







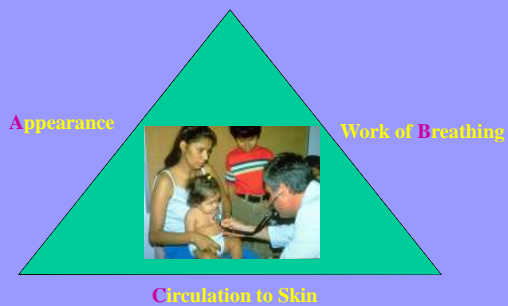
Contents

- Assessment & management
- ABC's
- Tracheostomies and O₂ delivery
- Tracheostomy emergencies
- Mechanical ventilators
- Central venous catheters and Feeding tubes
- CFS shunts

- Children with special health care needs are children with any type of disability, including physical or mental limitations.



General Approach and Assessment The A-B-Cs



Airway & Breathing

- **Blue is bad!** Oxygen consumption is 6-8 ml/kg/min in infants versus 3-4 ml/kg/min in adults
- The smaller you are the faster you breath
- A breathing rate that is too slow and shallow signals imminent respiratory failure; aggressive intervention is needed to prevent death

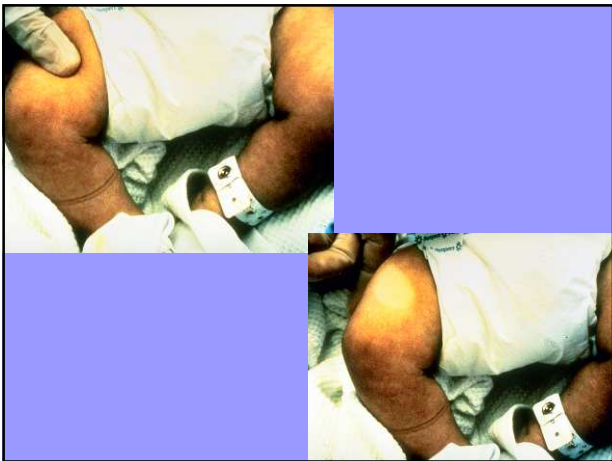
Normal Respiratory rates in Children

<u>Age</u>	<u>Normal Values</u>
Infant	30 - 60
Toddler	24 - 40
Preschooler	22 - 34
School age	18 - 30
Adolescent	12 - 18

Circulatory Considerations

- Respiratory rate and quality
- Heart rate
- Location and quality of pulses
- Capillary refill time
- Skin color and temperature
- Altered mental status
- Blood pressure







Normal Heart Rates

<u>Age</u>	<u>Normal Values</u>
• Infant	120 - 160
• Toddler	90 - 140
• Preschooler	80 - 110
• School age	75 - 100
• Adolescent	60 - 90



14-month-old child 

- You are called to the home of a 14-month-old child whose mother reports that she has trouble breathing and refuses to eat.
- Child born three months prematurely and was on a ventilator for his first 4 months

14-month-old child 

Appearance
Alert, irritable

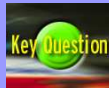
Work of Breathing
Retractions, grunting, nasal flaring

Circulation to Skin
Normal

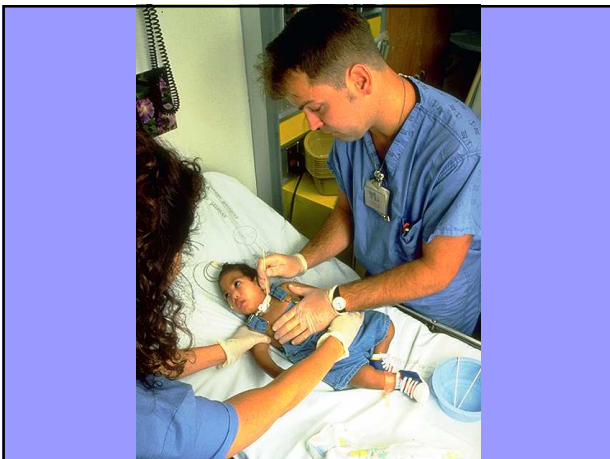
Initial Assessment



- Airway - Open, no stridor
- Breathing - RR 60 breaths/min, wheezing, SaO₂ 88% on 2L home oxygen
- Circulation - HR 140 beats/min; CRT 2 seconds; BP not obtained
- Disability - AVPU=A
- Exposure - No sign of trauma




What immediate action should be taken to manage this child?



7-year-old child 

- You are called to the home of a 7-year-old child with trouble breathing.
- He is lying in a hospital-style bed, with a ventilator and suction machine on the nightstand.
- He is being ventilated through a tracheostomy tube.

