remove excess clothing, but take great care to avoid shivering. Consider environment and temperature of vehicle.

B. DO NOT sponge child unless treating for heat exposure. (This includes use of moist towels to “cool” the child).

C. Suggest transport or urgent medical attention for all infants < 8 weeks of age with a reported temperature of > 100.4F (38C) or < 96F (35.5C).

D. Children < 6 months old with a fever (>102 F) should be seen in the ED.

E. Obtain history:
   1. Feeding.
   2. Previous illnesses.
   3. Degree of temperature.
   4. Medications or therapies administered.
   5. Immunizations.

F. Complete physical exam with special attention to:
   1. Patient’s appearance (awake and playful to unresponsive)
   2. Skin perfusion (normal ->pale -> mottled -> cyanotic)
   3. Work of breathing. (Normal -> retractions -> grunting and flaring)
   4. Vital signs.
   5. Any skin rashes.

G. Contact med control, report all above, and discuss transport code.

PEDIATRIC
FLUID AND DRUG ADMINISTRATION

INTERMEDIATE

A. Peripheral venous access lines will be the first route for fluid and drug administration for any life or limb threatening emergency situation.

B. Unless there are compelling factors, no more than two attempts at peripheral access should be made in the pediatric patient.

C. In **life threatening situations** where venous access appears futile, immediately establish an intraosseous route (decompensated shock, near full arrest, in extremis).

D. Intraosseous Infusion.

1. The following are guidelines for the UNSTABLE child requiring alternative vascular access AFTER ensuring airway and ventilation are established:

   a. **Indications**: Intraosseous access should be established if you cannot rapidly achieve venous access in a patient in decompensated shock.

   b. **Contra-indications:** Recently fractured bone, known bone disorder, and unsuccessful prior attempt. Relative Contra-indication: cellulitis or infected burn at site.

   c. **Equipment**: bone narrow aspiration needle, iodine and alcohol preps, 5cc syringe.

2. Procedure:

   a. Select site (Tibia preferred).

      Tibia – anteromedial aspect of proximal tibial shaft, 1-3 cm below tibial tuberosity.

      Femur – distal 1/3 of femur, midline, 3 cm above condyle.

   b. Prep skin with iodine and alcohol.

   c. After penetration of the skin, direct the needle at 90 degree angle OR at a slight 10-15 degree vertical angle away from knee, while applying gentle pressure, using a twisting motion.

   d. After penetration through the cortex, as marrow cavity is entered, operator may feel a ‘pop’ or less resistance. Remove the inner stylet and attach 5cc syringe.

   e. Placement usually confirmed by successful fluid administration without edema or swelling.

   f. 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.

   g. Secure as needed, immobilize extremity and observe site frequently for extravisation of fluid.

PEDIATRIC DRUG AND FLUID ADMINISTRATION (cont)

h. Infusion may require pressure bag to maintain patency or 60 cc syringe to provide bolus dosing.

i. Document procedure and child's response.

E. Fluid of choice is Normal Saline, utilizing a macrodrip administration set. If child is less than 2 years old a micordrip set should be used is available.

PARAMEDIC

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

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

Lidocaine
Atropine
Narcan
Epinephrine

2. Intramuscular (IM) route may be used for Versed, Morphine, Benadryl, or Glucagon.

3. Intranasal (IN) route may be used for Narcan, Versed, or Glucagon.

PEDIATRIC DEXTROSE ADMINISTRATION GUIDELINES

INDICATIONS:

INFANT OR CHILD WITH BLOOD GLUCOSE LEVEL OF <70 mg/dl
NEWBORN WITH A BLOOD GLUCOSE LEVEL OF <40 mg/dl

TREATMENT:

***NEWBORN* - GIVE D10W, 2-4 ml/kg IV / IO**
(1 part D50W, 4 parts normal saline)

***CHILD ≤2 YEARS OLD* - GIVE D25W, 2-4 ml/kg IV / IO**
(Dilute D50W 1:1 with normal saline)

***CHILD >2 YEARS OLD* - GIVE D50W, 1-2 ml/kg IV / IO**
IF NO IV ESTABLISHED, GIVE GLUCAGON 1.0 mg IM

MULTI-TRAUMA

GENERAL CONSIDERATIONS

A. The basics of trauma care apply to Pediatric patients and should primarily follow the general Adult Trauma Protocol.

B. Areas where special focus should occur:

   1. May involve both respiratory failure and shock.

   2. Assessment and support of cardiopulmonary function is fundamental.

C. Common errors of pediatric trauma resuscitation are:

   1. Failure to open and maintain the airway.

   2. Failure to provide appropriate fluid resuscitation to children with head injury.

   3. Failure to recognize and treat internal hemorrhage.

D. IO infusion is indicated in the trauma setting when shock needs to be treated and rapid venous access is unobtainable.

E. 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.

F. MAST devices are not indicated except for the treatment of shock associated with unstable pelvic fractures. Do not inflate the abdominal cavity of the trousers.

NOTE: FOLLOW APPLICABLE REGIONAL PEDIATRIC TRAUMA TRIAGE PROTOCOL

NEWBORN RESUSCITATION

GENERAL CONSIDERATIONS

A. The five initial questions to assess in every newborn are as follows:

- Is the baby full term and how many babies are expected?
- Is there THICK meconium present?
- Is the baby breathing or crying?
- Does the baby have good muscle tone?
- Is the baby's color pink?

These questions will help determine the amount of intervention needed. Most term healthy infants do not require ALS intervention. This initial assessment should be completed within 30 seconds.

B. Normal newborn (pink, crying/breathing, good tone)

- Complete initial assessment: Dry, Warm, Suction/Stimulate.
- Suction secretions from the mouth and then the nose.
- Body heat must always be maintained. As soon as the baby is born, wipe the baby dry and place in a warm environment.
- Cover infant's head, place infant against mother's skin, and cover both.
- Use indirect, heated, humidified oxygen if available. Avoid direct application of cold oxygen to infant's face as this may cause respiratory depression.

C. Distressed newborn (pale or cyanotic, poor respiratory effort, floppy or limp tone).

- Complete initial assessment: Dry, Warm, Suction/Stimulate.
- Suction secretions from the mouth and then the nose.
- Position infant in the sniffing position (with a 1" towel under shoulders). This will provide an optimally opened airway and adequate drainage of secretions.
- Use indirect, heated, humidified oxygen if available. Avoid direct application of cold oxygen to infant's face as this may cause respiratory depression.

D.

E. If drying and suction has not provided enough stimulation, try flicking the infant's feet and/or rubbing the infant's back. If the infant still has poor respiratory effort, poor tone, or central cyanosis, considers them to be distressed. Most distressed infants will respond quickly to BVM.

F. The APGAR score should be used in the initial assessment of normal newborns and is a measure of the effectiveness of interventions for the distressed newborn. Scoring must not delay intervention in the distressed newborn. The score is completed at 1 and 5 minutes after delivery. If the 5-minute score is less than 7, repeat every 5 minutes for the next 20 minutes.

NEWBORN RESUSCITATION (cont)

APGAR SCORE

Sign	0	1	2
Color	Blue / Pale	Pink Body, Blue Extremities	Completely Pink
Heart Rate	Absent	Below 100	Above 100
Irritability (response to stimulation)	No Response	Grimace	Cries
Muscle Tone	Limp	Flexion of Extremities	Active Motion
Respiratory Effort	Absent	Slow and Regular	Strong Cry

I. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage.

FIRST RESPONDER

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

B. After delivery of the infant, assess airway and breathing while drying and positioning head down. If amniotic fluid is NOT clear, continue to suction PRIOR to ventilating and stimulating.

C. If infant not breathing, assist ventilations via mouth to mouth using barrier device.

D. If no pulse or pulse below 60, begin CPR.

E. Keep infant warm. Wrap in dry blankets.

EMT-B / EMT-I

A. Reevaluate: If poor respiratory effort, heart rate <100, or poor color, begin BVM with 100% O2 at 40 bpm. Most distressed infants respond quickly to BVM.

B. After 30 seconds, recheck HR. If HR < 60, begin chest compressions at 120 events/min. (90 compressions interspersed with 30 ventilations); prefer 2-thumbs encircling technique if able and does not interfere with airway management.

C. Establish communications with medical Control and advise them of the patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enrobe and has an ETA of less than 5 minutes to the scene.

NEWBORN RESUSCITATION (cont)

PARAMEDIC

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Intubate patient if thick meconium is present in lower airway; suction through ET tube using a meconium aspirator and re-intubate with new tube. Meconium aspiration is a major cause of death and morbidity among infant. If THICK meconium is present and not removed, 60% of these infants will aspirate the meconium. If meconium is present, suction the newborn's mouth and nose immediately upon delivery of the head (before delivery of the body). If THICK meconium is present, it may 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. Each time this suctioning is done the infant will have to be re-intubated with a new tube. Watery or thin meconium does not require suctioning of the lower airway.

C. Reevaluate: If poor respiratory effort, heart rate <100, or poor color, begin BVM with 100% O2 at 40 bpm. Most distressed infants respond quickly to BVM.

D. After 30 seconds, recheck HR. If HR < 60, begin chest compressions at 120 events/min. (90 compressions interspersed with 30 ventilations); prefer 2-thumbs encircling technique if able and does not interfere with airway management.

