PEDIATRIC GUIDELINES

5-01 GUIDELINES FOR PEDIATRIC CARE

I. Cardiac arrest in children is not a sudden event. It is almost always due to a respiratory problem, which leads to hypoxia, bradycardia, and eventually asystole. Initial treatment should be directed at establishment of an airway, administration of supplemental oxygen, and mechanical ventilation.

II. Intubation is not recommended for the neonate, infant or small child as a first maneuver. Appropriate basic life support airway management should be initiated as soon as possible.

III. The intraosseous route of fluid and medication administration is available in children.

IV. Do not use BP as the only indication of shock. Blood pressure is a late sign of shock in children. Instead, you should evaluate end-organ perfusion using capillary refill, pulses, and skin color/temperature.

IV. It is important that prehospital time be at a minimum for pediatric patients. Early transport will be a priority.

V. Length based resuscitation tapes (Broslow tape) and charts should be utilized during the treatment of the pediatric patient. This allows the best estimation of the patients weight for drug calculations.

5-02 ANTICIPATING CARDIOPULMONARY ARREST

All sick children should under go a Rapid Cardiopulmonary Assessment. The goal is to answer the question, **"*Does this child have pulmonary or circulatory failure that may lead to cardiopulmonary arrest?"***

I. Respiratory

A. Assessment of a child's respiratory status is crucial to preventing cardiopulmonary arrest.

B. Identify signs of respiratory distress early, including tripoding, nasal flaring, retractions, grunting, wheezes, rhonchi and crowing.

C. Identify and rapidly treat signs of respiratory failure. Look for changes in mental status, cyanosis, delayed capillary refill, loss of peripheral pulses and cold/mottled extremities.

D. Treatment should be focused on:

1. Ensuring patency of the airway by suctioning secretions from oral and nasal passages and utilizing airway adjuncts.

2. Positioning of the child, which is critical to maintaining an airway. Padding is needed under the torso of all children, even those being immobilized for c-spine injuries.

3. Providing supplemental oxygen, which is needed to prevent progression to arrest. Consider use of blow by oxygen to decrease anxiety produced by mask oxygen. Remember that a calm child uses less oxygen than an anxious child. Do not hesitate to assist ventilations with signs of respiratory failure.

4. Intubation is not recommended for the neonate, infant or small child as a first maneuver. Appropriate basic life support airway management should be initiated as soon as possible.

II. Circulatory

A. Cardiovascular Assessment

1. Heart Rate:
   a. Tachycardia is an early sign of shock.

   b. Bradycardia in a distressed infant or child may indicate hypoxia and is an ominous sign of impending cardiac arrest.

2. Peripheral Circulation:
   a. The presence of peripheral pulses is a good indicator of the adequacy of an end-organ perfusion.

   b. Loss of central pulses is an ominous sign.

3. End-Organ Perfusion:
   a. The end-organ perfusion is most evident in the skin, kidneys, and brain.

   b. Decreased perfusion of the skin is an early sign of shock.

   c. A capillary refill time of greater than two seconds is indicative of low cardiac output.

   d. Impairment of brain perfusion is usually evidenced by a change in mental status. The child may become confused or lethargic. Failure of the child to recognize familiar faces is often an ominous sign.

   e. Urine output is directly related to kidney perfusion.

4. Blood Pressure:
   a. BP is the last and least important vital sign to obtain in children.

   b. Hypotension is a late and often sudden sign of cardiovascular decompensation.

   c. The presence of a normal BP does not rule out shock and should not be used to evaluate children with other signs and symptoms of shock.

5-03 ROUTINE PEDIATRIC PARAMEDIC LEVEL CARE

I. Evaluate the patient for airway, breathing and circulation.

A. If airway, breathing and/or circulation are absent:

1. Maintain the patient's airway, if necessary, utilizing an airway adjunct.

2. Position child with padding under torso.

3. Treat the patient following the appropriate patient care guideline(s).

B. If airway, breathing and circulation are present:

1. Maintain the patient's airway if necessary utilizing an airway adjunct.

2. Position child with padding under torso.

3. Obtain the patient's chief complaint or presenting problem from parents/family/bystanders if necessary.

4. Evaluate the associated signs and symptoms.

5. Obtain vital signs using age/size appropriate equipment.

6. Establish intravenous access/intraosseous per guideline and initiate cardiac monitoring as appropriate to the patient's condition; evaluate and document cardiac rhythm.

7. Initiate pulse oximetry monitoring as available, as appropriate to the patient's condition.

8. Treat the patient based on his/her condition and the information obtained, following appropriate patient care guidelines.

9. Transport the patient as appropriate to patient's condition.

10. Maintain Warmth.

11. With few exceptions, i.e. unconscious patient, a parent should be allowed to accompany a child in the patient compartment.

12. Establish communication with the Emergency Department.

5-04 PEDIATRIC INTRAVENOUS CANNULATION/FLUID THERAPY

I. Indications:
   A. Cardiac Arrest

   B. Clinical impression indicating possible need for IV medication administration.

   C. Shock or compensated shock.

   D. Respiratory failure or arrest.

   E. Altered mental status.

II. Infusions (the following crystalloid solutions may be used):
   A. Lactated Ringers Solution.

   B. 0.9% Saline Solution.

   C. D10

III. Intravenous access may be maintained via a saline flushed injection adapter.

IV. Intraosseous access may not be maintained via a saline flushed injection adaptor.

V. Needles/Catheters
   A. Catheter-over-the-needle and scalp vein needles may be used in conjunction with solution administration/IV maintenance apparatus appropriate to the patient's condition.

