

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

Altered Mental Status	1
Asthma/Bronchiolitis.....	2
Administration Of Blood	3
Burns	4
Congestive Heart Failure	6
Cyanotic Congenital Heart Defect	7
DKA	8
Asystole/Pea	9
Bradycarrhythmias	10
Tachycarrhythmias	11
(Hemodynamically Unstable)	11
Ventricular Fibrillation /	12
Pulseless Ventricular Tachycardia.....	12
Ventricular Tachycardia.....	13
Wide Complex Tachycardia Secondary To Ingestion Or Poisoning Due To Sodium	14
Epiglottitis/Croup/Bacterial Tracheitis	15
Foreign Body Obstruction Of Airway	16
Heat Illness.....	17
Hypoglycemia.....	18
Hypothermia	19
Hypovolemia	20
Iv Fluid Maintenance	21
Multiple Trauma	22

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

Nausea/Vomiting	23
Neonatal Resuscitation	24
Poisonings/Ingestions	25
Rapid Sequence Intubation	26
Retropharyngeal Abscess / Peritonsillar Abscess	27
Sedation / Muscle Relaxation-Intubated	28
Seizures.....	29
Shock	30
Transcutaneous Pacing	31
Appendix: A	32
Appendix: B	33

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

ALTERED MENTAL STATUS

Criteria:

All children with alteration in consciousness which is unexpected and non-traumatic or as a result of traumatic event.

Protocol:

1. Secure and maintain a patent airway and provide O₂ to keep oxygen saturation > 90%.
2. Maintain c-spine immobilization if trauma suspected. If GCS < 8 or evidence of circulatory collapse, assist ventilation with bag-valve-mask and 100% FiO₂. Consider intubation (RSI).
3. If Glucose < 50, give D25W 2 cc/kg IV or IO. (D25W can be made by adding 22ml of D50 to 28 ml of D5 W). If no IV access, Glucagon 0.1- 0.2mg/kg IM.
4. Narcan 0.1 mg/kg IV or IO.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

ASTHMA/BRONCHIOLITIS

(Lower Airway Disorders)

Criteria:

Asthma is manifested by hyper reactive airways and bronchospasms in which reversible airflow obstruction can be demonstrated. Bronchiolitis is the inflammatory obstruction of the terminal bronchioles. It is a viral infection most frequently caused by RSV and occurs in children < 1 year.

Indications:

1. Dyspnea
2. Nasal flaring
3. Costal retractions
4. Tachycardia
5. Wheezing

Protocol:

1. Maintain a patent airway.
2. Administer humidified FiO₂ 100% via blow-by or NRM.
3. Allow the child to determine position of comfort.
4. Aerosolized Albuterol 0.15 mg/kg (max dose 10 mg) in 3cc NS by face mask, or blow by if necessary. If intubated, give in line through ETT. (Note: May repeat every 15 minutes as necessary. If airway obstruction is severe, give as continuous nebulization: 0.5 mg/kg/hr (max 15 mg/hr).
5. If ineffective, administer EPI 1:1000 0.01 ml/kg SQ (max dose 0.4 ml). Repeat every 20" x 2 as needed.
6. Solu Medrol 2 mg/kg IV, if not already treated by referring physician.

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1. Magnesium Sulfate 40 mg/kg IV over 10-20 minutes. (Contraindication - Magnesium is contraindicated if on Digoxin or with renal insufficiency.)

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LifeFlight**

Pediatric Protocols

ADMINISTRATION OF BLOOD

Indications:

The infant or child who exhibits signs of inadequate system perfusion due to trauma (tachycardia, delayed capillary refill, lethargy and hypotension as a late sign).

Protocol:

1. Maintain patent airway and provide supplemental O₂ to keep SaO₂ > 90%. Consider intubation.
2. Administer 20 cc/kg NSS bolus x 2.
3. If no improvement after second fluid bolus, give PRBC O neg or type and crossmatched 10 cc/kg.
4. Repeat additional PRBC 10 cc/kg if child continues to exhibit signs of inadequate perfusion. If necessary, O positive can be transfused.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

BURNS

Criteria:

Any child with 2° partial thickness or 3° full-thickness.
Any child with an electrical injury.
Any child with a suspected inhalation injury secondary to a thermal insult.
Any child with tissue destruction related to chemical contact.

