



**EMS Pediatric
Pre-Hospital
Treatment Manual**

January 2014

Table of Contents

PEDIATRIC ASSESSMENT PROCESS AND MANAGEMENT	4-14
Pediatric Assessment Triangle (PAT)	5
Pediatric Age Definitions	8-9
Assessment of the Pediatric Patient	10-12
Normal Pediatric Vital Signs Range	12
Routine Pediatric Treatment Protocol	13-14
PEDIATRIC AIRWAY	15-23
Basic Airway Management of the Pediatric Patient	16-17
Pediatric Airway Obstruction	18
King LTD Airway Procedure	19-20
Advanced Airway Procedure	21-23
PEDIATRIC VASCULAR ACCESS	24-28
Pediatric Intravenous Cannulation Procedure	25-26
Pediatric Intraosseous Procedure	27-28
PEDIATRIC MEDICATION ADMINISTRATION	29-34
Pediatric Medication Administration Procedure	30
Pediatric Pain Protocol	31-32
Intranasal Fentanyl Dosing Chart	33
Intranasal Versed Dosing Chart	34
PEDIATRIC RESUSCITATION	35-52
Pediatric Cardiac Arrest Protocol	36-38
V-fib or Pulseless V-tach Protocol	39-40
PEA and Asystole Protocol	40
Pediatric Bradycardia Protocol	41
Pediatric Narrow Complex Tachycardia Protocol	43-44
Pediatric Wide Complex Tachycardia Protocol	45-46
Pediatric Respiratory Distress Protocol	47-48
Pediatric Tracheostomy Protocol	49-50
Pediatric Respiratory Arrest Protocol	51-52
PEDIATRIC TREATMENT PROTOCOLS	53-82
Pediatric Altered Level of Consciousness Protocol	54-55
Pediatric Seizure Protocol	56-57
Pediatric Allergic Reaction/Anaphylaxis Protocol	58-59

Pediatric Ingestion/Overdose/Toxic Exposure Protocol	60-61
Routine Pediatric Trauma Treatment Protocol	62-64
Pediatric Shock Protocol	65-66
Pediatric Closed Head Injury Protocol	67-69
Pediatric Burn Protocol	70-72
Pediatric Heat Related Emergencies Protocol	73-74
Pediatric Hypothermia Protocol	75-76
Pediatric Near Drowning Protocol	77-78
Suspected Child Maltreatment Protocol	79-80
Sudden Infant Death Syndrome (SIDS) Protocol	81-82

Pediatric Assessment Process & Management

A patient **under the age of sixteen (16)** is considered to be a pediatric patient. Utilization of pediatric treatment guidelines and the extent of care rendered are based on the general impression of the pediatric patient's condition, physical examination findings and the history of the event. *Patients 16 years or older will be treated with adult protocols.* The goal of the pediatric patient assessment process is similar to that of the adult patient. However, children are not "little adults". The causes of catastrophic events, such as cardiac arrest, are most often related to respiratory failure, shock or central nervous system injuries. Early recognition and treatment of the pediatric patient's injuries or illness is important to ensure the best outcome.

Special attention and awareness must be given to the pediatric patient's exceptional ability to compensate for respiratory failure and shock. Vital signs are valuable in the assessment of the pediatric patient but do have significant limitations and can be dangerously misleading. For example, hypotension is a late and often sudden sign of cardiovascular decompensation. Tachycardia (which varies by age group) will persist until cardiac reserve is depleted. Bradycardia is an ominous sign of impending cardiac arrest.

Infants and children are able to maintain their blood pressure by increasing peripheral vascular resistance (shunting) and heart rate. **The pediatric patient can be in compensated shock and exhibit a normal blood pressure and skin condition.** This increases the importance of the EMS provider understanding of pediatric vital signs and behavior patterns.

The EMS provider must establish a general impression of the pediatric patient. This impression, which is critical, should be done from the doorway of the room. Therefore, the pediatric patient will not be disturbed by a "hands-on" assessment. A simple question to ask yourself is, "How sick is this child?"

Three (3) key areas of importance of a general impression are:

1. **Appearance**
2. **Work or breathing**
3. **Circulation to skin**

The three components are known as the *Pediatric Assessment Triangle (PAT)* established by the American Academy of Pediatrics (2000).

Pediatric Assessment Triangle (PAT)

Appearance

The appearance of the pediatric patient should be assessed from the doorway. This is the most important aspect to consider when determining how sick or injured the child is. *Appearance* will give the EMS provider insight on oxygenation, neurological status and ventilation. Remember, the sick child may be alert on the conventional A VPU scale, but still have an abnormal appearance. Children need a more subtle assessment tool so that life-threatening injuries can be identified earlier. A good mnemonic to remember when assessing appearance is "tickles" (TICLS):

Characteristic	Features to look for:
Tone	Is he/she moving or resisting examination vigorously? Does he/she have good muscle tone? Or, is he/she limp, listless or flaccid?
Interactiveness	How alert is the child? How readily does a person, object, or sound distract him/her or draw his/her attention? Will he/she reach for, grasp and play with a toy or exam instrument such as a penlight or tongue blade? Or, is he/she uninterested in playing or interacting with the caregiver or professional?
Consolability	Can he/she be consoled or comforted by the caregiver or by the pre-hospital professional? Or is his/her crying or agitated unrelieved by gentle assurance?
Look/Gaze	Does he/she fix his/her gaze on a face? Or, is there a "nobody home" glass-eyed stare?
Speech/Cry	Is his/her cry strong and spontaneous, or weak or high pitched? Is the content of speech age appropriate, or confused and garbled?

The TICLS Mnemonic (PEPP/AAP 2ⁿ Edition 2006)

Work of Breathing

Assessing work of breathing must go beyond the rate and quality of respirations that is used for adult patients. Work of breathing is an accurate indicator of the oxygenation and ventilation status of the pediatric patient. This is another "hands off" evaluation method in order to avoid disturbing the pediatric patient and causing any more respiratory distress (other than what is already present in the patient).

Characteristics	Features to look for:
Abnormal Airway Sounds	Snoring, muffled or hoarse speech, grunting, wheezing
Abnormal Positioning	Sniffing position, tripodding, refusing to lie down
Retractions	Supraclavicular, intercostals, or substernal retractions of the chest wall; "head bobbing" in infants
Flaring	Flaring of the nares on inspiration

Characteristics of Work of Breathing (PEPP/AAP 2 Edition 2006)

Circulation to Skin

A rapid circulatory assessment is needed to determine the perfusion status of the pediatric patient. The key is to assess the core perfusion status of the child. Assessing the skin and mucous membranes can do this. Circulation to the skin reflects the overall status of core circulation.

Characteristics	Features to look for:
Pallor	White or pale skin/mucous membrane coloration from inadequate blood flow
Mottling	Patchy skin discoloration due to vasoconstriction/vasodilation
Cyanosis	Bluish discoloration of skin and mucous membranes

Characteristics of Circulation to Skin (PEPP/AAP 2nd Edition 2006)

Putting it all Together

The goal of pediatric patient care is to identify patients in shock or at risk of shock, initiating care that will directly assist maintaining the patient's perfusion and safely transporting the patient to an emergency department or trauma center in a timely manner.

The benefit of remaining on scene to establish specific treatments versus prompt transport to a definitive care facility should be a consideration of each patient contact. Requesting advanced assistance is another important resource that BLS & ILS providers should consider.

Notes on Pediatric Shock:

Mechanism	Medical	Traumatic
Hypovolemia	Blood loss-Internal bleeding Fluid Loss-Dehydration	Blood Loss-Trauma Fluid Loss-Burns
Cardiogenic (Pump Failure)	Respiratory Failure Airway Obstruction Dysrhythmia	Chest Trauma Pneumothorax Pericardial Tamponade
Cyanosis	Sepsis Anaphylaxis Chemical Poisoning Endocrine Dysfunction	Spinal Cord Injury (Neurogenic)

Pediatric Age Definitions

Neonate (0-1 Month):

- Utilization of APGAR Scoring is helpful in assessing the neonate patient.

Infant (1-12 Months):

- Approach the infant slowly and calmly. Fast motion and loud noises may startle or agitate the infant.
- Use warm hands and assessment tools.
- Avoid doing anything potentially painful or distressing until after the assessment is completed.
- Have the caregiver assist in care -this is less threatening to the infant.

- Children over six (6) months of age are usually best examined in the arms of a parent. "Stranger anxiety" may be present and could eliminate other assessment options.
- If needed, calm the infant with a pacifier, blanket or favorite toy.

Toddler (1-3 Years):

- Approach the toddler slowly. Keep physical contact at a minimum until he/she feels familiar with you.
- Perform the assessment at the level of the toddler by sitting or squatting next to them and **allow the toddler to remain in the caregiver's lap** whenever possible.
- Assessment should be **toe to head**. This is less threatening to the toddler.
- Give limited choices such as "Do you want me to listen to your chest or feel your wrist first?"
- Use simple, concrete terms and continually reassure the toddler.
- Do not expect the toddler to sit still and cooperate-be flexible.

Preschooler (3-5 Years):

- A preschool aged child is a "magical thinker." Concrete concepts must be described in short, simple terms.
- A preschooler is often very cooperative during the assessment process and may be able to provide a history.

- Questions should be simple and direct.
- Allow the child to handle equipment.
- Use distractions.
- Do not lie to the child. If the procedure is going to hurt, tell them.
- Set limits on behavior (*i.e.* "You can cry and scream, but not bite or kick.")
- Focus on one thing at a time.
- Play games with immobilizing preschoolers to distract him/her and prevent them from

squirming.

School Age (5-13 Years):

- The school aged child is usually cooperative and can be the primary source for the patient history.
- Explain all procedures simply and completely and respect the patient's modesty.
- Substance abuse issues may be present in this age group and should be considered during the care of altered level of consciousness cases.
- Children at this age are afraid of losing control, so let him/her be involved in the care. However, do not negotiate patient care unless the child really has a choice.
- Reassure the child that being ill or injured is not a punishment and praise them for cooperating.

Adolescent (13-16 Years):

- The adolescent is more of an adult than a child and should be treated as such. Depending on the nature of the problem, an accurate history may not be possible with parents observing. It may be necessary to separate the parent and child during the assessment.
- Regardless of who is present, respect the patient's modesty. Avoid exposing the adolescent unnecessarily.
- Explain what you are doing and *why* you are doing it!
- Show respect-speak to the adolescent directly. Do not turn to the caregiver for the initial information.

Assessment of the Pediatric Patient

1. Scene Size-Up

- Note anything suspicious at the scene (e.g. medications, household chemicals, other ill family members, etc.).
- Assess for any discrepancies between the history and the patient presentation (e.g. infant fell on hard floor but there is carpet throughout the house).

2. General Approach to the Stable/Conscious Pediatric Patient

- Utilize the PAT (*Pediatric Assessment Triangle*) to gain a general impression of the child.
- Assessments and interventions must be tailored to each child in terms of age, size and development.
- Smile, if appropriate to the situation.
- Keep voice at an even, quiet tone -do not yell.
- Speak slowly. Use simple, age appropriate terms.
- Keep small children with their caregiver(s) whenever possible and complete assessment while the caregiver is holding the child.
- Kneel down to the level of the child if possible.
- Be cautious in the use of touch. In the stable child, make as many observations as possible before touching (and potentially upsetting) the child.
- Adolescents may need to be interviewed without their caregivers present if accurate information is to be obtained regarding drug use, alcohol use, LMP, sexual activity or child abuse.
- Observe general appearance and determine if behavior is age appropriate.
- Observe for respiratory distress or extreme pain.
- Look at the position of the child.
- What is the level of consciousness?
- Muscle tone: good vs. limp.
- Movement: spontaneous, purposeful or symmetrical.
- Color: pink, pale, flushed, cyanotic or mottled.
- Obvious injuries: bleeding, bruising, gross deformities, etc.
- **Determine weight** -ask patient, caregiver(s) or use Broselow tape.

3. Initial Assessment

Airway access/maintenance with c-spine control

- Maintain with assistance: positioning
- Maintain with adjuncts: oral airway, nasal airway
- Listen for any audible airway noises (e.g. stridor, snoring, gurgling, wheezing)
- Patency: suction secretions as necessary

Breathing

- Rate & rhythm of respirations -compare to normal rate for age and situation
- Chest expansion -symmetrical?
- Breath sounds -compare both sides and listen for sounds (present, absent, normal, abnormal)
- Positioning -sniffing position, tripod position
- Work of breathing-retractions, nasal flaring, accessory muscle use, head bobbing, grunting

Circulation

- Heart rate -compare to normal rate for age and situation
- Central pulses (e.g. brachial, carotid, femoral)-strong, weak or absent
- Distal/Peripheral pulses (e.g. radial)-present/absent, thready, weak or strong
- Color-pink, pale, flushed, cyanotic, mottled
- Skin temperature -hot, warm, cool, or cold
- Blood pressure-use appropriately sized cuff and compare to normal for the age of the child
- Hydration status -observe anterior fontanel in infants, mucous membranes, skin turgor, crying tears, urine output, history to determine

Disability-Brief Neurological Examination:

- Assess responsiveness-APGAR or TICLS
- Assess pupils
- Assess for transient numbness/tingling

Expose and Examine:

- Expose the patient as appropriate based on age and severity of illness.
- Initiate measures to prevent heat loss and keep the child from becoming hypothermic.

4. Rapid Assessment vs. Focused History & Physical Assessment

- Tailor assessment to the needs and age of the patient.
- Rapidly examine areas specific to the chief complaint.
- *Responsive medical patients:* Perform focused assessment based on chief complaint. A full review of systems may not be necessary. If the chief complaint is vague, examine all systems and proceed to detailed exam. '
- *Unresponsive medical patients:* Perform rapid assessment (*i.e.* ABCs & a quick head-to-toe exam). Render emergency care based on signs & symptoms, initial impression and standard operating procedures.
- Proceed to detailed exam.
- *Trauma patients with **NO** significant mechanism of injury:* Focused assessment is based on specific injury site.
- *Trauma patients **with significant mechanism of/injury:*** Perform rapid assessment of

all body systems and then proceed to detailed exam.