   B. Catheter sizes may range from fourteen gauge to twenty-four gauge.

   C. Intraosseous needle may be used , as per sponsor hospital guidelines.

   D. Umbilical cord catheter, as per sponsor hospital guidelines.

VI. IV Sites
   A. Peripheral intravenous sites include hands, arms, feet, legs, neck and scalp.

   B. Umbilical vein, as per sponsor hospital guidelines.

   C. Intraosseous Sites include the medial aspect of the proximal tibia, distal medial tibia above the medial mallelous and the distal femur above the condyles.

5-05 ACCEPTABLE METHODS OF AIRWAY MANAGEMENT

I. Positioning.

II. Oral pharyngeal airway.

III. Nasal pharyngeal airway (child > 1 y/o).

IV. Endotracheal intubation.

V. LMA

VI. RSI

VII. Invasive airway (according to Sponsor Hospital Guidelines).

NOTES:

1. Intubation is not recommended for the neonate, infant or small child as a first maneuver. Appropriate basic life support airway management should be initiated as soon as possible.

2. Demand valves and FROPVD's should NOT be used in children because of the tendency to cause barotrauma and/or provide inadequate ventilation.

3. Newborns should have BVM ventilation done **with** pop-off valve activated.

4. All other children should have BVM ventilation done **without** pop-off valve activated.

5-06 PEDIATRIC CARDIAC ARREST

I. Routine Pediatric Paramedic Care.

II. Establish one peripheral IV as appropriate with a large bore catheter if possible. If no peripheral IV access is obtainable, intraosseous access should be established according to intraosseous procedural guideline.

III. **Ventricular Fibrillation/Pulseless Ventricular Tachycardia**

A. Search for treatable causes (See VI. below).

B. Defibrillate at 2 j/kg using paddles of the appropriate size.
NOTE:
1. Pediatric Paddles (or anterior-posterior placement) if less than 10 kg.
2. Pediatric Defib/pacer pads if less than 15 kg.
3. Resume CPR immediately, without a rhythm check.

C. After five cycles of CPR (roughly two minutes), check pulse and rhythm. If asystole or PEA, proceed to asystole/PEA below. If no pulse and shockable, continue here.

D. Repeat defibrillation at 4 j/kg.
1. Resume CPR immediately, without a rhythm check.

E. When IV/IO available, give epinephrine 0.01 mg/kg (0.1 cc/kg of 1: 10,000 solution) IV/IO, repeat every 3 to 5 minutes
1. If IV/IO is unobtainable, administer Epinephrine 0.1 mg/kg (0.1 cc/kg of 1:1000 solution) via the endotracheal tube.

F. If no change, repeat defibrillation at 4 j/kg.
1. Resume CPR immediately, without a rhythm check.

G. Give an antiarrhythmics during CPR, without a rhythm check:
1. Lidocaine 1 mg/kg IV/IO first dose (max of 100 mg), then 0.5 mg/kg, max of 3 mg/kg total
   a. If IV is unobtainable, administer Lidocaine 2 mg/kg via the endotracheal tube to a max dose of 6mg/kg via ETT.

   OR

   b. Poly-morphic ventricular tachycardia (including torsades de Pointes), give magnesium 25-50 mg/kg IV/IO. Max of 2 gm

H. After five cycles of CPR (roughly two minutes),
1. Continue cycles of CPR with epinephrine, shock, CPR with antiarrhythmic, shock.

I. Once an advanced airway is in place, do not deliver "cycles" of CPR. Instead, give continuous chest compressions, with 8-10 breaths per minute without pausing compressions. Placing an advanced airway is of relatively lower priority, and should not significantly interrupt chest compressions. Check rhythm every two minutes.

J. If no response, CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

1. MAGNESIUM SULFATE, 25 TO 50 MG/KG (2 GRAMS MAX DOSE) IV/IO OVER 10 MINUTES.

2. IF CASES OF ANAPHYLAXIS, SEPSIS OR OVERDOSE OF BETA BLOCKERS OR CALCIUM CHANNEL BLOCKERS CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF EPINEPHRINE 1/10,000, 0.03 MG/KG, IV/IO EVERY 3-5 MINUTES.

3. OTHER TREATMENT MODALITIES.

IV. **Asystole**

A. Search for treatable causes (See VI. below).

B. If witnessed, apply external cardiac pacer (if less than 15 kg use pediatric pads).

C. Administer 0.01 mg/kg epinephrine 1:10,000 IV/IO **or** 0.1 mg/kg epinephrine 1:1000 ET.
   1. If no response, repeat epinephrine at same dose every 3-5 minutes.

D. Administer fluid bolus of 20 cc/kg as quickly as possible.

E. IF CASES OF ANAPHYLAXIS, SEPSIS OR OVERDOSE OF BETA BLOCKERS OR CALCIUM CHANNEL BLOCKERS CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF EPINEPHRINE 1/10,000, 0.03 MG/KG, IV/IO EVERY 3-5 MINUTES.

1. OTHER TREATMENT MODALITIES.

NOTE: Refer to newborn resuscitation protocol for neonates.

V. **Pulseless Electrical Activity (PEA)**

A. Search for treatable causes (See VI. below).

B. Administer 0.01 mg/kg epinephrine 1:10,000 IV/IO **or** 0.1 mg/kg epinephrine 1:1000 ET.
   1. If no response, repeat epinephrine at same dose every 3-5 minutes.

C. If no response to epinephrine and heart rare is <60 beats per minute:
   1. Administer atropine 0.02 mg/kg IV/IO/ET. Minimum dose = 0.1 mg, maximum dose = 0.5 mg for child and 1.0 mg for adolescent.

