

Chapter 5

Pediatric Medical Care

Standard Medical Care Procedures

Rationale:

Pediatric emergencies make up a small percentage of our call volume. Children very seldom suffer a life-threatening medical emergency, but when it does occur, they generally deteriorate quickly. Calm action and speech will help decrease the child's and family's anxiety.

General Pediatric Care

Level I:

- Assess the scene for hazards or abuse. 1-800-96 ABUSE
- Note the patient's environment.
- Wear appropriate protective equipment (PPE).
- Provide standard BLS support (including cervical stabilization as needed).
- Perform a primary survey and provide emergency treatment.
- Perform a secondary survey, treat, and transport.
- Administer oxygen by appropriate device.
- Monitor oxygen saturation if indicated.
- Check a blood glucose level when indicated.

Level II:

- Provide ALS support (ECG, IV, Advanced airway).
- Establish an ALS airway if needed with ET tube (1 attempt only) or medical director approved dual lumen airway device (>12kg or 25lbs.)
- Confirm airway placement with capnography and 2 other documented methods
- Administer medication therapy as needed.

Abdominal Pain

Rationale:

A differential diagnosis of abdominal pain can be complex. Prolonged evaluation in the field is not appropriate. Suspect a severe underlying problem. Prompt and gentle transport is required.

Assessment Checklist

- Trauma
- Acute appendicitis
- Peritonitis
- Constipation
- Viral or bacterial infection
- Internal hemorrhage
- Poisoning
- Overdose
- Child Abuse

Pediatric Care

Level I:

- Examine for distended abdomen, bowel sounds, referred pain.
- Examine for hemorrhage (unexplained tachycardia, emesis, bloody stools, or rigidity).
- Examine for palpable increased body temperature and diaphoresis indicating illness.
- Test for orthostatic hypotension.
- Administer oxygen by appropriate device.
- Use Trendelenburg position if patient is hypotensive.

Level II:

- Establish IV
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Provide the shock patient a fluid challenge of 20 ml/kg. Repeat as indicated.
- If actively vomiting, Zofran 0.15 mg/kg IV for 6 months or older or Oral Dissolving Troche (ODT) 4mg for 4 years and above. Max dose 4mg.

Level III:

- None

Airway Management

Rationale:

Many pediatric emergencies are related to airway compromise. Maintenance of the airway takes an even greater importance than in the adult patient. Cardiac arrest in the pediatric patient is usually secondary to airway compromise. Avoid endotracheal intubation in the patient with croup or epiglottitis unless the patient has respiratory arrest. Maintain the infant or small child's airway with manual techniques such as chin lift / jaw thrust.

Assessment Checklist

- Asthma
- Trauma
- Cervical spine injury
- Foreign object obstruction or aspiration
- Hyperventilation
- Croup
- Epiglottitis
- Pneumonia
- Viral or bacterial infection
- Drowning
- Hypothermia

Pediatric Care

Level I:

- Assess respiratory effort for rate and quality.
- Assess gag reflex.
- Open airway (use jaw thrust if suspect cervical injury).
- Place appropriate airway device (oral or nasal).
- Monitor oxygen saturation.
- Administer oxygen by appropriate device.
- Suction airway if indicated.

Level II:

- Assess respiratory effort for rate and quality.
- Assess gag reflex.
- Establish an ALS airway if needed with ET tube (1 attempt only) or King Airway (>12kg or 25lbs).
- RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg. (if available)
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.

Level III:

- None

Allergic Reactions

Rationale:

This is more common than the more serious anaphylactic reaction. This patient responds well to prehospital treatment. Early recognition and treatment are important to prevent more severe problems.