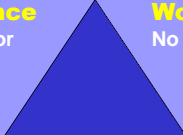



7-year-old child 

Appearance
Listless, poor muscle tone

Work of Breathing
No chest rise visible

Circulation to Skin
Pale skin color



Key Question 


What immediate action should be taken to manage this child?



Immediate Management 

- Disconnect the ventilator, and begin ventilation using bag-valve device via the tracheostomy tube




Initial Assessment 


- Child is not breathing spontaneously
- There is resistance to bagging
- Poor chest rise with bag-valve-tracheostomy ventilation
- HR 160 beats/min by palpation of femoral pulse

What is going on with this patient?

Secretions



Trached children lose the ability to humidify the air
Loss of cough



Discussion

- This child has an obstructed tracheostomy tube, a common complication of tracheostomy tube placement
- Usually due to mucus plugging
- Caregivers will often have attempted to clear tracheostomy prior to 911 call

What are your management priorities now?

Treatment Priorities



- Suction the tracheostomy tube
 - Instill 2 ml normal saline into tube prior to suctioning




Treatment Priorities




- If no chest rise after suctioning tube, immediately remove and replace the tracheostomy tube





Treatment Priorities



- Attempt to ventilate again
- If no chest rise, remove tracheostomy tube
- Begin BVM ventilation over the mouth, while partner covers stoma
- If no chest rise, ventilate using small mask over the stoma
- Consider ET placement via stoma or orally
- Rapid transport



Treatment Priorities



- Parents may have replacement tracheostomy tube
- Endotracheal tube may be substituted
 - Use tube of same internal diameter as tracheostomy tube
 - Insert into stoma 1/2 the length used for oral intubation
- Begin bagging via the newly inserted tube

Oxygen Delivery

- With Tracheostomy in place
 - Note: double lumen tubes need to have the inner cannula in place to attach a Bag-Valve device
 - Blow by
 - Direct to Tracheostomy tube:
 - Mask to tracheostomy tube or stoma:
 - Mask to mouth:
- With Tracheostomy removed
 - Mask to stoma
 - Mask to mouth
 - Intubation of the stoma
 - Oro-tracheal intubation

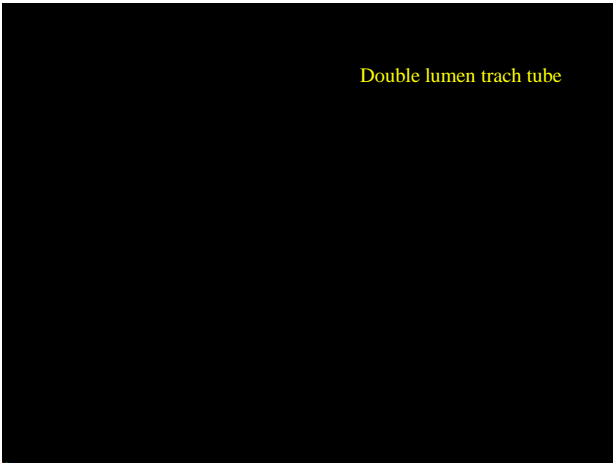


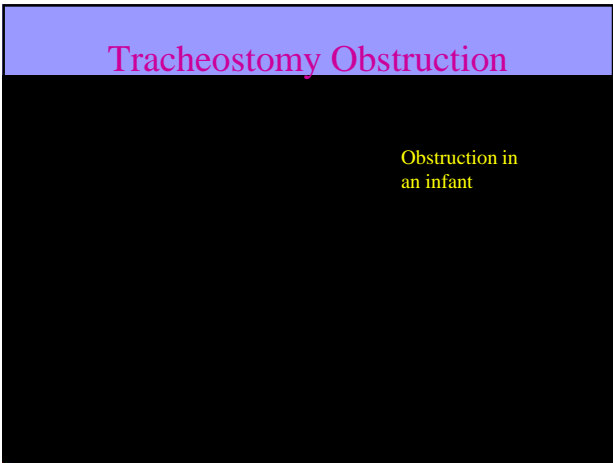
Tracheostomy Disasters

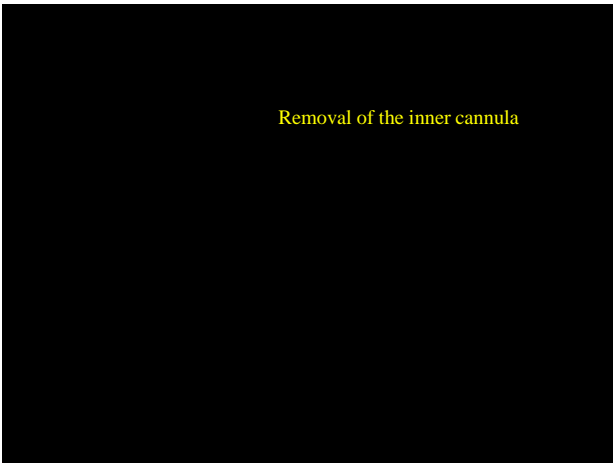
- Acute dislodgment
- Tube obstruction



Single lumen tube













- Tracheostomy tube suctioned
- Good chest rise with bagging
- HR decreases to 90 beats/min
- Child becomes alert and interactive