D. Administer fluid bolus of 20 cc/kg as quickly as possible.

E. IF CASES OF ANAPHYLAXIS, SEPSIS OR OVERDOSE OF BETA BLOCKERS OR CALCIUM CHANNEL BLOCKERS CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF EPINEPHRINE 1/10,000, 0.03 MG/KG, IV/IO EVERY 3-5 MINUTES.

   1. OTHER TREATMENT MODALITIES.

NOTE: Refer to newborn resuscitation protocol for neonates.

I. **Search for treatable causes:**

A. Hypovolemia
   1. Fluid Challenge 20 cc/kg cc NS, repeat PRN.

B. Tension Pneumothorax
   1. Needle Chest Decompression (as per Procedural Guideline 7-09)

C. Hypothermia, See guideline 3-10 Hypothermia
   1. Prevent further heat loss and handle gently.

D. Narcotic Overdose
   1. Narcan as per Pediatric Altered Mental Status Guideline 5-09.

E. Calcium Channel Blocker OD
   1. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF CALCIUM CHLORIDE 8 MG/KG IV/IO.

F. Tricyclic OD
   1. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF SODIUM BICARB 1 MEQ/KG IV/IO.

G. Hypoglycemia
   1. Glucose as per Pediatric Altered Mental Status Guideline.

H. Hyperkalemia
   1. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF:
      a) SODIUM BICARB 1 MEQ/KG IV/IO.
      b) CALCIUM CHLORIDE 8 MG/KG IV/IO.

I. Beta blocker OD
    1. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF GLUCAGON 0.1 MG/KG IV/IO.

J. Acidosis
    1. Respiratory: Ensure quality CPR and quality ventilations. Avoid hyperventilation.
    2. Metabolic: CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF SODIUM BICARB 1 MEQ/KG IV/IO.

5-07 PEDIATRIC BRADYCARDIA

It must be understood that the primary cause of bradycardia is hypoxia. Early oxygenation and ventilation is key to recovery.

NOTE: See newborn resuscitation protocol for neonates.

I. Routine Pediatric Paramedic Care with rapid supplemental oxygen and ventilation.

II. WITHOUT severe cardio-respiratory compromise:

A. Maintain airway and oxygenation.

B. Frequent reassessment.

C. CONTACT MEDICAL DIRECTION FOR FURTHER TREATMENT.

III. WITH severe cardio-respiratory compromise: If Bradycardia persists or patient remains unstable after proper oxygenation/ventilation, establish one peripheral IV as appropriate with a large bore catheter if possible.

A. If no peripheral IV access is obtainable, intraosseous access should be established according to Pediatric Intraosseous Guideline 7-15.

IV. If severe cardio-respiratory compromise exists (poor perfusion, hypotension, respiratory distress):

A. If, despite oxygen and ventilation, heart rate remains bradycardic (less than 60/min), perform chest compressions.

B. Administer 0.01 mg/kg epinephrine (1:10,000) IV/IO or 0.1 mg/kg (1:1,000) ET

1. May repeat at same dose every 3-5 minutes, if clinically indicated.

C. Administer Atropine 0.02 mg/kg (minimum dose 0.1 mg) IV/IO/ET. Maximum single dose of 0.5 mg for child and 1.0 mg for adolescent.

1. Atropine should be given before epinephrine if suspected increased vagal tone or AV block.

D. If no response, may be repeated once at 3-5 minutes.

E. Consider external cardiac pacing (if < 15 kg use pediatric pads).

F. If limited or no response from treatment, CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF OTHER TREATMENT MODALITIES.

5-08 PEDIATRIC TACHYCARDIA

The differentiation between extreme sinus tachycardia and SVT may be difficult. Paramedics are urged to obtain complete history and to use MEDICAL DIRECTION for treatment directions.

I. Sinus tachycardia WITHOUT signs of poor systemic perfusion.
- A. Routine Pediatric Paramedic Care.
- B. IV therapy is not standing order for stable tachycardias
- C. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:
    1. OTHER TREATMENT OPTIONS.

II. Extreme sinus tachycardia WITH associated signs of poor systemic perfusion (lack of peripheral pulses, delayed capillary refill, cold/mottled extremities, altered mental status).
- A. Heart rates usually in:
    1. Infants < 220 bpm.
    2. Children < 180 bpm.
- B. Look for history of:
    1. Fever and/or hypovolemia from vomiting/diarrhea.
        a) Refer to Sepsis/dehydration guideline.
    2. Trauma.

III. Narrow complex tachycardia (QRS < 0.08 sec) (possible SVT) with associated signs of poor systemic perfusion (lack of peripheral pulses, delayed capillary refill, cold/mottled extremities, altered mental status).
- A. Heart rates usually:
    1. Infants > 220.
    2. Children > 180.
- B. Look for rapid onset and/or history of cardiac abnormalities.
- C. Routine Pediatric Paramedic Care.
- D. Consider Vagal Maneuvers.
- E. Establish one proximal peripheral IV of 0.9% saline to run at KVO.

F. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

1. IF INTRAVENOUS ACCESS HAS BEEN UNSUCCESSFUL, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS.

2. FLUID BOLUS NS 20 CC/KG.

3. ADENOSINE 0.1 MG/KG (MAX OF 6 MG).

4. REPEAT ADENOSINE 0.2 MG/KG (MAX OF 12 MG).

5. CARDIOVERSION (WITH SEDATION IF NEEDED) AT 0.5 J/KG, REPEAT AT 1 J/KG IF NO RESPONSE.

IV. Wide complex tachycardia (QRS > 0.08 sec.)(Possible V-Tach) with associated signs of poor systemic perfusion (lack of peripheral pulses, delayed capillary refill, cold/mottled extremities, altered mental status).