Assessment Checklist

- Respiratory Arrest
- Airway obstruction
- Bronchospasm
- Rash, Hives, Edema, Itching

Pediatric Care

Level I:

- Administer oxygen by appropriate device.
- Attempt to determine the source of the allergic reaction.
- Poison Control # 1-800-222-1222 or 1-800-282-3171

Level II:

- Establish IV/IO
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Administer Benadryl 0.5 mg / kg IV. Repeat the dose once in 5 minutes (total maximum dose of 50 mg).
- Observe for the development of anaphylaxis and dysrhythmia.
- Consider Albuterol treatment PRN.

Level III:

- None

Altered Mental Status

Rationale:

It is uncommon to encounter pediatric patients with an altered mental status. It is important to attempt to determine the cause.

Assessment Checklist

- Trauma
- Overdose
- Hypoglycemia
- Past medical history - Medical or Psychological
- Seizures (postictal)

Pediatric Care

Level I:

- Evaluate the need for law enforcement assistance.
- Administer oxygen by appropriate device.
- Contact Poison Control at 1-800-282-3171 if indicated.
- Patients who must be restrained should be placed SUPINE on the stretcher, and a person must dedicated to monitor the patient's airway.
- Check a blood glucose level.

Level II:

- Establish IV/IO
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods
- If glucose < 60 mg / dl, follow Hypoglycemia Protocol.
- Administer Narcan 0.1 mg / kg, or nasal atomized in no IV access >12 years, as needed for respiratory depression. Repeat as needed.

Level III:

- None

Anaphylaxis

Rationale:

Anaphylaxis may be mistaken for cardiac arrest by the rescuer who does not witness its onset. It has a high mortality rate. It can become resistant to medical management especially if treatment is delayed. The rescuer must distinguish anaphylaxis from the related but less severe allergic reaction.

Assessment Checklist

- Airway obstruction
- Shock / Poor perfusion
- Hives / Edema
- Bronchospasm

Pediatric Care

Level I:

- Assess oxygen saturation.
- Assess for airway edema, stridor, and wheezing.
- Administer oxygen by appropriate device.
- Administer pediatric Epi-Pen if available. Leave in place for 5 seconds.
- Administer Benadryl 25 mg liquid or tablet if able to swallow.

Level II:

- Establish IV/IO.
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Administer the hypotensive patient a fluid bolus of 20 ml / kg. Repeat as needed.
- Administer albuterol 2.5 mg by nebulizer mask for mild respiratory compromise.
- Administer epinephrine 0.01 mg / kg of 1:1,000 SQ for moderate respiratory compromise in the normotensive patient.
- Administer epinephrine 0.01 mg / kg of 1:10,000 IV/IO for severe anaphylaxis.
- Administer Benadryl 0.5 mg / kg IV. Repeat the dose once after 5 minutes as needed (total maximum of 50 mg).

Level III:

- None

Asthma / Bronchitis

Rationale:

Asthma or Bronchitis emergencies can present with little distress at first onset but can deteriorate quickly. Watch them closely and treat the problem aggressively as needed. *Cyanosis is a late indicator of hypoxia in children.*

Assessment Checklist

- Airway obstruction
- Asthma
- Bronchitis
- Epiglottitis
- Status asthmaticus
- Anaphylaxis
- Overdose
- Pneumonia

Pediatric Care

Level I:

- Assess oxygen saturation.
- Assess for airway edema, stridor, and wheezing.
- Administer oxygen by appropriate device.

Level II:

- Establish IV/IO.
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Administer Albuterol 2.5 mg by nebulizer. This may be administered (as needed) before vascular access and repeated as needed.
- Administer epinephrine 0.01 mg / kg of 1:1,000 SQ for severe asthma not improving with Albuterol.

Level III:

- None

Carbon Monoxide Inhalation

Rationale:

Carbon monoxide can pose a serious threat to the rescuer as well as the patient. Use caution in assessing the CO patient. Some normal diagnostic methods such as SaO₂ and capillary refill may give false positives. This exposure interferes with oxygen exchange on the cellular level. Always consider it in any airway burn.