E. After 30 seconds, recheck HR. If HR < 60, initiate endotracheal intubation

F. Apply monitor and check rhythm.

G. Establish IV or IO.

H. If asystole or spontaneous heart rate is less than 60 despite adequate ventilation:

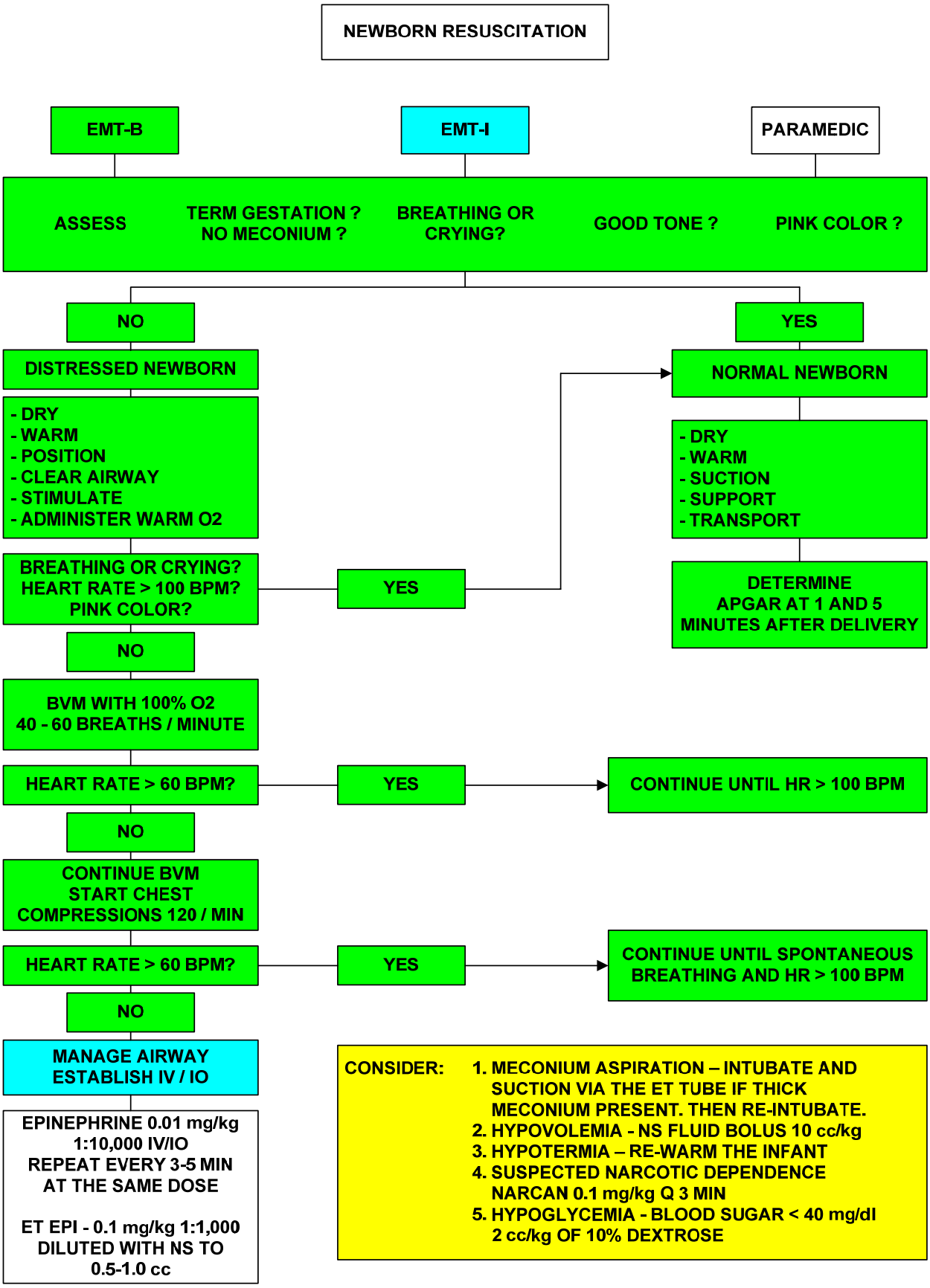
1. Administer epinephrine 0.01 – 0.03 mg/kg (0.1 – 0.3 ml/kg) of 1:10,000 via IV or IO. If ET, administer epinephrine 0.1 mg/kg of 1:1,000 diluted with NS to 0.5 - 1 ml.

2. If no response, repeat every 3-5 minutes.

I. If infant continues with low heart rate, consider:

- Hypovolemia, administer saline, 10 cc/kg over 5 minutes.
- Hypothermia, re-warm the infant.
- Narcan administration if respirations are depressed and narcotic dependence is suspected.
    - 0.1mg/kg repeated every 3 minutes until respirations improve.
- Hypoglycemia, check blood sugar level and administer 2 cc/kg of 10% Dextrose (1 part D50, 4 parts normal saline) if level is below 40 mg/dl.

J. Contact Medical Control and transport to hospital.


NEWBORN RESUSCITATION
EMT-B
EMT-I
PARAMEDIC
ASSESS
TERM GESTATION ?
NO MECONIUM ?
BREATHING OR
CRYING?
GOOD TONE ?
PINK COLOR ?
NO
YES
DISTRESSED NEWBORN
NORMAL NEWBORN
- DRY
- WARM
- POSITION
- CLEAR AIRWAY
- STIMULATE
- ADMINISTER WARM O2
- DRY
- WARM
- SUCTION
- SUPPORT
- TRANSPORT
BREATHING OR CRYING?
HEART RATE > 100 BPM?
PINK COLOR?
YES
DETERMINE
APGAR AT 1 AND 5
MINUTES AFTER DELIVERY
NO
BVM WITH 100% O2
40 - 60 BREATHS / MINUTE
HEART RATE > 60 BPM?
YES
CONTINUE UNTIL HR > 100 BPM
NO
CONTINUE BVM
START CHEST
COMPRESSIONS 120 / MIN
HEART RATE > 60 BPM?
YES
CONTINUE UNTIL SPONTANEOUS
BREATHING AND HR > 100 BPM
NO
MANAGE AIRWAY
ESTABLISH IV / IO
EPINEPHRINE 0.01 mg/kg
1:10,000 IV/IO
REPEAT EVERY 3-5 MIN
AT THE SAME DOSE
ET EPI - 0.1 mg/kg 1:1,000
DILUTED WITH NS TO
0.5-1.0 cc
CONSIDER:
1. MECONIUM ASPIRATION – INTUBATE AND SUCTION VIA THE ET TUBE IF THICK MECONIUM PRESENT. THEN RE-INTUBATE.
2. HYPOVOLEMIA - NS FLUID BOLUS 10 cc/kg
3. HYPOTERMIA – RE-WARM THE INFANT
4. SUSPECTED NARCOTIC DEPENDENCE NARCAN 0.1 mg/kg Q 3 MIN
5. HYPOGLYCEMIA - BLOOD SUGAR < 40 mg/dl 2 cc/kg OF 10% DEXTROSE

PEDIATRIC PAIN CONTROL

A. Consider in any patient complaining of severe pain, where appropriate administration of pain medication will not mask serious injury, prevent further evaluation, cause cardio respiratory depression or hypotension.

B. Indications for Morphine Sulfate 0.1mg/kg IV include:

- Severe burns without suspected CO exposure or respiratory compromise.
- Isolated extremity trauma to include crush injury, lacerations, fractures, or road rash

C. Contraindications include:

- Multiple trauma with potential for intra-abdominal or intra-thoracic hemorrhage.
- Suspected pneumothorax
- Head injury or altered LOC.
- Non-traumatic abdominal pain or possible bowel obstruction
- Symptomatic asthma
- Hypotension or respiratory distress
- Alcohol or drug intoxication

PEDIATRIC RESPIRATORY DISTRESS

GENERAL CONSIDERATIONS

A. In children, open airway by using the sniffing position.

B. 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.

C. If BVM ventilation is necessary, cricoid pressure can be applied to minimize gastric distention until airway is secured.

D. Refer to length based drug treatment guide (e.g. BROSELOW PEDIATRIC EMERGENCY TAPE) when unsure about patient weight, age and/or drug dosage.

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

Onset
Provokes
Quality
Radiates
Severity
Time
Interventions

Allergies
Medication
Past Medical History - especially RESPIRATORY
Last Meal
Events leading to present illness

UPPER AIRWAY OBSTRUCTION

Causes:

- Obstruction secondary to croup (onset at night)
- Obstruction secondary to foreign body (history of choking spell)
- Obstruction secondary to anaphylaxis (exposure may or may not be identified.
- Obstruction secondary to epiglotittis (usually high fever and very toxic)

FIRST RESPONDER / EMT-B

A. Quickly obtain history and non-invasive respiratory assessment.

1. Total airway obstruction / History of foreign body airway.

   a. Manual clearing only if foreign body is visible – NO BLIND FINGER SWEEP

   b. Back blows and chest thrust in children less and 1 yr.

   c. Abdominal and/or chest thrusts in children over 1 yr.

   d. If airway cannot be cleared in 60 seconds:

      i. Transport immediately to nearest hospital.

      ii. Do not take history.

      iii. Do not make further physical assessment.

PEDIATRIC RESPIRATORY DISTRESS (cont)

e. If patient becomes unresponsive;

i. Open airway with head tilt/chin lift and attempt to BVM with 100% O2.

ii. Continue back blows / abdominal thrusts.

2. Partial airway obstruction:

a. DO NOT AGITATE CHILD, DO NOT EXAMINE THROAT. Most are able to clear their airway with coughing and/or vomiting.

b. Consider oxygen administration via NRB if tolerated or by “blow-by”.

B. Allow the child to assume a position of comfort. The child may assume the tripod position. Keep the child and parent (or caregiver) CALM. Do not agitate child.

C. Transport immediately in a secure upright position to closest appropriate hospital.

EMT-I

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Reassess breath sounds and treat as follows:

1. Do not establish IV access unless child is in arrest. DO NOT agitate child.

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.

PARAMEDIC

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Reassess lung sounds and treat as follows:

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. Discontinue the aerosol if it causes the patient to cough.

2. Do not attempt invasive airway unless child has respiratory arrest. Bag-valve mask ventilation is acceptable.

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.

4. If airway is completely obstructed a needle, or surgical cricothyrotomy may be life saving. Contact Medical Control. If the patient has a tracheostomy tube, see page 42.

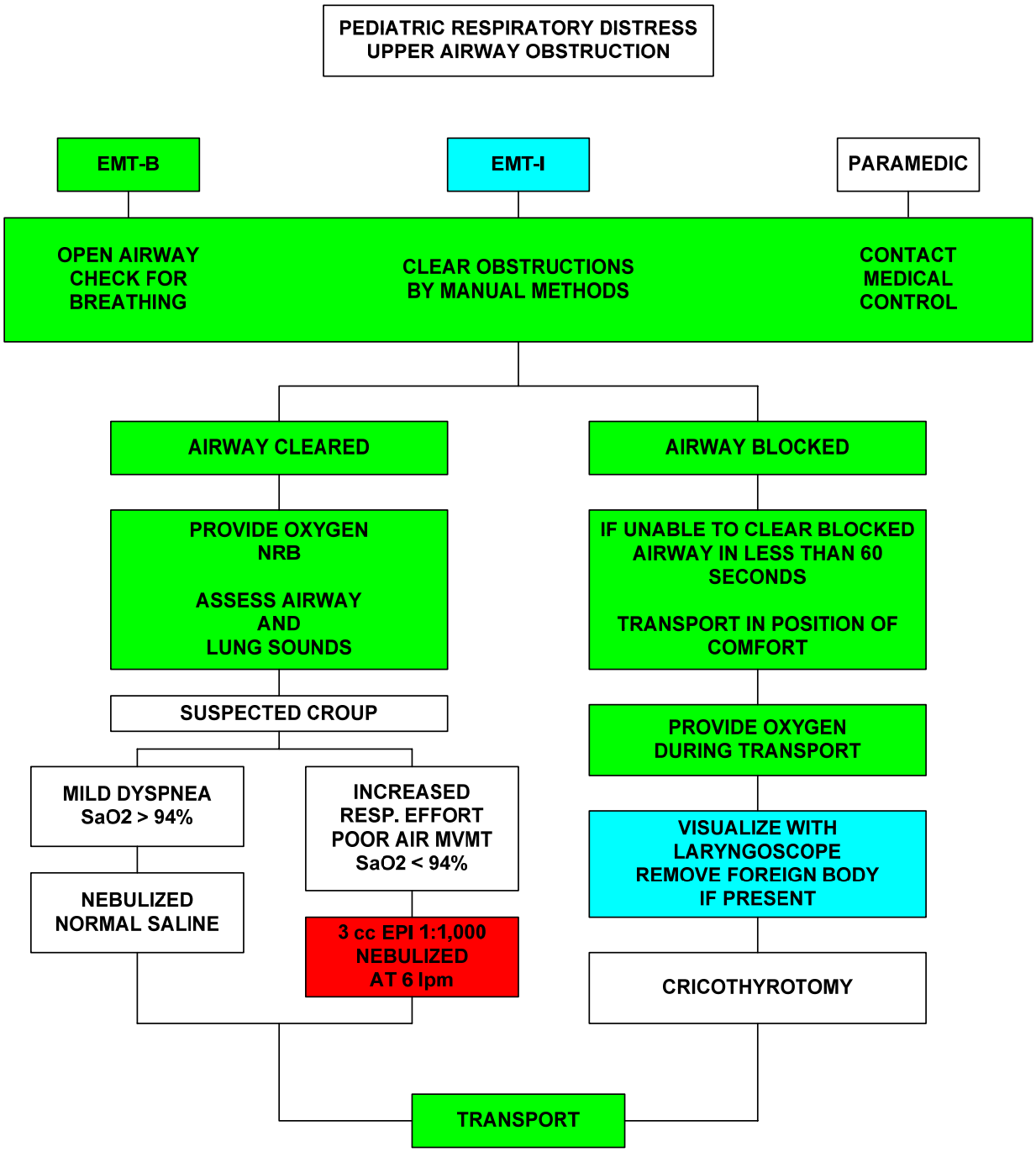
5. If the child is awake and alert with a recent history of cold symptoms, fever, barking cough, and / or the symptoms become worse at night, consider croup.