5. Detailed Assessment

- SAMPLE history -acquire/incorporate into physical exam.
- Vital signs (*i.e.* pulse, BP, respirations, skin condition, pulse ox)
- Assessment performed (usually en route) to detect non life-threatening conditions and to provide care for those conditions or injuries

6. Ongoing Assessment

- To effectively maintain awareness of changes in the patient's condition, repeated assessments are essential and should be performed at least every 5 minutes on the unstable patient and at least every 15 minutes on the stable patient.

Critical Thinking Elements

- **Remember: Pediatric patients have extraordinary ability to compensate and may show normal vital signs even though they are in shock.**

NORMAL PEDIATRIC VITAL SIGN RANGES

	Heart Rate	Respiratory Rate	Blood Pressure
Infant	100-160 bpm	30-60 rpm	>60mmHg systolic
Toddler	90-150 bpm	24-40 rpm	>70mmHg systolic
Preschooler	80-140 bpm	22-34 rpm	>75mmHg systolic
School Age	70-120 bpm	18-30 rpm	>80mmHg systolic
Adolescent	60-100 bpm	12-16 rpm	>90mmHg systolic

Routine Pediatric Treatment Protocol

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and establishing initial care to treat and prevent shock:

1. Open and/or maintain an open airway. Have suction equipment readily available to suction nose and mouth as needed.
2. Protect the child from environmental exposure. Give special consideration to the warmth of the infant (*i.e.* cover the head to prevent heat loss).
3. Reassure the patient and caregiver(s). Speak softly and calmly, maintaining conversation and explanation of exam and treatment. Use age-appropriate communication techniques.
4. Patient positioning will be based on assessment, patient condition, age, development and safety. Both the patient and caregiver should have the appropriate safety restraint devices, seat belts in place for transport. .
5. Administer oxygen, preferably 10-15 L/min via non-rebreather mask (either on the child's face or holding the mask close to the face). If the patient does not tolerate a mask, then administer 4-6 L/min by nasal cannula.
6. Ensure that EMS has been activated for further care and transport. Provide responding units with pertinent patient information.
7. Monitor the patient's level of consciousness, vital signs, etc. for any acute changes.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, providing care to treat for shock and preparing for or providing patient transportation.

1. BLS Treatment includes the components of *First Responder Treatment*.
2. Attach pulse oximeter and obtain analysis, if indicated.
3. Attach cardiac monitor and print rhythm strip for documentation, if indicated.
4. Initiate ALS intercept, if indicated (or ILS intercept if ALS is unavailable).
5. Simultaneously with above, perform physical exam/assessment, obtain baseline vital signs and obtain patient history.
6. Establish on-line Medical Control as indicated.
7. Continue to reassess patient en route to the hospital.
8. Transport should be initiated at the earliest possible opportunity.

ILS Treatment

ILS Treatment should be directed at conducting a thorough patient assessment, providing care to treat for shock and preparing for or providing patient transportation. The necessity of establishing IV access is determined by the patient's condition and chief complaint. Consideration should also be given to the proximity of the receiving facility.

1. ILS Treatment includes all of the components of *BLS Treatment*.
2. If indicated, establish IV access using a 1000 mL solution of .9% Normal Saline with

macro drip or blood tubing. No more than one (1) attempt should be made on scene. Infuse at a rate to keep the vein open (TKO) -approximately 8 to 15 drops (gtts) per minute. Dependent upon patient condition, consider initiating IV access when enroute.

ALS Treatment

ALS Treatment should be directed at conducting a thorough patient assessment, providing care to treat for shock and preparing or providing patient transportation. The necessity of establishing IV access is determined by the patient's condition and chief complaint. Consideration should also be given to the proximity of the receiving facility.

1. ALS Treatment includes all of the components of *ILS Treatment*.

Critical Thinking Elements

- When determining the extent of care needed to stabilize the pediatric patient, the EMS provider should take into consideration the patient's presentation, chief complaint, risk of shock and proximity to the receiving facility.
- IV access in pediatric patients is difficult and may complicate the situation. Indications and benefits vs. patient disturbance and complications should be considered.
- If the patient exhibits signs of shock, administer fluid bolus (.9% Normal Saline) at 20mL/kg over 2 minutes.
- If the pediatric patient is in emergent need of fluids and/or medications (*i.e.* cardiac arrest, trauma, decompensated shock or severe burns) and peripheral IV access is unobtainable, proceed with intraosseous infusion (**ALS only**).
- Saline locks may be used as a drug administration route if fluid replacement is not indicated.
- IV access should not significantly delay initiation of transportation or be attempted on scene with a trauma patient meeting load-and-go criteria.

Pediatric Airway

Basic Airway Control of the Pediatric Patient

Establishing and maintaining an open airway and assuring adequate ventilation is a treatment priority with all patients. Proper techniques must be used to assure treatment maneuvers do not inadvertently complicate the patient's condition. Special consideration needs to be given when caring for the pediatric airway due to anatomical difference from adult.

Basic Airway Control

1. Assure an open airway by utilizing with the head tilt/chin lift maneuver or the modified jaw thrust maneuver (without head tilt). The head tilt/chin lift maneuver is NOT to be used if there is any possibility of cervical spine injury.
2. Expose the chest and visualize for chest rise and movement, simultaneously listen and feel for air movement at the mouth and nose. This procedure will need to be done initially and after correcting an obstruction and securing the airway.
3. If the chest is not rising and air exchange cannot be heard or felt:
 - a. Deliver two positive-pressure ventilations. If resistance continues, follow AHA sequences for obstructed airway rescue.
 - b. Reassess breathing and check for brachial or carotid pulse.
 - c. If spontaneous respirations return and a pulse is present, provide supplemental oxygen by non-rebreather mask or assist respirations with bag-valve mask (BVM) at 15 L/min.
 - d. If the patient remains breathless and a pulse is present, initiate ventilations with a BVM at 15 L/min at a rate of 20-30 breaths per minute.
 - e. If the patient remains breathless and a pulse is not present, initiate CPR and institute the appropriate cardiac protocol.
4. If the patient presents with stridor, 'noisy breathing' or snoring respirations, render treatment for partial airway obstruction in accordance with AHA guidelines:
 - a. Reassess effectiveness of the airway maneuver.
 - b. If initially unable to resolve partial obstruction, suction the airway and visualize the pharynx for any evidence of foreign objects. Perform a finger sweep if a foreign object can be seen. **Do not perform a blind finger sweep.**
 - c. If partial airway obstruction persists, treat according to AHA guidelines for resolving a complete airway obstruction.
5. Once the obstruction has been corrected
 - a. Insert an oropharyngeal airway in the unconscious patient (without gag reflex).
 - b. Insert a nasopharyngeal airway in the conscious patient or an unconscious patient with a gag reflex. **Note:** Do not use a nasopharyngeal airway if the possibility of head injury exists.
6. Establish the presence of adequacy of breathing by observing the frequency, depth and consistency of respiration. Also, observe the chest wall for any indications of injuries

which may contribute to respiratory compromise.

7. Supplemental oxygen should be delivered to any patient who exhibits signs of difficulty breathing, sensation of shortness of breath, tachynea, use of accessory muscles, altered level of consciousness/altered mental status, cyanosis, cardiac symptoms, head injury or any indications of shock.
 - a. Supplemental oxygen should be provided by a non-rebreather mask (NRM at a rate of 10-15 L/min (assuring reservoir bag is inflated).
 - b. If patient is unable to tolerate the NRM, administer oxygen via nasal cannula at a rate of 4-6 L/min.
8. Bag-valve mask ventilation with supplemental oxygen at 15L1min should be initiated at the rate of 20-30 if respirations are absent, there is evidence of inadequate ventilation, absent or diminished breath sounds, or wounds to the chest wall.

Critical Thinking Elements

- The pediatric airway varies anatomically from the adult airway. The airway is smaller and more flexible, the tongue is relatively larger and the epiglottis is higher. These differences must be taken into consideration when positioning the head to maintain the airway (i. e. less hyperextension is needed to open the pediatric airway than the adult).
- Mucous, blood, and vomit may easily block the pediatric airway. Therefore, careful attention must be given to clear the airway and appropriate pediatric suction equipment should be available.
- Inadequate maintenance of the patient's airway, inappropriate maneuvers, using inappropriately sized airway equipment and/or failure to recognize an obstructed airway will complicate the patient's condition and can lead to bradyarrhythmias/cardiac arrest.
- Do NOT use the head tilt/chin lift maneuver on a patient with a suspected cervical spine injury.
- Proper facemask seal during artificial ventilations is imperative to assure adequate ventilation.
- Inadequate oxygen delivery settings (i.e. too low) will complicate the patient's condition.

Pediatric Airway Obstruction

An airway obstruction is life threatening and must be corrected immediately upon discovery.

1. If the patient has an obstructed airway and is still conscious:
 - a. Encourage the patient to cough.
 - b. Perform 5 abdominal thrusts (5 back blows and 5 chest thrusts in the infant) if the cough is unsuccessful.
 - c. Repeat until the obstruction is relieved or the patient becomes unconscious.
 - d. Administer oxygen at 15 L/min if the patient has a partial airway obstruction and is still able to breathe.
2. If the patient is unconscious:
 - a. Open the patient's airway and attempt to ventilate.
 - b. Reposition the head and reattempt to ventilate if initial attempt is unsuccessful.
 - c. Perform 5 abdominal thrusts (5 back blows/chests thrusts in the infant).
 - d. Remove object if visualized. **Do not perform a blind finger sweep of the patient's mouth.** Reattempt to ventilate.
 - e. Repeat step c if obstruction persists.
 - f. BLS & ILS immediately initiate ALS intercept.
 - g. ILS & ALS attempt direct extraction via laryngoscope and Magill forceps.
 - I. Use the laryngoscope and examine the upper airway for foreign matter and suction as needed.
 - II. Remove any foreign objects with forceps and suction.
 - III. Re-establish an open airway and attempt to ventilate.
 - IV. If the obstruction is relieved, continue with airway control, ventilations, assessment and care.
 - h. Continue abdominal thrusts (or back blows/chest thrusts) sequence if unable to relieve obstruction and expedite transport.

Critical Thinking Elements

- Maintain in-line c-spine stabilization using 2 EMTs in patients with suspected cervical spine injury.
- Poor abdominal/chest thrust technique, inappropriate airway maneuvers, and/or failure to recognize an obstructed airway will complicate the patient's condition.

KING LTS-D Airway Procedure (ILS & ALS ONLY)

The KING Airway is an effective airway adjunct when intubation is not available or difficult to perform. Insertion is rapid & easy and does not require specialized equipment or visualization of the larynx. It is latex-free and should be considered safe to use on latex-sensitive patients.

Indication

- The King L TS-D is an airway device designed for emergency or difficult intubation in the apneic or unresponsive patient without a gag reflex.

Contraindications

- Active gag reflex
- Patient under four (4) feet tall-see Pediatric Pre-hospital Care Manual: *King LTD Airway Procedure*
- Patient less than 16 years old
- Ingestion of a caustic substance (e.g. gasoline, drain cleaner, etc.)
- Known or suspected esophageal disease (e.g. esophageal varices)
- Tracheostomy (will be ineffective with esophageal placement)

KING Airway Insertion Procedure

1. Pre-oxygenate/ventilate utilizing a bag-valve mask (BVM) at 15 L/min according to the *Basic Airway Control Procedure*.
2. Choose the correct size

King LTD Size	2	2.5
Connector Color	Green	Orange
Patient Criteria	35-45 inches OR 12-25 kg	41-51 inches OR 25-35 kg
Cuff Volume	25-35 mL	30-40 mL

3. Test cuff inflation system by injecting the maximum recommended volume of air into the cuffs. Remove all air from both cuffs prior to insertion.

4. Apply a water-based lubricant (e.g. K-Y or Surgilube) to the beveled distal tip and posterior aspect of the tube. Avoid introducing lubricant in or near the ventilatory openings.
5. Position the head in the "sniffing position" if possible. It can also be inserted with the head in the neutral position if following c-spine precautions/c-collar in place.
6. Hold the KING LTS-D at the connector with the dominant hand. With the non-dominant hand, hold mouth open and apply chin lift.
7. With the KING LTS-D rotated laterally 45-90° (such that the blue orientation line is touching the corner of the mouth), introduce tip into the mouth and advance behind the base of the tongue. **Never force the tube into position** and do not take longer than **20 seconds** for the attempt.
8. As the tube tip passes over the tongue, rotate the tube back to midline (blue orientation line faces chin).
9. Without exerting excessive force, advance the KING LTS-D until the proximal opening of gastric access lumen is aligned with teeth or gums.
10. Inflate the cuffs with the minimum volume necessary to seal the airway (see chart).
11. Attach BVM. Gently bag the patient while assessing ventilations. Simultaneously withdraw the airway very slowly until ventilation is easy & free-flowing.
12. Use multiple confirmation techniques:
 - Confirm Presence of breath sounds
 - Visualize rise and fall of the chest
 - Monitor for clinical improvement
 - Colormetric ETCO₂ (e.g. EasyCap)**
 - Capnography (if available)

****NOTE:** Ventilate the patient at least six (6) times prior to attaching a colormetric device (EasyCap).
13. The gastric access lumen allows the insertion of up to an 18 Fr diameter gastric tube into the esophagus & stomach. Lubricate the gastric tube prior to insertion (ALS only).

Critical Thinking Elements

- If unsuccessful after 1 attempt, refer to the *Basic Airway Control Procedure*.
- ILS/ALS should consider the King LTS-D Airway if the pre-intubation assessment is GRADE 3 or GRADE 4 on the **Cormack-Lehane** scale (refer to the *Advanced Airway*

Control Policy).

- Do NOT administer medications via the King LTS-D Airway. It is designed as an airway adjunct only and cannot be utilized as a medication route.

