

Special Children's Outreach and Prehospital Education



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ABC's and Sample History for Special Needs Children

I. The ABCDEs: A Different Look

A Different Look

Why CSHCN Caregivers Call 9-1-1

- 97 of 100 CSHCN families surveyed have sought emergency care
- 75 sought emergency care three or more times
- CSHCN require EMS services because:
 - Home health care equipment fails
 - Caregivers panic
 - No improvement with therapy
 - Child in respiratory or cardiac distress/arrest

A Different Look

Differences to Consider

- Medical issues vs. equipment issues
- Atypical baseline vital signs
- May be smaller than same age peers
- May be developmentally delayed

A Different Look

General Approach

- Ask “What is normal for your child?”
- Respect caregiver’s opinion on child’s condition.
- Treat the child, not the technology.
- Simple illnesses can be life-threatening .
- Caregivers are experienced with the medical system.

II. The ABCDEs: Interventions Using Special Technology

AIRWAY: Tracheostomies

Airway

Tracheostomy

- An artificial airway passed through a surgical opening (stoma) in the anterior aspect of the neck and into the trachea



Airway

Tracheostomy Indications:

- To bypass an upper-airway obstruction
- To provide long-term mechanical ventilation
- To facilitate clearance of excess secretions



Airway

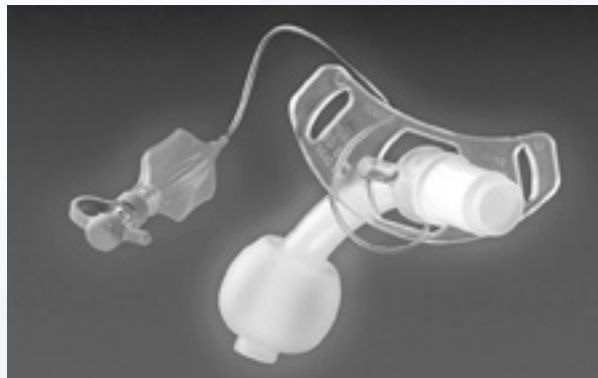
Tracheostomy Types and Features



Single
Lumen



Fenestrated



Double
Lumen

Airway

Interventions:

- Position of comfort
- Humidified air or O₂
- Nebulized 1:1000 epinephrine, if protocols allow
- If child is in extremis, consider endotracheal intubation

Airway

Case 2

An 8-year-old child with a tracheostomy tube has acute onset of respiratory distress. On physical exam, RR is 32 and breath sounds course with frequent loose cough. Gurgling secretions can be heard in the airway.

What will your interventions include?

Airway

Alleviating Respiratory Distress

- Position
- Suction
- Oxygen
- Repeat
- An emergency tracheostomy tube change may be necessary.

Airway

When to ventilate manually

- Upon removal from ventilator
- Consider before/after suctioning or trach change
- Signs of respiratory distress or failure



Airway

Case 3

A 2-year-old girl with a tracheostomy tube presents with acute onset of agitation, severe retractions, faint breath sounds, RR 48 and HR 150. You suspect a tracheostomy-tube obstruction.

What are some of the causes of tracheostomy tube obstruction?

Airway

Causes of Tube Obstruction

- Improper airway positioning
- Improper insertion of the trach tube
 - Creation of a “false track”
- Mucous plug
- Failure to remove obturator after tube insertion

BREATHING: Home Ventilation

Breathing

Case 1

A 6-year-old special needs child presents with a RR of 12 and frequent periods of paused breathing lasting 10–15 seconds per episode.

What considerations should be made when caring for this child?

Breathing

Considerations

- An abnormal breathing pattern may be normal for this child
 - Secondary to neurological damage
 - Base treatment interventions on baseline breathing patterns

Breathing

Case 2

A child with complex heart disease presents with irritability and a fever of 102°F. On exam, he is dusky in appearance with oxygen saturation 82% on room air.



What questions should be asked prior to initiation of treatment?

Breathing

Questions to ask:

- What is the child's baseline pulse ox?
- What is this child's normal skin color?
- How much oxygen should be administered?

Breathing

Case 3

Parents report that their infant's apnea monitor has alarmed several times. On exam, the baby is pink and not in respiratory distress. RR is 30 and HR is 120. However, the parents are concerned and request transport to the hospital.

What should your interventions include?