PEDIATRIC RESPIRATORY DISTRESS (cont)

a. With stridor, cough, mildly increased respiratory effort and SaO2 >94%, administer nebulized saline.

b. With stridor, increased work of breathing, poor air exchange, and SaO2 < 94%, administer nebulized epinephrine PER MEDICAL CONTROL ORDER ONLY.

   i. 3 cc Epi 1:1,000 nebulized with 6 lpm


PEDIATRIC RESPIRATORY DISTRESS
UPPER AIRWAY OBSTRUCTION
EMT-B
EMT-I
PARAMEDIC
OPEN AIRWAY
CHECK FOR
BREATHING
CLEAR OBSTRUCTIONS
BY MANUAL METHODS
CONTACT
MEDICAL
CONTROL
AIRWAY CLEARED
AIRWAY BLOCKED
PROVIDE OXYGEN
NRB
ASSESS AIRWAY
AND
LUNG SOUNDS
IF UNABLE TO CLEAR BLOCKED
AIRWAY IN LESS THAN 60
SECONDS
TRANSPORT IN POSITION OF
COMFORT
SUSPECTED CROUP
PROVIDE OXYGEN
DURING TRANSPORT
MILD DYSPNEA
SaO2 > 94%
INCREASED
RESP. EFFORT
POOR AIR MVMT
SaO2 < 94%
VISUALIZE WITH
LARYNGOSCOPE
REMOVE FOREIGN BODY
IF PRESENT
NEBULIZED
NORMAL SALINE
3 cc EPI 1:1,000
NEBULIZED
AT 6 lpm
CRICOTHYROTOMY
TRANSPORT

PEDIATRIC RESPIRATORY DISTRESS LOWER AIRWAY OBSTRUCTION

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.

FIRST RESPONDER

A. Place child in position of comfort, encourage parent to hold child in a secure position. Keep child and parent CALM.

B. Quickly obtain history and non-invasive respiratory assessment.

C. Administer 100% Oxygen in the least threatening manner.

D. If respiratory effort is insufficient or patient is becoming unconscious, assist ventilations with bag-valve-mask.

1. If allergic reaction is suspected:

a. Secure airway and support with oxygen.

b. Ask patient or bystanders if epinephrine by auto-injector has been prescribed for these situations, assist with the administration of the medication as per protocol, then transport patient immediately.

c. Apply ice if insect bite or sting.

EMT-B

A. IF MEDICATION IS NOT AVAILABLE – Transport immediately, unless ALS unit is enroute and has an ETA of less than 5 minutes.

B. 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.

EMT-I

A. Assume change of situation.

B. Reassess breath sounds.

C. DO NOT establish IV access unless child is in arrest. Do not agitate child.

1. If allergic reaction is suspected.

a. Give 0.01 mg/kg (0.01cc/kg) of 1:1,000 Epinephrine by subcutaneous injection. The MAX dose is 0.3 mg (0.3 ml).

PEDIATRIC RESPIRATORY DISTRESS – LOWER AIRWAY OBSTRUCTION (cont)

PARAMEDIC

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Reassess breath sounds and treat as follows:

1. If allergic reaction is suspected:

   a. Give 0.01 mg/kg (0.01cc/kg) of 1:1,000 Epinephrine by subcutaneous injection. The MAX dose is 0.3 mg (0.3 ml).

   b. May repeat subcutaneous epi dose or 0.1ml/kg (max 4ml) Epinephrine 1:10,000 IV

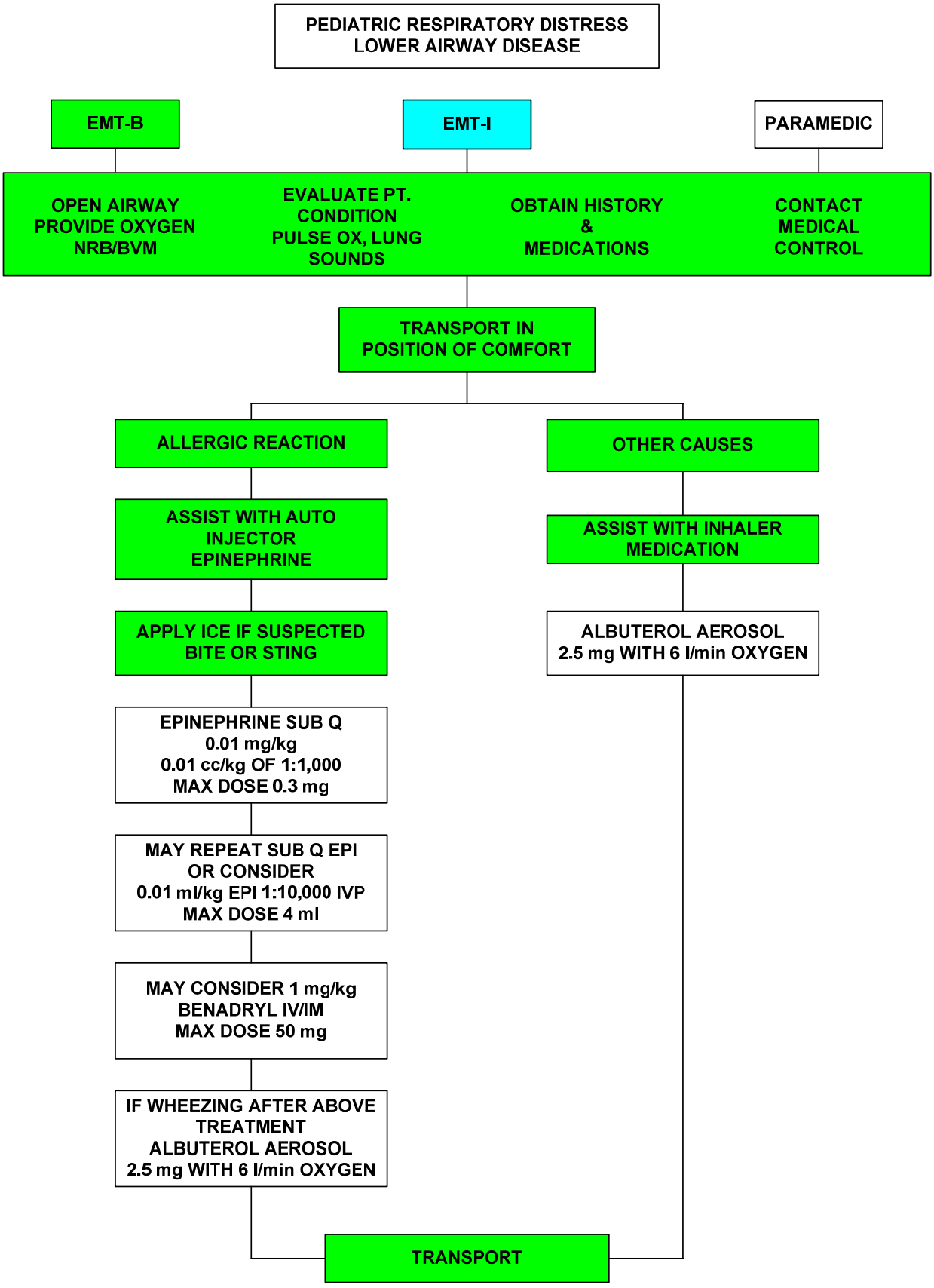
   c. Consider Benadryl 1mg/kg IV/IM (max 50mg)

   d. Consider Albuterol unit dose (2.5 mg by mask with 6 l/min oxygen) aerosol if wheezing after above treatment.

2. For other causes of wheezing:

   a. 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.

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


PEDIATRIC RESPIRATORY DISTRESS
LOWER AIRWAY DISEASE
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 INHALER
MEDICATION
APPLY ICE IF SUSPECTED
BITE OR STING
ALBUTEROL AEROSOL
2.5 mg WITH 6 l/min OXYGEN
EPINEPHRINE SUB Q
0.01 mg/kg
0.01 cc/kg OF 1:1,000
MAX DOSE 0.3 mg
MAY REPEAT SUB Q EPI
OR CONSIDER
0.01 ml/kg EPI 1:10,000 IVP
MAX DOSE 4 ml
MAY CONSIDER 1 mg/kg
BENADRYL IV/IM
MAX DOSE 50 mg
IF WHEEZING AFTER ABOVE
TREATMENT
ALBUTEROL AEROSOL
2.5 mg WITH 6 l/min OXYGEN
TRANSPORT

PEDIATRIC SEIZURE

GENERAL CONSIDERATIONS

A. The seizure may be stopped by the time the EMS personnel arrive. The patient will normally be in the postictal state.

B. The basic rule with seizures is to "protect and support" the patient.

C. Pediatric seizures may be subtle: eye blinking, sucking, lip smacking, eye twitching or deviation to one side.

D. Aspiration precautions should include:

1. Coma position: a side-lying position with the head lowered 15 to 30 degrees.

2. Suction readily available.

3. Clear mouth of foreign bodies (food, gum, etc.).

E. Febrile Seizures (seizures with fever) are common in children and should be treated like other seizures. Remove clothing to cool. Do not cool with water or alcohol.

F. First time seizure, regardless of etiology, will be transported by EMS.

FIRST RESPONDER

A. Place patient away from objects on which they might injure themselves; protect but do not restrain them.

B. Clear and maintain airway; consider the possibility of C-spine injury.

C. Administer 100% oxygen with NRB as needed for ventilation.

D. Obtain history from family and/or bystanders:

1. Seizure history.
2. Description of onset of seizure.
3. Medication.
4. Other known medical history, especially fever, head trauma, diabetes, drugs.