Advanced Airway Procedure (ALS ONLY)

Endotracheal intubation is an effective method of securing the airway. However, if endotracheal intubation is difficult or unsuccessful in one (1) attempt basic airway control measures should be re-established without delay and maintained throughout transport with no additional attempts made at intubation.

Indications

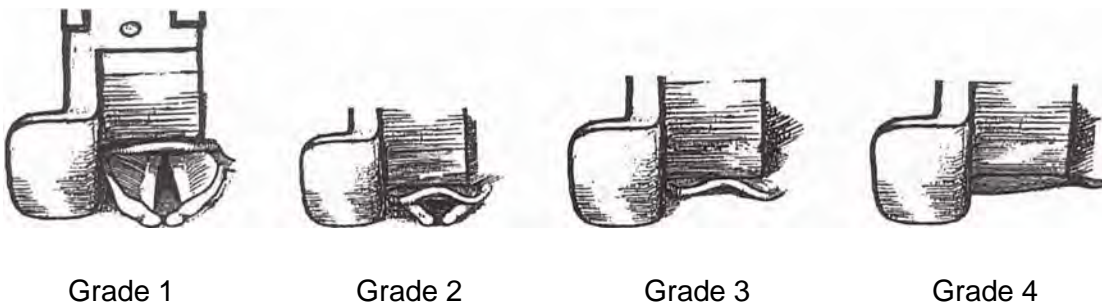
- Endotracheal intubation is an airway device designed for securing the airway in the apneic or unresponsive pediatric patient without a gag reflex.

Contraindication

- Active gag reflex
- Suspected Epiglottitis

Endotracheal Intubation Procedure

1. Implement basic airway measures in accordance with the *Basic Airway Control Procedure*.
2. **Conduct a pre-intubation assessment** using the **Cormack-Lehane** scale:



- **If the pre-intubation assessment is Grade 3 or Grade 4, do not attempt intubation. Return to basic airway control measures using a BVM with OPA or NPA.**

3. Select the proper tube size (based on patient size) and attach a 10mL syringe, if appropriate. Inflate the cuff to be sure it does not leak (the cuff must be deflated prior to insertion).

Ave. Age	0-12 mo.	1-2 yrs.	3-4 yrs.	5 yrs.	6-7 yrs.	8-11yrs.	>12 yrs.
Wt. in kg.	3-9 kg	10-13 kg	14-16 kg	16-20 kg	18-25 kg	24-32 kg	32-54 kg
Blade size	0-1 Miller	1 Miller	2 Miller	2 Miller	2 Miller	2 Miller/ Macintosh	2 Miller/ Macintosh
ET Tube	3-4.0 NC	4.0 NC	4.5 NC	5.0 NC	5.5 NC	6.0 Cuffed	6.5 Cuffed
Distance to upper lip	7-10.5 cm	11-12 cm	12.5-13.5 cm	14-15 cm	15.5-16.5 cm	17-18 cm	18.5-22 cm

4. Insert stylet and bend to the approximate configuration of the pharynx
5. Lubricate the ETT with a water-soluble lubricant.
6. Have suction, BVM, stethoscope, colormetric end-tidal CO2 detector/capnography and commercial ETT holder readily available.
7. Pick up the laryngoscope handle with your left hand and the appropriate blade with your right hand.
8. Holding the blade parallel to the handle, attach the blade to the handle by inserting the U shaped indentation of the blade into the small bar at the end of the handle. When the indentation is aligned with the bar, press the blade forward and snap into place.
9. Lower the blade until it is at a right angle to the handle. The light should come on. If it does not, see if the bulb is tight and/or the batteries need to be replaced (This should be done on a daily basis so you do not have to spend valuable time fixing it at the scene of a call).
10. Suction the pharynx as needed.
11. Pre-oxygenate the patient with high concentration oxygen prior to intubation attempt.
12. Insert the blade into the mouth on the right side, moving the tongue to the left. Follow the natural contour of the pharynx, lifting the tongue (not prying) until you can see the glottic opening.
 - a) If you are using a straight blade (Miller), insert it until you can see the epiglottis. With the tip of the blade, lift up on the epiglottis so that you can visualize the vocal cords and glottic opening. If needed, have someone gently press down on the cricoid cartilage (Sellick Maneuver) so that you can see the cords well.
 - b) If you are using a curved blade (Macintosh), insert the tip into the vallecula and lift up. This will lift the epiglottis and expose the vocal cords and glottic opening. If needed, have someone gently press down on the cricoid cartilage (Sellick Maneuver) so that you can see the cords well.
13. After visualizing the glottic opening, grasp the ETT with your right hand and advance the tube from the right corner of the mouth. Insert the tube into the glottic opening between the vocal cords, just far enough to pass the cuff of the tube past the opening.
14. Verify proper position by ventilating the patient through the tube with a bag-valve device while listening to each side of the chest with a stethoscope to be sure air is entering both lungs. Also, check for inadvertent esophageal intubation by listening for air movement in the epigastric area during ventilations.
15. Utilize a colormetric end-tidal CO2 (ETC02) detector or capnography.
16. If breath sounds are heard on both sides of the chest, no epigastric sounds are heard colormetric ETC02 detector/capnography indicate proper placement, inflate the cuff with

10mL (if indicated) of air and secure the tube with a commercial ETT holder.

- a) If you have inserted the ETT too far, it will usually go into the right main stem bronchus. Therefore, if you hear breath sounds only on the right, you should pull the tube back Y2 inch at a time until you hear bilateral breath sounds. Inflate the cuff with 10mL of air and secure the ETT with a commercial holder.
 - b) If you hear no breath sounds, you are in the esophagus and *must* remove the ETT immediately. Ventilate patient and continue basic airway control measures.
17. Frequently reassess breath sounds to be sure that the ETT is still in place.
 18. Ventilate the patient at a rate of 12 times per minute.
 19. If intubation is unsuccessful after one (1) attempt, proceed to *King LTD Airway Procedure* or *Basic Airway Control Procedure*.

Airway Control in the Trauma Patient

Any type of airway manipulation may be dangerous during airway control of the suspected spinal injury patient. Maintain in-line stabilization.

1. A minimum of two (2) trained rescuers is needed to assure special attention to spinal precautions.
2. One rescuer will apply manual in-line stabilization by placing the rescuers hands about the patient's ears with the little fingers under the occipital skull and the thumbs on the face over the maxillary sinuses.
3. The rescuer performing airway placement should be at the head.
4. Maintain the patient's head in a neutral position and perform endotracheal intubation without cervical manipulation.

Prohibited Advanced Airway Maneuvers

Attempting difficult and unfamiliar procedures poses a danger to the patients those procedures are being performed on. Certain procedures that are used in the hospital setting are **not approved** for pre-hospital personnel in the St. John's Hospital EMS System. These include:

- Extubation
- Nasotracheal Intubation
- Percutaneous Transtracheal Ventilation
- Cricothyrotomy/Surgical Airway

Critical Thinking Elements

- Intubation may be attempted if the pre-intubation assessment is GRADE 1 or GRADE 2. If intubation attempt fails (1 attempt), switch to the King LTS-D airway or basic airway control.
- The definition of an "attempt" is actually trying to pass the ET tube through the vocal chords.

- Verification of proper ETT placement is of vital importance. Utilize multiple methods of verifying placement including direct visualization of the ETT passing through the cords, auscultation of bilateral breath sounds, absence of epigastric sounds during ventilation, and positive color change (purple to yellow) with ETCO₂ or capnography levels between 35-45mmHg. Document findings.
- If intubated patient deteriorates, consider: **D**isplacement of the tube, **O**bstruction of the tube, **P**neumothorax, and **E**quipment failure (mnemonic -DOPE).

Pediatric Vascular

Pediatric Intravenous Cannulation Protocol (ILS & ALS ONLY)

IV Access

Intravenous cannulation is used in the pre-hospital setting to establish a route for drug administration and/or to provide fluid replacement. Intravenous cannulation should not significantly delay scene times or be attempted while on scene with a trauma patient who meets load-and-go criteria.

1. Explain to the patient the need for and a brief description of the procedure. Use distraction therapy to put the pediatric patient more at ease.
2. Observe the universal precautions for body substance exposure.
3. Obtain an appropriately sized catheter: a) 18 or 20 gauge for trauma patients. b) 20 or 22 gauge for fluid replacement.
4. Check the fluid (1000mL .9% Normal Saline): a) Is it the right fluid? b) Check the expiration date. c) Check for color and clarity (NS should be clear with no particles).
5. Connect the administration set to the IV fluid. Make sure that air bubbles are expelled from the tubing and that all chambers have the appropriate fluid levels.
6. Prepare veniguard (or tape).
7. Maintain a clean environment and protect the administration set from contamination. *Any IV supplies that become contaminated (e.g. an uncapped administration set dropped on the floor) should be discarded and replaced with clean equipment.*
8. Apply a venous tourniquet just proximal to the antecubital area.
9. Select (by palpation) a prominent vein. Choose a distal vein on the forearm or back of the hand. The antecubital space may be used if needed for drug administration, fluid replacement, the patient condition requires a more proximal site, or in cases where no other vein is accessible.
10. Cleanse the site with an alcohol prep pad using a circular motion moving outward from the site.
11. Stabilize the vein by applying traction below the puncture site.
12. Inform the patient of your intent to puncture the site.
13. Enter the vein directly from above or from the side of the site. With the bevel of the needle upward, puncture the skin at a 30 to 45 degree angle.
14. If blood returns through the catheter, proceed with insertion. If you do not see blood return, release the tourniquet and discontinue the attempt. If time and patient condition allows, you may attempt another site with a new catheter (do not exceed more than two (2) attempts).
15. Insert the catheter. Carefully lower the catheter and advance the needle and catheter just enough to stabilize the needle in the vein. Slide the catheter off of the needle into the vein.
16. Slightly occlude the vein proximal to the catheter with gentle finger pressure. Remove the needle and immediately dispose of it in an approved sharps container.
17. Release the tourniquet.
18. Connect the administration set to the catheter.

19. Open the flow regulator on the administration set and briefly allow IV fluid to run freely to assure a patent line (less than 20mL). If the line is patent, adjust flow rate as indicated by protocol or Medical Control order.
20. Secure the catheter and tubing using a veniguard or tape. Loop the IV tubing and secure to the patient's arm. Do not apply tape circumferentially to the extremity.

Saline Locks

Saline locks may be used if fluid replacement is not indicated:

1. Assemble the pre-filled saline and tubex syringe or draw up 2-3mL of normal saline.
2. Obtain and inspect an injection site link. Inject saline and expel air from the injection site chamber leaving the syringe attached.
3. After successful venipuncture, connect the saline lock to the catheter.
4. Pull back (aspirate) on the syringe to confirm placement by observing for blood return. If blood is aspirated, continue by injecting 2-3mL of saline into the chamber. If no blood is aspirated, discontinue the attempt and prepare to repeat the procedure at a new site.
5. If fluid replacement becomes necessary, attach an administration set to the injection port by needleless device or Luer adapter.
6. Secure the catheter and link using a veniguard or tape.

Fluid Replacement

Age	Average Weight for Age in Pounds (lbs)	Average Weight for Age in Kilograms (kg)	Fluid Bolus at 20mL per kg
Newborn	7	3	60
3 months	13	6	120
6 months	15	7	140
9 months	20	9	180
12 months	22	10	200
2 years	26	12	240
4 years	35	16	320
6 years	44	20	400
8 years	57	26	520
10 years	66	30	600
12 years	90	41	820

**Total fluid bolus must not exceed 40mL/kg without Medical Control Order. Maximum fluid replacement not to exceed 60mL/kg.

Pediatric Intraosseous Infusion Procedure (ALS ONLY)

Intraosseous infusion is defined as a puncture into the medullary cavity of a bone that provides a rapid access route for fluids and medications. Obtaining emergency intravenous access in critically ill pediatric patients (especially those less than 3 years old) can be extremely difficult, time consuming and, at times, impossible. Intraosseous access is performed on critically ill children in whom fluid and/or drug treatment is paramount and intravascular access is not rapidly accessible or feasible.

Indications for IO

- Cardiac arrest
- Multi-system trauma with associated shock and/or severe hypovolemia
- Severe dehydration associated with vascular collapse and/or loss of consciousness
- Any child who is unresponsive and in need of immediate drug administration or fluid resuscitation (and vascular access is not available)

EZ-IO procedure

NOTE: The EZ-IO System is the preferred device. However, this device can only be used on children **greater than 3kg**. For children <3kg, refer to the Jamshidi procedure.

1. Observe universal precautions. .
2. Prepare the EZ-IO driver and pediatric needle set:
 - a) 15ga, 15mm long needle for patients weighing between 3kg and 39k
 - b) 15ga, 25mm long needle for patients weighing greater than 40kg
3. Locate landmark of insertion site by palpating the anterior surface of the tibial bone 1-3 cm below the tibial tuberosity and slightly medial. Landmark for insertion must avoid the joint and epiphyseal plate.
4. Prep the site with Betadine and set up infusion solution as for regular IV.
5. Stabilize site and insert appropriate needle set.
6. Remove EZ-IO driver from needle set while stabilizing catheter hub.
7. Remove stylet from the catheter; place stylet in EZ-10 shuttle or approved sharps container.
8. Attach 5-10mL syringe and aspirate bone marrow to confirm placement.
 - a) 10 catheter should be at a 90 degree angle and firmly seated in the tibial bone.
 - b) Blood may be visible at the tip of the stylet.
 - c) The 10 catheter should flush freely without difficulty or evidence of extravasation.
9. Connect the luer-lock equipped IV administration set.
10. For **conscious** patients: **Lidocaine:** 0.5mg/kg 10 (**maximum dose; 30mg**).
11. Flush the 10 catheter with 5mL of normal saline.
12. Utilize a pressure bag for continuous infusions where applicable. If a pressure bag is

not available, wrap a BP cuff around the bag of normal saline and inflate the cuff until desired flow rate is achieved.

