

Hamilton County Emergency Medical Services



Pediatric Medical and Trauma Protocols

“Setting the Standard of Care”



Hamilton County EMS Pediatric Protocols



These protocols were designed to assist in treatment of a broad range of various disorders. Some patients may require care not otherwise covered in these sequences. These protocols are to be considered as standing orders until medical/trauma control is contacted. As in all pre-hospital care, medical/trauma control should be contacted as soon as emergency conditions allow. Only those paramedics and emergency medical technicians approved by the medical director of Hamilton County and currently certified in both International Trauma Life Support (ITLS) and Advanced Cardiac Life Support (ACLS) may use these protocols. These guidelines will replace those currently in use at Hamilton County EMS.

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Pediatric Circumstantial/ Skills Protocols



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PEDIATRIC PATIENT ASSESSMENT

General Assessment

1. Pediatric Assessment Triangle (PAT)

- *Appearance: Muscle tone, interaction, consolability, look/ gaze, or speech/ cry. A decrease in appearance may be a sign of a serious underlying illness or injury.*
- *Work of Breathing: Increased work of breathing, nasal flaring, intercostals retractions, decreased or absent respiratory effort, abnormal breath sounds. Abnormalities in work of breathing or abnormal breathing patterns, use of accessory muscles, or extra sounds in breathing may be a sign of a serious respiratory illness or injury.*
- *Circulation: Abnormal skin color or bleeding. Pale, mottled, bluish or gray may indicate poor perfusion, poor oxygenation, or both. Flushed skin suggests fever or toxicity. Diaphoresis suggests significant distress, which may be related to a cardiac problem or hyperthermia.*

2. Determine condition of the patient

- *Life threatening: Start life saving interventions and transport immediately*
- *Not life threatening: Continue with systematic assessment to further determine condition.*

****Be aware of a pediatric patient who's appearance might seem normal but they may yet have a life-threatening problem****

Primary Assessment

1. Airway

- *Look for movement of the chest or abdomen*
- *Listen for breath sounds and movement*
- *Feel the movement of air at the nose and mouth*

2. Breathing

- *Respiratory Rate*
- *Respiratory Effort*
- *Tidal Volume*
- *Airway and Lung Sounds*
- *Pulse oximetry*

3. Circulation

- *Skin color and temperature*
- *Heart rate*
- *Heart rhythm*
- *Blood pressure*
- *Pulses (peripheral and central)*
- *Capillary refill*

4. Disability

- *AVPU Pediatric Response Scale*
 - (a)** *A: Alert- The child is awake, active and responds appropriately to parents and external stimuli*
 - (b)** *V: Voice- The child only responds when you or the parent calls the child's name or speaks loudly.*



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(c) P: Painful- The child only responds to painful stimuli

(d) U: Unresponsive: The child does not respond to any stimuli

- *Glasgow Coma Scale (GCS)*
- *Pupil response*

5. Exposure

- *Undress the seriously ill or injured child as is appropriate to facilitate a focused physical examination. Remove clothing one area at a time to carefully assess the child then recover with the clothes or blanket to protect privacy of child and keep the child warm.*

Secondary Assessment

1. Focused History:

- *S: Signs and Symptoms*
- *A: Allergies*
- *M: Medications*
- *P: Past (pertinent) Medical History*
- *L: Last Meal*
- *E: Events Prior to*

2. Detailed Physical Examination

- *Do a thorough head to toe physical exam. The severity of the illness or injury should determine the extent of the physical exam.*



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WITHHOLDING OF ADVANCED LIFE SUPPORT

Purpose: To establish guidelines for the withholding of resuscitative measures in the following situations:

1. Asystole on the monitor, and
2. Fixed, dilated pupils, and
3. Documented lack of CPR for greater than 10 minutes (not including / involving hypothermia, cold water immersion, lightning strike, or barbiturate coma).
 - A. Decapitation, or
 - B. Massive trauma (evacuation of cranial vault), or
 - C. Severe blunt trauma with absence of vital signs, or
 - D. Absence of vital signs, respirations and neurological reflexes in situations requiring prolong resuscitation, or
 - E. Rigor mortis, or
 - F. Dependent lividity, or
 - G. Properly executed D.N.R. order
4. **If CPR has been initiated at any point prior to arrival, by either a first responder or bystander, then Medical Control must be contacted to discontinue efforts.**

The withholding of resuscitative measures is a standing order not requiring permission of Medical / Trauma control, unless CPR was initiated prior to the arrival of HCEMS. As in all standing orders, thorough documentation is required. Any situation / occurrence with less than items 1-3, and / or A-G should be referred to Medical / Trauma control for permission to withhold.



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WITHDRAWAL / DISCONTINUATION OF LIFE SUPPORT

Assessment:

The following are guidelines for making the choice. Discontinuation shall only be done with on line Medical / Trauma control.

- Asystole on ECG (without change for 10 minutes) and
- Fixed, dilated pupils and
- Absence of pulse, respirations and neurological reflexes

In Addition to:

1. EMS Provider documented lack of CPR for 10 minutes.
2. Prolonged resuscitation in the field without hope for survival.
3. Other signs of death in the absence of hypothermia, cold water drowning, lightning strikes, or barbiturate induced coma.
4. Decapitation.
5. Massive trauma such as evacuation of cranial vault.
6. Severe blunt trauma with absence of vital signs and papillary responses.
7. **IF CPR has been initiated at any point prior to arrival, by either a first responder or bystander, then Medical Control must be contacted to discontinue efforts.**

Note: Medical / Trauma control may choose to discontinue Life Support in the field and pronounce a patient dead at the scene. ***However, once transport has begun, Life Support will be continued!***



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TERMINALLY ILL PATIENT

- Pre-hospital providers are occasionally called to a residence where there is a terminally ill patient under the direct and continuous care of a physician.
- The patient's family and physician may only desire that the patient be kept comfortable.
- Family members or other persons may become overwhelmed by the situation and call an emergency number that may involve both ambulance and fire service. The sudden arrival of a number of people at the residence may result in confusion.
- Consequently, the patient may present with what is perceived, by a first responder or ambulance personnel, as sudden onset of symptoms which appear to be life threatening (most likely an altered mental status, respiratory distress or cardiac / pulmonary arrest). The provider, therefore, should be especially alert for patient information that may indicate the patient is in the terminal phase of a chronic disease with death imminent and proceed as follows:
- Maintain a calm environment and avoid automatically performing heroic and perhaps inappropriate measures beyond basic life support.
- Elicit as much information as possible from people present that are familiar with the patient's condition.
- Get the name and telephone number of the patient's physician if possible.
- Maintain BLS procedures and contact medical control through med comm. as soon as possible. Provide full information on the patient's condition, history of terminal illness, and the name of the patient's physician and telephone number.
- The Medical Control Physician should be provided full information by med comm. and direct the management of the call. When possible, the patient's physician should be consulted by the hospital.
- If the patient's private physician intervenes in person or by telephone the EMT / Paramedic shall:
 - Provide the physician with information on the patient's condition,
 - Inform the physician that they must make medical control contact through med comm.,
 - Request the physician to contact Med Comm. (provide direct telephone number),
 - At no time should any orders be taken over a phone, expect from med comm.



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EXTERNAL CARDIAC PACING

Indications:

1. Sinus Bradycardia
 - A. Unresponsive to Atropine, or
 - B. Unable to initiate IV access.
2. Type II 2nd degree AV block (Mobitz Type II) and 3rd degree AV block (complete heart block)
 - External cardiac pacing is class I (definitely helpful).
 - External cardiac pacing is recommended before Atropine.
 - Rhythm often associated with anterioseptal acute myocardial infarctions. Can progress to 3rd degree AV block.
 - ATROPINE is not the first choice. Atropine may worsen conditions in myocardial ischemia and VF or VT.

Procedure:

1. Apply pacing pads (Quick Combo Pads) and 4 lead monitor cable.
 - *Patient must be connected to leads to pace!*
2. Turn on pacing module.
3. Select rate (90/min...etc.)
4. Start with 0 mA and slowly increase in 5 mA increments until capture occurs.
5. Assess for capture by evaluating ECG and feeling to confirm whether the pacing is producing a carotid or femoral pulse.

External pacing is always uncomfortable for the patient. Contact Medical Control as early as possible to consider sedative medication options such as Versed, Valium, or Morphine.



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NEEDLE CHEST DECOMPRESSION

Qualifications to perform:

- Tennessee licensed EMT-P,
- Completion of in-service training,
- Approval of Service Medical Director,
- On-going demonstration of proficiency,
- On-line medical / trauma control should be sought prior to procedure. However, in the event medical / trauma control cannot be contacted, chest decompression can be performed in critical patients.

Indications:

- Critical evidence of tension pneumothorax,
- Markedly diminished or absent breath sounds unilaterally, subcutaneous emphysema, distended neck veins (may be absent in a hypovolemic patient),
- Respiratory distress / hypoxia in the presence of penetrating or blunt chest trauma,
- Profound hypotension in the presence of penetrating or blunt chest trauma,
- Decreased lung compliance (difficulty with mechanical ventilation),
- Tracheal shift away from affected side is a late sign, rarely found,
- Cardiac arrest with PEA rhythm, especially if asthmatic / COPD or if difficulty ventilating patient,
- Cardio respiratory decompensation following intubation and positive pressure ventilation, with decreased lung compliance (difficulty with mechanical ventilation).

Contraindications:

- None.
- Must confirm appropriate endotracheal tube position if patient is intubated.
- Must have signs / symptoms of hypoxia, respiratory distress, or hypotension in addition to signs of pneumothorax.

Equipment:

- Use a 20 gauge IV catheter on all pediatric patients under 10 kg.
- Use an 18 or 20 IV gauge catheter on all pediatric patients between 10 kg and 40 kg.
- Use an 14 or 16 gauge IV catheter for all patients greater than 40 kg, 2.5" catheter minimum,
- 5 or 10cc syringe, with 1 or 2ml of saline within syringe,
- Skin antiseptic (betadine).

Continued on next page!