Indications:

Early management and appropriate stabilization play a significant role. Children's skin is thinner than adult skin, therefore they sustain greater injury than adults from a similar burn.

Protocol:

1. Secure and maintain a patent airway as well as adequate respiratory effort.
 - a. Maintain c-spine immobilization if trauma involved.
2. Administer 100% FiO₂ via NRM. If an inhalation injury is suspected, provide humidified O₂.
3. Determine if inhalation injury may lead to obstruction.
 - a. Absolute Intubation Criteria
 - i. Erythema, swelling, or blistering of oro/nasopharyngeal mucosa.
 - ii. Soot in pharynx
 - iii. Mechanism (closed space)
 - iv. Hoarseness, stridor, brassy cough
 - v. Wheezes, rales
 - vi. Grunting, flaring, retracting
 - vii. Agitation, stupor cyanosis
 - viii. SaO₂ < 90
 - b. Relative Criteria for Intubation
 - i. Singed eyebrows or nasal hair
 - ii. Facial burns
4. Remove any burned or wet clothing as well as jewelry.
5. Determine burn percentage:
 - a. If < 10%, may use wet dressings.
 - b. If > 10%, may use only dry, clean dressings.
 - c. Keep warm.
6. Establish peripheral IV access with NSS. If unattainable, establish IO infusion with NSS.

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

7. Determine infusion rate 2 - 4 cc/kg/% burn in first 24 hours. Administer 2 of total infusion amount in the first 8 hours from onset of burns. (See attached Burn Chart)
 - a. For electrical burns, give 20 cc/kg NS bolus until adequate urine output (1 cc/kg/hr).
 - b. For myoglobinuria infuse IV fluids at a wide open rate.
8. If possible, place a urinary catheter prior to interfacility transport. Do not delay transport if concurrent injuries mandate expeditious transfer.
9. Morphine 0.1 mg/kg IV every 3-5 minutes prn. Assess for respiratory depression if not intubated.
10. Perform chest escharotomy if signs of symptoms of ventilatory compromise (i.e. circumferential chest burn)

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In cases of circulatory compromise in extremities with circumferential burns, determine time frame for delivery to burn center. Call for transport times >4 hours for permission to perform extremity escharotomy.

Index

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

CONGESTIVE HEART FAILURE

Criteria:

Alteration of myocardial performance
Initiation and full manifestation of compensatory mechanisms
Pulmonary venous congestion
Systemic venous congestion

Protocol:

1. Maintain patent airway and provide supplemental O₂ to keep SaO₂ > 100%.
2. Elevate head of stretcher.
3. Initiate INT or KVO line IV or IO.

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1. Lasix 1.0 mg/kg IV or IO.
2. Morphine 0.1 mg SQ, IV, IO.
3. Consider Dopamine infusion at 2 - 5 mcg/kg/min.
4. Consider Dobutamine infusion at 5- 20 mcg/kg/min.

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LifeFlight**

Pediatric Protocols

CYANOTIC CONGENITAL HEART DEFECT

Criteria:

Cyanosis and persistent hypoxemia in the infant during hyperventilation with 100% oxygen and age greater than two weeks old.

Protocol:

1. Maintain patent airway and provide supplemental 100% O₂ by blow by technique.
2. Place infant in knee chest position.

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1. Consider Morphine Sulfate 0.1 mg/kg IM or SQ.
2. Consider IV Propranolol 0.05 mg/kg over 5 minutes. (Be prepared for Bradycardia).
3. Consider Sodium Bicarbonate 1 mEq/Kg IV.

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LifeFlight**

Pediatric Protocols

DKA

Criteria:

Diagnosed or highly suspected DKA

Protocol:

1. Maintain patent airway and provide supplemental O₂ at 100%.
2. IV or IO NSS 20cc/kg bolus and repeat if necessary until signs of shock improve. Then maintain NSS at 20cc/kg/hr.
3. Bolus of regular Insulin 0.1 u/kg IV followed by infusion at 0.1 u/Kg/hr if available from outlying facility. If blood glucose drops below 250mg/dl decrease infusion to 0.5 u/Kg/hr.

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Pediatric Protocols

ASYSTOLE/PEA

Criteria:

Absent pulse accompanied by apnea.