A. Look for rapid onset and/or history of cardiac abnormalities.

B. Routine Pediatric Paramedic Care.

C. If patient is unconscious, with pulses:

1. Cardioversion immediately at 0.5 j/kg.

2. Repeat cardioversion at 1.0 j/kg.

3. Establish one proximal peripheral IV of 0.9% saline to run at KVO.

(i If no peripheral IV access is obtainable, intraosseous access should be established according to Pediatric Intraosseous Guideline 7-15.

4. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

a) FLUID BOLUS NS 20 cc/kg.

b) IF SUCCESSFUL CONVERSION, LOADING DOSE OF LIDOCAINE 1 MG/KG.

c) IF UNSUCCESSFUL CARDIOVERSION, LIDOCAINE 1 MG/KG IV.

d) REPEAT CARDIOVERSION AT 1 J/KG.

e) TRIAL OF ADENOSINE 0.1 MG/KG (MAX SINGLE DOSE OF 6 MG).

D. If patient is conscious:

1. Establish one proximal peripheral IV of 0.9% saline to run at KVO.

2. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

a) IF INTRAVENOUS ACCESS HAS BEEN UNSUCCESSFUL, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS.

b) FLUID BOLUS OF NS 20 CC/KG.

c) LIDOCAINE 1 MG/KG IV BOLUS.

d) CARDIOVERSION (WITH SEDATION IF NEEDED) AT 0.5 j/kg, FOLLOWED BY CARDIOVERSION AT 1 j/kg IF NO CHANGE.

e) TRIAL OF ADENOSINE 0.1 MG/KG (MAX SINGLE DOSE OF 6 MG).

5-09 PEDIATRIC ALTERED MENTAL STATUS
(HYPOGLYCEMIA/ COMA)

I. Routine Pediatric Paramedic Care.

II. Consider hypoxia and/or trauma as primary or contributing factor.

III. Establish one peripheral IV to run at KVO rate.
A. If IV unsuccessful, establish intraosseous access.

IV. Obtain blood sample for serum glucose level. Determine blood glucose level by rapid assay.
A. If glucose less than 60 mg/dl (Newborns up to 1 week of age, <40 mg/dl):
1. Administer dextrose 0.5 gm/kg IV.
a) If less than one year old, D10. Administer 5 cc/kg of D10 solution.
(1) Mix 10 cc of D50 with 40 cc of NS or Sterile H20.

b) If one year or older and less than ten years old
(1) D10 as noted above
OR
(2) D25. Administer 2 cc/kg of D25 solution.
(a) Mix 30 cc D50 with 30 cc of NS or Sterile H20.

c) If 10 years of age or older
(1) D10 as noted above
OR
(2) D50. Administer 1 cc/kg of D50 solution.

1. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:
a) REPEAT DEXTROSE.
B) GLUCAGON
(1) IF OVER 2 YEARS OLD
(2) HISTORY OF IDDM WITH BLOOD GLUCOSE <60
(3) IF >20 KG, 1 MG IM, IF <20 KG, 0.5 MG/KG
(A) GLUCAGON MAY BE CONTRAINDICATED FOR STARVATION INDUCED HYPOGLYCEMIA (DEHYDRATED, NOT EATING, NO HISTORY OF IDDM, ETC.)
c) OTHER TREATMENT OPTIONS.

II. If narcotic overdose is suspected:
A. Administer Naloxone slow IV or IM, if IV unsuccessful.
1. Titrate dose, starting at lowest possible dose
a) Base administration on respiratory rate and mental status.
b) Repeat above dose once if limited response or respiratory depression returns.
2. Less than 6 years old, administer up to 1 mg.
3. Over 6 years old, administer up to 2 mg.

B. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

1. ADDITIONAL NARCAN.

2. IF INTRAVENOUS ACCESS HAS BEEN UNSUCCESSFUL, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS.

3. OTHER TREATMENT OPTIONS.

III. If unknown etiology and/or ingestion of non-narcotic, CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

A. IF INTRAVENOUS ACCESS HAS BEEN UNSUCCESSFUL, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS.

B. IV/IO BOLUS OF DEXTROSE (as noted above).

5-10 PEDIATRIC RESPIRATORY DISTRESS/ FAILURE

I. Routine Pediatric Paramedic Care.

A. IV therapy is not standing order for respiratory distress

II. Initiate treatment based on history and clinical presentation. If respirations begin to decrease in rate or depth with change in mental status or cyanosis, begin to assist ventilations immediately.

III. If bradycardia present, begin assisting ventilations immediately and follow Bradycardia protocol if rate not improved.

IV. Acute bronchospasm

A. In patients who have severe respiratory distress and present with acute bronchospasm:

1. Administer Albuterol 2.5 mg of 0.5% solution via nebulizer. Consider blow by technique if patient does not tolerate mask.

a) Use secondary bronchodilator as per local sponsor hospital guideline

2. Consider repeat of Albuterol nebs if indicated.

3. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

a) EPINEPHRINE 1:1,000, 0.01 mg/kg SQ (Max. 0.3 mg).

V. Croup/Epiglottitis

A. In the conscious child patient with suspected croup (e.g. stridor, barking cough, retractions of intercostal and suprasternal muscles, history of upper respiratory infection) or epiglottitis (e.g. high fever, stridor, muffled voice, drooling):

1. Begin transport. DO NOT EXAMINE THE ORAL PHARYNX.

2. Avoid agitating the patient. Allow a parent to accompany the patient. Allow the patient to be transported in a sitting position/ position of comfort.

