Airway Clearance

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Topics

Suctioning and suctioning equipment

Medications to facilitate airway clearance

Bronchial hygiene modalities

Preparing for suctioning

Why: does the child have a trach or why does the child need a ventilator?

How: often is the child suctioned? do the secretions normally look?

What: signs indicate a need for suctioning? is the child’s oxygen requirement? size tracheostomy tube? size suction catheter? depth to suction? pressure setting on the suction machine? use of manual resuscitation?
When to Suction: Signs/symptoms

- Noisy, visible secretions "rattling in the chest"
- High pressure alarm sounds on ventilator, lower oxygen saturation levels on pulse oximeter
- Child acts anxious or asks to be suctioned
- Respiratory distress, cough, breathing hard, diaphoresis, color change, retractions, nasal flaring, coarse breath sounds
- Vital sign changes: High heart rate, change in respiratory rate
- Child specific signs that suctioning is needed

When to Suction: Frequency

- Frequency based on clinical assessment
- No secretions: minimum suctioning twice each day to evaluate tube patency
- Special cases:
  - Increased frequency
  - Respiratory infection
  - Increased activity

Suction Machine

- Recommended pressures:
  - Infants: 60-80 mm Hg, 5-10 inches Hg
  - Children: 80-100 mm Hg, 5-10 inches Hg
  - Teen/Adults: 100-120 mm Hg, 10-15 inches Hg
- Is part of emergency “Go-Bag”
- Internal battery lasts approximately 45 minutes
How to suction: Sterile vs Clean Technique

- Sterile technique used in the hospital setting
- Clean used in the home setting

How to suction: Suctioning technique

- Apply suction pressure on insertion and withdrawal.
- Twirl the catheter when inserting and withdrawing to effectively suction the tube wall

How to suction: Depth

Definitions
- Shallow
- Pre-measured
- Deep
How to suction: Pre-measured depth
- Prevent internal granulomas
- Measure the catheter so that distal side holes are just past the tip of the tracheostomy tube
- Reference guide showing depth

How to suction: Oxygenation/hyperventilation
- Apply suction for less than 5 seconds
- Allow child to rest for 10 seconds after each suctioning pass
- Use manual resuscitation device to give breaths after the first suctioning pass for children on ventilators, or on oxygen or if ordered.

How to suction: Saline use
- Reasons for use
  - stimulate a cough
  - loosen secretions
  - lubricate catheter
- Possible problems
  - oxygen desaturation
  - poor mixing with mucus
  - contamination
How to suction:
Saline use

- **Consensus**
  - Routine use of normal saline is **NOT** recommended
  - Maintain adequate humidification
  - Use 1-3 ml

How to suction:
Supplies and Equipment

- Suction machine with bottle, gauge and connecting tubing
- Appropriate size suction catheter
- Clean gloves
- Clean paper or plastic cup with sterile water
- Clean paper or plastic cup with solution to clean catheter
- Catheter storage container

Suctioning a Child on a Ventilator
Complications of Suctioning

1. Granuloma
   Measured suction catheter
2. Bleeding/Bronchospasm
   Avoid suctioning mucosa
   Hyperinflate/oxygen during/end of suctioning
   Hyperinflate/oxygen between suction passes and at the end of suctioning
   Suction for less than 5 seconds and allow for recovery

Assessment of Secretions

- **Color**: Change due to: Infection (yellow in AM common)
- **Blood tinged**: Suctioning too deep; Granuloma, pneumonia, arterial bleed
- **Consistency**: Change due to: Inadequate humidification, infection or dehydration
- **Odor**: Change due to infection
- **Amount**: Increased amount may indicate infection

Key Points:
Airway clearance: Suctioning

- Clean technique in home setting
- Suction both on insertion and removal of the catheter, twirling the catheter
- Suction less than 5 seconds per pass; allow child to rest for 10 seconds between passes
- Oxygenate/ventilate between passes
- Assess the color, odor, quantity and consistency of the secretions
Medications to Facilitate Airway Clearance

- Bronchodilators (Albuterol, Atrovent)
- Inhaled steroids (Pulmicort)
- Mucolytics (Mucomyst, Pulmozyme)

Bronchial Hygiene Modalities

- Chest Physiotherapy
- Postural Drainage

Assists in movement of secretions out of the lungs
**Bronchial Hygiene Modalities**

**Intrapulmonary Percussive Ventilation (IPV)**
- Delivery of nebulized medication using pneumatic interface
- High flow mini bursts of air
- Phasitron

**Cough Assist**
- Improves ineffective cough
- Positive pressure rapidly shifts to negative pressure simulating a cough

**Vest Therapy**
Key Points:
Modalities for Airway Clearance

- Suctioning
- Vest
- Mediations
- Cough Assist
- IPV
- Chest Physiotherapy