E. Evaluate any evidence of injury, especially head trauma.

EMT-B

A. Bring any medications with child to the hospital.

B. Establish communications with Medical Control and advise them of the patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

C. Check blood sugar level.

PEDIATRIC SEIZURE (cont)

1. If the blood sugar is less than 70 mg/dl, administer oral glucose if alert. This may be repeated in 10 minutes if blood sugar remains below 70 mg/dl. **PATIENT MUST HAVE A GAG REFLEX**

EMT-I

A. Assist EMTs, obtain patient condition and circumstances.

B. Apply monitor and check rhythm.

C. Check Blood Sugar level.

1. If the blood sugar is less than 70 mg/dl, administer oral glucose if alert. This may be repeated in 10 minutes if the blood sugar remains below 70 mg/dl. **PATIENT MUST HAVE A GAG REFLEX**

D. If seizure activity persists:

1. Establish airway.

2. Start IV.

PARAMEDIC

A. Assume charge of the situation and confer with EMTs about patient and situation.

B. Make sure patient has good airway. In some cases intubation may be necessary.

C. If seizure activity persists, determine blood sugar level and treat accordingly.

1. Blood sugar less than 70, administer IV bolus:

a. 2 cc/kg of 25% Dextrose for children $\leq$ 2 years old.

b. 1 cc/kg of 50% Dextrose for children > 2 years old.

c. May be repeated in 10 minutes if blood sugar remains below 70 mg/dl.

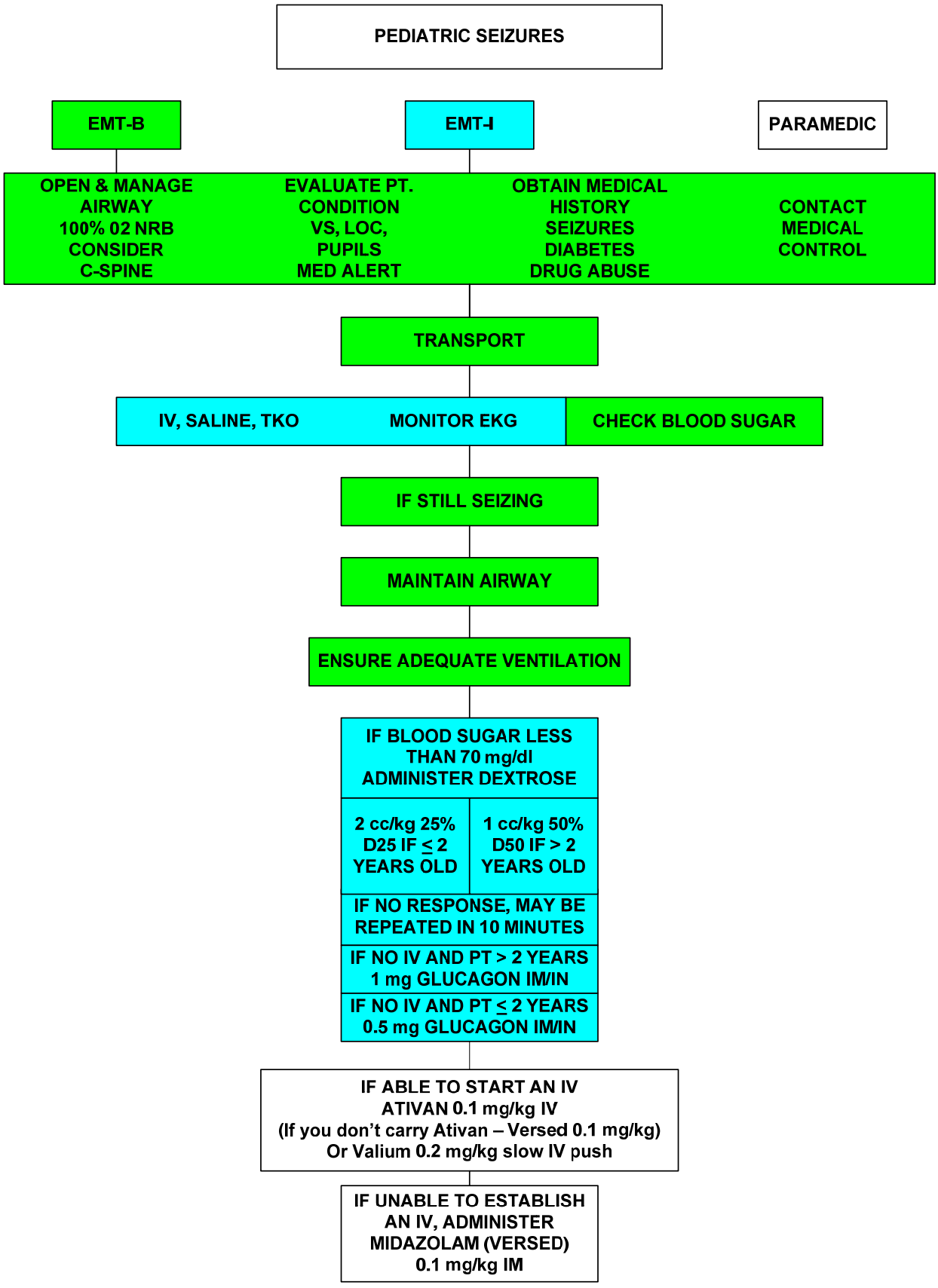
d. If the patient is greater than 2 years of age and an IV has not been established, may administer 1 mg Glucagon IM/IN.

e. If the patient is less than 2 years of age and an IV has not been established, may administer 0.5 mg Glucagon IM/IN.

2. If you are able to establish an IV, administer Ativan 0.1 mg/kg IV.

a. If you do not carry Ativan, administer 0.1 mg/kg Midazolam (Versed) IV or IM or Valium 0.2 mg/kg, slow IV push over three minutes to a maximum dose of 5 mg.

3. If unable to establish an IV, administer Midazolam (Versed) 0.1 mg/kg IM.


PEDIATRIC SEIZURES
EMT-B
EMT-I
PARAMEDIC
OPEN & MANAGE AIRWAY
100% 02 NRB
CONSIDER C-SPINE
EVALUATE PT. CONDITION
VS, LOC, PUPILS
MED ALERT
OBTAIN MEDICAL HISTORY
SEIZURES
DIABETES
DRUG ABUSE
CONTACT MEDICAL CONTROL
TRANSPORT
IV, SALINE, TKO
MONITOR EKG
CHECK BLOOD SUGAR
IF STILL SEIZING
MAINTAIN AIRWAY
ENSURE ADEQUATE VENTILATION
IF BLOOD SUGAR LESS THAN 70 mg/dl
ADMINISTER DEXTROSE
2 cc/kg 25% D25 IF ≤ 2 YEARS OLD
1 cc/kg 50% D50 IF > 2 YEARS OLD
IF NO RESPONSE, MAY BE REPEATED IN 10 MINUTES
IF NO IV AND PT > 2 YEARS
1 mg GLUCAGON IM/IN
IF NO IV AND PT ≤ 2 YEARS
0.5 mg GLUCAGON IM/IN
IF ABLE TO START AN IV
ATIVAN 0.1 mg/kg IV
(If you don't carry Ativan – Versed 0.1 mg/kg)
Or Valium 0.2 mg/kg slow IV push
IF UNABLE TO ESTABLISH AN IV, ADMINISTER
MIDAZOLAM (VERSED)
0.1 mg/kg IM

PEDIATRIC SHOCK

GENERAL CONSIDERATIONS

A. 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.

B. Do not use only the patient's blood pressure in evaluating shock; also look for lower body temperature, poor capillary refill, decreased level of consciousness, increased heart rate, and/or poor skin color or turgor. **Tachycardia is often the first sign of shock**.

NOTE: DO NOT depend on blood pressure.

C. The lowest minimal SBP = 70 + (2 x age in years). A drop in blood pressure to this minimal level is a sign of impending cardiovascular collapse and arrest.

D. Transport should not be delayed. The airway must be secured and then transport immediately. It is preferable that IV's and/or IO's be done during transportation.

FIRST RESPONDER

A. Open and maintain the airway with sniffing position and the use of an oral airway if needed.

B. Control all external bleeding and evaluate for internal hemorrhage and/or dehydration.

C. Provide 100% oxygen through NRB mask, and if needed assist ventilations with a BVM.

D. Obtain vital signs: pulse and respirations.

EMT-B

A. Establish communications with Medical Control and advise them of the patient's condition. Transport IMMEDIATELY unless an advanced life support unit is enroute and has an ETA of less than 5 minutes to the scene.

EMT-I

A. Assist EMT, obtain patient condition and circumstance.

B. Hypovolemic, Neurogenic, or Septic Shock:

1. Start IV saline during transport to the hospital.

DO NOT DELAY TRANSPORT FOR IV

2. Administer IV fluid bolus of 20cc/kg of saline if signs of hypoperfusion or dehydration are present.

3. Transport. Repeat bolus during transport if patient does not respond to first bolus.

C. Anaphylaxis from an insect bite or sting:

1. If breathing difficulty with low blood pressure establish IV saline during transport.

PEDIATRIC SHOCK (cont)

a. Give 0.01cc/kg Epinephrine 1:1,000, maximum 0.3 mg (0.3 ml) epinephrine by subcutaneous injection.

2. Hives, itching, and/or swelling:

a. Give 0.01 cc/kg Epinephrine 1:1,000, maximum 0.3 mg (0.3 ml) epinephrine by subcutaneous injection.

D. Apply monitor and check rhythm.

PARAMEDIC

A. Assume charge of situation and confer with EMTs about condition of patient and situation.

B. Apply monitor and follow protocol for Arrhythmias.

C. Identify type of shock and treat as follows:

1. Hypovolemic, Neurogenic, Septic:

a. Start IV or IO saline and administer fluid bolus of 20cc/kg if signs of hypoperfusion or dehydration are present (low BP, poor capillary refill, poor skin turgor).

b. Repeat bolus during transport.

c. Check blood sugar; if less than 70, administer IV bolus:

i. 2 cc/kg of 25% Dextrose (D25) if less than 2 years old.

ii. 1 cc/kg of 50% Dextrose (D50) if more than 2 years old.

iii. May be repeated in 10 minutes if blood sugar remains below 70 mg/dl.

2. Anaphylactic:

a. Respiratory distress.

i. Give 0.01cc/kg (1:1000) epinephrine by injection subcutaneously. Maximum dose 0.3mg.

ii. Administer Benadryl (Diphenhydramine) to be administered 1 mg/kg IM or IV.

NOTE: This is especially indicated when drug reactions are suspected.