Breathing

Interventions for Alarms:

- Assess, observe, monitor
- Be familiar with types of apnea monitor alarms
 - High HR, low HR
 - Apnea
 - Artifact, lead problems
- Transport child with apnea monitor
 - Some have “smart chips” that are downloaded to review alarms



Breathing

Case 4

An 8-month-old, former 27-week preemie with BPD presents with retractions and wheezing. He is usually on 1/4 liter of O₂ per minute. His parents increase his O₂ flow to 1 liter/min. He received an albuterol nebulizer treatment. On exam, RR is 70 and HR is 160, pulse ox is 88% on 1 liter FIO₂, and wheezing is found on lung exam.

What questions do you ask?

What are your interventions?

Breathing

Questions to ask:

- Did this change in respiratory status occur suddenly or gradually? (gradually over 24 hours)
- When was the child's last albuterol nebulizer treatment? (3 hours ago)
- Did his oxygen saturation level improve after his oxygen was increased to 1 liter? (current reading 93%)

Breathing

Interventions

- BLS interventions
 - Position of comfort
 - Increase oxygen concentration via face mask
 - Transport
- ALS interventions
 - All of the above and
 - Administer albuterol nebulizer treatment
 - Observe for signs/symptoms of respiratory failure

BREATHING: Ventilators/CPAP/BiPAP



Breathing

Ventilator Indications

- Chronic lung disease
 - BPD
 - Restrictive lung disease
- Muscular Diseases
 - Muscular dystrophy
 - Spinal muscle atrophy
- Apnea
 - Due to prematurity
 - Due to brain or c-spine injuries



Breathing

Types of Ventilators:

- Volume ventilators
- Pressure-cycled ventilator

Pressure-cycled ventilator



Breathing

Ventilator Alarms

- Low pressure/apnea
- High pressure
- Setting error
- Power switchover
- Low power



Breathing

Case 5

A 3-year-old ventilator-dependent child presents with abnormally low O₂ saturation, agitation, decreased breath sounds bilaterally, and tachycardia.

What do your interventions include?

Breathing

Interventions

- Disconnect patient from the ventilator
- Began manual ventilation
- Assess for chest rise, breath sounds
- If no improvement, check for tracheostomy-tube obstruction
- If improved, consider ventilator issue
- Prepare for transport

Breathing

CPAP: Continuous positive airway pressure

BiPAP: Bilevel positive airway pressure

- Purpose
 - CPAP prevents airway collapse
 - BiPAP prevents airway collapse and delivers pressure during inspiration
- Precautions
 - Not used as ventilatory support in prehospital environment

Breathing

EMS Considerations

- Observe for signs/symptoms of respiratory distress
- If in respiratory distress
 - Disconnect from ventilator and ventilate manually
 - If no improvement, consider trach-tube obstruction
- Evaluate chest rise and breath sounds
- Check for pulse

Breathing

EMS Considerations

- Consider how ventilator will be powered
- Bring ventilator/BiPAP/CPAP to hospital
- Home health care notes have settings
- Ensure proper humidification

CIRCULATION: Internal Pacemakers and Defibrillators

Circulation

Internal Pacemakers and Defibrillators:

- May be required in children with abnormal heart rhythm
 - Purpose
 - Restore normal cardiac rhythm
 - Ensure normal circulation
 - Potential problems
 - Failure
 - Disconnected leads



Circulation

Case 1

A 10-year-old with hemophilia fell 3 hours prior to presentation. Child injured her knee. On exam, child appears to be in pain, HR is 120, and knee is markedly swollen and tender to touch.

What are your concerns?

What are your interventions?

Circulation

Interventions

- Hemophilia is an inherited disorder—a blood-clotting factor is missing
 - BLS
 - Check pulses distal to extremity
 - Splint extremity
 - Direct pressure/elevation
 - Transport factor to hospital with patient
 - ALS
 - All of the above and consider IV
 - If local protocols allow, consult medical control to administer factor *or*
 - Assist caregiver in administration of factor

Circulation

Case 2

A 5-year-old African-American child with sickle cell disease complains of severe abdominal pain. He is grunting, holding his abdomen, and he cannot stand. He is pale and has a distended abdomen. HR is 150, RR is 30, and capillary refill is 2–3 seconds.

What could be causing this child's symptoms?

What are your interventions?