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NEEDLE CHEST DECOMPRESSION (continued)

Procedure:

1. Cleanse skin of anterior chest with betadine.
2. Identify affected side (decreased breath sounds on affected side). Trachea may or may not be deviated away from affected side (remember this is rarely seen).
3. Identify landmarks:
 - Angle of Louis at junction of manubrium and sternal body is palpable landmark for junction of 2nd rib and sternum.
 - Second intercostal space is below 2nd rib.
 - Catheter puncture site is the 2nd intercostal space where it intersects and imaginary line through the midpoint of the clavicle (midclavicular line).
4. With syringe attached to the IV catheter, enter the chest cavity at the 2nd intercostal space, midclavicular at a 90-degree angle with the chest wall. Aspirate for “bubbles” as you advance the syringe and catheter. Correct placement will generally necessitate advancing the catheter up to the hub. Closely observe for redevelopment of signs and symptoms of tension pneumothorax. Optimally, a longer decompression specific catheter should be used.
5. Contact Med Comm. with response to decompression and to prepare receiving hospital for formal chest tube insertion.



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BEDSIDE GLUCOSE MONITORING

Qualifications to Perform:

- Tennessee licensed EMT-IV / EMT-P.
- On-going demonstration of proficiency.

Glucose monitoring should be performed on any patient with:

- Loss of consciousness.
- Confusion / combativeness.
- Signs of stroke, including unilateral hemiplegia or speech difficulties.
- Seizures.
- Profound bradycardia.
- Severe illness or injury in a known or suspected diabetic.
- Ingestion / overdose with iron, aspirin, alcohol, insulin, oral diabetic agents, or betablockers.
- Severe dehydration.
- Severe liver disease.

Note: Patients, who suffer a major traumatic closed head injury, should have glucose measurements to exclude hypoglycemia as a contributing or treatable factor.

Contraindications: None.

Record keeping issues: The Tennessee State Board of Lab Licensure has granted a wavier for EMS personnel to be excluded from their rules and regulations regarding prehospital glucose assessments. EMS agencies must apply for CLIA wavier from the federal government. For quality assessment, the State EMS Division will require that:

- All open glucose reagent strip containers be tested against known standard on a weekly basis with records maintained for site visit by State EMS officials.
- For CQI purposes, it is helpful to obtain and record hospital laboratory readings on field drawn samples to evaluate field-testing procedures.



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EZ IO

Supervisor Skill

Indications

1. Intravenous fluid or medications needed **AND**
2. Peripheral IV cannot be established in 2 attempts or 90 Seconds (from start of attempts) **AND** the patient exhibits one or more of the following:
 - Altered mental status (GCS of 8 or less)
 - Respiratory Compromise (SaO₂ of 80% or less following appropriate oxygen therapy, and/or respiratory rate <10 or >40/min)
 - Hemodynamically unstable Blood Pressure (Systolic BP<90)
3. IV access is preferred, however, IO may be considered prior to peripheral IV attempts in the following situations:
 - Cardiac Arrest (Medical or Trauma)
 - Profound hypovolemia with an altered mental status

Contraindications

1. Fracture of the Tibia or femur (for tibia insertion)- may consider the alternate tibia if no trauma involved in it
2. Fracture of the humerus (for humeral head insertion)- may consider alternate humerus if no trauma involved in it
3. Previous orthopedic procedures (ex: IO within previous 24 hours, knee replacement, shoulder replacement)
4. Infection at insertion site
5. Significant edema
6. Excessive tissue at insertion site
7. Inability to locate landmarks

Considerations

1. Flow Rates: Due to the anatomy of the IO space you will note flow rates to be the slower than those achieved with peripheral IV access.
 - Ensure administration of 10mL rapid bolus with syringe.
 - Use a pressure bag or pump for fluid challenge.
2. Pain: Insertion of the IO device in conscious patients causes mild to moderate discomfort and is usually no more painful than a large bore IV. However, fluid administration into the IO space is very painful and the following measures should be taken for conscious patients:
 - Prior to IO bolus or flush on a conscious **adult** patient, SLOWLY administer 20 – 50 mg of 2% Lidocaine.
 - Prior to IO bolus or flush on a conscious **pediatric** patient, SLOWLY administer 0.5 mg/kg 2% Lidocaine.

Precautions

1. The EZ IO is not intended for prophylactic use.
2. The EZ IO infusion system requires specific training prior to use.

Adult Patient

1. Any patient weighing 40kg (88lb's) or greater.
2. The adult (blue cap) needle set shall be used for adult patients.
3. Primary insertion site: Should IO access be warranted then the Tibia shall be the insertion site of choice if possible.
4. Alternate Insertion Site: Should IO access be warranted and it is not available via the tibia insertion site due to contraindications or inability to access the site due to patient entrapment and vascular access is imperative the IO may be placed in the humeral head.

Pediatric Patient

1. Any patient weighing 3 – 39kg (6.6lb's – 85.98lb's).
2. The pediatric needle set (pink cap) shall be used for pediatric patients.
3. Use the length based assessment tape to determine pediatric weight.



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4. The only approved site for pediatric IO insertion is the tibia

Landmarks

1. Tibia:
 - Three important landmarks- the Patella, The Tibial Tuberosity (if present), and the flat aspect of the Medial Tibia
 - The Tibial Tuberosity is often difficult or impossible to palpate on very young patients. The traditional approach for IO insertion in small patient's- where the tibial tuberosity cannot be palpated- is to identify the insertion site- **"TWO FINGER WIDTHS BELOW THE PATELLA and then medial along the flat aspect of the tibia."**
 - The traditional approach to IO insertion in slightly larger patients- where the tibial tuberosity can be appreciated- generally suggests- **"One finger width distal to the tibial tuberosity along the flat aspect of the medial tibia."**
 - **The EZ-IO should be inserted two fingers widths below the patella (kneecap) and one finger medial (toward the inside) to the tibial tuberosity.**
 - **For the morbidly obese patient-** consider rotating the foot to the mid-line position (foot straight up and down). With the knee slightly flexed, lift the foot off of the surface allowing the lower leg to "hang" dependant. This maneuver may improve your ability to visualize and access the tibial insertion site.
2. Humerus:
 - Place the patient in a supine position.
 - Expose the shoulder and place the patient's arm against the patient's body.
 - Rest the elbow on the stretcher with the forearm on the abdomen. Palpate and identify the mid-shaft humerus and continue palpating toward the humeral head. As you near the shoulder you will note a small protrusion. This is the base of the greater tubercle insertion site. With the opposite hand "pinch" the anterior and inferior aspects of the humeral head confirming the identification of the greater tubercle. This will ensure that you have identified the midline of the humerus itself. The insertion site is approximately two finger widths inferior to the coracoid process and the acromion.
 - **Do Not attempt insertion medial to the Intertubercular Groove or the Lesser Tubercle**

Procedure for EZ-IO Insertion

1. Determine that the EZ IO is indicated.
2. Ensure that there are no contraindications present.
3. Locate the proper insertion site.
4. Clean the insertion site with alcohol wipes.
5. Prepare the EZ IO driver and needle set.
6. Stabilize the extremity (leg or arm).
7. Position the driver at the insertion site with the needle at 90 degree angle to the surface of the bone.
8. Power the needle set through the skin until you feel the tip of the needle set encounter the bone. Apply firm steady pressure on the driver and power through the cortex of the bone. Stop when the needle flange touches the skin or a sudden resistance is felt. **Stop on the POP.** This indicates entry into the bone marrow cavity.
9. Grasp the hub firmly with one hand and remove the driver from the needles set.
10. While continuing to hold the hub firmly, rotate the stylet counter clockwise and remove it from the needle set. Dispose of the stylet properly in a sharps container.
11. Confirm Proper placement of the EZ IO catheter tip:
 - The catheter stands straight up at a 90 degree angle and is firmly seated in the tibia.
 - Blood is sometimes visible at the tip of the stylet.
 - Aspiration of a small amount of marrow with a syringe.
12. Attach a primed extension set to the hub and flush the IO space with 10 cc of Normal Saline.
 - **NO FLUSH – NO FLOW**
13. If the patient is conscious, administer Lidocaine 2% 20 – 50mg (0.5mg/kg for pediatric patient) slowly **PRIOR** to the initial bolus.
14. Initiate the infusion. Use of mechanical means to pressure infuse is recommended to maintain adequate flow rates.
15. Apply the wrist band (yellow band that comes with the kits...must have date and time on it) and dressing.
16. Secure IO Needle set.



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Pediatric Rhythm Treatment Protocols



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CARDIAC- VENTRICULAR FIBRILLATION / PULSELESS VT ALGORITHM

ASSESSMENT:

PRIMARY: ABCD SURVEY.

FOCUS: BASIC CPR AND DEFIBRILLATION.

Check responsiveness.

A- airway: open the airway.

B- breathing: provide positive-pressure ventilations with BVM and Mask and Oxygen.

C- circulation: give chest compressions until defibrillator is ready.

D- defibrillation: assess for and defibrillate VF / Pulseless VT one (1) time at 2 J/kg.

AFTER DEFIBRILLATION PERFORM APPROXIMATELY TWO (2) MINUTES OF CPR BEFORE CHECKING THE RHYTHM. CHECK CARDIAC MONITOR AFTER TWO MINUTES OF CPR AND THEN PROCEED TO APPROPRIATE ALGORITHM. IF RHYTHM IS PERSISTENT OR RECURRENT VF/VT THEN CONTINUE DOWN THIS ALGORITHM.

PERSISTENT OR RECURRENT VF / VT:

SECONDARY ABCD SURVEY.

FOCUS: MORE ADVANCED ASSESSMENTS AND TREATMENTS.

A- airway: place airway device as soon as possible.

B- breathing: confirm airway device placement by exam plus confirmation device.

B- breathing: secure airway device: purpose made tube holders preferred.

B- breathing: confirm effective oxygenation and ventilation.

C- circulation: establish IV or IO access.

C- circulation: identify rhythm on monitor.

⊖ Check Pulse

D- differential diagnosis: search for and treat identified reversible causes.

**Defibrillate one (1) time at 4 J/kg
Resume CPR immediately**

EPINEPHRINE 1:10,000- IV/IO 0.01 mg/kg (0.1 mL/kg)

OR

EPINEPHRINE 1:1,000- ET 0.1 mg/kg (0.1 mL/kg) if no IV/IO access available

Repeat every 3-5 minutes (Either route)

After shock and medicines perform two (2) minutes (5 cycles) of CPR and then check rhythm and pulse.