13. Dress site, secure tubing and apply wristband as directed.
14. Closely monitor EZ-IO site en route.

Critical Thinking Elements

- Do not access a site that is fractured at or above the insertion site or has obvious indications of infection
- Do not use an area previously used for 10 attempts.
- **Sometimes marrow cannot be aspirated and does not necessarily indicate improper placement.**
- Excessive movement of the 10 needle may result in leakage.
- The volume of pediatric fluid resuscitation is based on weight and clinical response. Pediatric fluid administration must be carefully regulated.

Jamshidi Style IO Procedure

NOTE: The EZ-IO System is the preferred device for children weighing greater than 3kg. The Jamshidi 10 should be used in children weighing less than 3kg.

1. Observe universal precautions.
2. Assemble and prepare equipment.
3. Locate landmarks of insertion site by palpating the anterior surface of the tibial bone 1-3 cm below the tibial tuberosity and slightly medial. Landmark for insertion must avoid the joint and epiphyseal plate.
4. Prep the site with Betadine and set up infusion solution as for regular IV.
5. With sterile technique, using a commercial 10 (Jamshidi) needle, insert needle at a 90 degree angle and slightly 10-15 degrees inferior through the bone using firm downward pressure with a twisting motion. You should feel a "pop" when the needle goes into the medullary space.
6. Remove the inner stylet and attach a 5-10mL syringe. Aspirate for bone marrow contents, and then connect a conventional IV line with pressure infuser (or BP cuff).
7. Secure the line with tape and dressing.
8. Administer drugs and fluids as needed.
9. Assess sight for signs of infiltration or leakage. Discontinue 10 line if either of these occurs.

Critical Thinking Elements

- Do not access a site that is fractured at or above the insertion site or has obvious indications of infection.
- Do not use an area previously used for 10 attempts.
- **Sometimes marrow cannot be aspirated and does not necessarily indicate improper placement.**
- Remember: Jamshidi needles can only be used on children 3 years of age and under.

Pediatric Medication Administration

Pediatric Medication Administration Procedure

Medication administration is accomplished by specific routes as indicated by the protocols. Pediatric medication routes and procedures are analogous to the adult patient with the exception of the intraosseous (IO).

Special consideration needs to be given to patient age and weight when administering medications. Resources for medication dosages include:

- Specific treatment protocol
- Medical Control
- Broselow Tape**

**Per St. John's Hospital EMS System protocol, do not exceed the adult dose when administering pediatric medications.

Approximate weight based on age: Age
Weight

AGE	Weight
Newborn	3kg / 7lbs
2 months	5kg / 8lbs
6 months	7kg / 15lbs
1 year	10kg / 22lbs
5 years	20kg / 44lbs
10 years	30kg / 66lbs
15 years	Adult values

Pediatric Pain Control Protocol

Pain, and the lack of relief from the pain, is one of the most common complaints among patients. Pediatric pain must not be ignored and must be identified and treated if appropriate. The pre-hospital provider must use clinical observations and a pain scale to rate the pain of the child

First Responder Treatment

First Responder Treatment should focus on the reduction of the patient's anxiety due to the pain.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*
2. Assess level of pain using the Pain Assessment Scale (0-10) or the Wong-Baker Faces Pain Rating Scale.
3. Place patient in a position of comfort.
4. Reassure the patient.
5. Use distraction therapy to help reduce the patient's anxiety (e.g. stuffed animals, discussing favorite foods, toys, etc.)
6. Consider ice or splinting.
7. Reassess level of pain using the approved pain scale.

BLS Treatment

BLS Treatment should focus on the reduction of the patient's anxiety due to the pain.

1. BLS Treatment includes all of the components of *First Responder Treatment*.
2. Initiate ALS intercept, if indicated.

ILS Care Treatment

ILS Treatment should focus on the reduction of the patient's anxiety due to the pain.

1. ILS Care includes all of the components of *BLS Treatment*.
2. Establish IV access.
3. Initiate ALS intercept.

ALS Treatment

ALS Treatment should focus on the pharmaceutical management of pain.

1. ALS Treatment includes all of the components of *ILS Treatment*.
2. In cases of isolated extremity fractures, chest pain, burns and discomfort from IO infusion, pain medication may be given without calling medical control if the systolic BP is in normal range (see *Normal Pediatric Vital Sign Ranges*). **Any other situation involving pain medication administration requires Medical Control order prior to giving the medication.**

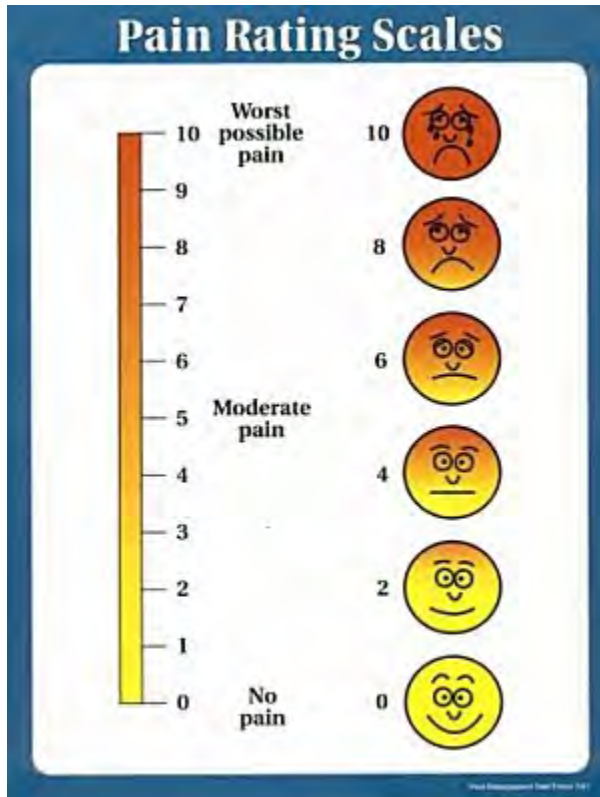
3 Manage the patient's pain b using one of the following medications:

Morphine Sulfate	0.1mg/kg IV/IM (Max single dose: 2mg) every 5 minutes to reduce the patient's anxiety and severity of pain.
Fentanyl	1mcg/kg IV over 2 minutes for pain. (max single dose: 50mcg). Fentanyl 1mcg/kg may be repeated every 5 minutes. (Total of 100mcg) If unable to establish IV access may administer Intranasal Fentanyl. See pediatric intranasal dosing sheet, of this manual.

Critical Thinking Elements

- Closely monitor the patient's airway -have BVM and suction readily available.
- Consider sucrose for infants from birth to 4 months for minor procedural pain, or for additional pain control when used with other pharmacologic agents.
- Apply directly onto the infant's anterior tongue and immediately provide the infant with a pacifier for non-nutritive sucking, OR
- Dip the tip of a pacifier into the sucrose solution and provide to the infant.
- If pacifier is not available, may use tip of a gloved finger to apply.
- A maximum of 3 doses may be given in one hour.
- **Note:** Do not administer sucrose solution by bottle or through a nipple. Sucrose solution must be absorbed via the mucous membranes and not swallowed.

Pain Assessment Scales



Fentanyl Dosing for Pediatrics

Intranasal Fentanyl Dosing Chart		
Patient Weight	Dosage (2mcg/kg)	Dead Space Volume
3-5kg (6-11lbs)	10 mcg (0.2ml)	(+0.1 ml)
6-10kg (13-22lbs)	20mcg (0.4 ml)	(+0.1 ml)
11-15kg (24-33lbs)	30mcg (0.6 ml)	(+0.1 ml)
16-20kg (35-44lbs)	40mcg (0.8 ml)	(+0.1 ml)
21-25kg (46-55lbs)	50mcg (1.0 ml)	(+0.1 ml)
26-30kg (57-66lbs)	60mcg (1.2 ml)	(+0.1 ml)
31-35kg (68-77lbs)	70mcg (1.4 ml)	(+0.1 ml)
36-40kg (79-88lbs)	80mcg (1.6 ml)	(+0.1 ml)
41-45kg (90-99lbs)	90mcg (1.8 ml)	(+0.1 ml)
46-50kg (101-110lbs)	100mcg (2.0 ml)	No Extra
51-55kg (112-121lbs)	110mcg (2.2 ml)	**(+0.1 ml)**
56-60kg (123-132lbs)	120mcg (2.4 ml)	**(+0.1 ml)**
61-70kg (134-153lbs)	140mcg (2.8 ml)	**(+0.1 ml)**
71-80kg (156-176lbs)	160mcg (3.2 ml)	**(+0.1 ml)**
81-90kg (178-198lbs)	180mcg (3.6 ml)	**(+0.1 ml)**
91-100kg (200-220lbs)	200mcg (4.0ml)	**(+0.1 ml)**

** Divide dose in ½ and administer 10 minutes apart to reduce runoff **

Midazolam (Versed) Dosing for Pediatrics

Intranasal Versed (Midazolam) Dosing Chart					
Patient Age	Weight	5mg/5mL Concentration		10mg/2mL Concentration	
(years)		Dose (mg)	Dose (mL)	Dose (mg)	Dose (mL)
Neonate	3kg (6) lbs	0.6 mg	0.7 mL	0.6 mg	0.3 mL
<1yr.	6kg (13) lbs	1.2 mg	1.3 mL	1.2 mg	0.4 mL
1	10kg (22) lbs	2.0 mg	2.1 mL	2.0 mg	0.5 mL
2	14kg (30) lbs	2.8 mg	2.9 mL	2.8 mg	0.7 mL
3	16kg (35) lbs	3.2 mg	3.3 mL	3.2 mg	0.8 mL
4	18kg (40) lbs	3.6 mg	3.8 mL	3.6 mg	0.9 mL
5	20kg (44) lbs	4.0 mg	4.1 mL	4.0 mg	1.0 mL
6	22kg (48) lbs	4.4 mg	4.5 mL	4.4 mg	1.0 mL
7	24kg (53)	4.8 mg	4.9 mL	4.8 mg	1.1 mL
8	26kg (57) lbs	5.2 mg	5.3 mL	5.2 mg	1.2 mL
9	28kg (62) lbs	5.6 mg	5.7 mL	5.6 mg	1.3 mL
10	30kg (66) lbs	6.0 mg	6.1 mL	6.0 mg	1.4 mL
11	32kg (70) lbs	6.4 mg	6.5 mL	6.4 mg	1.4 mL
12	34kg (75) lbs	6.8 mg	6.9 mL	6.8 mg	1.5 mL
Small Teenager	40kg (88) lbs	8.0 mg	8.1 mL	8.0 mg	1.8 mL
Full Grown Teen or Adult	>50kg (>110) Lbs	10.0 mg	10.1 mL	10.0 mg	2.0 mL

For Children: Total weight (kg) x 0.2 mg= total mg dose of Midazolam, maximum dose of 10 mg

*Volume is based on calculated dose PLUS 0.10mL dead space in the device.

The total volume is then rounded off to the next highest 0.1 mL. In some children a higher dose may be needed (0.3 mg/kg)

Pediatric Resuscitation

Pediatric Cardiac Arrest Protocol

The successful resuscitation of a child in cardiac arrest is dependent of a systematic approach of initiating life-saving CPR, recognition of any airway obstructions, adequate oxygenation & ventilation, early defibrillation and transferring care to advanced life support providers in a timely manner. The majority of pediatric patients found in non-traumatic cardiac arrest are found to have some form of airway obstruction or respiratory failure. Providing good BLS care with regards to relieving foreign body airway obstructions and/or initiation of CPR, pediatric patients have a better chance at a positive outcome. Adequate ventilation is the most important step in pediatric resuscitation.

First Responder Treatment

First Responder Treatment should be focused on confirming that the patient is in full arrest and in need of CPR. Resuscitative efforts should be initiated by opening the airway and initiating ventilations & chest compressions while attaching a defibrillator. It is important to assure that CPR is being performed correctly following AHA guidelines.

1. Determine unresponsiveness. Confirm that a transporting unit (and ALS intercept) has been activated).
2. Maintain patent airway and assess breathing. If breathing is absent or inadequate, give two (2) rescue breath with a barrier device. Use AHA guidelines: CAB – **C**ompressions, **A**irway, **B**reathing
3. Check for a pulse (10 seconds). If pulseless, begin CPR. The patient should be ventilated at 20-30 breaths/min using oxygen at 15 L/min via BVM. 100 compressions/minute.
4. Apply an AED after 2 min of CPR to determine if defibrillation is needed.
 - a) If PEDIATRIC PADS *are available-apply* as pictured on each of the AED electrodes with proper contact and without any overlap of the pads. If overlap of the pads occurs, use anterior (front)/ posterior (back) placement with cervical spine precautions if neck/back injury is suspected.
 - b) If ADULT PADS *only-apply* anterior (front)/ posterior (back) with cervical spine precautions if neck/back injury is suspected (see diagram at the end of the protocol).
5. Continue CPR until the AED is attached and turned on. Stop CPR when the AED is analyzing:
 - a) If the AED indicates "SHOCK ADVISED", call out "CLEAR!" check for the safety of others, and push the shock button (or stand clear if the AED device does not require shock activation).
 - b) Immediately resume CPR for 2 minutes.

- c) Reassess the patient and allow the AED to analyze
 - d) If the AED indicates "SHOCK ADVISED", call out "CLEAR!" check for the safety of others and push the shock button (or stand clear if the AED device does not require shock activation).
 - e) Check for a pulse if the AED states "NO SHOCK ADVISED".
 - f) Continue CPR if pulse is absent.
 - g) Reassess every 2 minutes. Shock if indicated.

 - h) If the patient regains a pulse at any time during resuscitation, then maintain the airway and assist ventilations.
 - i) Re-analyze the patient' rhythm with the AED if the patient returns to a pulseless state. Shock if indicated.
6. Immediately turn the patient over to the transporting provider or ALS intercept crew upon their arrival
 7. Complete all necessary cardiac arrest documentation.