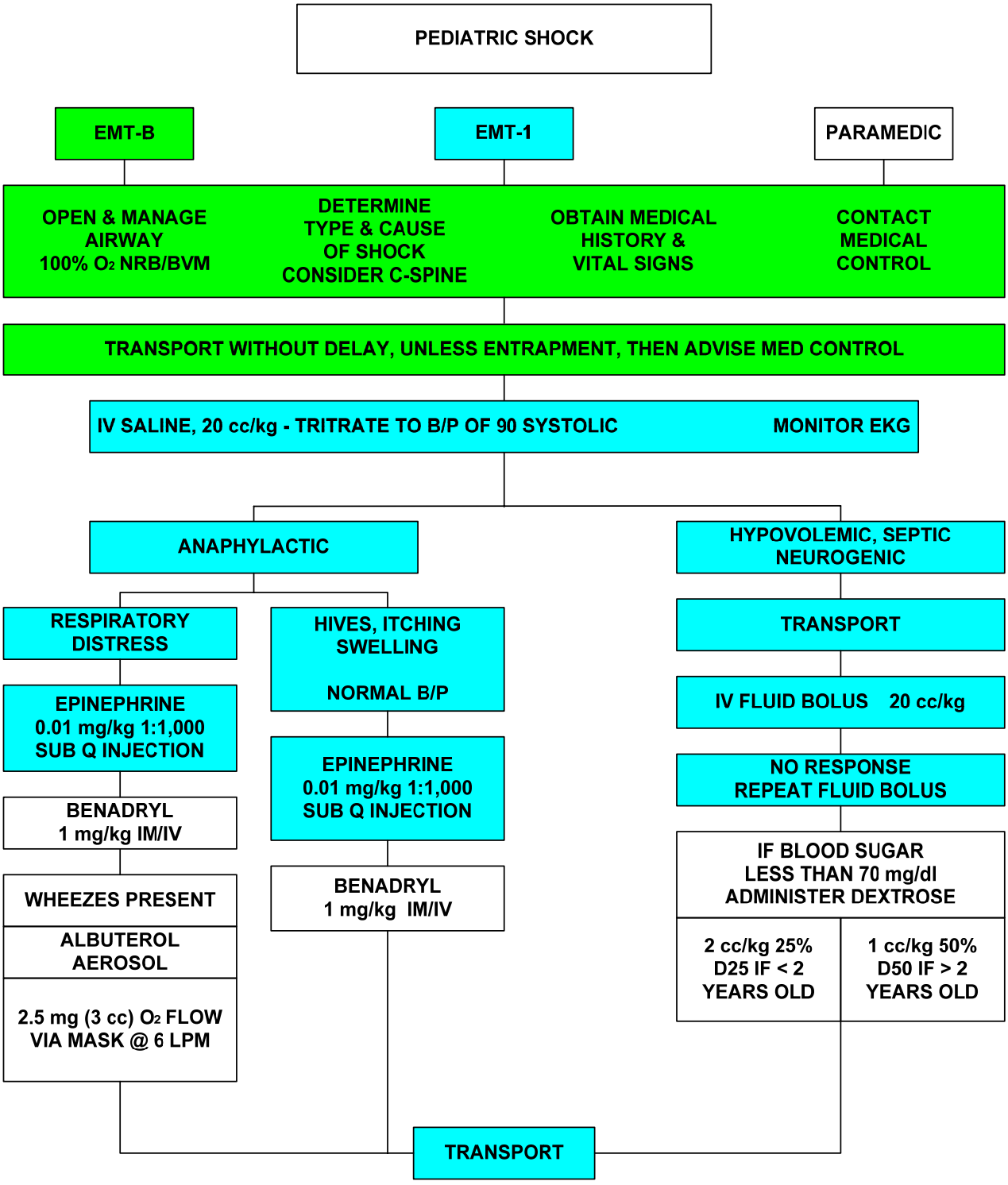
iii. When wheezes are present and not cleared by epinephrine, provide Albuterol breathing treatment. 1 unit dose, 2.5 mg (3cc), by child aerosol mask over 10-15 min.

b. Hives, itching, and/or swelling with normal B/P:

i. Give 0.01cc/kg (1:1,000) epinephrine by injection subcutaneously. Maximum dose 0.3mg.

ii. Administer Benadryl (Diphenhydramine) to be administered 1 mg/kg IM or IV.

NOTE: This is especially indicated when drug reactions are suspected.


PEDIATRIC SHOCK
EMT-B
EMT-1
PARAMEDIC
OPEN & MANAGE AIRWAY 100% O2 NRB/BVM
DETERMINE TYPE & CAUSE OF SHOCK CONSIDER C-SPINE
OBTAIN MEDICAL HISTORY & VITAL SIGNS
CONTACT MEDICAL CONTROL
TRANSPORT WITHOUT DELAY, UNLESS ENTRAPMENT, THEN ADVISE MED CONTROL
IV SALINE, 20 cc/kg - TRITRATE TO B/P OF 90 SYSTOLIC
MONITOR EKG
ANAPHYLACTIC
HYPOVOLEMIC, SEPTIC NEUROGENIC
RESPIRATORY DISTRESS
HIVES, ITCHING SWELLING
NORMAL B/P
TRANSPORT
EPINEPHRINE 0.01 mg/kg 1:1,000 SUB Q INJECTION
IV FLUID BOLUS 20 cc/kg
EPINEPHRINE 0.01 mg/kg 1:1,000 SUB Q INJECTION
NO RESPONSE REPEAT FLUID BOLUS
BENADRYL 1 mg/kg IM/IV
BENADRYL 1 mg/kg IM/IV
IF BLOOD SUGAR LESS THAN 70 mg/dl ADMINISTER DEXTROSE
WHEEZES PRESENT
ALBUTEROL AEROSOL
2 cc/kg 25% D25 IF < 2 YEARS OLD
1 cc/kg 50% D50 IF > 2 YEARS OLD
2.5 mg (3 cc) O2 FLOW VIA MASK @ 6 LPM
TRANSPORT

CHILDREN WITH SPECIAL NEEDS (CSHCN)

SPECIAL CONSIDERATIONS

A. Treat the ABC's first. Treat the child, not the equipment. If the emergency is due to an equipment malfunction, manage the child appropriately using your own equipment.

B. 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. Special needs children include technology-assisted children such as those with tracheostomy tubes with or without assisted ventilation, children with gastrostomy tubes, and children with indwelling central lines. The most serious complications of these devices are related to tracheostomy problems.

C. CSHCN have many allergies. Children with spina bifida are often allergic to latex. Before treating a patient, ask caregivers if the children are allergic to latex or have any other allergies. If possible, keep latex-free equipment. (Some regularly used equipment that contains latex includes gloves, oxygen masks, IV tubing, BVM's, blood pressure cuffs, IV catheters, etc.)

D. Knowing which children in a given area have special needs and keeping a log book is encouraged.

E. Parents and caretakers are usually trained in emergency management and can be of assistance to EMS personnel. Listen carefully to the caregiver and follow his/her guidance regarding the child's treatment.

F. Children with chronic illnesses often have different physical development from well children. Therefore, their baseline vitals may differ from normal standards. The size and developmental level may be different from age-based norms and length based tapes used to calculate drug dosages. Ask the caregiver if the child normally has abnormal vital signs (i.e. – a fast heart rate or a low pulse oximeter reading).

G. Some CSHCN may have sensory deficits (i.e. – they may be hearing impaired or blind) yet may have age-appropriate cognitive abilities. Follow the caregivers lead in talking to and comforting a child during treatment and transport. Do not assume that a CSHCN is developmentally delayed.

H. When moving a special needs child, a slow careful transfer with two or more people is preferable. Do not try to straighten or unnecessarily manipulate contracted extremities as it may cause injury or pain to the child. Certain medical conditions will require special care. Again, consult the child's caregiver.

I. Caregivers of CSHCN often carry "go bags" or diaper bags that contain supplies to use with the child's medical technologies and additional equipment such as extra tracheostomy tubes, adapters for feeding tubes, suction catheters, etc. Before leaving the scene, ask the caregivers if they have a "go bag" and carry it with you.

J. Caregivers may also carry a brief medical information form or card. The child may be enrolled in a medical alert program whereby emergency personnel can get quick access to the child's medical history. Ask the caregivers if they have an emergency information form or some other form of medical information for their child.

K. Caregivers of CSHCN often prefer that their child be transported to the hospital where the child is regularly followed or the "home" hospital. When making the decision as to where to transport a CSHCN, take into account: local protocols, the child's condition, capabilities of the local hospital, caregivers' request, ability to transport to certain locations, and the ability to request helicopter transport for a distant home hospital.

EMERGENCIES IN CHILDREN WITH TRACHEOSTOMIES

GENERAL CONSIDERATIONS

A. The child should be examined for other possible problems. Do not assume the problem is with the tracheostomy tube.

FIRST RESPONDER

A. Examine the child quickly for possible causes of distress which may be easily correctable, such as a detached oxygen source.

B. Try to establish the child's baseline: the child may never look normal.

C. 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.

EMT-B & EMT-1

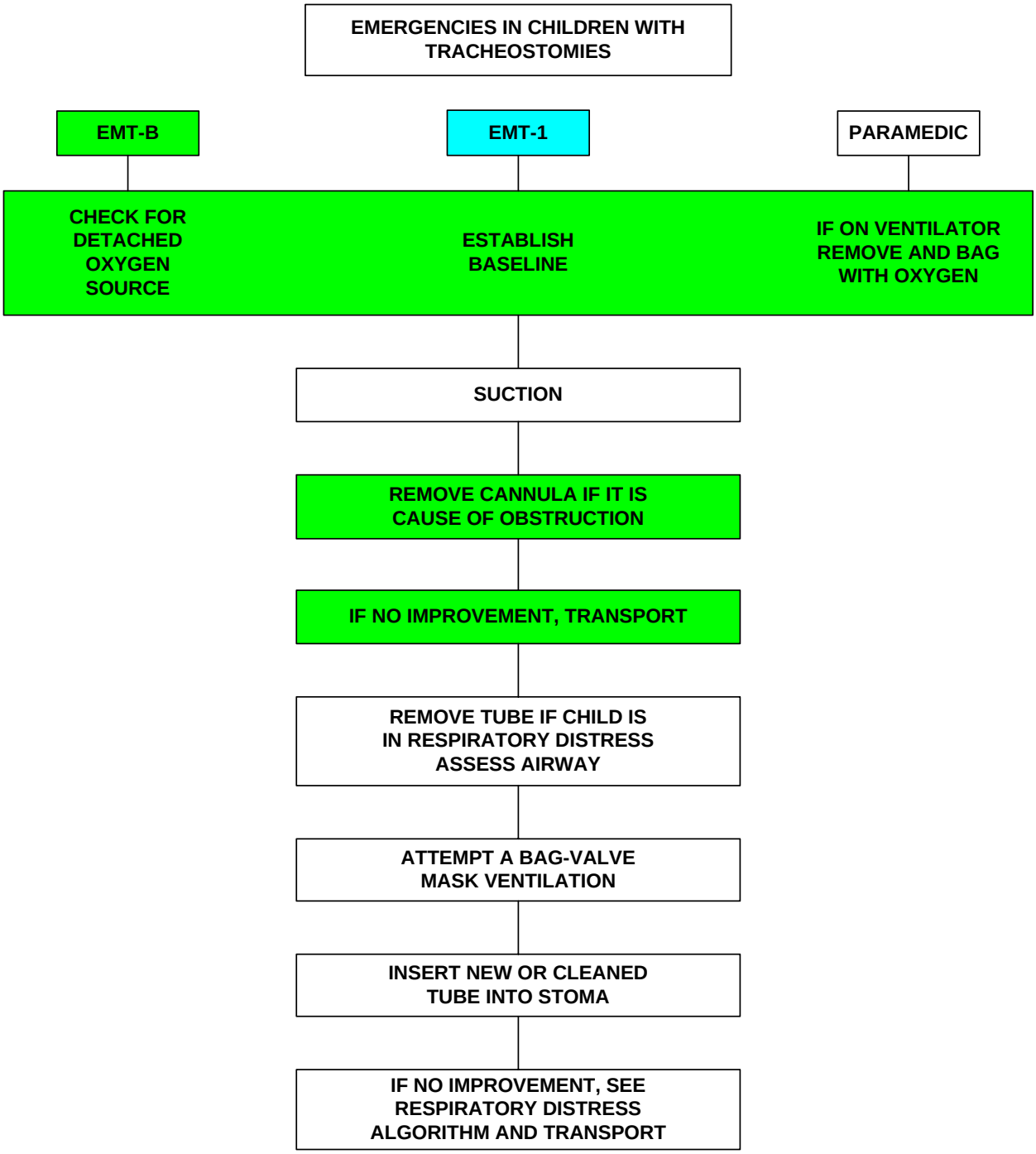
A. If still no improvements immediately transport to the nearest medical facility; initiate appropriate resuscitation as needed.