3. Administer nebulized saline (preservative free), via blow by technique as not to agitate patient.

4. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

a) NEBULIZED EPINEPHRINE (1:1000, 2.5 cc), 2.5 MG.

A. If the child is unconscious and you have reason to believe this is secondary to complications of croup/epiglottitis:

1. Provide ventilations with BVM as appropriate to patient respiratory status. DO NOT ATTEMPT TO INTUBATE.
    a) Confirm that BVM pop-off valve is off.

2. If unable to ventilate with BVM, CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF INVASIVE AIRWAY.

II. Respiratory distress of unknown etiology without bronchospasm:

A. Administer humified oxygen or nebulized NS (preservative free).

B. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

1. ALBUTEROL 2.5 mg OF 0.5% SOLUTION VIA NEBULIZER.

2. OTHER TREATMENT OPTIONS.

5-11 PEDIATRIC SEIZURE/STATUS EPILEPTICUS

I. Routine pediatric paramedic care. Initiate treatment based on history and clinical presentation. It is essential to make the distinction between focal motor, general motor seizures and Status Epilepticus.

II. Most seizures do not require emergent intervention.

III. **General Motor Seizures (Grand Mal):**If the patient is conscious but has a history of a witnessed general motor seizure:

A. Rule out etiologies (hypoglycemia, trauma, drug overdose, febrile seizures, etc.) and treat accordingly.

B. Transport.

IV. **Status Epilepticus**

A. Status Epilepticus: (Three or more general motor seizures without a lucid interval. Seizures lasting five minutes or more may also be considered Status seizures).

B. Obtain blood sample for serum glucose level. Determine blood glucose level by rapid method and treat according to Pediatric Altered Mental Status guideline.

C. If active general motor seizure, consider administering Diastat rectal valium as per sponsor hospital guidelines. (as per procedural guideline 7-21.)

1. If patient has received a benzodiazepine for current seizure, CONTACT MEDICAL DIRECTION PRIOR TO ADMINISTRATION OF DIASTAT
2. If delay in administering Diastat, proceed to "D" below.
3. CONTACT MEDICAL DIRECTION FOR ALL REPEAT DOSES OF DIASTAT
4. Diastat dosing

2-5 years	
6-11 kg	5 mg
12-22 kg	10 mg
23- 33 kg	15 mg
34-44 kg	20 mg

6 - 11 years	
10-18 kg	5 mg
19-37 kg	10 mg
38-74 kg	15 mg
56-74 kg	20 mg

D. Establish one <u>peripheral</u> IV of 0.9% saline to run at KVO.

E. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

1. IF INTRAVENOUS ACCESS HAS BEEN UNSUCCESSFUL, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS.

2. ADMINISTER DIAZEPAM (VALIUM) 0.2 MG/KG IV OVER 3 MINUTES. THIS DOSE MAY BE REPEATED AS PER MEDICAL DIRECTION. (CONSIDER 0.1 MG/KG IF PATIENT TAKING PHENOBARBITAL OR OTHER BENZODIAZEPINES)

3. RECTAL DIAZEPAM (VALIUM), 0.5 MG/KG, MAX SINGLE DOSE OF 10 MG. MAY REPEAT AT 0.25 MG/KG IN 10-15 MINUTES AS PER MEDICAL DIRECTION.

a) NOTE: SEE RECTAL ADMINISTRATION PROTOCOL IN PROCEDURAL GUIDELINES.

4. MIDAZOLAM (VERSED) 0.1 MG/KG (MAX DOSE 2.5 MG) SLOW IV, TITRATED TO STOP SEIZURE.

a) MAY REPEAT AT SAME DOSE ONCE AFTER 5 MINUTES IF INDICATED.

5. IF UNABLE TO ACHIEVE IV ACCESS, ADMINISTER MIDAZOLAM (VERSED) 0.2 MG/KG (MAX DOSE 5 MG) DEEP IM.

6. PERMISSION TO ADMINISTER PATIENTS MEDICATION (S), AS PER PATIENT SUPPLIED EMERGENT MEDICATIONS APPENDIX 8-01.

7. REPEAT DIASTAT RECTAL VALIUM PER PROCEDURAL GUIDELINE

8. ADMINISTER DEXTROSE OR NARCAN AS PER ALTERED MENTAL STATUS PROTOCOL (IF PATIENT DOES NOT MEET STANDING ORDER CRITERIA).

9. OTHER TREATMENT OPTIONS.

V. Documentation

A. Obtain MD signature as per sponsor hospital guidelines.

B. If controlled substance was given under standing orders, note which dose(s) was standing order on PCR.

5-12 PEDIATRIC ANAPHYLAXIS

I. Routine Pediatric Paramedic Care.

II. Establish peripheral IV of 0.9% saline solution.

III. Begin transport while continuing resuscitation.

IV. In patients who have respiratory distress and present with bronchospasm:
A. Administer albuterol 2.5 mg of 0.5% solution via nebulizer.

V. Patients with severe cardiopulmonary compromise (impending upper airway obstruction with stridor, poor perfusion, hypotension, respiratory distress).

A. Administer Epinephrine 1:1,000, 0.01 mg/kg not to exceed 0.3 mg SQ (can be administered without IV access if IV access unsuccessful or delayed).