Protocol:

1. Confirm rhythm in another lead.
2. Initiate CPR
3. Identify and treat cause (severe hypoxemia, severe acidosis, severe hypovolemia, tension pneumothorax, cardiac tamponade, and profound hypothermia, poisons, drugs, hypo/hyperkalemia, thromboembolism)
4. Secure a patent airway and hyperventilate with 100% oxygen.
5. Epinephrine
 - a. ETT: 0.1 mg/kg (0.1ml/kg, 1:1,000 solution)
6. Secure IV or IO access.
7. Epinephrine
 - a. IV/IO: 0.01 mg/kg (0.1 ml/kg of the 1: 10,000 solution)
 - b. ETT: 0.1 mg/kg (0.1 ml/kg, 1:1,000 solution)
8. Subsequent doses of epinephrine may be repeated every 3 to 5 minutes. May consider doses as high as 0.2 mg/kg (0.2 ml/kg of 1:1,000 solution) IV/IO/ or ETT.
9. Administer 20cc/kg NS fluid bolus.
10. If hypothermia is suspected, initial re-warming techniques.
11. If tension pneumothorax is suspected, perform needle decompression.

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LifeFlight**

Pediatric Protocols

BRADYARRHYTHMIAS

Criteria:

Heart rate of less than 60 beats per minute associated with poor systemic perfusion, even if BP is normal.

Protocol:

1. Maintain patent airway and provide 100 % supplemental O₂.
2. Initiate IV/IO access.
3. If HR remains < 60 in infants and children after oxygenation and ventilation begin chest compressions;
4. The administer Epinephrine:
 - a. IV/IO: 0.01 mg/kg (0.1 ml/kg of 1:10,000 solution)
 - b. ETT: 0.1-0.2 ml/kg of the 1:1,000 solution.
 - c. Repeat same dose every 3-5 minutes.
5. If no response, consider Dopamine at 2-20 mcg/kg/min. Or Epi 2-10 mcg/min.
6. For vagally induced bradycardia or symptomatic bradycardia with AV block, give Atropine .02 mg/kg with a minimum dose of 0.1 mg. Maximum dose is 0.5 mg for child or 1 mg for an adolescent.
7. May repeat dose 1 time in 3 min.

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1. Consider external pacing.

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

**TACHYARRHYTHMIAS
(HEMODYNAMICALLY UNSTABLE)**

Criteria:

Heart rate > 220
Infants, > 180
Children with signs of cardiovascular compromise. Probable SVT.

Protocol:

1. Supplemental O₂, consider intubation and ventilation with 100% O₂, but do not delay cardioversion.
2. Secure vascular access, but should not delay cardioversion.
3. Consider sedative - Valium 0.1-0.2 mg/kg. IV/IO.
4. Synchronized cardioversion of 0.5-1.0 joules/kg; tachyarrhythmia persists, then may increase to 2 joules/kg if initial attempt ineffective.
5. For SVT not relieved by first synchronized shock, give adenosine 0.1 mg/kg rapid IV bolus, and flush with 3 cc NSS.
6. If no response, then double initial adenosine dose, up to 12 mg total.

Criteria:

Probable VT

Protocol:

1. Immediate cardioversion 0.5-1 joules/kg.
2. Consider sedation (per above), do not delay cardioversion.
3. Consider alternative medications:

Amiodarone 5mg/kg IV/IO over 20-60 minutes
OR
Procainamide 15mg/kg IV/IO (at a rate not to exceed 50mg/min.).
(Do not administer Amio or Procan together.)
OR
Lidocaine 1 mg/kg IV/IO/ETT
(Wide complex only)

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

**VENTRICULAR FIBRILLATION /
PULSELESS VENTRICULAR TACHYCARDIA**

Criteria:

Ventricular fibrillation/Pulseless V-tach

Protocol:

1. CPR
2. Secure airway and hyperventilate with 100 % oxygen.
3. Obtain IV or IO access, but do not delay defibrillation.
4. Defibrillate up to 3 times if needed, 2 joules/kg, 4 joules/kg, 4 joules /kg.
5. Epinephrine first dose:
 - a. IV/IO: 0.01 mg/kg (0.1 ml/kg of the 1:10,000 solution).
 - b. ETT: 0.1 -0.2 mg/kg (0.1-0.2ml/kg of 1:1,000 solution)
6. Defibrillate 4 joules/kg; CPR, repeat 30-60 seconds after each medication.
7. Initiate medications: Options:
 - a. Amiodorone 5mg/kg bolus IV or IO
 - b. Lidocaine 1 mg/kg IV, IO or ETT
 - c. Magnesium 25-50 mg/kg for Torsade Hypomagnesemia
8. Defibrillate 4 joules/kg.
9. Epinephrine second and subsequent doses (may repeat every 3-5 minutes):
Consider
 - a. IV/IO/ ETT: 0.1 mg/kg (0.1 ml/kg of 1:1,000 solution) In cases of suspected hypoperfusion.
 - b. Otherwise: Continue 0.01 mg/kg (0.1 ml/kg of the 1:10,000 solution)
10. Defibrillate 4 joules/kg.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

VENTRICULAR TACHYCARDIA

Criteria:

Regular ventricular rate of 120-400 with QRS > 0.08 seconds. Suspect V-tach if underlying heart disease, prolonged QT syndrome, acute hypoxemia, acidosis, tricyclic overdose, electrolyte imbalance and poison ingestion. (See wide complex tachycardia protocol).

Protocol:

1. Supplemental O₂, ideally patient is intubated and ventilated with 100% O₂.
2. Secure IV access.
3. If stable: give Lidocaine 1mg/kg followed by infusion of 20 to 50 mcg/kg/min.
4. If unstable; cardiovert 0.5 J/kg, if unsuccessful use 1 J/kg.

Contact Medical Command

1. If Lidocaine unsuccessful and patient remains stable: consider:
 - a. Amiodarone 5mg/kg IV over 20-60 minutes

OR

 - b. Procainamide 15 mg/kg IV over 30-60 minutes.
2. Do not routinely administer these drugs together.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

**WIDE COMPLEX TACHYCARDIA SECONDARY TO
INGESTION OR POISONING DUE TO SODIUM**

Criteria:

Wide Complex at a rate of 120-400 with a QRS > 100 ms and a prolongation of the QTC > .440 ms. Substances to include: Cyclic anti-depressants, quinidine, procainamide, phenothiazines, Group IC antiarrhythmics, Norflex, and local anesthetics.

Protocol:

1. Supplemental oxygen. Intubation if necessary and ventilate with 100% oxygen.
2. Establish IV access
3. Bicarbonate 1-2 meq/kg IV push, if complex does not narrow after bicarbonate administration, may repeat as necessary.
4. If unresponsive to bicarbonate, use ACLS protocols.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

EPIGLOTTITIS/CROUP/BACTERIAL TRACHEITIS

(Upper Airway Disorders)

Criteria:

A life threatening emergency resulting from a rapidly progressing upper respiratory inflammation and edema.

Indications:

Most often septicemia that has disseminated to the epiglottis causing a cherry-red, swollen epiglottis, which occludes the trachea.

Protocol:

1. Determine severity of distress. Provide supplemental O₂ as tolerated by humidified NC mask or blow-by.
 - a. If mild or moderate distress and patient is cooperative, keep patient in upright position. Minimize procedures and discomfort including IV starts and looking into patient's mouth unless absolutely necessary.
 - b. If moderate to severe and patient is incapable of cooperating, administer epinephrine 1:1000 aerosol in 4 - 5 ml NSS, aerosolized and blow over patient's face. Use dosage of 2.5cc of epinephrine for children < 10 Kg and 5cc epinephrine for children > 10 Kg.
 - c. If in severe distress, respiratory failure, and patient is tiring and in prearrest state, intubate emergently. If intubation is not successful, consider cricothyrotomy.
 - d. While attempting , or if unable to acquire, an artificial airway, a BVM may be successful in Epiglottitis.
2. Parent may accompany child if cleared by pilot.

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LifeFlight**

Pediatric Protocols

FOREIGN BODY OBSTRUCTION OF AIRWAY

Criteria:

Previously healthy child who develops sudden onset of coughing, wheezing, stridor or some other manifestation of airway obstruction.

Protocol:

1. Incomplete Obstruction: (phonation, coughing present)
2. Avoid agitation, allow position of comfort.
3. Apply supplemental O₂ to maintain SaO₂ > 90%.
4. Anticipate complete obstruction.