Assessment Checklist

- Hypoxia of unknown cause
- Smoke inhalation
- Poisoning
- Overdose
- Burns

Pediatric Care

Level I:

- Remove the patient from source of exposure. Take precautions against a possible toxic environment.
- Assess for signs including vomiting, altered mental status, seizure, flushing, cyanosis, or cherry red skin (late sign).
- Assess for symptoms including headache and tinnitus.
- Administer 100% oxygen by appropriate device.
- Keep patient calm to minimize oxygen demand.

Level II:

- Establish vascular access.
- Monitor ECG.
- Evaluate the need for advanced airway.
- Draw blood. Cover blood tubes with a cold pack.
- Administer Albuterol 2.5 mg by nebulizer for the wheezing patient. Repeat as needed.
- Transport to the closest emergency department.

Level III:

- None

Croup / Epiglottitis

Rationale:

This is a potentially disastrous emergency. Avoid unnecessary treatment and handling of the patient unless severe respiratory compromise has occurred. **Rapid and gentle transport is indicated.**

Assessment Checklist

- Viral infection
- Pneumonia
- Bronchitis
- Asthma
- Foreign body airway obstruction

Pediatric Care

Level I:

- Assess airway from a distance if possible.
- Administer oxygen by appropriate device. Have parent hold the oxygen near the child.
- Keep patient calm.
- Assess oxygen saturation.

Level II:

- Administer a saline mist treatment (if available) for mild croup.
- Refrain from intubation unless the patient is in respiratory arrest.
- Refrain from IV or IO therapy unless the patient is in respiratory arrest.
- Consider cricothyrotomy (or needle cricothyrotomy if less than 10 years of age) if unable to intubate.

Level III:

- None

Diabetic Emergencies (Hyperglycemia)

Rationale:

Hyperglycemic patients may present with an altered mental status. The patient's increased blood glucose may cause severe diuresis. This can cause dehydration and hyperosmolar coma. Hyperglycemic emergencies usually onset over several days.

Assessment Checklist

- History of diabetes
- Hypoglycemia
- Dehydration
- Hypotension
- Coma
- Psychosis

Pediatric Care

Level I:

- Assess for Kussmaul respirations.
- Administer oxygen by appropriate device.
- Check a blood glucose level.

Level II:

- Establish IV/IO.
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Administer normal saline 20 ml / kg IV rapid infusion for dehydration as needed.
- Repeat the infusion for the shock patient.
- Continue with an infusion of 20 ml / kg / hour.

Level III:

- None

Diabetic Emergencies (Hypoglycemia)

Rationale:

The hypoglycemic patient suddenly develops a hyper-adrenal state as the body attempts to raise glucose levels. The patient may very quickly suffer brain damage. The patient's mental condition deteriorates, and seizure activity or coma may develop. Some patients become agitated, develop psychotic behavior or CVA like symptoms such as hemiplegia, paresthesia, or cranial nerve palsies. Always suspect hypoglycemia in mentally obtunded patient. An imbalance of insulin may precipitate hypoglycemia in the insulin dependent diabetic. Insulin abuse can also cause hypoglycemia.

Assessment Checklist

- History of diabetes (particularly with insulin use)
- Dehydration
- Hypotension
- Coma
- Psychosis
- Drug ingestion
- Assess for trauma

Pediatric Care

Level I:

- Assess for last insulin injection and food intake.
- Administer oxygen by appropriate device.
- Administer oral glucose if the patient is conscious and able to maintain airway.
- Check a blood glucose level.

Level II:

- Establish IV.
- Monitor ECG.
- Administer D10 2 – 4 ml / kg IV/IO if glucose < 60 mg / dl.
- If unable to establish IV and glucose < 60 mg / dl, administer Glucagon 0.5 mg IM or SQ (< 20 kg) or administer Glucagon 1.0 mg IM or SQ (> 20 kg).

