Airway Indications for a Tracheostomy and Tubes

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Topics

- Indications for tracheostomy tubes
 - congenital upper airway obstruction
 - acquired upper airway obstruction
 chronic aspiration
- Types and sizing of tracheostomy tubes
- Developmental considerations

Indications for a Tracheostomy Upper Airway Obstruction Congenital

- Congenital Craniofacial Syndromes
- Other congenital syndromes
- Blockage from polyps, tumors, or cystic hygromas
- Malacia of trachea or bronchi
- Vocal cord paralysis

Indications for a Tracheostomy Upper Airway Obstruction Congenital Craniofacial Syndromes Abnormalities of midfacial area

- abnormalities in the growth of the skull and facial bones
- choanal (nasal) atresia or stenosis
 - infants are obligate nose breathers

• relative small mandible (lower



jaw) • relatively large tongue

Indications for a Tracheostomy Upper Airway Obstruction Congenital Craniofacial Syndromes

- Pierre Robin sequence
- Treacher Collins
- Goldenhar
- Nager



http://tracheostomy.com/trachkids/

Indications for a Tracheostomy Upper Airway Obstruction Congenital Craniofacial Syndromes

Surgical placement of Mandibular lengthening devices







Indications for a Tracheostomy Upper Airway Obstruction Congenital Syndromes

- Down's Syndrome
 upper airway obstruction
- CHARGE syndrome - choanal stenosis



Indications for a Tracheostomy Upper Airway Obstruction Congenital Defects

Blockage from

- polyps,
- tumors,
- hemangiomas
- cystic hygromas



Indications for a Tracheostomy Upper Airway Obstruction Congenital Malacia

- Malacia of larynx, trachea, or bronchi
- Softening of the cartilage resulting in collapse of the airway



Indications for a Tracheostomy Upper Airway Obstruction Acquired Causes

- Vocal cord paralysis
- Subglottic stenosis from intubation
- Injuries or burns to the head/neck that cause airway swelling

Indications for a Tracheostomy Upper Airway Obstruction **Acquired Causes**

·Vocal cord paralysis Unilateral vocal cord paralysis.

abduction.



On right: Larynx in adduction, showing paralyzed vocal cord *(arrow)*.

Indications for a Tracheostomy Upper Airway Obstruction

Acquired Causes

•Subglottic stenosis from intubation



After repair with rib graft



Indications for a Tracheostomy Upper Airway Obstruction Acquired Causes

- Injuries head/neck
 - Thermal burns
 - Chemical caustic ingestion
 - Blunt trauma
 - Motor vehicle accident
 - · Snowmobile/ ATV



Tend to be school aged boys

Indications for a Tracheostomy Chronic Aspiration

Recurrent pneumonia

- Inadequate ability to swallow oral secretions
- Impaired nasopharyngeal control
- Associated with developmental delay, CP, and seizure disorder



Indications for a Tracheostomy Chronic Aspiration

Laryngotracheal separation

- Surgical separation between the larynx and trachea
- Tracheostomy stoma is the only airway



Types of Tracheostomy Tubes Parts of a Tracheostomy Tube

• An adaptor

- the portion of the trach tube seen on the outside of the patient's neck between the flanges

• Flange

- Tube
- Obturator





Types of Tracheostomy Tubes Sizing of a Tracheostomy Tubes Variable sizes & styles Consider Length Internal diameter External diameter Curvature

ww.ich.ucl.ac.uk/factsheets/families/F000305/trac1.htm

Types of Tracheostomy Tubes

Sizing of a Tracheostomy Tube

- Length
- Neonatal pediatric or adult tube
- Internal diameter
 - Measured in mm for neonatal and pediatric sized tubes
- External diameter
 - Larger with a double cannula tube
- Curvature
 - Need to avoid touching the posterior wall of the trachea



Types of Tracheostomy Tubes Jackson Metal

- All have inner cannula can be cleaned
- Needs special adaptor to connect to a
- ventilator or resuscitation bag • Can be sterilized & used for several

patients •May be hard on the airway •Very durable



Types of Tracheostomy Tubes Plastic Tracheostomy Tubes

- No inner cannula for smaller neonatal and pediatric sizes
- One patient use
- Universal adapter for resuscitation bag or ventilator
- More flexible

Types of Tracheostomy Tubes Plastic Tracheostomy Tubes

Shiley[®]

- most common
- PVC Plastic



Types of Tracheostomy Tubes Plastic Tracheostomy Tubes

• Bivona®

- Silicone plastic with wire coil
- More flexible
- Swivel attachment
- wedge to remove for cleaning



Types of Tracheostomy Tubes Double Cannula • Available on adult trach tubes





Types of Tracheostomy Tubes Cuffed Tube

- Additional parts
 - Cuff, pilot balloon, and a pilot line
- Indications
 - To try to limit aspiration
 - Chronic nocturnal ventilation
 - High pressure ventilation



Types of Tracheostomy Tubes Cuffed Tube

- Complications
 - Tracheomegaly
 - Tracheal stenosis
 - Trachea perfusion compromise



Types of Tracheostomy Tubes Air Cuffed Tube (high volume/low pressure)

- DO NOT use minimal leak techniques
- Maintain cuff pressure < 20 cm of H2O





Shiley ® Cuffed Pediatric

Bivona® Aire-Cuf® Neonatal and Pediatric Silicone Tracheostomy Tubes

Types of Tracheostomy Tubes Tight to Shaft Cuffed Tube

(high pressure/low volume) Bivona® tight-to-shaft, inflated with water

Sivona tight-to-shaft, inflated with wate - Do not inflate to occlusion

• Optimal inflation is less than minimal diameter of the trachea

<u>Unable to</u> determine transtracheal pressure

Bivona® TTS™ Cuffed Neonatal and Pediatric Silicone Tracheostomy Tube

The TTS™ tube is like an uncuffed tube, but it has a cuff. When completely deflate it collapses tight to the shaft of the tube.

Types of Tracheostomy Tubes Foam Cuffed Tube

(high volume/low pressure)

•Remove air before insertion

•Pilot balloon kept open to manage pressure



Fome-Cuf® tubes are a unique problem-solver that is used to address extremely difficult airway management problems.

These tubes are ideal when long-term ventilator support is indicated

Cuff Leak

- Signs
 - Frothy and thinner secretions or signs of recently eaten food
 Increased vocalization

 - Low pressure alarm or airway pressure readings decreased on vent
 - Pilot balloon is flat or air can't be withdrawn from cuff

Intervention

- Withdraw any air or fluid from the cuff. Then instill the prescribed volume.
 Change trach if any of the above signs reoccur.



Developmental Issues for Newborns

- Parents need to grieve the loss of the "Gerber Baby"
- May be first child for parents
- May delay normal development
- Child unable to cooperate



Developmental Issues for Toddlers/Pre-schoolers

- Increasing mobility
- Desire for independence
- Need to explore
- Other children
- Environmental concerns
- Educational system



Developmental Issues for School Aged Children

- Body image
- Integration into school
- Communication







Developmental Issues for Adolescents

- Self cares
- Body image
- Increasing independence
- Transition to adult services



Key Points: Indications & Types of Tubes
It is critical to know the reason a child has a tracheostomy as it may impact the care of the child
There are a variety of tracheostomy tubes that may be used by children
Know the brand, length, and size of the tube
Remember developmental considerations