Circulation

Interventions

- BLS
 - Position of comfort
 - Oxygen
 - Transport to closest appropriate hospital
- ALS
 - All of the above and IV
 - Administer IV fluids
 - Monitor

Circulation

Case 3

A 3-year-old with cancer presents with a fever of 101°F. The child is described as listless by parents. She has a central venous line. Her last chemotherapy was 3 days prior to presentation. On exam, she appears tired; HR is 160, RR is 40, and capillary refill is 3 seconds.

What are your concerns?

What are your interventions?

Circulation

Concerns

- This child is in shock
 - Elevated HR, prolonged capillary refill
 - Ill appearance
 - High risk of serious infection, shock

Interventions

- Position
- Oxygen
- ALS: IV fluid—peripheral line vs. CVL
- Sterile technique—wear facemask
- Transport to closest appropriate hospital

CIRCULATION: Central Venous Catheters

Circulation

Purpose of Central Venous Catheters

- Administration of Medications
- Delivery of chemotherapy
- Nutritional support
- Infusion of blood products
- Blood draws

Circulation

Types of Catheters

- Broviac, Hickman, Groshong
 - Tunneled central venous catheters
 - Proximal tip in the subclavian vein
 - External access
- Port-a-Cath/Med-a-Port/PAS Port
 - Catheter system is completely beneath skin
- Percutaneous Intravenous Catheter (PICC)
 - Proximal tip in central vein
 - Looks like a PIV

DISABILITY

Disability

Case 1

A 5-year-old with Down syndrome presents with vomiting for 2 days. On exam, the child is quiet and listless, HR is 160, RR is 48, capillary refill is 2–3 seconds, and weak peripheral pulses.

What are the appropriate interventions?

How do you assess the neurological status of this child?

Disability

Interventions

- Position
- Oxygen
- Maintain body temperature
- ALS: IV, fluids, IO
- ALS: Consider inotropes for shock if unresponsive to fluid resuscitation

Assessment of neurological status

- Ask caregiver to compare child's present status to baseline

Disability

Case 2

A 4-month-old with hydrocephalus and a VP shunt placed 2 weeks ago presents with lethargy, bulging fontanel, “sunset” eyes, fever, and a high pitched cry. The skin over the shunt is erythematous.

What could cause these symptoms?

Disability

Cause of symptoms:

- Shunt infection
 - If child presents with a fever or redness along the shunt tubing, suspect a shunt infection
- Meningitis
- Encephalitis

Disability

CSF Shunts

- A CSF shunt is a catheter with one end in a ventricle of the brain and the other end in the abdomen or atrium that drains excess CSF or bypasses a blockage of CSF.

Types:

- Ventriculoperitoneal
- Ventriculoatrial



Disability

Case 3

A 6-year-old with MR/CP and a VP CSF shunt has been struck by a car while in his wheelchair. He is awake and crying. A large laceration is noted above his right temporal scalp.

What is your concern with regard to the CSF shunt?

Disability

Concern

- The shunt could be damaged or disconnected. This can result in increased intracranial pressure.

Disability

Case 4

A 12-year-old with a VPS presents with a 1-day history of headache and vomiting. On exam, she is listless and difficult to arouse. HR is 54, RR is 12, BP is 160/90 mm Hg, and capillary refill is less than 2 seconds.

What is the cause of this child's symptoms?

What will your interventions include?

Disability

Causes of Complications:

- Brain infection
- Shunt obstruction (resulting in a dangerous build-up of fluid in the skull)
- Shunt malfunction
- Peritonitis

Disability

Interventions

- Raise head of stretcher to decrease intracranial pressure
- Oxygenate and ventilate as appropriate
 - Keep end-tidal CO₂ monitor at 35 if child is showing signs of herniation (infants at 35 breaths/min; children at 25 breaths/min)
- Don't restrict fluids if hypoperfused
- Treat seizure activity per local protocols

Disability

Case 5

A child with a history of epilepsy presents with a generalized tonic-clonic seizure that reportedly has lasted more than 20 minutes.

What are your interventions?

Disability

Interventions

- BLS
 - Position airway
 - Oxygenate, ventilate
 - Suction as needed
- ALS
 - IV vs. IO access
 - IV/IO/PR anticonvulsants as per local protocols
 - Valium
 - Versed

EXPOSURE

Exposure

Case 1

An 8-year-old with osteogenesis imperfecta fell off of his bed. He is complaining of right thigh pain. Your assessment reveals an alert child with an obvious deformity of the right femur.