**Defibrillate one (1) time at 4 J/kg
Resume CPR immediately**



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CONSIDER ANTIARRHYTHMICS:

AMIODARONE 5 mg/kg IV

OR

Lidocaine 1mg/kg IV

OR

Magnesium 25-50 mg/kg if rhythm is torsades de pointes

Resume attempts to defibrillate.

For prolonged resuscitation consider: Sodium Bicarbonate: 1 mEq/kg and may repeat at 0.5 mEq/kg every ten minutes

Consider Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hypo/ Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), and Trauma (hypovolemia/ increased ICP). See causes addendum!

If Rhythm is torsades de pointes then Magnesium 25 – 50 mg/kg will be first line drug of choice.



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ADVANCED CARDIAC LIFE SUPPORT ASYSTOLE/ PEA ALGORITHM

ASYSTOLE ON MONITOR MUST BE CONFIRMED IN 2 LEADS!

TREATMENT:

1. Determine “downtime”, Initiate / continue CPR.
2. Give oxygen 100% as soon as possible with BVM
3. Attach monitor and confirm rhythm, if Asystole then confirm in two (2) leads
4. Establish an airway with ET tube- confirm position of tube by exam plus confirmation device.
5. Establish IV/IO of Normal Saline
6. Give Epinephrine:
 - IV/IO: 0.01 mg/kg of 1:10,000 (0.1 mL/kg)
 - ET: 0.1 mg/kg of 1:1,000 (0.1 mL/kg)
 - Repeat every 3 – 5 minutes (either route)
7. Resume CPR for approximately two (2) minutes (5 cycles).
8. Check Rhythm and Pulse. If patient is still in Asystole or PEA then continue down protocol.
9. Check blood sugar- treat appropriately with D25W- 2 cc/kg if patient is hypoglycemic (< 50 mg/dl)
10. For prolonged resuscitation consider: Sodium Bicarbonate: 1 mEq/kg and may repeat at 0.5 mEq/kg every ten minutes.
11. Contact Medical Control as soon as possible.
12. Re-evaluate resuscitation- check oxygenation / airway and cardiac rhythm and go to appropriate protocol.
13. Consider Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hypo/ Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), and Trauma (hypovolemia/ increased ICP). See causes addendum!



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ADVANCED CARDIAC LIFE SUPPORT BRADYCARDIA (SYMPTOMATIC)

NOTES:

- Hypoxia is the # 1 cause of bradycardia in children and infants

SYMPTOMATIC SIGNS:

- Heart Rate <60 for children and <80 for infants.
- Altered Mental Status.
- Respiratory Distress
- Poor Perfusion

TREATMENT:

1. ABC's: Rapid Head to toe assessment
2. Oxygen 100% via non-rebreather mask or needed device for high flow O2 delivery and appropriate to patient condition
3. Attach Monitor and identify rhythm and get a 12 lead ecg.
4. Baseline Vitals and pulse oximetry
5. Establish IV NS and maintain to patients condition.
6. Check blood sugar if less than 50mg/dl administer 2 cc/kg of D25W.

If patient has adequate perfusion then monitor patient for changes. If patient has signs and symptoms of poor perfusion then continue to the next step:

7. If heart rate is less than 60 (<60) with poor perfusion then start CPR
8. Give Epinephrine:
 - IV/IO: 0.01 mg/kg of 1:10,000 (0.1 mL/kg)
 - ET: 0.1 mg/kg of 1:1,000 (0.1 mL/kg)
 - Repeat every 3 – 5 minutes (either route)
9. Consider Atropine 0.02 mg IV/IO. May repeat. Minimum dose of 0.1 mg and max dose for a child is 1 mg.
10. Consider Cardiac Pacing (Refer to External Cardiac Pacing Procedure Protocol)
11. Contact Medical Control.
12. Consider Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hypo/ Hyperkalemia, Hypoglycemia, Hypothermia, Toxins, Tamponade (cardiac), Tension Pneumothorax, Thrombosis (coronary or pulmonary), and Trauma (hypovolemia/ increased ICP). See causes addendum!



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ADVANCED CARDIAC LIFE SUPPORT

NARROW – COMPLEX SUPRAVENTRICULAR TACHYCARDIA ALGORITHM

ASSESSMENT:

1. Sinus Tachycardia
 - Infants: Heart Rate < 220 beats per minute
 - Children: Heart Rate <180 beats per minute
 - History Makes sense for heart rate
 - Heart rate varies
 - P Waves present and normal
2. Supra-ventricular tachycardia
 - Infants: Heart Rate > 220 beats per minute
 - Children: Heart Rate >180 beats per minute
 - History is vague, non-specific
 - Heart rate does not vary
 - Heart rate changes abruptly
 - P waves absent or abnormal
3. For Both Rhythm's
 - Primary survey focusing on Airway/Breathing/Circulation.
 - EKG monitor: Narrow QRS (<0.12 sec = 3 small blocks)
 - Carotid pulse palpable.

Stable Patient

1. ABC's with a rapid head to toe assessment
2. Give oxygen as needed for patient condition. If patient condition requires then intubate the patient.
3. Attach monitor and obtain a 12 lead ecg (Is QRS ,0.12 seconds?) If the rhythm is sinus tachycardia then give supportive care and treat the cause. If the rhythm is SVT then continue down the algorithm.
4. Consider Vagal Maneuvers (bearing down, holding breath, or place in trendelenburg)
5. Obtain vital signs and pulse oximetry.
6. Establish IV of NS
7. Give Adenosine IV SLAM
 - First dose: 0.1 mg/kg
 - Repeat dose: 0.2 mg/kg
8. Contact Med Control
9. Consider synchronized cardioversion
 - Sedate Before Cardioversion: Valium 0.2 mg/kg IV or Versed 0.1 mg/kg IV
 - First dose: 0.5 – 1 J/kg
 - Next dose: 2 J/kg
10. Consider and treat reversible causes. (6 H's and 5 T's- see addendum)
11. Continue to assess patient



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ADVANCED CARDIAC LIFE SUPPORT

NARROW – COMPLEX SUPRAVENTRICULAR TACHYCARDIA ALGORITHM (Continued)

IF AT ANY POINT THE PATIENT BECOMES UNSTABLE MOVE TO THE UNSTABLE PORTION OF THE PROTOCOL.

Unstable Patient

Symptoms:

- Persistent Chest pain.
- Shortness of breath.
- Light-headedness.

Signs:

- Hypotensive with a systolic BP < 90.
- CHF / Pulmonary Edema (More common in adult patients).
- Altered mental status.
- Myocardial infarction / Ischemia on 12 lead EKG.
- Other signs of shock

TREATMENT (Proceed Stepwise until Conversion)

1. ABC's with a rapid head to toe assessment
2. Give oxygen as needed for patient condition. If patient condition requires then intubate the patient.
3. Attach monitor and obtain a 12 lead ecg (Is QRS ,0.12 seconds?) If the rhythm is sinus tachycardia then give supportive care and treat the cause. If the rhythm is SVT then continue down the algorithm.
- 4.
5. Consider Vagal Maneuvers (bearing down, holding breath, or place in trendelenburg) but do not delay treatments to have patient do them.
6. Obtain vital signs and pulse oximetry.
7. Establish IV of NS
8. Give Adenosine IV SLAM
 - Sedate Before Cardioversion: Valium 0.2 mg/kg IV or Versed 0.1 mg/kg IV **But do not delay**
 - First dose: 0.1 mg/kg
 - Repeat dose: 0.2 mg/kg
9. **OR** synchronized cardioversion
 - First dose: 0.5 - 1 J/kg
 - Next dose: 0.2 J/kg
10. Contact Med Control
11. Consider Amiodarone 5 mg/kg IV over 30 – 60 min
12. Consider and treat reversible causes. (6 H's and 5 T's- see addendum)
13. Continue to assess patient

*****Adenocard should not be used for control of atrial flutter / atrial fibrillation (cases of prolonged asystolic pauses). For atrial flutter / atrial fibrillation with rapid ventricular response, see Cardizem Protocol.**



Hamilton County EMS

Pediatric Protocols



ADVANCED CARDIAC LIFE SUPPORT VENTRICULAR TACHYCARDIA (VT) WIDE COMPLEX

ASSESSMENT:

- Primary survey focusing on Airway/Breathing/Circulation.
- EKG monitor: Narrow QRS (<0.12 sec = 3 small blocks) Regular rhythm; rate >150 bpm.
- No p-waves or p-waves possibly inverted) following QRS.
- Carotid pulse palpable.
- No evidence of bleeding, dehydration, or hypovolemia.

Stable Patient

1. ABC's with a rapid head to toe assessment
2. Give oxygen as needed for patient condition. If patient condition requires then intubate the patient.
3. Attach monitor and obtain a 12 lead ecg (Is QRS ,0.12 seconds?)
4. Obtain vital signs and pulse oximetry.
5. Establish IV of NS
6. Consider Amiodarone 5 mg/kg IV over 30 – 60 minutes **OR**
7. Lidocaine 1 mg/kg IV bolus
8. Contact Med Control
9. Consider synchronized cardioversion
 - Sedate Before Cardioversion: Valium 0.2 mg/kg IV or Versed 0.1 mg/kg IV
 - First dose: 0.5 – 1 J/kg
 - Next dose: 2 J/kg
10. Consider and treat reversible causes. (6 H's and 5 T's- see addendum)
11. Continue to assess patient

Unstable Patient

Symptoms:

- Ongoing Chest pain.
- Shortness of breath.
- Light-headedness.

Signs:

- Hypotensive with a systolic BP<90.
- CHF / Pulmonary Edema (More common in adult patient's).
- Altered mental status.
- Myocardial infarction / Ischemia on 12 lead EKG.
- Other signs of shock

1. ABC's with a rapid head to toe assessment
2. Give oxygen as needed for patient condition. If patient condition requires then intubate the patient.
3. Attach monitor and obtain a 12 lead ecg (Is QRS ,0.12 seconds?)
4. Obtain vital signs and pulse oximetry.