B. If patient intubated with poor peripheral perfusion, administer epinephrine 0.02 mg/kg, 1:10,000 endotracheal.

C. Diphenhydramine 1 mg/kg IV, IO or IM up to a maximum of 50 mg.

D. If needed: infuse fluid (20 cc/kg as quickly as possible) to maintain age appropriate pulse and perfusion.

E. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

1. IF NO PERIPHERAL ACCESS, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS

2. FOR PATIENTS WITH PROFOUND HYPOTENSION, POOR PERFUSION AND/OR AIRWAY OBSTRUCTION, PER MISSION TO ADMINISTER EPINEPHRINE 1:10,000, 0.01 MG/KG IV OR INTRAOSSEOUS, MAX OF 0.3 MG, ADMINISTERED SLOWLY

3. REPEAT EPINEPHRINE.

4. REPEAT/ CONTINUE RAPID INFUSION OF 20 CC/KG.

5-13 PEDIATRIC MULTI-SYSTEM TRAUMA/HYPOVOLEMIA

Field time for multi-system trauma patients and hypovolemic patients must be kept to a minimum. Airway and C-spine control are the primary goals of pre-hospital care for the multi-system trauma patient. All other treatments should be performed while en route to the hospital.

I. Routine Pediatric Paramedic Care.

II. Basic primary and secondary surveys should be accomplished during on-going resuscitative measures.

III. Begin transport to an appropriate hospital/specialty center as quickly as possible. Continue treatment en route and CONTACT MEDICAL DIRECTION AS SOON AS POSSIBLE.

IV. Establish one or more peripheral IV lines as appropriate with large bore catheters and infuse fluid (20 cc/kg as quickly as possible) to maintain age appropriate pulse and perfusion.

A. IV fluids should be administered as a bolus.
B. Patient should be reassessed after each fluid bolus.
C. Do not administer more than three doses of 20 cc/kg.

V. If no peripheral IV access is obtainable, intraosseous access should be established according to Pediatric Intraosseous Procedural Guideline 7-15.

VI. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

B. REPEAT BOLUS, 20 CC/KG.

C. TRAUMA TEAM ACTIVATION.

5-14 PEDIATRIC TRAUMATIC CARDIAC ARREST

Field time for multi-system trauma patient and hypovolemic patients must be kept to a minimum. Airway and C-spine control are the primary goals of pre-hospital care for the multi-system trauma patient. All other treatments should be performed while en route to the hospital.

I. Routine Pediatric Paramedic Care.

II. Basic primary and secondary surveys should be accomplished during on-going resuscitative measures.

III. Begin transport as quickly as possible. Continue treatment en route and CONTACT MEDICAL DIRECTION AS SOON AS POSSIBLE.

IV. Establish one or more peripheral IV lines as appropriate with large bore catheters and infuse fluid (20 cc/kg as quickly as possible) to maintain age appropriate pulse and perfusion.

A. If no peripheral IV access is obtainable, intraosseous access should be established according to Pediatric Intraosseous Procedural Guideline 7-15.

V. Administer 0.01 mg/kg epinephrine 1:10,000 IV/IO or 0.1 mg/kg epinephrine 1:1000 ET.

A. If no response, repeat epinephrine at same dose every 3-5 minutes.

VI. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

A. REPEAT/ CONTINUE RAPID INFUSION, 20 CC/KG.

B. TRAUMA TEAM ACTIVATION.

5-15 OVERDOSE/POISONING

I. Routine paramedic care.

II. If the patient orally ingested a poison and/or overdosed:

A. Identify substance and amount ingested.

B. Nothing by mouth unless under order of Medical Direction.

C. Rapidly transport the patient as soon as possible.

D. CONTACT MEDICAL DIRECTION FOR THE FOLLOWING:

1. ACTIVATED CHARCOAL 1 GRAM/KG.

2. IF DYSTONIC REACTION,
   a) Diphenhydramine 1 mg/kg IV, IO or IM up to a maximum of 50 mg.

3. IF BETA BLOCKER OD, GLUCAGON:
   a) > 25 KG, 1 MG IV
      (1) REPEAT DOSE Q 5 MINUTES PRN TO A MAX DOSE OF 3 MG.
   b) <25 KG, 0.5 MG IV, IO
      (1) REPEAT DOSE Q 5 MINUTES PRN TO A MAX DOSE OF 1.5 MG.
   c) CONTRAINDICATED IF PATIENT ON DIGOXIN.

4. IF CALCIUM CHANNEL BLOCKER OD, CALCIUM CHLORIDE 8 MG/KG SLOW IV (50 mg/min), MAX SINGLE DOSE 1 GRAM.

5. OTHER TREATMENT MODALITIES.

III. If the patient inhaled a poisonous substance:

A. Follow BLS Haz Mat procedure.

B. Identify agent and method of exposure.

C. If organophosphate poisoning, consider Atropine 0.02 mg/kg mg IV, IO or IM.
   1. Repeat every 5-10 minutes as needed.

D. Consider antidote specific to agent if available.

E. CONTACT MEDICAL DIRECTION and transport ASAP.

NOTE: Pulse Oximetry may not be accurate for toxic inhalation patients.

IV. If the patient was exposed to a poison topically:

A. Follow BLS Haz Mat procedure.

B. Identify agent and method of exposure.

C. If organophosphate poisoning, consider Atropine 0.02 mg/kg mg IV, IO or IM.
   1. Repeat every 5-10 minutes as needed.

D. Consider antidote specific to agent if available.

E. Transport ASAP and CONTACT MEDICAL DIRECTION for receiving area.

5-16 SEPSIS AND DEHYDRATION

I. Children can become septic from many causes. The receiving facility should be notified of possibility of the sepsis as to protect staff and other children in the ED.

A. Signs and symptoms of sepsis may include:

1. Fever over 101 rectally.
2. Nonspecific respiratory distress.
3. Vomiting, diarrhea, abdominal distress.
4. Poor feeding.
5. Cyanosis, pallor, mottled skin.
6. Poor general appearance with altered mental status, irritability, seizures.