*This child also has a feeding tube in place.
What are some potential complications of this device?*

Feeding Tubes

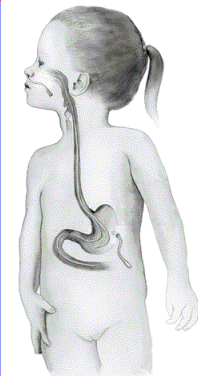


- A feeding tube is used for nutritional supplementation when the child cannot take adequate nourishment by mouth
- Common complications include:
 - Dislodged tube
 - Leakage of stomach/bowel contents around the tube
 - Infection of the insertion site

Feeding Tubes

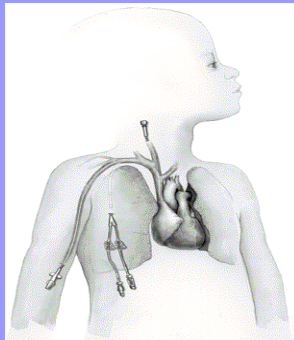
- Nose to the stomach
 - NG or nasogastric tube
 - NJ or nasojejunal tube
- Directly into the stomach
 - G or Gastrostomy tube
- Directly into the jejunum

Never (rarely) use feeding tubes to give fluids or medications



Central venous catheters and Feeding tubes

- List three complications related to central intravenous catheters
- list two types of feeding catheters and their locations on the body
- describe the assessment for intravenous and feeding catheters





Types of Central Catheters

- Central Venous Catheters
 - PICC
 - Breviac
 - Hickman
 - Infusaports
 - Portacaths

Can you utilize these lines for a resuscitation?

Complications related to central venous catheters

- Air embolism
- migration of the catheter
 - further into the heart - **arrhythmias**
 - catheter may pull out of vessel and end up in the pleural space - **effusion**
- infection
- adverse effects from the infusate its self

Cerebrospinal fluid (CSF) shunts

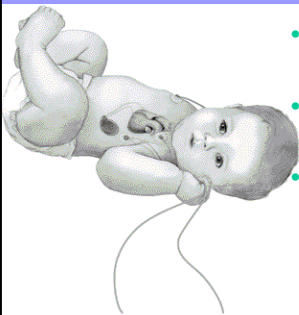


- Define a cerebrospinal fluid shunt
- list three points related to the patient's condition that should be assessed for a child with a CSF shunt
- describe the appropriate interventions for a child showing signs of CSF shunt malfunction

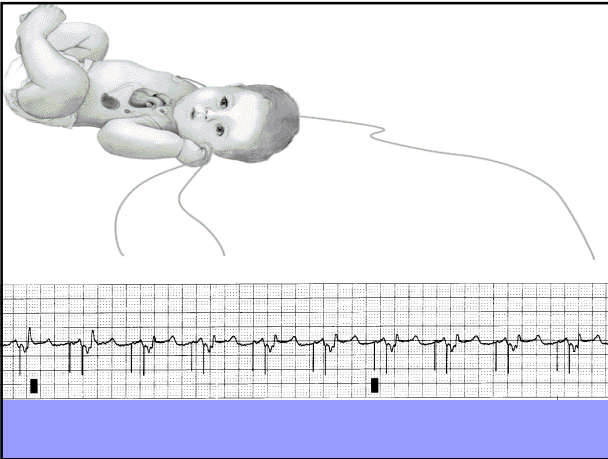
Special Considerations for CSF Shunts

- Assess the patient for complications related to airway, breathing, and circulation
- Assess for Fever
 - evaluation by a physician is essential if the child has a fever

Artificial Pacemakers




- Describe the indications for an artificial pacemaker
- describe the EKG wave form of a pacemaker
- describe the environmental exposures that may cause a pacemaker malfunction





Conclusion



- CSHCN encounters are becoming more common.
- Baseline assessment requires assistance and information from the caregiver.
- Technology-assisted children may present with complications unique to the presence of indwelling devices.
- Enlist assistance of caregiver
- Establish baseline functional status
- Establish baseline medical status
- Have a low threshold for transport