Level III:

- None

Environmental Cold Emergencies

Rationale:

Cold related emergencies are possible even in Florida. These situations usually involve water immersion. The wide range of temperatures between day and night can cause problems for the unprepared. The use of alcohol and various drugs can also effect how a patient reacts to cold. Drowning patients should be managed for hypothermia.

Assessment Checklist

- Frostbite
- Coma
- Cardiac Arrest
- Drowning

Pediatric Care

Level I:

- Asses for shivering, lethargy, muscle stiffness, mental status changes, discoloration of the skin, and numbness.
- Remove wet clothing and protect patient against continued heat loss and wind chill.
- Place patient in a horizontal position avoiding rough movement and excess activity.
- Completely dry patient and cover with insulated blankets.
- Administer oxygen by appropriate device.
- NPO

Level II:

- Establish IV/IO.
- Monitor ECG.
- Evaluate the need for advance airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Warm the IV fluid with hot packs.

Level III:

- None

Environmental Heat Emergencies

Rationale:

Cooling the heat emergency patient helps protect the body and CNS from permanent damage. A good history of the event is essential. Some people, especially the elderly and pediatric patients, are more sensitive to heat than others. Assess the patient's environment in the primary survey.

Assessment Checklist

- Heat stroke
- Heat exhaustion
- Heat cramps
- Hyperglycemia / hypoglycemia
- Seizures

Pediatric Care

Level I:

- Move patient to cool environment and remove clothing.
- Place the heat exhaustion patient in a supine position with feet elevated.
- Place the heat stroke patient in semi-reclining position (with head elevated 15-30 degrees if normotensive).
- Sponge with cool water or cover with a wet sheet and fan the patient.
- Apply cold packs to the lateral chest wall, groin, axilla, carotid arteries, temples and behind knees if rapid cooling is required.
- Administer oxygen by appropriate device.

Level II:

- Establish IV/IO
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- Administer fluid boluses of 20 ml / kg titrate as needed to maintain adequate blood pressure.

Level III:

- None

Overdose

Rationale:

Children who take unprescribed medication may not take large quantities due to its unpleasant taste. Any pediatric patient who has a potential overdose should receive prompt Emergency Department evaluation. Suspect overdose in any patient who has a decreased level of consciousness. Consider the possibility that siblings or playmates have also taken medication and will not admit it. **Call Poison Control.**

Assessment Checklist

- Poisoning
- Hyperglycemia / hypoglycemia
- Seizures

Pediatric Care

Level I:

-
- Secure all possible sources of the overdose and transport them to the hospital with the patient.
- Administer oxygen by appropriate device.
- Monitor for rapid changes in condition and behavior.
- Patients who must be restrained should be placed SUPINE on the stretcher, and a person must be dedicated to monitor the patient's airway.
- Contact Poison Control 1-800-222-1222 or 1-800-282-3171
- Check a blood glucose level.

Level II:

- Establish IV/IO
- Monitor ECG.
- Obtain 12 lead ECG if high suspicion for Tricyclic antidepressant overdose.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- If glucose < 60 mg / dl, follow Hypoglycemia Protocol.
- Administer Narcan 0.1 mg / kg, if no IV access and >12years nasal atomizer, as needed for respiratory depression. Repeat as needed.

Level III:

- None

Poisoning

Rationale:

The poisoning victim may present with an unrelated complaint and not be aware of the poisoning. The rescuer must suspect poisoning. Poisonings may include pesticides, petroleum, and cleaning solvents. They may occur by ingestion, inhalation, or absorption.