II. If meningitis is suspected, protection of caregivers with mask, gloves and gown is required. The receiving facility should be notified of the possibility of meningitis as to protect staff and other patients in the ED.

A. Additional signs and symptoms of meningitis may include:

1. Stiff neck, head ache.
2. Bulging fontanels.
3. Petechial rash.

III. Note any prolonged vomiting, diarrhea, dry mucous membranes and poor urinary output.

IV. Routine Paramedic Care.

V. Begin transport as quickly as possible. Continue treatment en route and notify receiving facility as soon as possible.

VI. Establish one or more peripheral IV lines as appropriate with large bore catheters and infuse fluid (20 cc/kg as quickly as possible) to maintain age appropriate pulse and perfusion.

VII. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:

A. REPEAT/ CONTINUED RAPID INFUSION, 20 CC/KG.

B. IF INTRAVENOUS ACCESS HAS BEEN UNSUCCESSFUL, PERMISSION TO ESTABLISH INTRAOSSEOUS ACCESS.

5-17 NEWBORN RESUSCITATION

I. Assist in delivery in accordance with BLS guidelines. Ensure adequate care for the mother as resuscitation continues.

II. If term gestation, amniotic fluid clear, breathing and crying with good muscle tone, Routine newborn care

A. Clamp and cut the umbilical cord according to BLS guidelines as soon as possible.
B. Provide warmth
C. Clear airway if needed
D. Dry
E. Assess color

III. For newborns requiring resuscitation whose amniotic fluid contains meconium:

A. If newborn vigorous (strong respiratory effort, heart rate over 100 per minute)
    1. Proceed with II. above
B. If newborn is not vigorous:
    1. Do NOT dry, warm or stimulate until airway is clear.

    2. Thin meconium, newborn is vigorous:
        a) Aggressive suctioning of posterior pharynx until clear

        b) Continue with drying, warming and stimulating. Clamp and cut the umbilical cord. Continue with below.

    3. Meconium thick or particulate and/or newborn depressed:
        a) Perform ET intubation and direct suction the ET tube via a meconium aspirator/adapter while slowly withdrawing ET tube.

        b) Repeat with new ET tubes until clear of meconium.

        c) Do NOT replace ETT once airway has been cleared of meconium unless newborn remains limp, apneic or pulseless.

    2. Continue with drying, warming and stimulating. Clamp and cut the umbilical cord. Continue with below.
    3. Obtain blood sample for serum glucose level. Determine blood glucose level by rapid assay. If less than <40 mg/dl, refer to guideline 5-09 Pediatric Altered Mental Status.

IV. Assess APGAR (1 and 5 minutes) if possible. Give high flow oxygen.

V. If signs of adequate ventilation and perfusion do not improve with high flow oxygen and heart rate < 100, provide assisted ventilation via BVM with 100% oxygen.

VI. If signs of adequate ventilation and perfusion do not improve with BVM assist within 30 seconds, reassess cardiorespiratory status (heart rate, capillary refill, skin color and respirations) and consider cardiac compressions (if heart rate is below 60 bpm) and endotracheal intubation.

VII. If no improvement in status, administer epinephrine
A. 1:10,000 0.1 mg/kg via ET tube.

VIII. CONTACT MEDICAL DIRECTION FOR CONSIDERATION OF THE FOLLOWING:
A. ESTABLISH VASCULAR ACCESS (PERIPHERAL, UMBILICAL).
1. IO IS CONTRAINDICATED FOR NEWBORNS

B. EPINEPHRINE

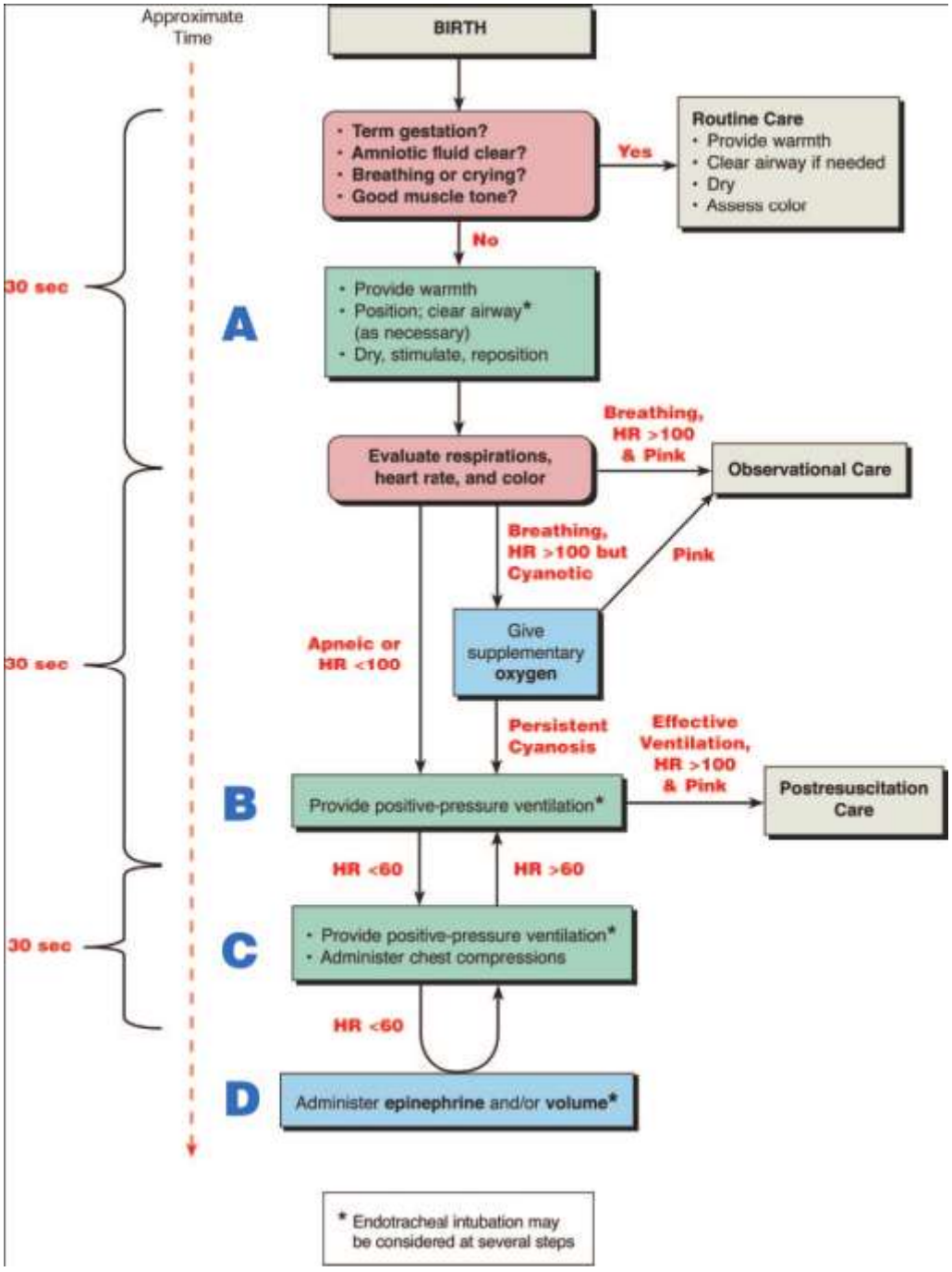
1. IV OR UMBILICAL LINE: 0.01 MG/KG, 1:10,000