BLS Treatment

BLS Treatment should focus on maintaining the continuity of care by confirming the patient is in cardiac arrest and continuing resuscitative efforts initiated by the First Responders.

Transporting BLS units should initiate an ALS intercept as soon as possible.

1. BLS Treatment includes all of the components of *First Responder Treatment*.
2. Shocks delivered to the patient prior to the transporting unit arriving on scene should be taken into consideration during the transition of care. Transporting crews may want to utilize the AED used by the non-transporting First Responders if circumstances allow for exchange of equipment or personnel ride-along.
3. Call for ALS intercept and initiate transport as soon as possible.
4. **Contact Medical Control.**

ILS Treatment

ILS Treatment should focus on maintaining the continuity of care by conforming that the patient is in cardiac arrest and beginning resuscitative efforts or continuing efforts initiated by the First Responders.

1. ILS Treatment includes all components of *BLS Treatment*.
2. Apply Quick-Combo pads (of Fast Patches).
3. Evaluate rhythm.
4. If V-fib or pulseless V-tach, immediately defibrillate at 2 J/kg.
5. immediately resume CPR for 2 minutes.
6. Evaluate the patient rhythm and defibrillate if needed at 4J/kg. Continue CPR and re-evaluate patient rhythm every 2 minutes.
7. Obtain peripheral IV access.
8. If advanced airway is needed and you are comfortable with the procedure, you can

attempt to control airway with a King LTD Airway.

- If not, ventilate the patient with BVM and **OP/NP** as needed.

ALS Treatment

ALS Treatment should focus on maintaining the continuity of care by confirming that the patient is in cardiac arrest and beginning resuscitative efforts or continuing resuscitative efforts initiated by the First Responders. .

1. ALS Treatment includes all components of *ILS Treatment*.
2. Obtain peripheral IV or IO access.
3. Identify and treat cardiac dysrhythmias according to the appropriate protocol.
4. If advanced airway is needed and you are comfortable with the procedure, you can attempt to control airway with intubation.

- If not, ventilate the patient with a King Airway or BVM and *OP/NP* as needed.

Anterior/Posterior pad placement: Placement of the anterior AED pad (electrode) on the front of the patient mid-chest and the posterior pad of the back of the patient mid-back. (Always follow manufacture's recommendations and diagrams for pad placement)

**Use the anterior/posterior pad placement if no pediatric pads are available and adult Quick Combos or Fast Patches are being utilized for a pediatric patient.

Critical Thinking Elements

- If the cardiac arrest is witness by EMS personnel, start CPR and defibrillate immediately after the Fast Patches or Quick Combos are placed.
- Treat the patient-not the monitor. A rhythm present on the monitor screen should NOT be used to determine pulse. If the monitor shows a rhythm and the patient has no pulse, begin CPR (the patient is in PEA-*pulseless electrical activity*.)

Resuscitation of Pediatric Pulseless Rhythms Protocol

The successful resuscitation of patients in cardiac arrest is dependent on a systematic approach to resuscitation. ACLS medications are an important factor in successful resuscitation of the pulseless patient when the initial rhythm is not ventricular fibrillation (V-fib) or in cases when defibrillation has been unsuccessful. It is important that BLS providers understand the value of effective CPR and an ALS intercept is providing the patient with ACLS therapy.

First Responder Treatment

Not applicable. First Responders are not equipped with ACLS medications and shall treat the patient in accordance with the *Pediatric Cardiac Arrest Protocol*.

BLS Treatment

Not applicable. BLS Providers are not equipped with ACLS medications and shall treat the patient in accordance with the *Pediatric Cardiac Arrest Protocol*.

ILS Treatment

1. Initiate *Pediatric Cardiac Arrest Protocol*.
2. Evaluate the rhythm after 2 minutes of CPR. If V-Fib or pulseless V-Tach: Defibrillate at 2 J/Kg**
 - **If the patient converts to a perfusing rhythm (with a heart rate > 80 bpm), administer **Lidocaine: 1mg/kg IV (with Medical Control order only)**.
3. **Immediately resume CPR for 2 minutes** and re-evaluate the patient/rhythm.
4. **Epinephrine 1:10,000:** 0.01mg/kg IV Minimum dose 0.1 mg (**Max single dose: 1 mg**) and repeat every **3 to 5 minutes** as needed.
5. If pulseless F -fib/V -tach persists: **Defibrillate at 4J/kg.**
6. **Immediately resume CPR for 2 minutes** and re-evaluate patient/rhythm every 2 minutes.
7. **Lidocaine:** 1 mg/kg *N*. Repeat bolus: 1 mg/kg IV in 3-5 *minutes* to a total of 3 mg/kg for refractory V-fib/ V-tach.
8. If pulseless V-fib/ V-tach persist: **Defibrillate at 4J/ kg.**
9. **Immediately resume CPR** and re-evaluate patient rhythm every 2 minutes.
10. Dextrose: if blood sugar is < 60mg/dL
 - a) 0-1 month: **D10:** 2mL/Kg IV
 - b) 1 month -2 years **D25:** 2mL/Kg *N*
 - c) > 2 years: **D50:** 2mL/Kg IV

11. Narcan: 0.1mg/kg *N* (**Max single dose: 2 mg**) if suspected narcotic overdose.
12. Initiate ALS intercept and transport as soon as possible.
13. **Contact Medical Control** as soon as possible.

ALS Treatment

1. ALS Treatment includes all components of *ILS Treatment*.
2. Transport as soon as possible.

Pulseless Electrical Activity and Asystole

ILS Treatment

1. Initiate *Pediatric Cardiac Arrest Protocol*.
2. Evaluate rhythm after 2 minutes of CPR.
3. **Epinephrine 1: 10,000**: 0.01 mg/kg IV (*Minimum does 0.1mg*) (**Max single dose: 1mg**) every 3-5 minutes as needed.
4. **Continue CPR** and re-evaluate patient/rhythm every 2 minutes.
5. **IV Fluid Therapy**: 20 mL/kg fluid bolus for suspected hypovolemia.
6. **Dextrose**: if blood sugar is < 60mg/dL
 - a) 0-1 month: **D10**: 2mL/Kg IV
 - b) 1 month -2 years **D25**: 2mL/Kg *N*
 - c) > 2 years: **D50**: 2mL/Kg IV
7. **Narcan**: 0.1 mg/kg IV (**Max single dose: 2 mg**) if suspected narcotic overdose.
8. Initiate ALS intercept and transport as soon as possible.
9. **Contact Medical Control** as soon as possible.

ALS Treatment

1. ALS Treatment includes all components of *ILS Treatment*.
2. Needle chest decompression for a patient in **traumatic** cardiac arrest with suspected tension pneumothorax.
3. **Contact Medical Control** as soon as possible.
4. Transport as soon as possible.

Critical Thinking Elements

- Pediatric cardiac arrest is often related to hypoxia and poor ventilation. Ensure proper oxygenation and ventilation.
- Prompt transport of the pediatric patient is an important aspect of successful resuscitation. **Do not spent time at the scene attempting to do procedures you may not feel confident in or experienced in doing.** CPR and good BVM are the only procedures needed initially.
- Broselow tapes are an effective means to estimate weight. Refer to the St. John's Hospital EMS protocols for medication doses.

Pediatric Bradycardia Protocol

Pediatric bradycardia is defined as a heart rate less than the normal beats per minute for a given age group. Determining the stability of the pediatric patient with bradycardia is an important factor in patient care decisions. The assessment of the patient with bradycardia should include evaluation for signs and symptoms of hypoperfusion and hypoventilation.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to treat for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. Assess the pediatric for signs and symptoms of hypo perfusion and possible causes, including:
 - Respiratory difficulty
 - Cyanosis
 - Cool/Cold Skin
 - Hypotension! Lack of palpable blood pressure
 - Decreasing level of consciousness
3. Oxygen: 15 L/min via BVM if the child is in respiratory distress. If the child is alert, 10-15 via non-rebreather mask or 4-6 L/min via nasal cannula if the child will not tolerate a mask.
4. For children **< 12 months of age**: If, despite oxygen and ventilation the child continues to appear hypoperfused and has a pulse **< 60 beats per minute**, initiate chest compression.
5. *Immediately* turn patient care over to the transporting provider or ALS intercept upon their arrival.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to treat for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. IV (NS) Fluid Therapy: 20mL/kg bolus if hypovolemia is suspected.
3. Initiate ALS intercept and transport as soon as possible. (*Transport can be initiated at any time during this sequence.*)
4. **Contact Medical Control** as soon as possible.
5. **Epinephrine 1: 10,000**: 0.01mg/kg (*Minimum does 0.1mg*) (**Max single dose: 1mg**)

(with Medical Control order only) and repeat every **3 to 5 minutes** as needed.

6. **Atropine:** 0.02mg/kg IV (with Medical Control order only) (*Minimum dose: 0.1mg*) (**Max single dose: 1mg**) for children **greater than 6 months of age**.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. **Immediate Transcutaneous Pacing:** If the patient remains bradycardic with continued signs of hypoperfusion
 - a) **Contact Medical Control for specific rate**
 - b) Current should be set at minimum to start and increase until capture is achieved
 - c) Refer to the *Transcutaneous Pacing Procedure* for additional information.
3. **Midazolam (Versed):** 0.1mg/kg IV/IO (**Max single dose: 2mg**) for patient comfort after pacing is initiated. Re-check vital signs 5 minutes after administration. May repeat dose one time if systolic BP > 100 mmHg and respiratory rate > 10 RPM. Additional doses require **Medical Control order**
4. **Midazolam (Versed):** Versed Intranasal may also be used if unable to give IV Versed. (**See intranasal dosing sheet**) (**with Medical Control order**).
5. Transport as soon as possible (*transport can be initiated at any time during this sequence.*)

Critical Thinking Elements

- Monitor the child's respiratory status, SP02 and or Waveform Capnography if available.
- Assess for the possibility of foreign body.
- Hypothermia-warm the patient
- Assess for mechanical problems with oxygen delivery
- Hypoxemia
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia
- Most maternal medication passes through breast milk in the infant.

Pediatric Narrow Complex Tachycardia Protocol

Tachycardia may be a nonspecific sign of fear, anxiety, pain, fever or shock in the pediatric patient. The heart rate needs to be assessed in conjunction with the PAT & ABCDEs. As with all cardiac dysrhythmias, assess the heart rate and EKG with knowledge based on ACLS principles and normal ranges for children. Always ask the child/caregiver about history of illness, congenital heart disease or cardiac surgery. Pediatric Supraventricular Tachycardia is defined as a narrow QRS (<0.08 seconds) and a heart rate greater than 220 BPM.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to treat for shock.

1. Render initiate care in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula is the patient cannot tolerate a mask.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to treat for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Initiate ALS intercept and transport as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20 mL/kg bolus of .9% Normal Saline.
3. Initiate ALS intercept and transport as soon as possible. (*Transport can be initiated as any time during this sequence.*)
4. **Contact Medical Control** as soon as possible.
5. **Adenosine (Adenocard):** 0.1 mg/kg IV {Rapid IV push} (**Max single dose: 6 mg**) (**with medical control order only**) if the child is alert and still has a HR greater than 220 BPM. If no response after 2 minutes, administer 0.2 mg/kg IV {Rapid IV push} (**Max single dose: 12 mg**) (**with Medical Control order only**).

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.

2. **Midazolam (Versed):** 0.1mg/kg IV (**Max single dose: 2mg**) in preparation for **synchronized cardioversion** if the patient has a respiratory rate > 10 RPM. If the patient's respiratory rate is < 10 RPM, proceed to immediate synchronized cardioversion without sedation.
3. **Midazolam (Versed):** Versed Intranasal may also be used if unable to give IV Versed. (See intranasal dosing sheet).
4. **Synchronized Cardioversion:** If the patient has an altered level of consciousness, diaphoresis, pale/mottled skin and/or is hypotensive:
 - a) Synchronized Cardioversion at **1 J /kg** if tachycardia persists.
 - b) Synchronized Cardioversion at **2 J /kg** if tachycardia persists.

Pediatric Wide Complex Tachycardia Protocol

Tachycardia should be assessed in conjunction with the PAT and ABCDEs. Pediatric ventricular tachycardia is defined as a wide complex QRS and a heart rate > 180 BPM. The child may have a history of serious systematic illness/ congenital heart defects.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to treat for shock.

1. Render treatment in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 10-15L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to treat for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Initiate ALS intercept and transport as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing a thorough patient assessment, stabilizing the patient's perfusion and preparing the patient for or providing transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **Contact Medical Control** as soon as possible.
3. **IV Fluid Therapy:** 20 mL/kg bolus of .9% Normal Saline.
4. If the patient becomes pulseless at any times, refer to the *Resuscitation of Pediatric Pulseless Rhythms Protocol (V-fib or Pulseless V-tach)*.
5. **Lidocaine:** 1mg/kg IV slowly over 2 minutes if the child is alert (**with medical control order only**). If no response, administer Lidocaine 0.5mg/kg every 5 minutes as needed to a total of 3 mg/kg (**with Medical Control order only**).

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing the patient for or providing transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. **Midazolam (Versed):** 0.1 mg/kg IV/IO (*max single dose: 2 mg*) for patient comfort prior to cardio version (with Medical Control order). Re-check vital signs 5 minutes after

administration. Additional doses also require Medical Control order.

3. **Midazolam (Versed):** Versed intranasal may also be used if unable to give IV Versed. (See intranasal dosing sheet) (**with Medical Control order only**).

4. **Synchronized Cardioversion:** If the patient has an altered level of consciousness, is in shock, and is in V-Tach with a heart rate > 180 BPM:
 - a) Synchronized Cardio version at **1 J/kg** if tachycardia persists.
 - b) Synchronized cardio version at **2 J/kg** if tachycardia persists.

Critical Thinking Elements

- Monitor the child's SP02 and or Waveform Capnography if available.
- Cardiac dysrhythmias such as V-tach are rare in children. Ask the caregiver if the child has a chronic or genetic cardiac condition.
- V -tach with a pulse could be from a serious illness, hypoxia or dehydration.