Complete Obstruction:

1. Children < 1 yr: Perform jaw lift, if object visualized then perform finger sweep. Attempt to ventilate, if still obstructed then reposition then re attempt ventilation. If unsuccessful, give five repetitive back blows and five chest thrusts. Repeat above sequence until effective or 1 minute has passed, then proceed to number 3.
2. Children 1-8 years of age: Perform jaw lift, if object visualized then perform finger sweep. Attempt to ventilate, if still obstructed then reposition and re attempt ventilation. If unsuccessful give 5 abdominal thrusts, repeat above sequence until effective or 1 minute has passed, then proceed to number 3.
3. If still unable to ventilate, perform laryngoscopy and remove FM using Magill Forceps.
4. Attempt vigorous BVM ventilation. A mainstem bronchus obstruction still permits one lung ventilation.
5. If necessary, perform intubation or cricothyroidotomy.

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LifeFlight**

Pediatric Protocols

HEAT ILLNESS

Criteria:

Exposure to heat load, elevation of body temperature > 39.0 C, sweating may be present or absent. Patient may exhibit signs of CNS dysfunction such as headache, confusion, psychotic behavior, seizures or coma, hypotensive, tachycardia and tachypnea.

Protocol:

1. Provide for a patent airway; oxygenation with 100% O₂.
2. Place cold packs to neck, axilla and inguinal regions. Monitoring rectal temperature if possible.
3. IV of NSS at maintenance rate unless exhibiting signs of vascular collapse, then give NSS 20cc/kg bolus.
4. Use glucometer for glucose check. If < 50 , give D25W 2cc/kg. (D25 W may be mixed by adding 22 ml of D50 to 28 ml of D5W)

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1. Place foley catheter to monitor urine output for transports > 45 minutes.

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LifeFlight**

Pediatric Protocols

HYPOGLYCEMIA

Criteria:

Plasma glucose level < 50 mg/dl even in the absence of symptoms.

Protocol:

1. Maintain patent airway. Provide supplemental O₂ at 100%.
2. D25 W 1-2 cc/kg IV/IO. If < one month old, use 12.5. (D12.5W may be mixed by adding 8 ml of D50 to 42 ml of D5W)
3. D5W at maintenance rate.

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1. If unable to achieve IV/IO access, give Glucagon 1.0 mg. IM if >20 kg, 0.5 mg. IM if <20 kg.

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LifeFlight**

Pediatric Protocols

HYPOTHERMIA

Criteria:

Core body temperature < 35.0 C.

Protocol:

1. Maintain a patent airway and provide 100 % supplemental O₂ with warmed humidification.
2. Maintain a warm environment, remove any wet clothing and circumferential wrap. Monitor rectal temperature if possible.
3. Avoid CPR in patients with temperatures below 28.0 C if any pulse is present or a narrow QRS is present on cardiac monitoring. Begin CPR if monitor reveals V.Fib. or Asystole.
4. Cardioversion and anti arrhythmics should be withheld until a body temperature of 30.0 C is obtained.
5. Fluid resuscitation with 20 cc/kg bolus warmed NSS. Do not give LR solution as the hypothermic liver can not metabolize lactate.

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LifeFlight**

Pediatric Protocols

HYPOVOLEMIA

Criteria:

Signs or symptoms of poor tissue perfusion with evidence on history or physical exam of active bleeding, severe trauma, vomiting, diarrhea or fever.

Indications:

Capillary refill > 2 seconds
Agitation/restlessness
Tachycardia
Tachypnea
Dry mucous membranes
Low urine output
*Hypotension is a LATE sign

Protocol:

1. Maintain patent airway and provide supplemental O₂ to keep SaO₂ > 90%.
2. Assist ventilations with BVM if indicated; consider intubation.
3. Establish IV access with large bore needle (2 if time permits). If unable to obtain IV access, initiate IO access.
4. Bolus with 20 ml/kg of NSS as fast as possible. Repeat x 1 as needed.
 - a. If perfusion improves (mentation, CO, cap, refill, etc.) maintain infusion at 10 - 15 cc/kg/hr.
 - b. If any suspicion of blood loss and patient is unresponsive to total of 40 ml/kg of crystalloid, initiate blood infusion 10 cc/kg for infusion bolus. Repeat prn.

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1. Apply and/or inflate MAST as time permits and perfusion status necessitates (Flight time > 15 minutes) if there is any suspicion for pelvic or lower extremity fracture.

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LifeFlight**

Pediatric Protocols

IV FLUID MAINTENANCE

Criteria:

Maintenance fluid requirements for infants and children.