Hamilton County EMS Pediatric Protocols



ADVANCED CARDIAC LIFE SUPPORT VENTRICULAR TACHYCARDIA (VT) WIDE COMPLEX (Continued)

5. Establish IV of NS
6. Synchronized cardioversion
 - Sedate Before Cardioversion: Valium 0.2 mg/kg IV or Versed 0.1 mg/kg IV, **but do not delay.**
 - First dose: 0.5 – 1 J/kg
 - Next dose: 2 J/kg
7. Contact Med Control
8. Consider Amiodarone 5 mg/kg IV over 30 – 60 minutes **OR**
9. Lidocaine 1 mg/kg IV bolus
10. Contact Med Control
11. Consider and treat reversible causes. (6 H's and 5 T's- see addendum)
12. Continue to assess patient

If Rhythm is torsades de pointes then Magnesium 25 – 50 mg/kg will be first line drug of choice.



Hamilton County EMS

Pediatric Protocols



ADVANCED CARDIAC LIFE SUPPORT

PREMATURE VENTRICULAR CONTRACTIONS (PVC'S)

ASSESSMENT

1. More than 5 PVC's per minute.
2. Multifocal PVC's.
3. Salvo's (2 or more PVC's in a row).
4. PVC's occurring near the T-wave.

TREATMENT

1. Oxygen 100%, and airway maintenance appropriate to patient condition
2. Apply monitor and get a 12 lead and pulse oximetry.
3. IV access NS TKO. Obtain blood sugar.
4. If heart rate is <60 then refer to Bradycardia Protocol.
5. If heart rate is greater than 60 then administer Lidocaine 1.0 mg/kg.
6. Contact Medical Control.
7. If PVC's are not suppressed within five minutes or patient remains unstable, re-contact Medical Control.



Hamilton County EMS Pediatric Protocols



ADVANCED CARDIAC LIFE SUPPORT Frequent Causes Addendum (The H's and T's)

Hypovolemia

ECG and Monitor Changes: Narrow Complex and a Rapid Rate

History and Physical Exam: History, Flat Neck Veins

Recommended Treatment: Volume Replacement

Hypoxia

ECG and Monitor Changes: Slow Rate

History and Physical Exam: Cyanosis and airway problems

Recommended Treatment: Oxygenation and ventilation

Hydrogen Ion (Acidosis)

ECG and Monitor Changes: Smaller Amplitude QRS Complexes

History and Physical Exam: Diabetes, bicarbonate responsive preexisting acidosis, renal failure

Recommended Treatment: Sodium Bicarbonate, Hyperventilation

Hyperkalemia (High Potassium)

ECG and Monitor Changes: Wide Complex QRS, T Waves Taller and Peaked, P wave get smaller, QRS Widens, Sine-Wave PEA.

History and Physical Exam: History of Renal Failure, Diabetes, Recent Dialysis, Dialysis Fistulas, Medications

Recommended Treatment: Sodium Bicarbonate, Glucose Plus Insulin, Calcium Chloride, Possibly Albuterol

Hypokalemia (Low Potassium)

ECG and Monitor Changes: T Waves Flatten, Prominent U Waves, QRS Widens, QT Prolongs, Wide-Complex Tachycardia

History and Physical Exam: Abnormal Loss of Potassium, Diuretic Use

Recommended Treatment: Add Magnesium if in Cardiac Arrest

Hypothermia

ECG and Monitor Changes: J or Osborne Waves

History and Physical Exam: History of Exposure to cold, Low Central Body Temperature

Recommended Treatment:

Tablets (Drug Overdose)

ECG and Monitor Changes: Various Effects on the ECG, Predominately Prolongation of the QT Interval

History and Physical Exam: Bradycardia, Pupils, Neurologic Exam, Scene Evidence

Recommended Treatment: Intubation, Activated Charcoal, , Toxidrome Apecific Agents and Antidotes



Hamilton County EMS Pediatric Protocols



ADVANCED CARDIAC LIFE SUPPORT Frequent Causes Addendum (The H's and T's) (continued)

Tamponade (Cardiac)

ECG and Monitor Changes: Narrow Complex, Rapid Rate

History and Physical Exam: History, No pulse felt during CPR, Vein Distention

Recommended Treatment: None Pre-Hospital (Treat signs and symptoms)

Tension Pneumothorax

ECG and Monitor Changes: Narrow Complex, Slow Rate (Hypoxia)

History and Physical Exam: History, No pulse felt during CPR, Neck vein distention, tracheal deviation, unequal breath sounds, difficulty with patient ventilation

Recommended Treatment: Needle chest decompression

Thrombosis Heart (Acute Massive MI)

ECG and Monitor Changes: Abnormal 12-lead ECG: Q-Waves, ST-segment changes, T-Waves, inversions

History and Physical Exam: Cardiac History

Recommended Treatment: None Pre-Hospital (Treat signs and symptoms)

Thrombosis Lungs (Acute Massive Pulmonary Embolism)

ECG and Monitor Changes: Narrow Complex, Rapid Rate

History and Physical Exam: History, No pulse felt during CPR, distended neck veins, prior test for DVT (Deep vein thrombosis) or PE

Recommended Treatment: None Pre-Hospital (Treat signs and symptoms)



Hamilton County EMS Pediatric Protocols



Pediatric Medical and Environmental Protocols



Hamilton County EMS Pediatric Protocols



ANAPHYLAXIS

ASSESSMENT

1. Contact with a known allergen or an item that is known to have a high possibility to cause an allergic reaction.
2. Acute onset with rapid progressions of signs and symptoms.
3. Dyspnea from minor to severe with audible wheezing upon contact or through auscultation or decreased air exchange on auscultation.
4. Generalized urticaria (hives), erythema (redness of skin from inflammation), angioedema (rapid swelling of tissue) that is more pronounced in the face and neck.
5. Chest tightness or the inability to take a deep breath.

BLS

1. A.B.C.s
2. Administer Oxygen and airway maintenance as needed for patient condition.
3. Monitor pulse oximetry.
4. IV/IO of Normal Saline at KVO unless HYPOTENSIVE then administer a 20 cc/kg fluid bolus. Repeat as needed.
5. Epinephrine 1:1000 0.01 mL/kg SQ (If given by EMT-P then give IM or IV). May repeat x 3 prn after 20 minutes each.
6. Albuterol (Proventil) 1.25 mg/ 3 ml Saline or Levalbuterol 0.63 – 1.25 mg via Nebulizer (Give if patient is still wheezing after epinephrine administration)

ALS

7. Cardiac monitor (Needs to be attached prior to medication administration).
8. Diphenhydramine (Benadryl) 2 mg/kg IV/IO/IM to a max of 50mg
9. Reassess frequently
10. Contact Med Comm.
11. Consider the need, from patient continued patient condition, to repeat the epinephrine, Albuterol or Levalbuterol breathing treatment, or the fluid boluses.



Hamilton County EMS Pediatric Protocols



CONSCIOUS SEDATION AND PRE-MEDICATED INTUBATION OR RSI

This is a skill that is used by Supervisors and Tactical Paramedics who have been trained, and approved by the Medical Director. Tactical Paramedics are only allowed to use this procedure when activated and acting as a Tactical Paramedic.

INDICATIONS

1. Acute head injury where a patient is combative with a need for airway control or the need for hyperventilation to control intracranial pressure or that are having difficulty breathing.
2. Severely combative patients that cannot be controlled without risk of further injury.
3. Phrophylaxis for airway burns or inhalation injuries.
4. Patients who need ventilator assistance or airway protection and other conventional methods have failed.

CONTRAINDICATIONS

1. Malignant hyperthermia
2. Known allergy to agents
3. Hyperkalemia
4. Severe burns greater than 12 hours.

ALS

1. A.B.C.s.
2. Pre-oxygenate patient with 100% Oxygen for 2 minutes.
3. IV or IO of Normal Saline
4. Cardiac monitor, pulse oximetry.
5. Limb restraints to protect the airway.
6. Pre-Medicate:
 - Atropine 0.02 mg/kg IV/IO (for prevention of Bradycardia)
 - Lidocaine 1.0 mg/kg IV/IO (only necessary if signs of intra-cranial pressure is present)
7. Sedation:
 - Versed: 0.1 – 0.2 mg/kg IV/IO until slurring of the speech, eyelids close, reflex disappears up to a maximum dose of 5 mg.
 - Valium: 0.2 – 0.3 mg/kg (Optional)
 - Ativan: 0.1 – 0.2 mg/kg (Optional)
8. Evaluate patient to see if intubation is now possible with just sedation.
9. **SUPERVISOR:** If sedation is not enough then give Anectine (Succinylcholine) 1.5 – 2.0 mg/kg over 30 seconds IV/IO for patient's < 12 years of age and 1.0 – 1.5 mg/kg for patients >12 years of age.
10. Intubate when patient is apneic and fasciculations have stopped.
11. Verify tube placement with visualization, condensation in the tube, esophageal detector, CO2 detector and continually monitor with frequent checks as well as the end-tidal CO2 function on Life Pak 12.



Hamilton County EMS Pediatric Protocols



CONSCIOUS SEDATION AND PRE-MEDICATED INTUBATION OR RSI

12. If unable to intubate within 20 seconds then cease attempts and ventilate for 30 to 60 seconds before attempting again.
13. If intubation is unsuccessful and ventilation with manual resuscitator is ineffective then consider:
 - Needle cricothyroidotomy OR
 - **SUPERVISOR:** A surgical cricothyroidotomy utilizing a # 6 – 7 ET tube on patient's greater than 12 years of age.
14. To maintain control of airway, administer Norcuron 0.1 – 0.2 mg/kg IV/IO.
15. Rapid transport to hospital.



Hamilton County EMS Pediatric Protocols



DRUG INGESTION / OVERDOSE/ POISONING

BLS

1. Scene Safety
2. A.B.C.s.
3. Specific History: when, what and how much?
4. Oxygen and airway maintenance appropriate to patient condition.
5. Place patient in position appropriate to patient condition.
6. Monitor pulse oximetry.
7. Establish IV NS or INT. **(DO NOT DELAY TRANSPORT FOR IV)**
8. Perform glucose test, if reading is less than **50mg/dl** give D25 2.0 ml/kg for any child over 6 months and D50 1.0 ml/kg for any child over 2 years.
9. If patient is showing signs and symptoms of shock then administer a 20 cc/kg fluid bolus.