Pediatric Respiratory Distress Protocol

Respiratory Distress is common in the pediatric patient. The small airways of children are compromised more quickly during medical and traumatic problems. Identifying the degree of respiratory distress is crucial for stopping a process that can lead into respiratory failure. At that point, the child has lost the ability to compensate for the lack of oxygen. If not treated immediately, respiratory failure will lead to arrest.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiated routine patient care to treat for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask.
3. Utilize the *Pediatric Assessment Triangle* to gain a general impression.
4. Assess abnormal airway sounds.
5. Place patient in a position of comfort.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to treat for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. **Proventil (Albuterol):** 2.5 mg in 3 mL of normal saline via nebulizer over 15 minutes for wheezing or absent/diminished breath sounds. May repeat Albuterol 2.5 mg **every 15 minutes** as needed (**with Medical Control order**).
3. Initiate ALS intercept and transport as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. Obtain peripheral IV access.
3. **Contact Medical Control** as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient perfusion and preparing for or providing patient transport.

1. ALS treatment includes all components of *ILS Treatment*.
2. **Proventil (Albuterol):** 2.5 mg in 3 mL if normal saline via nebulizer mixed with **Ipratropium (Atrovent):** 0.5 mg via nebulizer over 15 minutes. May repeat Albuterol 2.5 mg with Atrovent 0.5 mg every **15 minutes** as needed. In-line nebulizer may be utilized if patient is unresponsive or in respiratory arrest.
 - **Do not administer Ipratropium (Atrovent) to patients with known allergy to Atropine, peanuts or soy.**
3. Establish IV or IO access.
4. **Epinephrine 1: 1,000:** 0.01 mg/kg (**Max single dose: 0.3 mg**) if the patient is suffering status asthmaticus and does not improve with nebulizer treatment. May repeat every **20 minutes**.
5. Transport as soon as possible.
6. Contact the receiving hospital as soon as possible or Medical Control if necessary.

Epiglottitis

Symptoms of epiglottitis may include:

- ALOC
- Fever
- Hoarseness
- Brassy cough
- Inspiratory stridor
- Drooling
- Tripod position

If Epiglottitis is suspected:

First Responder, BLS, ILS, ALS Treatment

1. Initiate *Routine Pediatric Care Protocol*.
2. **Do not look in the child's mouth or attempt to visualize the interior of the throat.**
3. **Do not agitate the child. He/she should be kept as calm as possible-do not attempt to obtain IV access.**
4. **Oxygen:** 10-15 L/min via non-rebreather mask or by best means tolerated by the patient (i.e. blow-by or 4-6 L min via nasal cannula).
5. Transport the child sitting up.

Pediatric Tracheostomy Protocol

With today's technology and improving home health care, more critical care patients are being sent home early. Home health care professionals and family members can duplicate the care the child receives in the hospital. This allows the patient to return home, spending less time in the hospital. EMS is activated when there is a problem with complex medical equipment, or the patient relapses into a more critical condition. EMS providers need to gain knowledge of critical medicine not previously needed.

First Responder Treatment

First Responder Treatment should be focused on ensuring a patent airway.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 15 L/min via tracheostomy collar.
3. Assess work of breathing.
4. Assess abnormal airway sounds.
5. Place patient in a position of comfort.
6. If tracheostomy tube is obstructed with secretions:
 - a. Suction with whistle-tip catheter.
 - b. Repeat suction after removing inner catheter of tracheostomy tube.
 - c. Have caregiver change tracheostomy tube.
7. If the airway continues to be obstructed or if ventilatory effort is inadequate, **ventilate with 100% oxygen** by attaching a BVM to the tracheostomy tube.
8. If the tracheostomy tube is still not patent, ventilate **mask to mouth** while covering the stoma.
 - The balloon on the trach must be deflated prior to attempting mask to mouth ventilation.
9. Initiate ALS intercept as soon as possible.

BLS Treatment

BLS Treatment should be directed as conducting a thorough patient assessment and ensuring that the child has a patent airway.

1. BLS Treatment includes all components of *First Responder Treatment*.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment and ensuring a patent airway.

1. ILS Treatment includes all components of *BLS Treatment*.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment and ensuring a patent airway.

1. ALS Treatment includes all components of *ILS Treatment*.
2. If the airway is still obstructed:
 - a. Reassess patency of the airway
 - b. Suction as needed

Pediatric Respiratory Arrest Protocol

When the pediatric patient enters respiratory arrest, cardiac arrest (and poor outcome) is sure to follow. Assisted ventilations with a BVM can be the most useful skill in resuscitation of the child in respiratory arrest. Remember-the pediatric patient responds to oxygen very favorably. Therefore, it is important to try to identify the cause of the respiratory arrest after securing the patient airway and providing proper ventilation.

First Responder Treatment

First Responder Treatment should be focused on ensuring a patent airway and proper ventilation

1. Assess airway. If agonal respirations are present or the child is not breathing at all
 - a. Perform jaw thrust
 - b. Suction airway
 - c. Insert oropharyngeal or nasopharyngeal airway
2. Administer **100% oxygen** using appropriately sized BVM
3. If chest rise is inadequate:
 - a. Relieve upper airway obstruction
 - b. Reposition airway
 - c. Refer to *Basic Airway Management of the Pediatric Patient Protocol*.
4. Refer to *Pediatric Respiratory Distress Protocol*. if breathing resumes.
5. If hypoperfusion is present, refer to *Pediatric Shock Protocol*.
6. Follow *Routine Pediatric Treatment Protocol* for general treatment guidelines.
7. Initiate transport as soon as possible.

BLS Treatment

BLS Treatment should be directed as conducting a thorough patient assessment, ensuring that the child has a patent airway and proper ventilation.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Apply pulse oximetry and document oxygen saturation.
3. Initiate ALS intercept and transport as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, ensuring a patent airway and proper ventilation.

1. ILS Treatment includes all components of *BLS Treatment*.
2. Consider underlying etiologies and treat according to the appropriate protocol:
 - Airway obstruction
 - Cardiac dysrhythmias
 - CNS injury
 - Anaphylaxis
 - Poisoning/Overdose

- Suffocation
 - Metabolic (refer to *Pediatric ALOC Protocol*)
 - Hypovolemia (refer to *Pediatric Shock Protocol*)
 - Near Drowning
 - Carbon monoxide exposure
3. Initiate IV access, if possible.
 4. Initiate ALS intercept and transport as soon as possible.
 5. If advanced airway is needed and you are comfortable with the procedure, you can attempt to control airway with King LTD Airway.
 - If not, ventilate the patient with a BVM and *OPINP* as needed.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, ensuring a patent airway and proper ventilation.

1. ALS Treatment includes all components of *ILS Treatment*.
2. If an advanced airway is needed and you are comfortable with the procedure, you can attempt to control the airway using endotracheal intubation. (**Only one (1) attempt is allowed**).
 - If not, ventilate the patient with a King LTD airway or BVM and *OPINP* as needed.
3. Needle chest decompression of the affected side with a 14g, 16g, or 18g IV catheter if tension pneumothorax is suspected. (**With Medical Control order only**)
4. Transport as soon as possible.

Critical Thinking Elements

- Gastric distention is very common in pediatric patients and may cause poor compliance. Ventilation too fast or giving too much tidal volume are the top two reasons for distention. Use *proper ventilation techniques and an appropriately sized BVM for the pediatric patient*.

Pediatric Treatment Protocols

Pediatric Altered Level of Consciousness Protocol

The EMS Professional needs to consider *all causes* of a child's altered level of consciousness. A good assessment is paramount to identify life-threatening injuries. Focus should also be on causes for the event and the child's past medical history.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all of the components of *First Responder Treatment*.
2. Perform **blood glucose level test**.
3. **Oral Glucose:** 15g PO if the patient's blood sugar is <60mg/dL, the patient is alert to verbal stimuli, is able to sit in an upright position, has good airway control and has an intact gag reflex.
4. Perform a **2nd blood glucose level test** to re-evaluate blood sugar 5 minutes after administration of Oral Glucose. If blood sugar remains <60mg/dl, administer a 2nd dose of Oral Glucose (15g).
5. Initiate ALS intercept if needed and transport as soon as possible.
6. Contact the receiving hospital as soon as possible.

ILS Treatment

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all of the components of *BLS Treatment*.
2. Perform **blood glucose level test**.

3. Dextrose: if blood sugar is <60mg/dL:
 - a) 0-1 month: **D10**: 2mL/kg IV
 - b) 1 month -2 years: **D25**: 2mL/kg IV
 - c) >2 years: **D50**: 2mL/kg IV
4. Perform a 2nd blood glucose level test to re-evaluate blood sugar 5 minutes after administration of Dextrose or Glucagon. Repeat dose of Dextrose if BS is still <60mg/dL.
5. **Glucagon**: 1mg IN if the patient's blood sugar is <60mg/dL and unable to establish an IV.
6. **Narcan**: 0.1mg/kg IV/IM/IO/IN (**Max single dose: 2mg**) if suspected narcotic overdose.
7. Initiate ALS intercept if needed and transport as soon as possible.
8. **Contact Medial Control** as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all of the components of *ILS Treatment*.

Critical Thinking Elements

- ALOC in a child can range from trauma to a systemic infection (sepsis). A good medical history might provide clues as to the reason for the ALOC.

- Accidental overdose/ingestion of medications can be a cause of the ALOC.

Pediatric Seizure Protocol

First Responder Care Seizures are common in childhood. About 5% of all children will have at least one seizure by the age of three. (Febrile seizures account for the largest percentage of pediatric seizures.) This condition can cause much concern and anxiety in the caregiver and EMS is called. Pediatric seizures are usually short-lived and stop before the arrival of EMS. Since there are many causes of pediatric seizures, treatment and transport to an appropriately equipped emergency department is necessary.

Classification of Seizure (PEPP 2001)	
Generalized Seizure	Description
Tonic-Clonic (Grand Mal Seizure)	Trunk rigidity and loss of consciousness with sudden, jerking movements of both arms and/or both legs; may be only tonic (rigidity) or clonic (jerking) seizure activity.
Absence (Petit Mal Seizure)	Brief loss of awareness without any abnormal movements; child may appear to be staring.
Partial (Focal) Seizure	Description
Simple Seizure	Focal motor jerking without loss of consciousness; may be sensory, autonomic or psychic without jerking.
Complex Seizure	Focal motor jerking with loss of consciousness; second generalization to a tonic-clonic seizure.

Common Causes of Seizures in Pediatric Patients:

- Fever
- Trauma
- Hypoxia
- Hypoglycemia
- Infection/Sepsis
- Ingestion of toxins
- Cerebral hemorrhage
- Metabolic disorders
- Congenital neurological problems

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary and have suction readily available.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Perform blood glucose level test.
3. Initiate ALS intercept and **transport without delay**.
4. Check and record vital signs and GCS every **5 minutes**.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **Dextrose**: if blood sugar is < 60mg/dL:
 - a) 0-1 month: **D10**: 2mL/kg IV
 - b) 1 month -2 years: **D25**: 2mL/kg IV
 - c) >2 years: **D50**: 2mL/kg IV
3. **Glucagon**: 1 mg IN if the patient's blood sugar is <60mg/dL and unable to establish an IV.
4. Perform a 2nd blood glucose level test to reevaluate blood sugar 5 minutes after administration of Dextrose or Glucagon. Repeat dose of Dextrose if BS is still < 60mg/dL.
5. Contact Medical Control as soon as possible.
6. Initiate ALS intercept if needed and transport as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. **Midazolam (Versed)**: 0.1mg/kg IV (Max single dose: 2 mg)'over 1 minute for seizure activity. May repeat Midazolam (Versed) 0.1 mg/kg IV every 5 minutes as needed to a total of 10mg.
3. **Midazolam (Versed)**: 0.2mg/kg IM (Max single dose: 5mg) if the patient is seizing and attempts at IV access have been unsuccessful. May repeat dose one time in 15 minutes if the patient is still seizing.
4. **Midazolam (Versed)**: Versed Intranasal may also be used if unable to give IV Versed. (**See intranasal dosing sheet Pre-hospital Care Manual**).

Critical Thinking Elements

- Benzodiazepines can cause severe respiratory depression. Monitor the child's respiratory status, SP02 and or Wave Form Capnography if available. Ventilate if needed.
- 30% of all pediatric seizures are febrile in nature. However, the presence of a fever

may not necessarily be the cause of the seizure. The child needs to be transported to the hospital for further evaluation.

- Seizure activity usually indicates a serious underlying problem. Check the oxygenation and perfusion of the child along with the blood glucose level and temperature. Treat accordingly.

Pediatric Allergic Reaction/Anaphylaxis Protocol

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary
3. **Epi-Pen Jr.:** If the patient has a history of allergic reactions and has in their possession a prescribed Epi-Pen Jr., is suffering from hives, wheezing, hoarseness, hypotension, ALOC, or indicated a history anaphylaxis, assist the patient with administering the Epi-pen Jr.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Initiate ALS intercept and transport as soon as possible.
3. **Proventil (Albuterol):** 2.5mg in 3mL of normal saline via nebulizer over 15 minutes. May repeat Albuterol 2.5mg every 15 *minutes* as needed (**with Medical Control order**).
4. Contact Medical Control as soon as possible.
5. **Epi-Pen Jr.:** 0.15mg IM if the patient has a history of allergic reactions and/ or is suffering from hives, wheezing, hoarseness, hypotension, ALOC or indicates a history of anaphylaxis.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus if patient is hypotensive. May repeat x2 to a maximum of 60mL/kg (**Note: Exceeding 40ml/kg requires Medial**

Control order.)