2. CONTINUED ETT: 0.1 MG/KG, 1:10,000 VIA ENDOTRACHEAL TUBE.

3. REPEAT EVERY 3-5 MINUTES IF NO IMPROVEMENT.

C. DEXTROSE, D10, 5-10 CC/KG IV/UMBILICAL.

D. FLUID BOLUS NS 10 CC/KG.


Approximate Time
BIRTH
• Term gestation?
• Amniotic fluid clear?
• Breathing or crying?
• Good muscle tone?
Yes
Routine Care
• Provide warmth
• Clear airway if needed
• Dry
• Assess color
No
30 sec
A
• Provide warmth
• Position; clear airway* (as necessary)
• Dry, stimulate, reposition
Evaluate respirations, heart rate, and color
Breathing, HR >100 & Pink
Observational Care
Breathing, HR >100 but Cyanotic
Pink
Apneic or HR <100
Give supplementary oxygen
30 sec
Persistent Cyanosis
Effective Ventilation, HR >100 & Pink
B
Provide positive-pressure ventilation*
Postresuscitation Care
HR <60
HR >60
30 sec
C
• Provide positive-pressure ventilation*
• Administer chest compressions
HR <60
D
Administer epinephrine and/or volume*
* Endotracheal intubation may be considered at several steps

5-18 PEDIATRIC SEVERE HEAD TRAUMA

I. Routine paramedic care with C-Spine precautions.

II. Assess GCS
- A. Complete early and repeated neurological assessments

III. Assess the need to secure airway.
- A. GCS less than 9
- B. See RSI Guideline 7-07 as needed
- C. Reassess airway status every 5 minutes
- D. Patient with ETI or LMA must have continuous ETCO2 monitoring

IV. Assess for hypoxia
- A. Should maintained a SPO2 greater than 90%

V. Assess for shock / hypotension
- A. Should maintain a systolic BP greater than:
  1. 65 mmHg (0-1 year)
  2. 75 mmHg (2-5 years)
  3. 80 mmHg (6-12 years)
  4. 90 mmHg (13-16 years)
- B. Fluid resuscitation with NS or LR to maintain a minimum systolic BP as noted above

VI. Assess for signs of herniation:
- A. An unresponsive patient (comatose) with:
  1. Bilateral dilated unresponsive pupils **OR** unilateral dilated unresponsive pupils

  AND

  2. Abnormal extension (decerebrate posturing) **OR** No motor response to painful stimuli

VII. If no signs of herniation:
- A. Ventilate at:
  1. 10 bpm Adolescent
  2. 20 bpm Child
  3. 25 bpm Infant
  4. Hyperventilate only for clinical signs of herniation
- B. **Avoid hypoxia, keep SaO2 greater than 90%.**Increase ventilation rate to maintain a SP02 greater than 90%

VIII. If signs of herniation:

A. Ventilate at:

1. 20 bpm Adolescent
2. 30 bpm Child
3. 35 bpm Infant
4. Hyperventilate only for clinical signs of herniation

B. **Avoid hypoxia, keep SaO2 greater than 90%.** Increase ventilation rate to maintain a SP02 greater than 90%

IX. Continuous end-tidal CO2 measurements must be used to measure the adequacy of ventilation.

A. For hyperventilation, aim for a CO2 around 35 mmHg.

B. Below 30 mmHg is considered severe hyperventilation. Below 25 mmHg is not recommended.

C. **Avoid hypoxia, keep SaO2 greater than 90%.** Increase ventilation rate to maintain a SP02 greater than 90%.This takes priority over end-tidal CO2.

X. CONTACT MEDICAL DIRECTION for early transport to an appropriate hospital.

XI. Record patient's condition every 5 minutes including GCS. If <12 consider transport to trauma center.