PARAMEDIC

A. Suction the child as accumulation of debris is a common cause of obstruction; if the tracheostomy tube has a cannula, remove it; if it is the cause of obstruction there should be immediate improvement.

B. 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 endotracheal tube may be used or the used tracheostomy tube after being cleaned).

C. If there is still no improvement see the respiratory distress protocol.


EMERGENCIES IN CHILDREN WITH TRACHEOSTOMIES
EMT-B
EMT-1
PARAMEDIC
CHECK FOR DETACHED OXYGEN SOURCE
ESTABLISH BASELINE
IF ON VENTILATOR REMOVE AND BAG WITH OXYGEN
SUCTION
REMOVE CANNULA IF IT IS CAUSE OF OBSTRUCTION
IF NO IMPROVEMENT, TRANSPORT
REMOVE TUBE IF CHILD IS IN RESPIRATORY DISTRESS ASSESS AIRWAY
ATTEMPT A BAG-VALVE MASK VENTILATION
INSERT NEW OR CLEANED TUBE INTO STOMA
IF NO IMPROVEMENT, SEE RESPIRATORY DISTRESS ALGORITHM AND TRANSPORT

EMERGENCIES IN CHILDREN WITH IN-DWELLING CENTRAL LINES

GENERAL CONSIDERATIONS

A. 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.

B. 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.

FIRST RESPONDER

A. Always evaluate child for cardiovascular stability as some complications may be life threatening.

B. Children may be experiencing complications from their underlying medical condition; as caretakers about the child's condition.

EMT-B, EMT-I & PARAMEDIC

A. If line is blocked, do not attempt to force the catheter open, transport to a facility capable of managing central lines.

B. For complete removal, do not attempt to reinsert; transport to the nearest emergency department.

   1. Infections are a common complication; don't try to push a line back in, even if it is only slightly out.

C. 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).

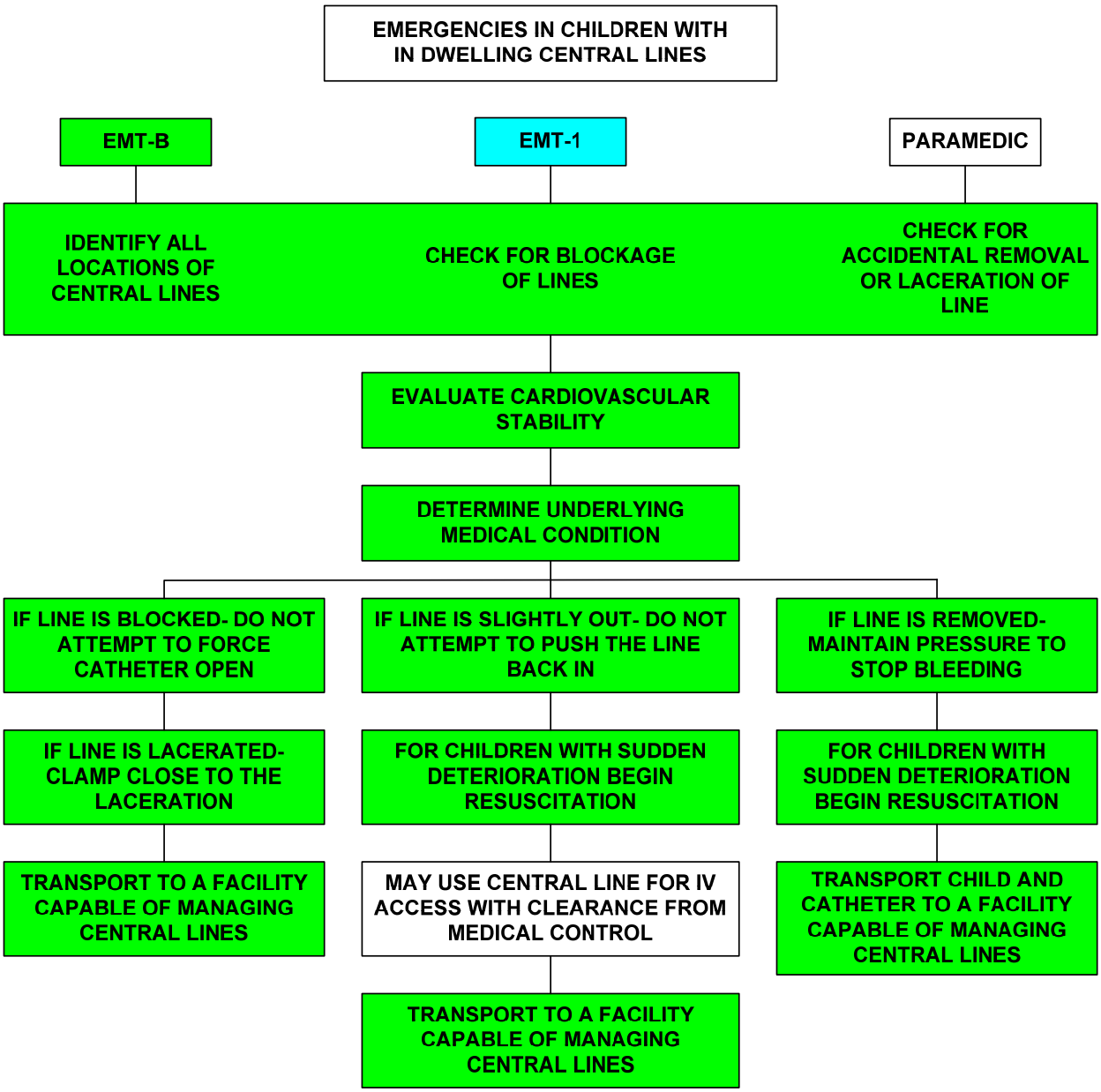
   1. Always bring the line with you to the hospital.

D. For partial or complete laceration of the line, clamp proximally to laceration utilizing a padded clamp and transport child and catheter to nearest emergency department.

E. For children with sudden deterioration begin basic resuscitation and transport to nearest emergency facility (child may have pneumothorax or internal bleeding).

F. If there are fluids infusing through the central line, determine the nature of the fluid and the time that the fluid was started.

G. For Paramedics only: May use the central line for IV access if permitted by protocol, and given clearance by medical control.


EMERGENCIES IN CHILDREN WITH IN DWELLING CENTRAL LINES
EMT-B
EMT-1
PARAMEDIC
IDENTIFY ALL LOCATIONS OF CENTRAL LINES
CHECK FOR BLOCKAGE OF LINES
CHECK FOR ACCIDENTAL REMOVAL OR LACERATION OF LINE
EVALUATE CARDIOVASCULAR STABILITY
DETERMINE UNDERLYING MEDICAL CONDITION
IF LINE IS BLOCKED- DO NOT ATTEMPT TO FORCE CATHETER OPEN
IF LINE IS SLIGHTLY OUT- DO NOT ATTEMPT TO PUSH THE LINE BACK IN
IF LINE IS REMOVED- MAINTAIN PRESSURE TO STOP BLEEDING
IF LINE IS LACERATED- CLAMP CLOSE TO THE LACERATION
FOR CHILDREN WITH SUDDEN DETERIORATION BEGIN RESUSCITATION
FOR CHILDREN WITH SUDDEN DETERIORATION BEGIN RESUSCITATION
TRANSPORT TO A FACILITY CAPABLE OF MANAGING CENTRAL LINES
MAY USE CENTRAL LINE FOR IV ACCESS WITH CLEARANCE FROM MEDICAL CONTROL
TRANSPORT CHILD AND CATHETER TO A FACILITY CAPABLE OF MANAGING CENTRAL LINES
TRANSPORT TO A FACILITY CAPABLE OF MANAGING CENTRAL LINES

EMERGENCIES IN CHILDREN WITH GASTROSTOMY TUBES

GENERAL CONSIDERATIONS

A. 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 tub e should be replaced as soon as possible. Both conditions are easily recognized.