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of ILS Treatment.
2. **Epinephrine: 1: 1 000:** 0.01mg/kg 1M (*Max single dose:* 0.3mg) if the patient has respiratory distress (inspiratory & expiratory wheezing, stridor and/or laryngeal edema), hypotension and/or ALOC.
3. **Benadryl:** 1 mg/kg IV or 1M (Max single dose: 50mg) for severe itching and/or hives.
4. **Proventil (Albuterol):** 2.5mg in 3mL normal saline via nebulizer over 15 minutes. May repeat Albuterol 2.5mg every 15 minutes as needed. In-line nebulizer may be utilized if the patient is unresponsive or in respiratory arrest.
 - **Do not administer Ipratropium (Atrovent) to patients experiencing an allergic reaction/anaphylaxis.**

Critical Thinking Elements

- Patients who have an allergic reaction can develop anaphylaxis over time. Monitor patients very closely.
- A void establishing an IV in the same extremity as a bee sting / allergy site.
- Both an allergic reaction & anaphylaxis can present with hives.
- Remember: An allergic reaction is localized while anaphylaxis is a systemic reaction.
- Do not waste time on scene -begin transport as soon as possible and treat en route.

Pediatric Ingestion/Overdose/Toxic Exposure Protocol

This protocol focuses on two problems. First, exposure to a chemical substance that causes adverse medical effects. Secondly, the protocol covers accidental or intentional ingestion of harmful substances into the body. Toddlers explore their environment with all five senses and ingestion of toxic substances is common for this age group. The adolescent age group deals mainly with intentional overdoses due to attempted suicide or recreational pharmaceuticals & alcohol use.

General response information:

1. If the scene is considered a *Hazardous Materials* incident, do not treat patients unless they are decontaminated or proper precautions have been implemented to protect EMS personnel.
2. In the event that the patient has not been decontaminated when EMS makes patient contact, removing all of patient's clothing take away 80-90% of the contaminated materials. Get patient to decontamination area as soon as possible.
3. If there is no patient contact but EMS has determined this to be a *Hazardous Materials* incident, do not enter the scene under any circumstances. Refer to St. John's Hospital EMS *Disaster Protocols*.

First Responder Treatment

First Responder Care should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Consider possible scene & patient contamination and follow agency safety procedures.
2. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
3. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.

ILS Treatment

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus if the patient is hypotensive. May repeat bolus x 2 to a maximum of 60mL/kg (**Note: Exceeding 40mL/kg requires Medical Control order**).
3. If patient is seizing, follow the *Pediatric Seizure Protocol*.
4. **Narcan:** 0.1mg/kg IV/IM/IN" (Max single dose: 2mg) if suspected narcotic

overdose.

5. Initiate ALS intercept if needed and transport as soon as possible.
6. **Contact Medical Control** as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. **Sodium Bicarbonate:** 1mEq/kg IV (Max single dose: 50meq) (**with Medical Control order only**) if known tricyclic antidepressant (TCA) or Aspirin (ASA) overdose.
3. If the patient has signs & symptoms of *organophosphate poisoning* or *nerve agent exposure*, **contact Medical Control:**
 - a) Ensure that the patient has been decontaminated prior to transport.
 - b) **Atropine:** 0.02mg/kg IV (Max single dose: 2mg) every 5 minutes until symptoms are suppressed. **OR**
Atropine: 0.05mg/kg 1M (Max single dose: 2mg) every 5 minutes until symptoms are suppressed.
 - c) If patient is actively seizing due to nerve agent exposure, refer to Pediatric Seizure Protocol.
4. Transport as soon as possible.

Routine Pediatric Trauma Treatment Protocol

The majority of pediatric contacts the pre-hospital professional will face involve traumatic injuries. Trauma care in the pediatric patient must be aggressive, due to the child's ability to compensate and mask otherwise obvious signs and symptoms of shock. Early recognition of potential life-threatening injuries due to trauma will help save the pediatric patient. In addition, pediatric patients may not always have obvious injuries. The anatomical position and size of internal organs are drastically different compared to the adult trauma patient. Children may not bruise or show marks of impact, thus disguising underlying life-threatening problems. When the pediatric patient presents as a possible trauma patient, treat them as such. Stay within the "*platinum 10 minutes*" of scene time, effectively immobilize the spine, keep the child warm and treat pain and anxiety.

First Responder, BLS, ILS, ALS Treatment

1. Scene Assessment (Scene Size-Up)

- Ensure scene safety -identify any hazards (e.g. fire, downed power lines, unstable vehicle, leaking fuel, weapons).
- Determine the number of patients.
- Identify the mechanism of injury (gunshot wound, vehicle rollover, high speed crash, ejection from the vehicle).
- Identify special extrication needs, if any.
- Call for additional resources if needed.

2. Primary Survey (Initial Assessment)

The purpose of the primary assessment is for the pre-hospital provider to rapidly identify and manage life-threatening conditions:

- Obtain a general impression of the patient's condition
- Assess, secure and maintain a patent airway while simultaneously using C-spine precautions.
- Assess breathing and respiratory effort:
 - Approximate respiratory rate.
 - Assess quality of respiratory effort (depth of ventilation and movement of air).
 - **Oxygen** : 15 L/min via non-rebreather mask. Be prepared to suction the airway and support the patient's respirations with BVM if necessary.
- Assess circulation:
 - Evaluate carotid and radial pulses.
 - Evaluate skin color, temperature and condition.
 - Immediately control major external bleeding.
- Critical Decision (based on mechanism of injury & initial exam):
 - Limit scene time to 10 minutes or < if the patient has a significant mechanism of injury or meets "Load & Go" criteria.
- Determine disability:
 - T -Tone
 - I – Interactiveness
 - C -Consolability
 - L -Look / Gaze
 - S -Speech / Cry

- Expose the patient:
 - Cut the patient's clothing away quickly to adequately assess for the presence (or absence) of injuries.
- 3. Secondary Survey (Focused History & Physical Exam) *The secondary survey is a head-to-toe evaluation of the patient. The object of this survey is to identify injuries or problems that were not identified during the primary survey.*
 - Examine the head:
 - Search for any soft tissue injuries.
 - Palpate the bones of the face & skull to identify deformity, depression, crepitus or other injury.
 - Check pupils for size, reactivity to light, equality, accommodation, roundness and shape.
 - Examine the neck:
 - Examine for contusions, abrasions, lacerations or other injury.
 - Check for JVD, tracheal deviation, deformity.
 - Palpate the c-spine for deformity & tenderness.
 - Examine the chest:
 - Closely examine for deformity, contusions, redness, abrasions, lacerations, penetrating trauma or other injury.
 - Look for flail segments, paradoxical movement & crepitus.
 - Auscultate breath sounds.
 - Watch for supraclavicular and intercostals retractions.
 - Examine the abdomen:
 - Examine for contusions, redness, abrasions, lacerations, penetrating trauma or other injury.
 - Palpate the abdomen and examine for tenderness, rigidity and distention.
 - Examine the pelvis:
 - Examine for contusions, redness, abrasions, lacerations, deformity or other injury.
 - Palpate for instability and crepitus.
 - Examine the back:
 - Log roll with a minimum of 2 rescuers protecting the spine.
 - Look for contusions, abrasions, lacerations, penetrating trauma, deformity or any other injury.
 - Log roll onto long spine board with padding or approved pediatric spinal immobilization device.
 - Examine the extremities:
 - Examine for contusions abrasions, lacerations, penetrating trauma, deformity or any other injury.
 - Manage injuries en route to the hospital.

- Neurological exam:
 - Calculate Glasgow Coma Scale (GCS)
 - Reassess pupils
 - Assess grip strength & equality and sensation.
 - Calculate Revised Trauma Score (RTS)

 - Vital signs:
 - Blood pressure
 - Pulse
 - Respirations
 - Pulse Oximetry
 -
 - History:
 - Obtain a SAMPLE history if possible.
 - Signs & symptoms
 - Allergies
 - Medications
 - Past medical history
 - Last oral intake
 - Events of the incident

 - Interventions (en route)
 - Cardiac monitor
 - Blood glucose level
 - IV access / fluid bolus
 - Wound care
 - Splinting
4. Monitoring and Reassessment (Ongoing Assessment)
- Evaluate effectiveness of interventions
 - Vital signs every 5 *minutes*
 - Reassess mental status (OCS) every 5 *minutes*
 - *Reassess Revised Trauma Score (RTS) every 5 minutes*
5. **CONTACT MEDICAL CONTROL AS SOON AS POSSIBLE**

Critical Thinking Elements

- Prompt transport with EARLY Medical Control contact & receiving hospital notification will expedite the care of the trauma patient.
- IVs should be established en route to the hospital thereby not delaying transport of critical trauma patients (unless scene time is extended due to prolonged extrication).
- Trauma patients should be transported to the closest most appropriate Trauma Center. Medical Control should be contacted immediately if there is ANY question as to which Trauma Center the patient should be transported to.
- Children are prone to hypothermia in traumatic situations -keep the patient warm!!!!

Pediatric Shock Protocol

The pediatric patient in shock can pose a challenge to the pre-hospital professional. Since pediatric patients have young, strong cardiovascular systems, they can compensate extremely well. This can mask the signs and symptoms of shock until the child's cardiovascular system tires and begins to decompensate. Once the pediatric patient enters into a state of decompensated shock, prognosis for a full recovery is poor.

Conditions that may indicate impending shock include:

- Significant mechanism of injury
- Tender and/or distended abdomen
- Pelvic instability
- Bilateral femur fractures

"Load & Go" with any trauma patient with signs and symptoms of shock -on scene treatment should be minimal. Conduct a *Primary Survey*, manage the airway, take C-spine precautions & immobilize and control any life-threatening hemorrhage. Contact Medical Control as early as possible.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol* and *Routine Pediatric Trauma Treatment Protocol*.
2. **Oxygen:** 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.
3. Control bleeding using direct pressure, pressure dressings and pressure points.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Repeat vital signs, GCS & R TS every **5 minutes**.
3. Initiate ALS intercept and transport as soon as possible.
4. **Contact Medical Control** as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus. May repeat x 2 to a maximum of 60mL/kg (*Note: Exceeding 40mL/kg requires **Medical Control order***).
3. **Contact Medical Control** and transport as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus. May repeat x 2 to a maximum of 60mL/kg (*Note: Exceeding 40mL/kg requires **Medical Control order***).
3. Transport as soon as possible.
4. Contact Medical Control as soon as possible.

Critical Thinking Elements

- Pediatric patients will compensate for shock as long as they have the energy to do so. Once pediatric patients start to decompensate due to shock, it is exceedingly difficult to reverse the process. Therefore, it is **imperative** that shock is identified and treated early!

Pediatric Closed Head Injury Protocol

The causes of closed head injuries in pediatric patients are numerous. Injuries resulting from vehicular accidents or failure to wear proper safety gear (e.g. helmets) are common. The most effective way of determining the extent of closed head injury is mechanism of injury and level of consciousness.

The head is the largest body part of a pediatric patient which makes him/her "top heavy" and quick to fall head first during a trauma. The head is usually more seriously injured than any other area of the body in pediatric trauma. Proper management of a closed head injury patient can impact long term damage.

Priorities for the treatment of head injury patients include airway management, maintenance of adequate oxygenation & blood pressure as well as appropriate C-spine control & immobilization.

First Responder Treatment

First Responder Care should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol* and *Routine Pediatric Trauma Treatment Protocol*.
2. Be prepared for vomiting and have suction readily available.
3. Oxygen: 15 L/min via non-rebreather mask. Be prepared to support the patient's respirations with BVM if necessary.
4. Control bleeding using direct pressure, pressure dressings and pressure points.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Repeat vital signs, GCS & RTS every **5 minutes**.
3. Initiate ALS intercept and transport as soon as possible.
4. Contact Medical Control as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus if needed to a maximum of 60mL/kg (**Note: Exceeding 40mL/kg requires Medical Control order**).

3. Initiate ALS intercept if needed and transport as soon as possible.
4. **Contact Medical Control** as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Care includes all components of *ILS Care*.

Pediatric Glasgow Coma Scale

ACTIVITY	SCORE	INFANT	CHILDREN
Eye Opening	4	Spontaneous	Spontaneous
	3	To speech or sound	To speech
	2	To painful stimuli	To painful stimuli
	1	None	None
VERBAL	5	Appropriate words or sounds, social smile, fixes and follows	Oriented
	4	Cries, but consolable	Confused
	3	Persistently irritable	Inappropriate words
	2	Restless, agitated	Incomprehensible sounds
	1	None	None
Motor	6	Spontaneous movement	Obeys commands
	5	Localizes to pain	Localizes to pain
	4	Withdraws to pain	Withdraws to pain
	3	Abnormal flexion (decorticate)	Abnormal flexion (decorticate)
	2	Abnormal extension (decerebrate)	Abnormal extension (decerebrate)
	1	None	None
13-15 Minor head injury 9-15 Moderate head injury ≤ Severe head injury/ coma			

Pediatric Trauma Score

Components	+2	+1	-1	Score
Weight	>20kg (44 lbs)	10-20kg (22-44 lbs)	<10kg (22 lbs)	
Airway	Patent	Maintainable	Un-maintainable	
Systolic BP Pulse	>90 Radial	50-90 Carotid	<50 Non-palpable	
CNS	Awake	+LOC (responsive)	Unresponsive	
Fractures	None	Closed or Suspected	Multiple closed or open	
Wounds	None	Minor	Major, Penetrating or Burns >10%	
TOTAL SCORE				
9-12 Minor Trauma (Use local guidelines/protocols) 6-8 Potentially Life Threatening (Suggest need for Trauma Center) 0-5 Life Threatening (Need for Trauma Center) <0 Usually Fatal (Transport to Nearest Facility)				

Pediatric Burn Protocol

The primary goal in the treatment of the pediatric burn patient is the same as when caring for an adult -to stop the acute burning process by removing the patient from direct contact with the source of the burn and maintaining the patient's body fluids. Special attention should be given to limit further pain and damage of the burn to the patient. However, burn care should not interfere with lifesaving measures.