ALS

10. Cardiac monitor, consider 12 lead ECG.
11. If known drug or poison was a narcotic, or unknown, then give Narcan 0.1 mg/kg IV/IO to a max of 2 mg titrated to effect.
12. Perform NG tube placement (i.e. indicated by unresponsive or substance taken) and contact Medical Control to give Activated Charcoal via NG tube.
13. If patient starts to have seizure/ convulsions then administer Lorazepam (Ativan) 0.1 mg/kg IV/IO and may repeat up to 3 doses at 4-5 minute intervals if seizing continues. Second choice is Midazolam (Versed) 0.1 mg/kg IV/IO and may repeat in 4 – 5 minutes. Versed may be given IM 0.2 mg/kg to a max of 4 mg if no IV access or Intranasal at 0.4mg/kg.
14. **CONTACT MED COMM AS SOON AS PATIENT CONDITION ALLOWS.**

Treatment specific to known substance or Exposure

1. Carbon Monoxide: oxygen
2. Narcotics: Narcan (See above for dosage)
3. Organophosphates: Atropine 0.1 mg/kg IV/IO every 10 minutes
4. Phenothiazines: Diphenhydramine (Benadryl) 1 mg/kg IV/IO/IM
5. Tricyclic Anti-depressants- Sodium Bicarbonate
6. Ocular Exposure: Flush Eyes with Normal Saline for 15-20 minutes. Do not delay transport for flushing, do it en-route if needed.
7. Dermal Exposure: Remove clothes and jewelry and brush away and powder and then flush with Normal Saline for 15-20 minutes. Do not delay transport for flushing, do it en-route if needed.
8. Inhaled exposure: Treat with oxygen and aggressive airway management.



Hamilton County EMS Pediatric Protocols



HYPERGLYCEMIA

BLS

1. A.B.C.s.
2. Obtain history, both patient's as well as diabetic specific family history.
3. Oxygen and airway maintenance appropriate to patient condition.
4. Monitor pulse oximetry.
5. Place patient in position of comfort for non-life threat delivery
6. Establish IV NS.
7. Obtain blood sugar, if reading is above **200mg/dl**, then administer 20 cc/kg of Normal Saline over 1 hour. If patient is Hypotensive then the 20 cc/kg of Normal Saline should be given as a fluid bolus. (If patient is not hyperthermic IV fluid should be warm)

ALS

8. Cardiac monitor
9. Recheck blood sugar en-route every fifteen (15) minutes.
10. **CONTACT MED COMM AS SOON AS PATIENT CONDITION ALLOWS.**
11. Continue re-assessment, supportive care and fluids as needed.



Hamilton County EMS Pediatric Protocols



HYPOGLYCEMIA

BLS

1. A.B.C.s.
2. Obtain History, patient specific as well as family diabetic specific.
3. Oxygen and airway maintenance appropriate to patient condition.
4. Monitor pulse oximetry.
5. Establish IV NS.
6. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM
7. If the patient is over 12 years or older and NO IV can be established then administer Glucagon 0.5 mg IM to a max of 1.0 mg. If patient is less than 12 years old then contact Med Control.

BLS

8. Monitor ECG. (Prior to medication administration)
9. Recheck blood sugar en-route every fifteen (15) minutes.
10. **CONTACT MED COMM AS SOON AS PATIENT CONDITION ALLOWS.**
11. Continue re-assessment, supportive care and fluids as needed.



Hamilton County EMS Pediatric Protocols



HYPERTHERMIA

BLS

1. Start passive cooling (remove from heat source)
2. ABC's
3. Obtain baseline temp and treat if greater than 100.5 F.
4. Oxygen 100% and maintain airway as appropriate to patient condition.
5. IV NS KVO, administer a 20 cc/kg fluid bolus if patient is tachycardic or hypotensive.
6. Start actively cooling patient:
 - Loosen clothes
 - Cool with room temperature water, applied with wet linen or abdominal pads.
 - Cold packs to groin, neck, axillary (Do this only if room temperature water not available or not working)
 - **DO NOT COOL PATIENT TO POINT OF SHIVERING**
7. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM

BLS

8. Cardiac monitor and pulse oximetry.
9. Contact Med Comm.
10. Continue supportive care and watch for over cooling of patient (shivering).



Hamilton County EMS Pediatric Protocols



FEVER

BLS

1. ABC's
2. Obtain baseline temp and treat if greater than 100.5 F.
3. Oxygen 100% and maintain airway as appropriate to patient condition.
4. IV NS KVO only if patient has been vomiting or seizing, administer a 20 cc/kg fluid bolus if patient is tachycardic or hypotensive.
5. If patient has a history of recent illness then give Tylenol 10 – 15 mg/kg PO if patient has had none in the last four (4) hours.
6. If patient has no history of recent illness then start actively cooling patient:
 - Loosen clothes
 - Cool with room temperature water, applied with wet linen or abdominal pads.
 - Cold packs to groin, neck, axillary (Do this only if room temperature water not available or not working)
 - **DO NOT COOL PATIENT TO POINT OF SHIVERING**
7. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM

BLS

8. Cardiac monitor and pulse oximetry.
9. Contact Med Comm.
10. Continue supportive care and watch for over cooling of patient (shivering).



Hamilton County EMS Pediatric Protocols



HYPOTHERMIA

Mild Hypothermia (90° - 95° F)

- Exposure to cold
- Consider head trauma, illness, or metabolic disorder
- Evidence of alcohol or drug use
- Shivering
- Altered mental Status
- Decreased muscle tone and uncoordinated movement
- Pale, dry or wet skin
- Slurred Speech
- Lethargy

Moderate Hypothermia (82° - 89° F)

- Signs of mild hypothermia
- Altered mental status with a decreased responsiveness
- Decreased respiratory rate
- Bradycardia
- Pale, cyanotic, or mottled skin
- Absence of shivering
- Stiffening of the muscles
- Edema and swelling from frostbite

Severe Hypothermia (<81° F)

- Signs of minor and moderate hypothermia
- Extreme disorientation and stuporous behavior
- Unresponsiveness
- Slow, shallow, or absent respirations
- Bradycardia
- ECG indicates atrial fibrillation, J-waves, other dysrhythmias, or ventricular fibrillation
- Cyanotic or mottled skin
- An overall “mimic” of death by the body

BLS

1. Handle patient gently, slightest jolt may trigger V-Fib. Do not allow the patient to walk or exert themselves.
2. ABC's (**Evaluate pulse for one full minute. No CPR until NO PULSE is confirmed**)
3. Oxygen 100% with airway maintenance appropriate to patient condition. (If ventilation assistance is needed and no warm humidified oxygen is available then consider Mouth to Mask as an alternate method)



Hamilton County EMS Pediatric Protocols



4. Monitor pulse oximetry.
5. Remove from cold environment. Remove wet clothing.
6. Insulate patient to prevent further heat loss.
7. Obtain temperature (rectal most accurate)
8. Apply heat packs, wrapped in a barrier (sheet, abdominal pad, etc) against critical areas of the body: trunk, head, neck, chest, axillary, and groin. **DO NOT ATTEMPT TO REWARM Extremities.**
9. IV of warm, if available, LR or NS and administer a 20 cc/kg fluid bolus then a 2 cc/kg/hr fluid infusion.
10. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration). **GIVE PROPER MEDICINE ONLY IF SUFFICIENT RE-WARMING HAS OCCURRED AND THE PATIENT'S BODY TEMPERATURE IS GREATER THAN 86° F.**
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg
 - If No IV then Glucagon 0.5 – 1 mg IM
11. Assess for the possibility of alcohol or illicit drug use.
12. **GIVE NOTHING BY MOUTH TO PATIENT UNTIL SUFFICIENT REWARMING HAS OCCURRED AND THEN ONLY WARM LIQUIDS.**

ALS

13. Cardiac monitor. **(NO CPR IF BRADYCARDIC RHYTHM EXISTS)**
14. If narcotic use is suspected and **THE PATIENT HAS BEEN SUFFICIENTLY REWARMED TO GREATER THAN 95° F** then give naloxone (0.1 mg/kg up to 2 mg maximum single dose) SQ, IM, IV, or ET.
15. Contact Medical Control for additional orders.

HYPOTHERMIC, APNEIC AND PULSELESS

1. Start CPR
2. If ventricular fibrillation or ventricular tachycardia is present then defibrillate one (1) time at 2 J/kg. Cease with electrical activity after single defibrillation until the body has been adequately re-warmed (>86° F).
3. BVM assistance and intubation with 100% oxygen.
4. IV access. IO if unable to get an IV due to vasoconstriction.
5. Administer an infusion of warm fluids.
6. **DO NOT GIVE ANY MEDICATIONS UNTIL THE BODY HAS BEEN RE-WARMED (>86° F).**
7. Once the body has been re-warmed to greater than 86° F then contact med control and follow appropriate ACLS protocol.
8. Continue to monitor core temperature.



Hamilton County EMS Pediatric Protocols



MEDICAL MANAGEMENT OF NERVE AGENT EXPOSURE

Purpose is to counteract the effects of exposure to nerve agents such as GA (Tabun), GB (Sarin), GD (Soman), GF, and VX. To achieve maximum effectiveness, these antidotes must be administered as quickly as possible once an emergency worker or other person has mild symptoms of nerve agent poisoning.

Description: Nerve agents are very toxic organophosphorus compounds (insecticides, weed killer). Some agents are more likely than others to pose a toxic hazard by inhalation, and some agents are likely to last longer than others. All are well absorbed across the skin. Under mild weather conditions, the liquids are clear, colorless, and mostly odorless. They cause biologic effects by inhibiting acetylcholinesterase (nerve conduction that affects many organ systems), thereby allowing acetylcholine to accumulate and cause hyperactivity in the muscles, glands, and nerves.

Environmental Hazards:

1. GB will react with water to produce toxic vapors; therefore decontamination with water causes a hazardous atmosphere.
2. Most GB spilled will be lost to evaporation.
3. VX is moderately long lasting in the soil, and because it has low water solubility and low volatility, water and ground may remain contaminated for a long time.