B. The child should be examined for any other possible problems.

FIRST RESPONDER

A. Children who have problems with their tubes may have problems with regurgitation or aspiration.

B. Be aware of and address any other possible problems from their underlying medical condition.

EMT-B and EMT-I

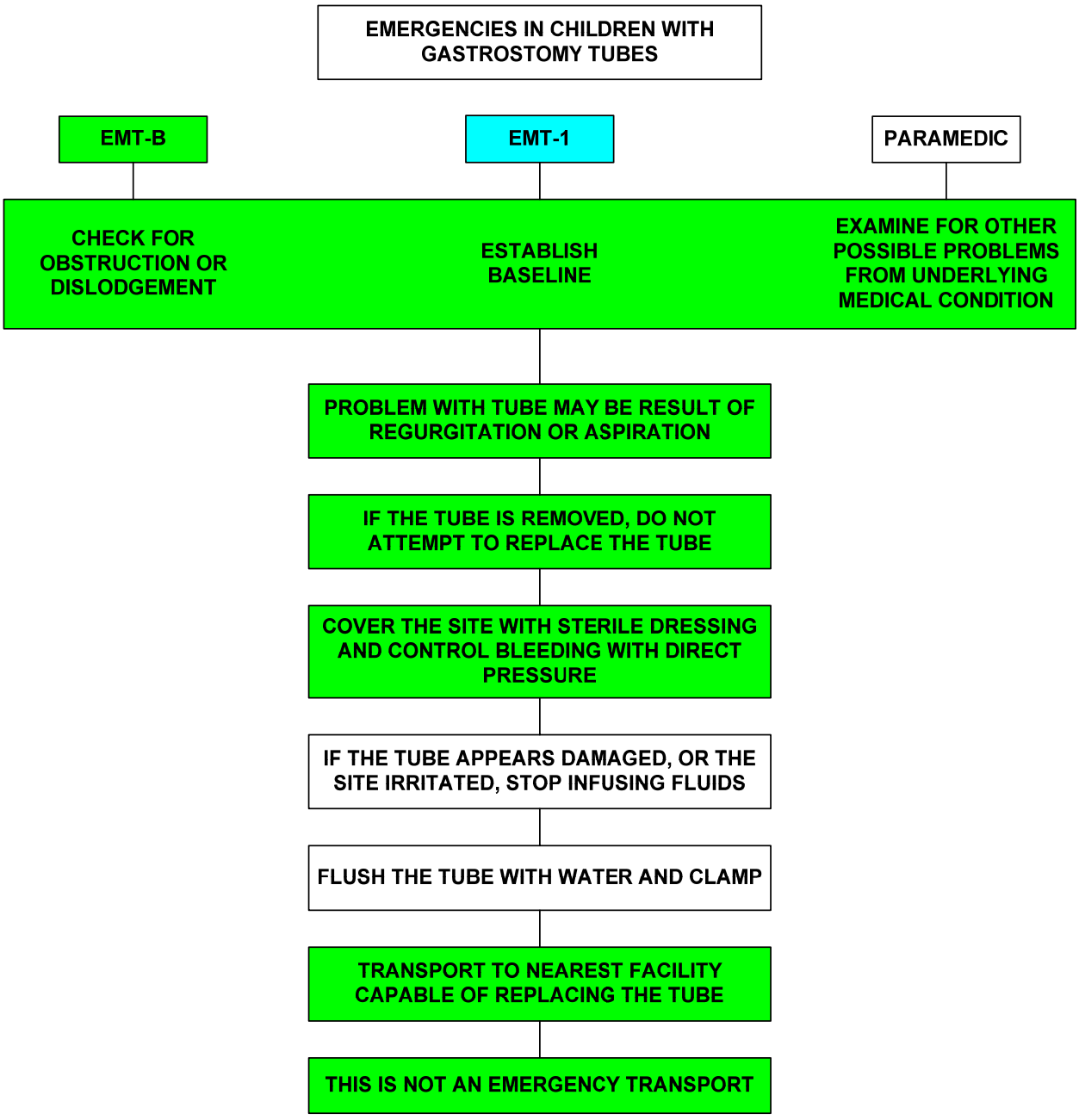
A. Transport the child and the tube to the nearest facility capable of replacing the tube; this is not an emergency transport.

B. Do not attempt to replace the tube; it is not as easy as it seems and there may be other complications.

C. Cover the site with a sterile dressing and control any bleeding with direct pressure.

PARAMEDIC

A. If there are fluids infusing through the feeding tube, determine the nature of the fluids and the time that the fluids were started. If the tube appears damaged, or the site is irritated, stop all infusing fluids, flush the tube with water, and clamp the tube.


EMERGENCIES IN CHILDREN WITH GASTROSTOMY TUBES
EMT-B
EMT-1
PARAMEDIC
CHECK FOR OBSTRUCTION OR DISLODGEMENT
ESTABLISH BASELINE
EXAMINE FOR OTHER POSSIBLE PROBLEMS FROM UNDERLYING MEDICAL CONDITION
PROBLEM WITH TUBE MAY BE RESULT OF REGURGITATION OR ASPIRATION
IF THE TUBE IS REMOVED, DO NOT ATTEMPT TO REPLACE THE TUBE
COVER THE SITE WITH STERILE DRESSING AND CONTROL BLEEDING WITH DIRECT PRESSURE
IF THE TUBE APPEARS DAMAGED, OR THE SITE IRRITATED, STOP INFUSING FLUIDS
FLUSH THE TUBE WITH WATER AND CLAMP
TRANSPORT TO NEAREST FACILITY CAPABLE OF REPLACING THE TUBE
THIS IS NOT AN EMERGENCY TRANSPORT

EMERGENCIES IN CHILDREN ON VENTILATORS

GENERAL CONSIDERATIONS

A. Children on mechanical ventilation may exhibit sudden or gradual deterioration, cardiac arrest, increased oxygen demand, increased respiratory rate, retractions, and change in mental status.

B. 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.

C. Medications the child is presently taking may be the cause of deterioration.

D. Try to establish the child's baseline; the child may never look normal.

FIRST RESPONDER

A. 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.

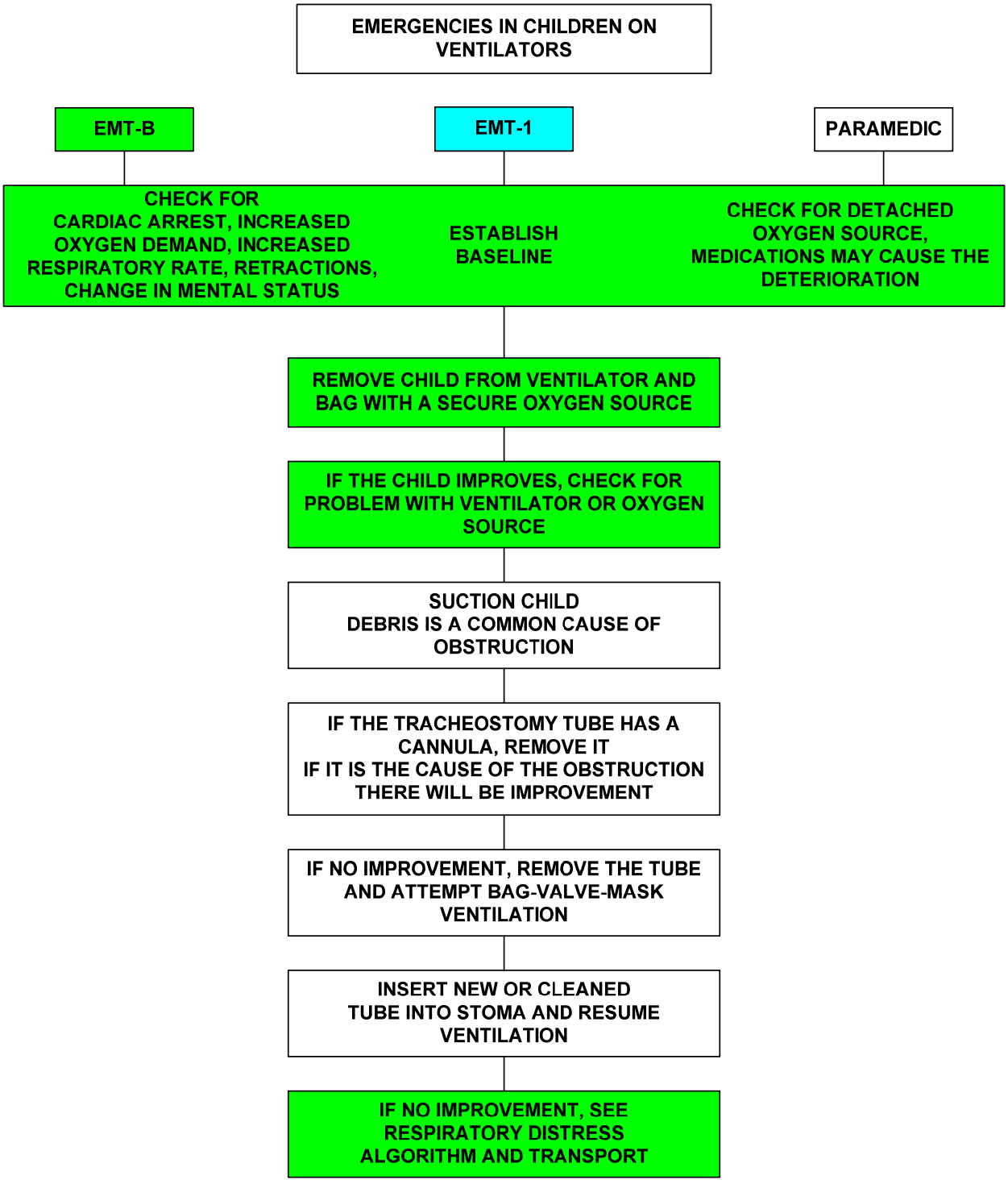
EMT-B & EMT-I

A. If there is no improvement immediately transport to the nearest medical facility; initiate appropriate resuscitation as needed.

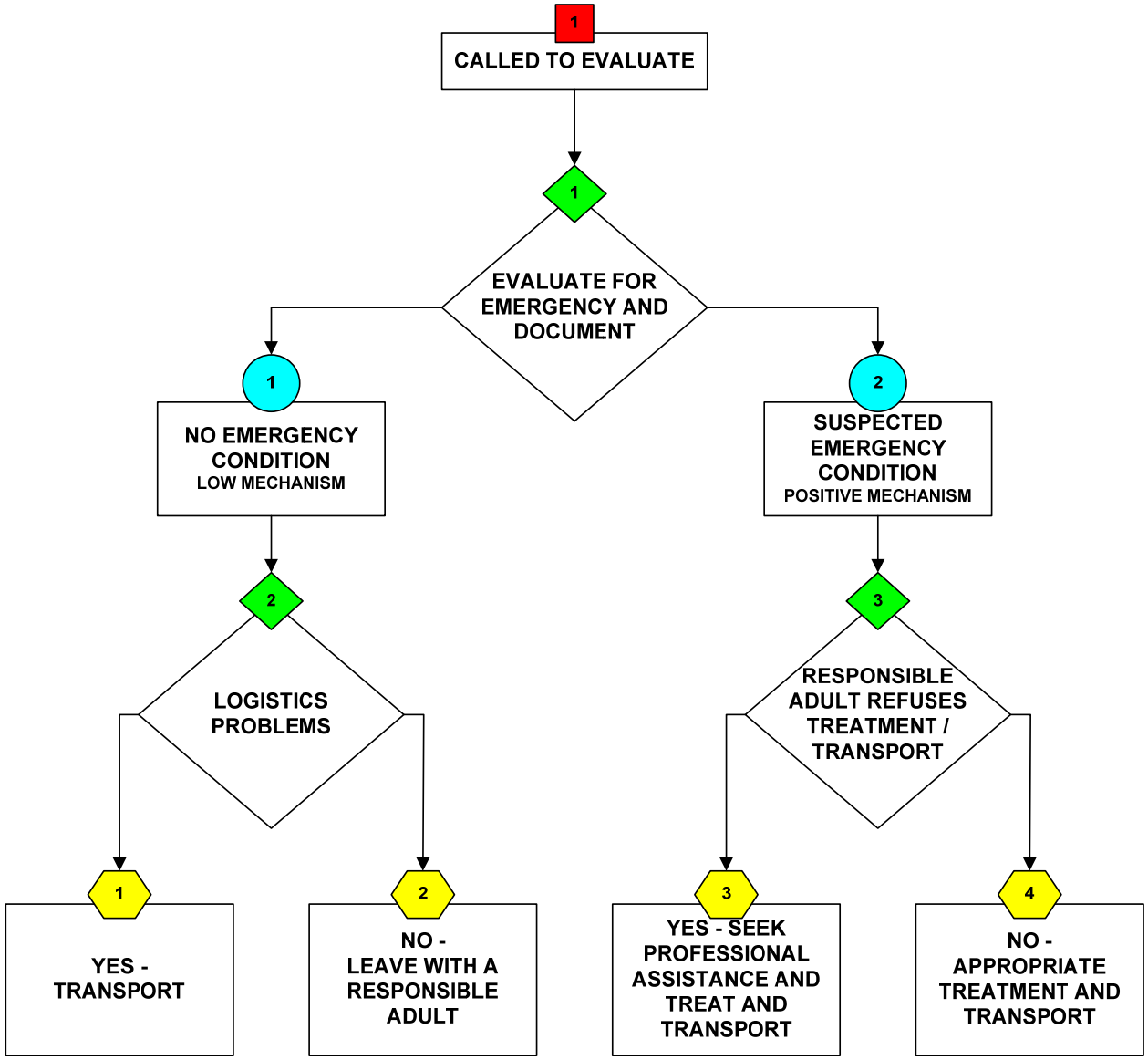
PARAMEDIC

A. Suction the child as accumulation of debris is a common cause of obstruction; if the tracheostomy tube has a cannula, remove it; if it is the cause of obstruction, there should be immediate improvement.