One aspect of pediatric burn care is different and pre-hospital providers need to be aware of it **suspicious burns**. Suspicious burns include burns that have a familiar pattern (e.g. circumferential burns, burns from a cigarette lighter, etc.) or a story that does not fit the injury sustained. Pediatric burns carry a high index of suspicion for abuse and neglect. Follow local protocol for reporting abuse and neglect if suspected.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation, removing the child from harm and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Make sure the scene is safe to enter.
2. Render initial care *in* accordance with the *Routine Pediatric Treatment Protocol*.
3. **Oxygen:** 15 L/min via non-rebreather mask. Be prepared to support the patient's respirations with BVM if necessary.
4. **THERMAL BURN TREATMENT:**
 - a) If the burn occurred within the last 20 minutes, reverse the burning process and cool the area by flushing the area with **1 Liter of Sterile Saline** (or Sterile Water if Sterile Saline is not available). The goal of cooling is to extinguish the burning process -not to systemically cool the patient. Fluid application should be held to a minimum and discontinued if the patient begins shivering.
 - b) Remove jewelry and loose clothing. Do not pull away clothing that is stuck to the burn.
 - c) Cover the wound with sterile dressings***
 - d) Place a sterile burn sheet on the stretcher. If the patient's posterior is burned, place a sterile burn pad on top of the sheet with the absorbent side toward the patient.
 - e) Place patient on the stretcher.
 - f) Cover the patient with additional sterile burn sheets and blanket to conserve body heat.
5. **ELECTRICAL BURN TREATMENT:**
 - a) Assure that the power service has been cut off and remove the patient from the source of electricity.

- b) Fully immobilize the patient due to forces of electrical current and possible trauma.
 - c) Assess for entry and exit wounds. No cooling or flushing is necessary due to the type of burn.
 - d) Cover the burn with dry, sterile dressings.
 - e) e) Closely monitor the patient.
6. **CHEMICAL BURN TREATMENT:**
- a) Consider possible scene and patient contamination and follow agency safety procedures.
 - b) Note which chemical agent caused the burn and obtain the MSDS for that chemical (if possible.)
 - c) The patient's clothing should be completely removed to prevent continued exposure and the patient decontaminated **prior to** being placed in the ambulance for transport.
 - d) **Dry chemical powder** should be brushed off before applying water.
 - e) Irrigate the patient with Sterile Water and if the MSDS indicates use of water will not cause an adverse reaction. Body parts should be flushed for at least 1-2 minutes. Do not use Sterile Saline on chemical burns.
 - f) Irrigate burns to the eye with Sterile Water for at least 20 minutes. Alkaline burns should receive continuous irrigation throughout transport.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Initiate ALS intercept and transport as soon as possible.
3. **Contact Medical Control** as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus to a maximum of 60mL/kg (**Note: Exceeding 40mL/kg requires Medical Control order**).
3. Initiate ALS intercept and transport as soon as possible.
4. **Contact Medical Control** as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. **Fentanyl:** 1mcg/kg IV over 2 minutes for pain (**Max single dose: 50mcg**). Fentanyl 1mcg/kg may be repeated every 5 minutes. (Total of 100 mcg.)
3. **Fentanyl:** Fentanyl Intranasal may also be used if unable to give IV Fentanyl. (**See intranasal dosing sheet.**)
4. Transport and Contact Medical Control as soon as possible.

Critical Thinking Elements

- ***WaterJel® may be used for **THERMAL BURNS** (after the burn has been irrigated according to protocol) if it is available.
- BurnJel® contains Lidocaine and may **NOT** be used in the St. John's Hospital EMS System.
- Treat other symptoms or trauma per the appropriate protocol.
- IV access should not be obtained through burned tissue unless no other site is available.
- Closely monitor the patient's response to IV fluids and assess for pulmonary edema.
- Closely monitor the patient's airway -have BVM and suction readily available.
- Do not delay transport of a "Load and Go" trauma patient to care for burns.
- For chemical/powder burns, be aware of inhalation hazards and closely monitor for changes in respiratory status.
- **In patients with known renal failure, the Fentanyl dose must be reduced to 0.5mcg/kg (Max single dose: 25 mcg). The dose may be repeated one time.**

Pediatric Heat-Related Emergencies Protocol

Heat-related emergencies can often be seen in the pediatric population involved in intense sporting activities. When the body loses the ability to cool itself off, the body will retain heat, elevating core body temperature. If the core body temperature rises above normal, physiological consequences can develop. These can range from muscle cramps up to loss of consciousness and death. The treatment of hyperthermic injuries is basic if caught early.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
2. Move the patient to a cool environment. Remove clothing as necessary to make the patient comfortable. Cold packs may be utilized for the neck (posterior), armpits, and groin and along the thorax. Do not cool the patient to a temperature that will cause them to shiver.
3. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Treat other symptoms per the appropriate protocol.
3. Initiate ALS intercept if needed and transport as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. IV Fluid Therapy: 20mL/kg fluid bolus if the patient is hypotensive. May repeat x 2 to a maximum of 60mL/kg (**Note: exceeding 40mL/kg requires Medical Control order**).
3. Treat other symptoms per the appropriate protocol.
4. Initiate ALS intercept if needed and transport as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. Transport as soon as possible.

HEAT DISORDERS

Heat (Muscle) Cramps -Heat cramps are muscle cramps caused by overexertion and dehydration in the presence of high temperatures. Signs & symptoms include: *Normal or slightly elevated body temperature; generalized weakness; dizziness; warm, moist skin and cramps in the fingers, arms, legs, or abdominal muscles.*

Heat Exhaustion -Heat exhaustion is an acute reaction to heat exposure and the most common heat-related illness a pre-hospital provider will encounter. Signs & symptoms include: *Increased body temperature; generalized weakness; cool, diaphoretic skin; rapid, shallow breathing; weak pulse; diarrhea; anxiety, headache and possible loss of consciousness.*

Heatstroke -Heatstroke occurs when the, body's hypothalamic temperature regulation is lost. Cell death and damage to the brain, liver and kidneys can occur. Signs & symptoms include: *Cessation of sweating; very high core body temperature; hot, usually dry skin; deep, rapid, shallow respirations '(which later slow); rapid, full pulse (which later slows); hypotension confusion, disorientation or unconsciousness and possible seizures.*

Fever (Pyrexia) -A fever is the elevation of the body temperature above the normal temperature for that person (98.6 F +/-2 degrees) Fever is sometimes difficult to differentiate from heatstroke; however, there is usually a history of infection or illness with a fever.

Pediatric Hypothermia Protocol

Hypothermia in children is common at any time of the year. Children dissipate heat faster than adults due to their body mass compared to the surface area of skin. EMS providers must suspect an onset of hypothermia in all cold environmental emergencies, child neglect and trauma. Rapid identification and treatment of hypothermia can have a significant effect on the outcome of the pediatric patient.

First Responder Care

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Pediatric Care Protocol*.
2. Handle the patient as *gently* as possible.
3. Create a warm environment for the patient. Remove wet or frozen clothing and cover the patient with warm blankets. Prevent re-exposure to cold. Warm packs may be utilized for the neck (posterior), armpits, and groin and along the thorax.
4. **Oxygen:** 10-15 L/min via non-rebreather mask or 4-6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.
5. Do not rub frostbitten or frozen body parts. Protect injured parts (e.g. blisters) with light, sterile dressings and avoid pressure to the area.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Treat other symptoms per the appropriate protocol.
3. Initiate ALS intercept if needed and transport as soon as possible.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. **IV Fluid Therapy:** 20mL/kg fluid bolus of **warmed** .9% Normal Saline.
3. Transport as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ALS Treatment includes all components of *ILS Treatment*.
2. Transport as soon as possible.

Critical Thinking Elements

- Do not thaw frozen parts in the field if there is a chance of refreezing. Protect frostbitten areas from refreezing.
- Patients with hypothermia should be considered at high risk for ventricular fibrillation. It is imperative that these patients be handled gently and not re-warmed aggressively.
- The presence of delirium, bradycardia, hypotension and/or cyanosis is usually indicative of severe hypothermia (core body temperature of < 90 degrees Fahrenheit).

Pediatric Near Drowning Protocol

Drowning remains one of the top five reasons pediatric patients are killed each year. EMS efforts need to focus on airway control and hypothermia management. Complications may arise from the fluid the child has downed in. Remember -children can drown in as little as two inches of fluid. Children not only drown in rivers or pools but also mop buckets and bathtubs.

First Responder Treatment

First Responder Treatment should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Patient Treatment Protocol* and *Routine Trauma Treatment Protocol*.
2. Make sure the scene is safe. Use appropriate personnel and equipment for rescue.
3. Establish and maintain spinal immobilization.
4. **Oxygen:** 15 L/min via non-rebreather mask" or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to clear the airway and support the patient's respirations with BVM if necessary.
5. Initiate **CPR** if indicated.
6. Treat respiratory and/or cardiac symptoms *per* the appropriate protocol.

BLS Treatment

BLS Treatment should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. BLS Treatment includes all components of *First Responder Treatment*.
2. Initiate ALS intercept and transport as soon as possible.
3. **Contact Medical Control** as soon as possible.
4. Treat respiratory and/or cardiac symptoms per the appropriate protocol.

ILS Treatment

ILS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. ILS Treatment includes all components of *BLS Treatment*.
2. Treat respiratory and/or cardiac symptoms per the appropriate protocol.
3. Initiate ALS intercept and transport as soon as possible.
4. **Contact Medical Control** as soon as possible.

ALS Treatment

ALS Treatment should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport,

1. ALS Care includes all components of *ILS Care*.
2. Treat respiratory and/or cardiac symptoms per the appropriate protocol.
3. Transport as soon as possible.
4. **Contact Medical Control** as soon as possible.

Suspected Child Maltreatment Protocol

Illinois state law mandates that EMS providers report any suspicious acts of suspected maltreatment. There is no profile of the "typical" family in which abuse is taking place. Maltreatment of children affects all socio-economic classes. As EMS professionals, we need to be aware of the warning signs, treat the injuries of the child and report accordingly.

First Responder, BLS, ILS , ALS Treatment

1. Consider scene safety issues:
 - a) If the offender is present and interferes with transportation of the patient, or is influencing the patient's acceptance of medical care, contact law enforcement and Medical Control for consultation on the appropriate action to take.
 - b) If the parent/guardian refuses to allow transportation of the child, contact law enforcement and Medical Control for consultation on the appropriate action to take.
2. Render initial care in accordance with the *Routine Pediatric Treatment Protocol*.
3. Treat obvious injuries or illnesses.
4. Survey the scene for evidence of factors that could adversely affect the child's welfare:
 - a) Environmental
 - b) Interaction with parents/guardians
 - c) Discrepancies in the history of events
 - d) Injury patterns inconsistent with history of events or anticipated motor skills based on the child's growth and development stage
 - e) Signs of intentional injury or emotional harm
5. Transport regardless of extent of injuries.
6. Upon arrival at the ED, notify the receiving physician or nurse of the suspected maltreatment. **Remember** -health care workers (including EMTs/Paramedics) are mandated by Illinois state law to report cases of suspected abuse or neglect to the Department of Children and Family Services (DCFS) by calling 1-800-252-2873.
7. **Thoroughly document** the child's history & physical exam findings.
8. The following information / telephone numbers regarding services available to victims of abuse shall be offered to all victims of abuse:

Crime Victims Compensation Program

Phone (312) 814-2581
Phone (800) 228-3368
TTY (312) 814-3374

Illinois Child Abuse Hotline

Phone (800) 252-2873
TTY (800) 358-5117

Critical Thinking Elements

- At no time should EMS confront the caregivers about the abuse.
- Do not make accusations on the PCR. Document objective physical findings, not opinion.
- A copy of the *Manual for Mandated Reporters* can be downloaded at www.state.il.us/dcfs.
- Willful failure to report suspected incidents of child abuse/neglect is a misdemeanor (1st violation) or a class 4 felony (2nd or subsequent violations).
- Reports must be confirmed in writing to the local investigation unit within 48 hours of the Hotline call.

Sudden Infant Death Syndrome (SIDS) Protocol

Sudden Infant Death Syndrome (SIDS) and the death of a child are among the most difficult patient care experiences for the pre-hospital professional. SIDS is the leading cause of infant mortality in the United States and the causes are not known.

The death of a child is a horrible event and creates difficult emotional issues for the caregivers as well as the pre-hospital professional. The infant may be in the care of a parent/caregiver or babysitter at the time of death and may not be at home. Absence of one or both parents may complicate field management and interactions at the scene (PEPP 2001).

First Responder, BLS, ILS, ALS Treatment

1. Render initial care in accordance with the *Routine Pediatric Care Protocol*.
2. **If obvious signs of biological death are present** (*pulseless, apneic, cold skin, frothy/blood tinged fluid in the mouth, lividity, dark red mottling on the body, rigor mortis*):
 - a) Confirm absence of breathing and pulse.
 - b) Confirm asystole in two (2) or more leads.
 - c) **Contact Medical Control** and follow procedure for death at scene.
 - d) Provide for the needs of the family:
 - Have at least one pre-hospital professional stay with the family until a support network is established. .
 - Contact support personnel:
 - Clergy
 - Other family members
 - Friends
 - Professional counselors
3. Consider the possibility of child maltreatment:
 - a) Refer to *Suspected Child Maltreatment Protocol*.
 - b) Obtain past medical history and the history of events.
 - Refrain from asking judgmental or leading questions.
 - Do not place blame or accusations.
4. Consider CISM for pre-hospital personnel.

Critical Thinking Elements

- The decision of staying on scene or transporting a dead infant to the ED is a difficult one. Consider these factors:
 - Could this be a crime scene?
 - Am I giving false hope to the family?
- The pre-hospital caregiver cannot determine the true cause of death in an infant. Therefore, do not rush to judgment. Treat every caregiver as a grieving parent regardless of the situation.
- There are nearly 3,000 SIDS cases per year in the United States:
 - 90-95% of SIDS cases are less than 6 months old.
 - Premature infants are at higher risk for SIDS.

- SIDS cases occur more frequently in males & during the winter months.
- 5% of SIDS cases are actually due to child neglect.