Protocol:

1. Initiate 2 IV lines if possible, utilizing a 20 gauge or larger over the catheter needle. Do not delay transport for second IV line access if patient is hemodynamically stable.
2. IV fluid maintenance dose of NSS according to weight of child:
 - a. Infants < 10 kg: 4 cc/kg/hr
 - b. Children 11-20 kg: 40 cc/hr plus 2 cc/kg/hr for each kg from 11-20.
 - c. Children > 20 kg: 60 cc/hr plus 1 cc/kg/hr for each kg from 21-60.
3. Decrease IV fluids to KVO if suspected increased intracranial pressure or otherwise indicated by patient assessment.
4. IV attempts are to be limited to 2 per nurse, then proceed to IO access.

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LifeFlight**

Pediatric Protocols

MULTIPLE TRAUMA

Criteria:

Mechanism of injury sufficient to cause blunt or penetrating trauma.

Protocol:

1. Maintain patent airway and provide supplemental oxygen at 100% if awake and breathing spontaneously
2. Ventilate with 100 % oxygen via BVM if child has altered mental status or respiratory distress, maintain C-spine immobilization.
 - a. Intubate using RSI in patient with head injury, combativeness.
3. Examine chest for tension/open pneumothorax and treat if found.
4. Control external bleeding as indicated.
5. Establish IV/IO access.
6. Rapidly infuse 20cc/kg NSS if signs of inadequate system perfusion are present.
7. Immobilize neck with semirigid collar head immobilization device, short or long spine board.
8. Infuse second crystalloid bolus of 20 cc/kg, if necessary.
9. If no improvement in systemic perfusion give 0 neg or type and cross matched blood 10 cc/kg.
10. Consider gastric decompression with OGT or NGT if not contraindicated and urinary catheter for flights > 1 hour.

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LifeFlight**

Pediatric Protocols

NAUSEA/VOMITING

Criteria:

Treatment or prevention of motion sickness, nausea or vomiting

Contraindications:

Comatose state
Allergy to promethazine (Phenergan)/sulfites
Patients who have received CNS depressant drugs
Age < 2 years

Protocol:

1. Maintain patient airway and provide supplemental O₂ to keep SaO₂ > 90%
2. If systolic BP > 90, give 0.5 mg/kg/dose IV of promethazine (Phenergan), max dose of 12.5 mg if < 12 years or 25 mg if > 12 years.

Adverse Effects:

1. For dystonic reaction give 1 mg/kg of diphenhydramine (Benadryl) IV.
2. Be sure IV is working well as subcutaneous or intra-arterial injection may cause gangrene.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

NEONATAL RESUSCITATION

Criteria:

Resuscitation of the neonate.

Indications:

If delivery is imminent, deliver prior to departure and assess need for neonatal team and incubator.

Protocol:

1. Suction mouth, then nose while delivering. *Note: if thick meconium, intubate trachea and suction until clear before other resuscitation steps are taken.
2. Dry, warm and stimulate newborn. Position on back with head down (sniffing position).
3. APGAR scores @ 1 and 5 minutes as time permits.
4. If respiratory effort: absent, slow, irregular, or gasping; ventilate with BVM and 100% O₂.
5. If HR \leq 60, initiate chest compressions in addition to BVM per PALS. If HR $>$ 60 or $<$ 100, VENTILATE ONLY.
6. Note time of delivery.
7. Reassess neonate frequently (every 5 minutes) for signs of distress.

Contact Medical Command

1. Notify of delivery and status of newborn.

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

POISONINGS/INGESTIONS

Criteria:

Known accidental or intentional exposure to or ingestion of potentially lethal dose or substance.

Protocol:

1. Provide for patent airway and oxygenation to maintain SaO₂ > 90%. Provide for early intubation if substance is caustic. Use conservative respiratory management if substance is petroleum distillate.
2. IV of D5/NS at maintenance rate unless otherwise contraindicated (see IV fluid protocol).

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1. Report substance involved for more specific intervention.
2. Activated charcoal in aqueous solution 1 gm/Kg of body weight PO, if indicated.

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

RAPID SEQUENCE INTUBATION

Criteria:

Difficult to intubate for reasons such as trismus, present gag reflex, combativeness. Must be able to maintain airway post RSI if the intubation attempt is unsuccessful.