B. 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 tracheostomy tube after being cleaned).


EMERGENCIES IN CHILDREN ON VENTILATORS
EMT-B
EMT-1
PARAMEDIC
CHECK FOR CARDIAC ARREST, INCREASED OXYGEN DEMAND, INCREASED RESPIRATORY RATE, RETRACTIONS, CHANGE IN MENTAL STATUS
ESTABLISH BASELINE
CHECK FOR DETACHED OXYGEN SOURCE, MEDICATIONS MAY CAUSE THE DETERIORATION
REMOVE CHILD FROM VENTILATOR AND BAG WITH A SECURE OXYGEN SOURCE
IF THE CHILD IMPROVES, CHECK FOR PROBLEM WITH VENTILATOR OR OXYGEN SOURCE
SUCTION CHILD
DEBRIS IS A COMMON CAUSE OF OBSTRUCTION
IF THE TRACHEOSTOMY TUBE HAS A CANNULA, REMOVE IT
IF IT IS THE CAUSE OF THE OBSTRUCTION THERE WILL BE IMPROVEMENT
IF NO IMPROVEMENT, REMOVE THE TUBE AND ATTEMPT BAG-VALVE-MASK VENTILATION
INSERT NEW OR CLEANED TUBE INTO STOMA AND RESUME VENTILATION
IF NO IMPROVEMENT, SEE RESPIRATORY DISTRESS ALGORITHM AND TRANSPORT

ALGORITHM FOR OUT-OF-HOSPITAL EVALUATION, TREATMENT, AND TRANSPORTATION OF MINORS



DECISION COMPONENTS
FOR OUT-OF-HOSPITAL EVALUATION, TREATMENT, AND TRANSPORTATION OF MINORS

1 **Begin: Called to Evaluate**
EMS Personnel are routinely called to evaluate a minor (less than 18 years of age). Their responsibility is to carry out an evaluation, then perform any emergency medical treatment and appropriate transportation. If a call for assistance is received by EMS, they must respond to evaluate the condition without any form of discrimination. The evaluation must be documented in a form that satisfies the usual department criteria.

1 **Decision Point: Must Evaluate for Emergency and Document Findings**
The minor patient must be evaluated. If the responsible adult refuses evaluation and there is reasonable suspicion that the child is either neglected, abused, or has a medical emergency, all reasonable efforts should be taken to make an evaluation. The local law enforcement agency should be called when a problem situation occurs. The state will support efforts of the EMS provider to assess a neglect or abuse situation. On-scene cooperation of law enforcement personnel will provide further supportive documentation.

1 **Outcome: No Emergency Condition**
Medical evaluation reveals no emergency condition. Observations and interviews do not support the possibility of a serious illness or injury. EMS personnel then evaluate for any logistics problems with the minor being left with an appropriate responsible adult.

2 **Outcome: Suspected Emergency Condition**
An emergency condition exists and/or interviews and observations indicate a suspected emergency medical problem. The child should be appropriately packaged, monitored, and transported to an ED for further evaluation and any necessary treatment. A responsible adult is notified of the situation and given the opportunity to participate in the transport decision, consolation of the child, and treatment. If the responsible adult refuses transportation or is unavailable, it should be performed anyway to protect the minor, again with good documentation and cooperation of law enforcement.

2 **Decision Point: Logistics Problems**
Logistics problems may include the following: no available transportation, no available responsible adult, responsible adult(s) have emergency conditions that must be dealt with, inclement weather, or a hostile environment for the minor.

1 **Resolution: Transport to Hospital**
If logistics problems are present, a convenient and 24-hour resource may be the Emergency Department at the appropriate hospital. The hospital may be a convenient rendezvous point for a responsible adult, and may caretake the child until the adult is able to take responsibility. If further medical evaluation is necessary, the ED personnel can perform.

2 **Resolution: Leave with a Responsible Person**
With appropriate documentation and follow up instructions the child is left with a responsible adult.

3 **Decision Point: Refusal of Treatment / Transportation**
Information given to a responsible adult. However, EMS personnel are suspicious of potential injuries or the actual emergency overrides any other consent issues.

3 **Resolution**
Appropriate treatment and transportation performed. Conflicting views of responsible adult and EMS personnel need to be resolved. Assistance from law enforcement, social service, child protective and hospital ED personnel is utilized.

4 **Resolution**
Transport to hospital ED.

*** A responsible adult is an identified individual who, based on the circumstances at hand, is a reasonable, competent individual to manage the decision-making for the involved child. This person may be a parent, grandparent, caregiver, neighbor, coach, educator, etc. who is responsible for the care of the child at the time of EMS evaluation.

NORMAL PEDIATRIC VITAL SIGNS						
	Newborn (0 - 1 mo)	Infant (1 mo - 1 yr)	Toddler (1-3 yrs)	Preschooler (3-6 yrs)	School-ager (6-12 yrs)	Adolescent (13+ yrs)
Respiratory	30-60	30-60	24-40	23-34	18-30	12-16
Pulse	100-180	100-160	80-110	70-110	65-110	60-90
Systolic BP*	60-90	88-105	95-105	96-108	98-112	112-128
*Blood pressure is an unreliable indicator of shock in children						

PEDIATRIC RESUSCITATION EQUIPMENT									
Equipment	Preemie	Newborn Small Inf.	Infant	Toddler	Small Child	Child	Child	Large Child	Adolescent
	1-2 kg (2-4 lb)	3-5 kg (6-11 lb)	6-9 kg (13-19 lb)	10-11 kg (22-24 lb)	12-14 kg (26-30 lb)	15-18 kg (33-39 lb)	19-22 kg (41-48 lb)	24-30 kg (52-66 lb)	32-34+ kg (71+ lb)
Laryngoscope Blade	0 straight	0-1 straight	1 straight	1 straight	2 straight	2 straight or curved	2 straight or curved	2/3 strt. or curved	3 straight or curved
Endotracheal Tube	2.5 - 3.0	3.0 - 3.5	3.5	4.0	4.5	5.0	5.5	6.0 cuffed	6.5 cuffed
ET at the lips	8	10-10.5	10-10.5	11-12	12.5-13.5	14-15	15.5-16.5	17-18	18.5-19.5
Suction Catheter (Fr)	5-6	6-8	8	8-10	10	10	10	10	12

PEDIATRIC RESUSCITATION MEDICATIONS										
Weight kg (lb)	4(9)	7(15)	10(22)	12(26)	15(33)	20(44)	25(55)	33(77)	40(88)	50(110)
Approx. Age	Nwb.	6 mos.	1 year	2 years	4 years	6 years	8 years	10 yrs.	12 yrs.	Adolescent
Epinephrine 1:10,000 IV/IO Dose: 0.1 cc/kg	0.4 ml	0.7 ml	1 ml	1.2 ml	1.5 ml	2 ml	2.5 ml	3.3 ml	4 ml	5 ml
Epinephrine 1:1,000 ET Dose: 0.1 cc/kg	N/A	0.7 ml	1 ml	1.2 ml	1.5 ml	2 ml	2.5 ml	3.3 ml	4 ml	5 ml
Atropine IV / IO .02 mg/kg	N/A	0.1 ml	0.2 ml	0.2 ml	0.3 ml	0.4 ml	0.5 ml	0.5 ml	0.5 ml	1 ml
Bicarbonate 8.4% IV / IO Dose: 1.0 cc/kg	4 ml	7 ml	10 ml	12 ml	15 ml	20 ml	25 ml	33 ml	40 ml	50 ml
Glucose 25% IV / IO Dose: 2 cc/kg	8 ml	14 ml	20 ml	24 ml	30 ml	40 ml	50 ml	66 ml	80 ml	100 ml
Lidocaine 2% IV / IO Dose: .05 cc/kg	N/A	0.35 ml	0.50 ml	0.60 ml	0.75 ml	1.0 ml	1.3 ml	1.7 ml	2.0 ml	2.5 ml

Adenocard IV 1st Dose: 0.1 mg/kg Double the second dose	Versed (Midazolam) IV / IM Dose: 0.1 mg/kg	Racemic Epinephrine 3-5 ml Epi 1:1,000 Via Nebulizer at 6 l/m

PEDIATRIC COMA SCORING[1]

	Glasgow	Infant	
Eye Opening	Spontaneous To voice To pain None	Spontaneous To voice To pain None	4 3 2 1
Verbal Response	Oriented Confused Inappropriate Garbled speech None	Coos, babbles Irritable cry, inconsolable Cries to pain Moans to pain None	5 4 3 2 1
Motor Response	Obeys commands Localizes pain Withdraws to pain Flexion Extension Flaccid	Normal Movement Withdraws to touch Withdraws to pain Flexion Extension Flaccid	6 5 4 3 2 1

NOTE: MOTOR RESPONSE IS MOST INDICATIVE OF LEVEL OF INJURY

[1] **A score of < 8 generally is an indication to hyperventilate the child.**

PEDIATRIC PREHOSPITAL MEDICATIONS

Medications	*Dose*	*Route*	*Remarks*
Acetaminophen (Tylenol)	10 mg/kg	PO	Useful for musculoskeletal pain and fever control
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 kg	Aerosol	Indicated for wheezing as per protocol
Amiodarone	5 mg/kg	IV, IO	Over 20-60 minutes, maximum 15 mg/kg per day. For shock-refractory pulseless VF/VT: 5mg/kg rapid IV/IO
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 xl, also useful before intubating children < 5 years old, blocks bradycardia due to vagal nerve stimulation.
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.
	0.01 mg/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.
Midazolam (Versed)	0.1 mg/kg	IV/IO/IM	Indicated for uncontrolled seizure activity; anticipate respiratory depression useful to facilitate advanced airway management in combative patients.
Naloxone (Narcan)	0.1 mg/kg	IV,IO,ET	Useful for unknown unconscious, known narcotic overdoses
Nalbuphne (Nubain)	0.1 mg/kg	IV	Use for mild or moderate pain, minimal pain, minimal respiratory depression

IV = Intravenous ET = Endotracheal IO = Intraosseous