Auto-Injector Use:

1. Pre-measured doses in auto-injectors should be safe for most adults.
2. Atropine auto-injector (2mg total dose per injection), Pralidoxime (2 PAM C1) auto-injector (600mg total dose per injection), Valium auto-injector (10mg total dose per injection) may be administered by qualified emergency personnel and designated emergency responders who have had adequate training in on-site recognition and treatment of nerve and/or organophosphate (insecticide, weed killer) agent intoxication in the event of a chemical release. This is specific to the disaster setting.
3. Medical treatment is directed to relieving respiratory distress and alleviating seizures.
4. These are antidotes to be used after the recognition of the existence of a potential chemical or organophosphate (insecticide, weed killer) agent release in an area.

Precautions:

1. The adult-size Atropine and 2-PAM Chloride injectors should never be given to infant or pediatric patients.
2. Morphine, theophylline, aminophylline, or succinylcholine should not be used with 2-PAM C1. Avoid reserpine or phenothiazine-type tranquilizers.

Continued on the next page!



Hamilton County EMS Pediatric Protocols



MEDICAL MANAGEMENT OF NERVE AGENT EXPOSURE (continued)

3. 2-PAM C1 is most effective if administered immediately after exposure. Less effective if given more than 6 hours after termination of exposure.

Immediate management:

Once determined that an emergency worker or other person is in a hazardous chemical environment and is exhibiting symptoms of nerve agent exposure administer Mark 1 Kits (atropine and pralidoxime chloride); and diazepam in addition if symptoms are severe with seizures; and ventilation and suction of airways for respiratory distress.

How to administer Auto-Injectors:

1. The injectors are in a plastic holder and numbered 1 and 2. The Atropine Injector, injector number 1 is administered first. The injector number 2, 2-PAM Chloride, is administered second. Remove auto-injector and remove the safety clip.
2. Form a fist around the injector without covering or holding the needle.
3. Place needle end of injector against your lateral thigh muscle. Injections site should be at least a hands width from any joint. Any large muscle may be used such as the buttocks, but the thigh muscle is preferred. The medication can be administered through the clothing. (*Note: Thin people should get the injection in the upper outer part of the buttocks*).
4. Check injection site to avoid buttons and possible objects in pockets.
5. Push the injector into the muscle with a firm even pressure until it functions. (The spring drives the needle through the seal and into the muscle, injecting the medication.)
6. Hold injector in place for at least 10 seconds.
7. Carefully place the used injector between two fingers of your opposite hand.

Signs and Symptoms:

1. Identify symptoms of nerve agent poisoning.

MILD-SLUDGEM

- S-** salivation (excessive drooling)
- L-** lacrimation (tearing)
- U-** urination
- D-** defecation / diarrhea
- G-** GI upset (cramps)
- E-** emesis (vomiting)
- M-** muscle (twitching, spasm, "bag of worms", weakness)

MEDICAL MANAGEMENT OF NERVE AGENT EXPOSURE (continued)

MODERATE-SLUDGEM + RESPIRATORY

Respiratory-Difficulty breathing, Respiratory distress (shortness of breath, wheezing, coughing).

SEVERE-SLUDGEM + RESPIRATORY + CNS



Hamilton County EMS Pediatric Protocols



CNS – Agitation, Confusion, Seizures, Sudden loss of consciousness, Coma, Pinpoint pupils (miosis), blurry or dim vision.

2. Notify Communications.
3. Depending on the level of exposure symptoms administer a Mark 1 Kit or Kits. Mark 1 Kits consist of Atropine and 2-PAM C1. Administer Atropine first and then 2-PAM C1. Give complete kit prior to giving the second or third kit it indicated. If multiple kits are indicated, administer them as quickly as possible and monitor the patient’s response. Maximum number of kits that can be administered to a patient is 3 kits.

Initial Treatment (Table 1)

Tag Color	Signs & Symptoms	Atropine & 2-PAM C1 Dose and Monitor Interval	Valium Dose
RED <i>SEVERE</i>	CNS, Respiratory Distress, SLUDGEM	3 Kits IM (Atropine 6mg) (2-PAM C1 1.8gm) Monitor every 5 minutes	1 Auto-Injector 10mg IM
YELLOW <i>MODERATE</i>	Respiratory Distress, <i>SLUDGEM</i>	2 Kits IM (Atropine 4mg) (2-PAM C1 1.2gm) Monitor every 10 minutes	Not Indicated
GREEN <i>MILD</i>	SLUDGEM	1 Kit IM (Atropine 2mg) (2-PAM C1 600mg) Monitor every 10 minutes	Not Indicated
AYSMPTOMATIC	No Symptoms	Not Indicated	Not Indicated

4. Secure the injectors, ***Push the needle of each used injector through the left pocket flap of shirt or other location on the front of the shirt and bend the needles to form a hook.*** This provides for accountability of how many doses of antidote you or a patient received, in case you or the patient loses consciousness and is unable to relay this information. These needles will be removed at decontamination sector disposed of properly and documented on triage tag.
5. Evacuate the area and if you treated a patient with severe symptoms take the patient with you. Report to the decontamination sector, after decontamination seek medical evaluation and transport to the hospital.

Continued on next page!

MEDICAL MANAGEMENT OF NERVE AGENT EXPOSURE (continued)



Hamilton County EMS Pediatric Protocols



The following will apply to extended on-scene operations by EMS, transport to the hospital, and treatment at patient staging sector while emergency worker or patient is awaiting transport to the hospital. The end point of treatment is drying of secretions and resolution of other symptoms.

Extended Re-Evaluation & Treatment by EMS (Table 2)

Tag Color	Signs & Symptoms	Atropine Dose Monitor Interval	2-PAM C1 Dose	Atropine Repeat Dosing Frequency	Valium Dosage
<u>RED</u> SEVERE	CNS, Respiratory Distress, SLUDGEM	2mg IM or IV Monitor every 5 minutes	Contact Medical Control	3-5 minutes as needed	Contact Medical Control
<u>YELLOW</u> MODERATE	Respiratory Distress, SLUDGEM	2mg IM or IV Monitor every 5-10 minutes	Contact Medical Control	5-10 minutes as needed	Not Indicated
<u>GREEN</u> MILD	SLUDGEM	2mg IM or IV Monitor every 5-15 minutes	Contact Medical Control	5-15 minutes as needed	Not Indicated
<u>ASYMPTOMATIC</u>	No symptoms	Not Indicated	Not Indicated	Not Indicated	Not Indicated

NOTE: DO NOT GIVE MORE THAN THREE 2-PAM C1 (GRAY TOP) AUTO-INJECTORS TO ANY PATIENT. THE MAXIMUM TOTAL DOSE OF 2-PAM C1 IS 1.8 GRAMS.

PEDIATRIC PATIENTS

Note: For the purposes of this protocol only, the effective pediatric age is 9 years of age or younger. No patients 9 years of age or younger may have 2-PAM C-1 administered.

For pediatric patient exhibiting **SLUDGEM** signs and symptoms refer to EMS who will, administer Atropine every 3-5 minutes until secretions begin to dry:

Age	Atropine Dose
Infant (0-2 years)	0.5mg IM
Child (2-9 years)	1mg IM

Continued on next page!



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MEDICAL MANAGEMENT OF NERVE AGENT EXPOSURE (continued)

Drug Reference

Atropine is a cholinergic blocking or anticholinergic compound. It is extremely effective in blocking the effects of excess acetylcholine at peripheral muscarinic sites. Under experimental conditions, very large amounts may block some cholinergic effects at nicotinic sites, but these antinicotinic effects are not evident even at high clinical doses. When small amounts (2mg) are given to normal individuals without nerve agent intoxication, Atropine causes mydriasis, a decrease in secretions (including a decrease in sweating), mild sedation, a decrease in GI motility, and tachycardia. The amount in three Mark 1 Kits may cause adverse effects on performance in a normal person. In people not exposed to nerve agents, amounts of 10mg or higher may cause delirium. Potentially, the most hazardous effect of inadvertent use of Atropine (2mg, IM) in a young person not exposed to cholinesterase inhibiting compound in a warm or hot atmosphere is inhibition of sweating, which may lead to heat injury.

Pralidoxime Chloride (Protopam chloride, 2-PAM C1) is an oxime. Oximes attach to the nerve agent that is inhibiting the cholinesterase and break the agent-enzyme bond to restore the normal activity of the enzyme. Clinically, this is noticeable in those organs with nicotinic receptors. Abnormal activity in skeletal muscle decreases and normal strength returns. 2-PAM C1 may cause blurred vision, double vision, dizziness, headache, drowsiness, nausea, rapid heart rate, increased blood pressure, and hyperventilation. The effects of an oxime are not apparent in organs with muscarinic receptors; oximes do not cause a decrease in secretions, for example. They are also less useful after aging occurs, both with the exception of GD (soman) intoxicated individuals, and casualties will be treated before significant aging occurs. Pralidoxime Chloride (600mg) is in an auto-injector for self-use along with the Atropine injector. These Atropine and Pralidoxime Chloride auto-injectors are packaged together in a MARK 1 Kit.

Diazepam is an anticonvulsant drug used to decrease convulsive activity and reduce the brain damage caused by prolonged seizure activity.

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U.S. Army Medical Research Institute of Chemical Defense (USAMRICD) "Medical Management of Chemical Casualties", Third Edition July 2000.



Hamilton County EMS Pediatric Protocols



NAUSEA / VOMITING

BLS

1. A.B.C.s.
2. Maintain open airway and monitor pulse oximetry.
3. Place patient in position of comfort.
4. Administer Oxygen and use appropriate adjuncts for patient's condition.
5. Assist ventilations and suction as needed.
6. Establish IV NS if showing signs of dehydration
7. Warm fluids are preferable.
11. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM

ALS

8. Cardiac monitor
9. Administer Zofran IV Push (Give over at least 30 seconds but 2-5 minutes preferred)
 - 1 month to 12 years and < 40 kg then dose is 0.1 mg/kg; to a max of 4 mg single dose.
 - > 12 years or > 40 kg then 4 mg IV one time.
10. If uncertain **CONTACT MEDICAL CONTROL FIRST**



Hamilton County EMS Pediatric Protocols



MEDICAL PAIN MANAGEMENT

BLS

1. A.B.C.s.
2. Administer oxygen and airway maintenance appropriate to patient condition.
3. Pulse oximetry.
4. Place patient in position of comfort.
5. Establish IV Normal Saline or Lactated Ringers.