Contraindications:

1. Inability to maintain BVM seal and inability to perform surgical cricothyrotomy.
2. Known history of pseudocholinesterase deficiency, known history of malignant hyperthermia, renal failure with hyperkalemia, severe soft tissue damage, including burns of more than 5 days duration, and some neuromuscular disorders (e.g. Duchenne's muscular dystrophy).
3. Relative contraindication-Globe rupture as fasciculations will increase ocular pressure.

Protocol:

1. Preoxygenate with 100% O₂.
2. Lidocaine 1 mg/kg if head injured.
3. If age > 5 years, optional administration of Vecuronium 0.01 mg/kg IVP to defasciculate if time is not a factor.
4. Atropine 0.02 mg/kg IVP (Minimum dose 0.1 mg).
5. Etomidate 0.2 - 0.3 mg/kg IVP if over 10 years. Midazolam 0.1 to 0.3 mg/kg if the patient is under 10 years old. (Avoid Midazolam if the patient is suspected to be hypovolemic or is hypotensive). Apply cricoid pressure.
6. Succinylcholine 1.5 mg/kg IVP. If unable to establish IV access, then give 4 mg/Kg IM.
7. Orally intubate patient after adequate relaxation is achieved.
8. If intubation attempts are unsuccessful after 3 minutes, ventilate the patient with BVM and transport.
9. If unable to ventilate with BMV, or patient deteriorates, perform cricothyroidotomy.
10. Refer to sedation protocol as needed.
11. Consider gastric decompression with OGT or NGT, if not contraindicated.

**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

**RETROPHARYNGEAL ABSCESS / PERITONSILLAR
ABSCESS**

Criteria:

Retropharyngeal abscess: Usually seen in children < 3 yrs., gradual onset of sore throat, fever, drooling, difficulty swallowing and muffled voice.

Peritonsillar abscess: Usually seen in children > 8 yrs., presentation of sore throat, difficulty swallowing, ipsilateral ear pain, drooling and "hot potato" voice.

Protocol:

1. Apply supplemental humidified oxygen at 100 %.
2. Avoid agitation: allow position of comfort.
3. BVM ventilation and intubation for obstruction.
4. If unable to ventilate: percutaneous cricothyrotomy or jet ventilation.

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**Allegheny General Hospital
LifeFlight**

Pediatric Protocols

SEDATION / MUSCLE RELAXATION-INTUBATED

Criteria:

For use in the intubated child to enhance artificial respirations or prevent dislodging of ET tube and IV lines.

Contraindication:

Non intubated child.

Protocol:

1. Give Valium 0.2 - 0.4 mg/kg IV for sedation up to 10 mg.
2. For muscular relaxation, child must be intubated and placement of endotracheal tube confirmed; give Vecuronium 0.1 mg/kg IV only after sedation has failed to achieve desired results.

SEDATION-NON INTUBATED

Criteria:

For non intubated children requiring sedation

Contraindication:

Not for use as analgesia.

Protocol:

1. Valium 0.10 - 0.2 mg/kg. IV/IO for light sedation.

Contact Medical Command

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SEIZURES

Criteria:

For use in children displaying CNS insult resulting from abnormal and uncontrolled activity of cerebral neurons to prevent the child from injury during seizure activity, prevent respiratory arrest, control seizures, and prevent seizure recurrence.

Indications:

1. Cerebral trauma
2. Fever
3. Metabolic disorders
4. Hypoglycemia
5. Anoxia
6. Ingestion of toxic substances

Protocol:

1. Secure and maintain a patent airway. Maintain cervical immobilization if trauma involved.
2. Administer 100% FiO₂ via non-rebreather mask, assist ventilation with BVM as needed, consider intubation.
3. Attempt to obtain blood glucose level. If blood glucose is < 60, administer 2 ml/kg D25W IV or IO.
4. If glucose level is unavailable or glucose is > 60, administer Valium 0.3 mg/kg IV or IO, up to 10 mg.
5. If IV/IO unavailable, give Valium 0.5 mg/kg per rectum.

Contact Medical Command

If seizure activity continues:

1. Administer Phenobarbital 20 mg/kg IV or IO. If necessary, give additional 10 mg/kg x 2.
2. If seizure activity is associated with head trauma, give Phenytoin 15 mg/kg IV or IO no faster than 1 - 2 mg/kg/min.