What should your interventions include?

Exposure

Interventions

- Assess neurovascular status distal to the injury.
- Gently place on a long-board splint.
- Avoid taking the blood pressure of a child with osteogenesis imperfecta.
- Do not use a hare traction splint or MAST trousers.

IMPORTANT POINTS

- Cover the child to maintain normal body temperature
- Respect the child's privacy

IMPORTANT POINTS

- Carefully examine for injuries
 - Assessment may be difficult due to developmental level
 - CSHCN are at high risk for abuse
 - Report any suspicious injuries to the proper agency.



I. SAMPLE History

SAMPLE History

- **S**igns and Symptoms:
- What is different for this child today?

SAMPLE History

- Allergies:
- Medication allergy
- Latex allergy



Jump bag

SAMPLE History

- **M**edications:
- Often multiple medications
- Ask if medications were given prior to EMS arrival

SAMPLE History

- **P**ast Medical History:
 - Diagnosis(es)
 - ICU admissions
 - Most recent significant illness
 - Previous surgeries
 - Previous hospitalizations
 - Long-term care/rehab

SAMPLE History

- **L**ast Oral Intake:
 - Amount of fluid/formula
 - Type of IV fluid
 - Route of intake
 - IV/CVC, NGT, GT, JT
- Also ask about output:
 - Urine (catheterization?)
 - Stool (colostomy?)

SAMPLE History

- **E**vents of the Injury or Illness:
- Was the child capable of contributing to event?
- Was the child properly secured?
- Car seat, wheelchair, side rails on bed/crib, etc.
- Was the change sudden or gradual?

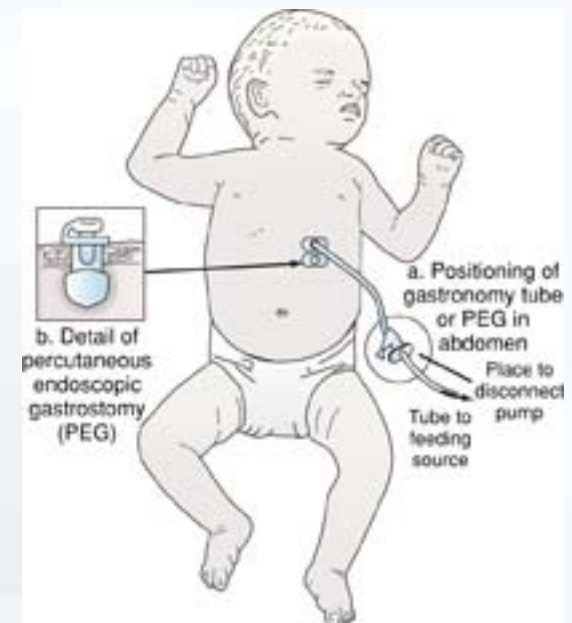
II. SAMPLE History: Feeding Catheters

Feeding Catheters

- **Nasogastric Tube (NGT):**
 - Catheter placed through the nose into stomach
 - For supplementation in children who cannot take enough by mouth
 - Short-term use
 - Can use to decompress stomach

Feeding Catheters

- **Gastrostomy Feeding Tube (GT):**
 - Catheter surgically or endoscopically placed into stomach or Jejunum
 - Provides long-term nutritional support
 - Can be used to decompress stomach



Feeding Catheters

- Feeding Catheter Complications:
 - Gastric contents can leak, causing irritation
 - Tube obstructed
 - Tube dislodged
 - Abdominal distention

II. SAMPLE History: Colostomies

Colostomies

- Colostomies:
 - Portion of intestine is attached to surgical opening on abdominal wall.
 - Digestive waste matter is collected in external bag.

Colostomies

- **Complications:**
 - Bag can burst as a result of overinflation with air and fecal contents.
 - Empty the bag if it is full. You may want to ask the child's caregiver to empty the bag prior to transport.
 - Bag may be torn off of the stoma. Cover the stoma with moist dressings.
 - Secure a nonrebreather facemask over stoma to collect stoma excretions or transport with additional dry dressings over the moist dressings.

IV. **SAMPLE** History: Important Points

Important Points

- **SAMPLE**

Signs and symptoms

Allergies

Medications

Past Medical History

Last Oral Intake

Events of the Injury or Illness

Important Points

- ABCs—as with any other patient
- Listen to the parents/caregivers
 - They usually know the child's problems and treatments.