ALS

6. Cardiac monitor.
7. If pain appears minor or moderate then give supportive (non-medicated) care and continue transport.
8. If Pain appears severe then:
 - 10 – 15 mg/kg of Tylenol PO, if recent history of illness.
 - Morphine Sulfate 0.1 mg/kg IV/IO.
 - Nubain 0.1 mg/kg (maximum dose of 1.6 mg/kg) ONLY IF PATIENT ALLERGIC TO MORPHINE SULFATE.
9. Administer Zofran IV Push (Give over at least 30 seconds but 2-5 minutes preferred)
 - 1 month to 12 years and < 40 kg then dose is 0.1 mg/kg; to a max of 4 mg single dose.
 - > 12 years or > 40 kg then 4 mg IV one time.
10. Contact Med Control as patient conditions allows and for further orders or repeat dosages.
11. Continue to monitor ABC's and supportive care



Hamilton County EMS Pediatric Protocols



RESPIRATORY DISTRESS

BLS

1. A.B.C.s. (Cyanosis will be a late sign in pediatric respiratory distress)
2. Place patient in position of comfort, usually sitting.
3. Administer Oxygen and airway maintenance appropriate to patient condition.
4. Monitor pulse oximetry. (Use appropriate size probe)
5. Establish IV NS or INT.
6. Auscultate breath sounds
7. Administer Nebulized medication:
 - Albuterol (Proventil) 1.25 mg/ 3 cc NS for < 1 year of age or 2.5 mg/ 3 cc of NS for >1 year of age.
 - Or Xopenex (Levalbuterol) 0.63 mg/ 3 cc of NS for <1 year of age or 1.25 mg/ 3 cc of NS for >1 year of age.

ALS

8. Cardiac Monitor (Must be attached prior to any medication administration). Use end-tidal CO₂ function of Life Pak 12.
9. If patient has deteriorated then intubate patient to maintain oxygenation. (If patient unruly or to control anxiety, consider conscious sedation. CONTACT MEDICAL CONTROL PRIOR TO ADMINISTERING VERSED.)
10. Patients who are in severe respiratory distress and showing signs of bronchospasm or do not respond to albuterol may be given Epi. 1:1000: 0.01 mg/kg SQ (CONTACT MEDICAL CONTROL PRIOR TO ADMINISTERING THIS TREATMENT).

CONDITION SPECIFIC TREATMENT

1. **Foreign Body Airway Obstruction or Stridor:**
 - 100% O₂ via BVM
 - Infants: 5 back blows, 5 Chest Thrusts (Repeat as needed alternating with ventilation attempts)
 - Child: Abdominal Thrusts (Repeat as needed alternating with ventilation attempts)
 - If foreign body is visible then remove with Magill forceps.
 - Continue airway support and vent with BVM as needed
 - Reassess, support ABC's
 - Intubate if necessary
2. **Croup (hoarse, barking cough, signs and symptoms of upper airway infection)**
 - 100% O₂
 - Give nebulized epinephrine 1:1000: 1mg in 3cc/NS via nebulizer.
 - BVM/ ET Tube as needed for patient condition (If Epiglottitis is suspected then only intubate if absolutely necessary)



Hamilton County EMS

Pediatric Protocols



- Reassess, support ABC's
- Intubate if necessary
- IV/IO of Normal Saline

3. Possible Epiglottitis (“sick”, fever, tripod position, excessive drooling)

- 100% O₂
- BVM/ ET Tube as needed (BVM is best alternative. DO NOT attempt intubation unless absolutely necessary)
- Keep patient calm, use parents in this if feasible.
- Avoid suctioning. Let patient lean forward to allow drainage of drool.
- Continue airway support and vent with BVM as needed
- Reassess, support ABC's
- IV/IO of Normal Saline.



Hamilton County EMS Pediatric Protocols



SEIZURES

BLS

1. A.B.C.s
2. Protect patient from further injury.
3. Place patient to maintain open airway.
4. Administer Oxygen and airway maintenance appropriate to patient condition
5. Monitor pulse oximetry.
6. If trauma noted treat per specific protocol (Suspect C-Spine Injury)
7. Establish IV/IO of Normal Saline (DO NOT DELAY TRANSPORT FOR IV).
8. If febrile, cool patient as needed and follow hyperthermia protocol.
9. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM

ALS

10. Monitor ECG.
11. If patient is actively seizing, prolonged, or status epilepticus then administer:
 - First Choice: Ativan: 0.1 mg/kg IV/IO repeat every 4-5 minutes as needed up to 3 doses.
 - Second Choice: Versed: 0.1 mg/kg IV/IO
 - If No IV then Versed 0.2 mg/kg IM (Max of 4 mg) or 0.4 mg/kg Intra-nasal (Max 4mg)
12. If cause is from a narcotic then give Narcan 0.1 mg/kg IV/IO to a max of 2 mg titrated to effect.
13. If patient is "status" CONTACT MEDICAL CONTROL!
14. Continue to monitor ABC's and give supportive care.



Hamilton County EMS Pediatric Protocols



UNCONSCIOUS / UNRESPONSIVE

BLS

1. A.B.C.s.
2. Assess patient for head injury, trauma, hypothermia, hemiparesis, and fever. Obtain temperature on patients that are hypothermic.
3. Place patient in recovery position (if trauma is not suspected).
4. Administer Oxygen 100 % and airway maintenance appropriate for patient condition
5. Monitor pulse oximetry.
6. Establish IV/IO (DO NOT DELAY TRANSPORT FOR IV).
7. Warm fluids on all suspected hypothermic patients.
15. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM

ALS

8. Cardiac monitor (Prior to medication administration), and obtain 12 lead ECG.
9. If cause is from a narcotic then give Narcan 0.1 mg/kg IV/IO to a max of 2 mg titrated to effect.
10. If hypotensive then give a fluid bolus of 20 cc/kg IV/IO, repeat once if necessary.
11. CONTACT MED COMM AS SOON AS POSSIBLE.



Hamilton County EMS Pediatric Protocols



VENOMOUS SNAKE BITE

BLS

1. A.B.C.s.
2. Oxygen 12 – 15 lpm via non-rebreather and airway maintenance as appropriate for patient's condition.
3. Monitor pulse oximetry.
4. Splint extremity in a neutral position and maintain at or below heart level.
5. Mark outer edges of swelling at time of initial assessment and then in 5 minute increments to trend progression.
6. IV of Normal Saline. Give 20 cc/kg bolus if hypotensive. DO NOT place IV in affected extremity if possible.
7. Remove any article that may constrict circulation due to swelling. (Give to family member if possible and with patient's permission).
8. Reassure and calm patient throughout the incident.
9. Rapid transport to the hospital.

ALS

10. Cardiac monitor.
11. Contact Med Comm.
12. Consider pain management only through Medical Control order.

*****Attempt to determine type of snake if possible.**

*****Do not delay transport.**

*****Do not apply ice.**

*****Do not use a tourniquet or constricting band at the bite site or proximal to the bite site.**



Hamilton County EMS Pediatric Protocols



Pediatric Trauma Protocols



Hamilton County EMS Pediatric Protocols



ABDOMINAL TRAUMA

BLS

1. A.B.C.s.
2. Oxygen and airway maintenance appropriate to patient condition
3. Spinal immobilization as indicated by mechanism of injury.
4. Control and life threatening hemorrhaging.
5. Dress and bandage abdominal injuries as appropriate:
 - Penetrating Object: Stabilize object. **DO NOT REMOVE OBJECT!**
 - Evisceration: Cover with saline soaked trauma dressing.
6. Rapid transport to receiving facility, with early notification.
7. Monitor pulse oximetry.
8. IV/IO of LR or NS with flow rate as appropriate to patient condition. If Blood Pressure is , 90 mm/Hg then give a 20 cc/kg fluid bolus. Repeat once as needed. Secondary IV as indicated.
9. Apply MAST – do not inflate without direct order from Medical Control (contraindicated in chest injuries!).

ALS

10. Cardiac monitor.
11. N.G. tube as needed.
12. Monitor ABC's and continue supportive care.



Hamilton County EMS Pediatric Protocols



PEDIATRIC SHOCK / TRAUMA PROTOCOL

BLS

1. A.B.C.s.
2. Oxygen 100% and additional airway maintenance as appropriate for patient condition
3. Spinal immobilization as indicated by mechanism of injury.
4. Control and life threatening hemorrhaging.
5. Trendelenburg position.
6. Maintain body temperature >97° F
7. IV/IO of LR or NS with flow rate as appropriate to patient condition. If Blood Pressure is , 90 mm/Hg then give a 20 cc/kg fluid bolus. Repeat once as needed. Secondary IV as indicated.
8. M.A.S.T garments applied. **DO NOT INFLATE WITHOUT ORDERS FROM MEDICAL CONTROL.**
9. Check blood sugar if level is below **50mg/dl (or 40 mg/dl for a newborn delivery in the pre-hospital setting)** administer Dextrose. (Cardiac monitor must be attached prior to medication administration)
 - Newborn/Infant: D10- 2.0 ml/kg (D10: 2 ml of D50 + 8 ml of Normal Saline = 10 ml D10)
 - Child (> 6 months up to 2 years old): D25- 2.0 ml/kg
 - Child (>2 years old): D50- 1.0 ml/kg.
 - If No IV then Glucagon 0.5 – 1 mg IM
10. Elicit history: Specifically for cardiac signs (SVT, congenital heart disease, down's syndrome)

ALS

11. Cardiac monitor and pulse oximetry.
12. If hypotensive and fluids not working consider Dopamine 2 – 20 mcg/kg/min (Contact Med Control before administering)
13. Consider cause and treat appropriately:
 - Anaphylactic (See anaphylaxis protocol)
 - Cardiogenic: history, correct dysrhythmias, Dobutamine: 2 – 20 mcg/kg/min, titrated to effect (Contact Med Control before administering)
 - Hypovolemic: Control Bleeding, IV Fluids
 - Neurogenic: note deficiencies and progression
 - Septic: Maintain body temperature and blood sugar
14. Contact and follow any additional treatment per Medical Control.
15. Reassess ABC's and continue supportive care

USE WARM IV FLUIDS ON ALL SHOCK / TRAUMA PATIENTS.