***NOTE:** Phenobarbital and diazepam in combination can cause hypotension and respiratory depression.

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SHOCK

DISTRIBUTIVE, NEUROGENIC, ANAPHYLACTIC, CARDIOGENIC

Criteria:

CLINICAL CHARACTERISTICS OF SHOCK*			
Signs	Hypovolemic	Cardiogenic	Distributive
Heart rate	+++	++++	+++
Respiratory rate	++	+++	++
Work of breathing	normal	++ to ++++	0 to ++++
Pulse volume	0 to ++	0 to +	0 to ++++
Capillary refill	> 2 sec.	> 4 sec.	> or < 2 secs.
Skin temperature	cool	cold	warm to cold
Skin color	pale	pale-ashen	pink-ashen
Mottling	+ to +++	++++	+ to ++++
Level of consciousness	normal to coma	depressed-coma	normal to coma
Liver size	normal	enlarged	normal
Acidosis	+ to +++	++ to ++++	+ to ++++
Urine output	< 1 cc/kg/hr	< 1 cc/kg/hr	< 1 cc/kg/hr

*The likelihood of a specific sign is indicated by the number of plus (+) signs.

Protocol:

1. Maintain patent airway and provide 100% supplemental O₂.
2. IV fluid bolus of NSS 20 cc/kg. Repeat as needed. Consider administration of blood if hypovolemic.

Contact Medical Command

1. Give patient history and physical exam and discuss further orders.

Revised/Reviewed 8/02

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TRANSCUTANEOUS PACING

Criteria:

Profound symptomatic bradycardia refractory to BLS and ALS measures

Protocol:

1. Set rate to 100.
2. Set mA to 20.
3. Increase mA by 5 until capture occurs.
4. Check for pulse with capture.
5. Consider sedation with Valium 0.1 - 0.2 mg/kg IV.

Contact Medical Command

1. Contact Medic Command for pain control.

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Appendix: A

CALCULATIONS

1. Basic
 - a. $1000 \text{ mcg} = 1 \text{ mg}$
 - b. $1:1000 = 1 \text{ mg/ml}$
 - c. $1:10000 = 0.1 \text{ mg/ml}$
2. Standard Concentration Method
 - a. Infusion rate = body weight x desired dose x 60 concentration of infusion
 - b. Lidocaine
 - i. Add 120 mg Lidocaine to D5W to make 100 ml of solution.
 - ii. Each ml/kg/hr infused will deliver 20 mcg/kg/minute.
 - iii. Example: To prepare a Lidocaine infusion for an 8 kg child to deliver 30 mcg/kg/min.
 1. Add 6 ml of 2% Lidocaine (120 mg) to 94 ml of D5W or D5 NSS (1200 mcg/ml).
 2. Rate = $8 \text{ kg} \times 30 \text{ mcg/kg/min} \times 60 \text{ ml/hr} = 12 \text{ ml/hr}$ (1200 mcg/ml)
3. Rule of Six Method
 - a. Epinephrine/Norepinephrine (0.1 - 2 mcg/kg/min)
 - i. $0.6 \times \text{body weight} = \text{amount of drug to be added to D5W or NSS to make 100 ml of solution.}$
 - ii. Each ml/hr delivers 0.1 mcg/kg/min
 - b. Dopamine/Dobutamine (2 - 20 mcg/kg/min)
 - i. $6 \times \text{body weight} = \text{amount of drug to be added to D5W or NSS to make 100 ml solution.}$
 - ii. Each ml/hr delivers 1.0 mcg/kg/min.

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Appendix: B

HEART RATE / RESPIRATORY RATE

(Pediatric)

[Child's age (y) x 2} + 8 = weight in kg.

\$Heart rate - varies inversely with age; heart rate increases with temperature, volume loss, anxiety.

Newborns	85 - 150
Infant to 24 months	100 - 140
2 - 6 years	80 - 115
6 - 10 years	70 - 100
> 10 years	55 - 90

\$Respiratory rate - also varies inversely with age.

Newborns	30 - 60
Infant to 24 months	20 - 40
2 - 6 years	20 - 30
6 - 10 years	20 - 25
> 10 years	12 - 20

\$Blood pressure - hypotension is a late sign.

SBP = 80 + [2 x age (y)]

Newborns and infants: SBP, 60 - 70