Assessment Checklist

- Overdose
- Hyperglycemia / hypoglycemia
- Respiratory arrest
- Hypotension
- Dysrhythmia

Pediatric Care

Level I:

- Remove the victim from the source (rescuers should wear S.C.B.A. if required).
- Decontaminate the victim as needed.
- Assess for SLUDGEM syndrome.
- Administer oxygen by appropriate device.
- Suction if indicated.
- Do not use a helicopter to transport any hazardous materials exposure patient.
- Contact Poison Control at 1-800-222-1222 or 1-800-282-3171

Level II:

- Establish IV/IO
- Monitor ECG.
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15-0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1-2 mg/kg (if available).
- If intubated, sedate with Versed IV 0.05mg/kg (max dose 2 mg)
- Confirm airway placement with capnography and 2 other documented methods.
- For the organophosphate or carbamate poisoning victim, administer atropine 0.05 mg / kg (0.1 mg is the minimum dose) IV / ET / IO. Repeat atropine at 5 minute intervals.
- Contact Poison Control at 1-800-222-1222 or 1-800-282-3171.

Level III:

- Perform Hazardous Materials protocols if approved by Medical Control.

Seizure Disorder

Rationale:

Most pediatric seizures are febrile and can be corrected by cooling the patient. Careful history taking and observation are important to determining the cause and appropriate emergency department treatment.

Assessment Checklist

- Febrile illness
- Overdose
- Poisoning
- Hypoglycemia

Pediatric Care

Level I:

- Passively protect the patient from self-injury.
- Cool the febrile patient and remove excess clothing.
- Administer oxygen by appropriate device.
- If the patient was not protected from injury during the activity, immobilize the patient's spine.
- Check a blood glucose level.

Level II:

- Establish IV/IO
- Monitor ECG
- If blood sugar is < 60mg/dl, follow Hypoglycemia Protocol
- Administer Versed 0.05 mg / kg IV/IO, maximum single dose of 1mg may repeat one time (maximum combined dose of 2mg), IM or intranasal if no IV/IO access is available 0.1mg/kg, repeat one time if seizures continue, max dose 2mg (if available).
- Evaluate the need for advanced airway with RSI if indicated including Etomidate IV 0.15 – 0.3 mg/kg, Atropine IV 0.02 mg/kg (if under age 5), and Succinylcholine IV 1 –2 mg/kg (if available).
- Confirm airway placement with capography and 2 other documented methods

Level III:

- Additional Versed

Sickle Cell Anemia

Rationale:

Sickle Cell Anemia crisis interferes with the normal delivery of oxygen at the cellular level and may be an emergency.

Assessment Checklist

- History of Sickle Cell Anemia
- Priapism
- Acute myocardial infarction / angina
- Unexplained pain

Pediatric Care

Level I:

- Assess the patient for large muscle mass pain, chest pain, and severe dyspnea.
- Administer oxygen by appropriate device.
- Keep patient as quiet as possible to minimize oxygen demand.

Level II:

- Establish IV/IO
- Monitor ECG.
- Draw blood.
- Administer a fluid bolus of 20 ml / kg and continue the IV at a TKO rate.
- Administer Albuterol 2.5 mg by nebulizer for the wheezing patient. Repeat as needed.
- Refer to the Chest Pain Protocol for any symptoms, chief complaint, or 12-lead ECG evaluation that suggests AMI.

Level III:

- Contact Medical Control for pain management.

Vomiting

Rationale:

By disrupting the stimulus to vomit, and reducing nausea, we can make the patient more comfortable during transport. As well, we can reduce the chance of aspiration due to excessive vomiting, and increase the effectiveness of pain management medications administered pre-hospital.

Assessment Checklist

- Vomiting caused by chemotherapy, narcotic pain medication, infectious disease, chest pain or other etiologies.
- Be sure to treat the primary signs/symptoms such as chest pain, hypotension, dyspnea, etc., prior to treating emesis.

Pediatric Care

Level I:

- Place the patient in a position of comfort.
- Administer oxygen by appropriate device.

Level II:

- Establish IV.
- Monitor ECG.
- Administer Ondansetron (Zofran) 0.15 mg/kg max dose 4 mg IV/IO/IM, 4 mg ODT (4 years and above).

Level III:

- None