Hamilton County EMS Pediatric Protocols



BURNS

BLS

1. Patient removed from source by trained personnel
2. A.B.C.s.
3. Oxygen 100% and additional airway maintenance as appropriate for patient condition, be prepared for aggressive prophylactic airway management with RSI (Supervisor).
4. Treat specific type of burn (See Below)
5. IV/IO of LR or NS
 - If hypotensive then 20 cc/kg fluid bolus, repeat once as needed.
 - If not hypotensive then IV fluids at 10 cc/kg/hr
6. Remove and constricting clothing or jewelry. Cover patient with blanket to protect modesty
7. Cover any burns with a dry sterile dressing or burn sheet. Attempt to keep blisters intact.
8. DO NOT use commercial manufactured burn treatment products. DO NOT remove if applied prior to arrival.
9. Monitor pulse oximetry.

ALS

10. Cardiac monitor. 12 lead ECG.
11. Treat dysrhythmias per appropriate ACLS algorithm.
12. If major burns are present and pain appears severe then:
 - Morphine Sulfate 0.1 mg/kg IV/IO.
 - Nubain 0.1 mg/kg (maximum dose of 1.6 mg/kg) ONLY IF PATIENT ALLERGIC TO MORPHINE SULFATE.
13. Contact Med Comm for further treatment and further pain management doses.
14. Attain 2nd IV line en-route if applicable

ALL ELECTRICAL INJURIES / BURNS SHOULD BE EVALUATED BY A PHYSICIAN.

CONDITION SPECIFIC TREATMENT

1. Chemical Burn

- Brush of excess powders or fluids.
- Irrigate with sterile water or saline for 20 minutes during transport.

2. Thermal Burn

- Cool for 1 minute with sterile water or normal saline. AVOID HYPOTHERMIA
- Apply DRY Sterile dressing or burn sheets
- Stabilize all associated injuries

3. Electrical Burn

- Cardiac Monitor and 12 lead
- Assess for entrance and exit wounds.
- Immobilize all associated injuries to include C-Spine.



Hamilton County EMS Pediatric Protocols



HEAD INJURY

BLS

1. A.B.C.s.
2. Oxygen 100% and appropriate airway maintenance.
3. Spinal immobilization.
4. IV/IO of LR or NS with rate appropriate to patient condition. Secondary IV of LR or NS as needed.
5. Rapid transport to trauma facility.
6. Monitor pulse oximetry.
7. Check blood sugar level if less than 50mg/dl, then administer 50ml of D50.

ALS

8. Cardiac monitor.
9. Contact Medical Control AS SOON AS POSSIBLE.
10. Consider sedation and intubation through Versed protocol, if patient shows signs of brain herniation, or potential loss of airway (See Conscious Sedation/ RSI Protocol)

*** Increase ventilations (hyperventilate) patient only if they begin to exhibit signs of brain herniation. i.e.: Patient begins to have seizures, posturing, or rapid increase in blood pressure without fluid overload.



Hamilton County EMS Pediatric Protocols



NEAR DROWNING

BLS

1. A.B.C.s.
2. Oxygen 100% and appropriate airway maintenance for patient condition.
3. If ventilations are needed then gastric decompression, by NG or OG, may be necessary to ensure adequate ventilations or respirations.
4. Spinal immobilization for patients with history of diving accident, mechanism of spinal injury is present, patient is unconscious, or history of incident is unclear.
 - Spinal immobilization prior to removing patient from water.
5. Remove wet clothing and maintain patient's body temperature.
6. IV of LR or NS at rate appropriate to patient's condition. Give 20 cc/kg fluid bolus if hypotensive.
7. Monitor pulse oximetry.

ALS

8. Cardiac monitor.
9. If patient apneic and pulseless then got to appropriate ACLS protocol
10. Treat hypothermia if needed according to the hypothermia protocol.
11. Contact Medical Control.
12. Supportive care en-route to the hospital



Hamilton County EMS Pediatric Protocols



Musculoskeletal Trauma

BLS

1. A.B.C.s.
2. Administer oxygen and airway maintenance appropriate to patient condition.
3. C-Spine stabilization as needed.
4. Control any life threatening hemorrhaging.
5. Splint extremities (may use appropriate sized MAST for leg and pelvic fractures), stabilize any penetrating objects.
6. Pulse oximetry.
7. Establish IV Normal Saline or Lactated Ringers at appropriate rate for patient condition. If hypotensive then give 20 cc/kg fluid bolus and repeat if needed one time.

ALS

8. Cardiac monitor.
9. If pain appears minor or moderate then give supportive (non-medicated) care and continue transport.
10. If Pain appears severe and only has extremity trauma inclusion then:
 - Morphine Sulfate 0.1 mg/kg IV/IO.
 - Nubain 0.1 mg/kg (maximum dose of 1.6 mg/kg) ONLY IF PATIENT ALLERGIC TO MORPHINE SULFATE.
12. Administer Zofran IV Push (Give over at least 30 seconds but 2-5 minutes preferred)
 - 1 month to 12 years and < 40 kg then dose is 0.1 mg/kg; to a max of 4 mg single dose.
 - > 12 years or > 40 kg then 4 mg IV one time.
13. **IF ANY LOSS OF CONSCIOUSNESS, HEAD INJURY, ABDOMINAL TRAUMA, OR CHEST TRUAMA NOTED THEN CONTACT MED COMM PRIOR TO PAIN MANAGEMENT MEDICATION ADMINISTRATION.**
14. Contact Med Control as patient condition allows and for further orders or repeat dosages.
15. Continue to monitor ABC"s and supportive care.



Hamilton County EMS Pediatric Protocols



TRAUMA PAIN MANAGEMENT

BLS

1. A.B.C.s.
2. Administer oxygen and airway maintenance appropriate to patient condition.
3. Pulse oximetry.
4. C-Spine Stabilization as needed.
5. Establish IV Normal Saline or Lactated Ringers at a TKO rate unless hypotensive then give a 20 cc/kg fluid bolus, may repeat one time if needed.

ALS

6. Cardiac monitor.
7. Pain scale rating
8. **IF ANY LOSS OF CONSCIOUSNESS, HEAD INJURY, ABDOMINAL TRAUMA, OR CHEST TRAUMA NOTED THEN CONTACT MED COMM PRIOR TO PAIN MANAGEMENT MEDICATION ADMINISTRATION.**
9. If pain appears minor or moderate then give supportive (non-medicated) care and continue transport.
10. If Pain appears severe then:
 - Morphine Sulfate 0.1 mg/kg IV/IO.
 - Nubain 0.1 mg/kg (maximum dose of 1.6 mg/kg) ONLY IF PATIENT ALLERGIC TO MORPHINE SULFATE.
11. Administer Zofran IV Push (Give over at least 30 seconds but 2-5 minutes preferred) if needed for nausea.
 - 1 month to 12 years and < 40 kg then dose is 0.1 mg/kg; to a max of 4 mg single dose.
 - > 12 years or > 40 kg then 4 mg IV one time.
12. Contact Med Control as patient conditions allows and for further orders or repeat dosages.
13. Continue to monitor ABC's and supportive care



Hamilton County EMS Pediatric Protocols



THORACIC TRAUMA

BLS

1. A.B.C.s.
2. Oxygen 100% and airway maintenance appropriate for patient condition.
3. Spinal immobilization as indicated by mechanism of injury.
4. Auscultate breath sounds and reassess them frequently.
5. Stabilization of chest injury:
 - a. Occlusive dressing for open chest wall or rib margin injuries.
 - b. Bulky dressing splint for rib fractures and / or flail segment.
6. Rapid transport to trauma facility, with early notification.
7. IV of LR or NS with rate appropriate to patient condition. If hypotensive then give a 20 cc/kg fluid bolus, may be repeated one time as needed.
8. Secondary IV of LR or NS as needed.

ALS

9. Cardiac monitor, use end-tidal function on Life Pak 12.
10. Intubate as needed for adequate ventilations (see Conscious Sedation/ RSI Protocol).
11. Chest decompression as indicated for tension pneumothorax after receiving orders from Medical Control. **(MUST MEET AT LEAST THREE OF THE CRITERIA LISTED BELOW)**
 - Acute respiratory distress, cyanosis
 - Unilaterally decreased breath sounds or absent breath sounds
 - Hyper-resonance of chest unilaterally
 - Jugular vein distention
 - Subcutaneous Emphysema
 - Acute Traumatic Chest Injury, ecchymosis or obvious rib fractures
 - History of COPD or other chronic lung disease with pre-disposes patient to spontaneous pneumothorax
 - Hypotension
 - Tracheal deviation away from the effected side
 - Arrhythmia
 - Oxygen saturation <90%
12. Continue to monitor ABC's, breath sounds, O2 saturation and supportive care



Hamilton County EMS Pediatric Protocols



TRAUMATIC ARREST

BLS

1. A.B.C.s.
2. Begin CPR.
3. Airway maintenance with Oxygen 100%:
 - Maintain manual C-spine control.
 - ALS: Intubation- ONLY 1 ATTEMPT ON SCENE!
4. Spinal package.
5. Rapid transport to level 1 Pediatric Trauma Center.
6. IV/IO of Normal Saline or Lactated Ringers (DO NOT DELAY TRANSPORT FOR IVs), Give 20 cc/kg fluid bolus.
7. Monitor pulse oximetry.

ALS

8. Cardiac monitor. Use end-tidal CO₂ function on Life Pak 12.
9. Treat any cardiac rhythms per specific protocols
10. Chest decompression as indicated for chest trauma (see Pediatric Thoracic Trauma Protocol).
11. Early notification to Med Comm.
12. Inflate appropriate sized M.A.S.T. garments per Medical Control only (Contraindicated in chest injuries).
13. Consider 2nd IV line while en-route to the hospital.

***Look for treatable causes:

i.e. Tension pneumothorax, airway obstruction, hypovolemia.