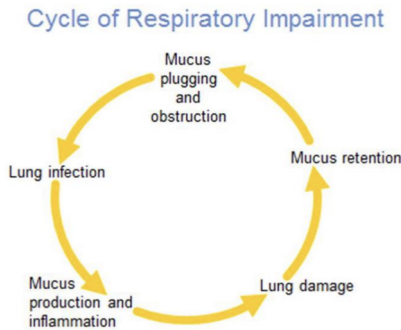


Airway Clearance

What is airway clearance, and how does it work?

- Prevents the cycle below by assisting secretion, mobilization, and expectoration in multiple ways:
 1. Pushing air behind mucus
 2. Loosening secretions from small airways
 3. Mobilizing secretions through the smaller airways to larger airways
 4. Clearing secretions from the central airways



***Pro-Tip*:** Try giving airway clearance in the following order -

1. Albuterol [open up airways]
2. Hypertonic saline [thin secretions]
3. Airway clearance therapy device [stimulate patient to cough out secretions]
4. Inhaled ABx or ICS [after secretions have been cleared]

Goal	Therapy	Mechanism of Action	Notes
Thinning and moving secretions via frequencies, percussions, vibrations	Chest Physical Therapy (CPT) or Postural Drainage and Percussion	Percussor applies external force to loosen mucus and increase peak expiratory flow to move secretions to larger airways.	Easily done outpatient.
	Vest Therapy	Patient wears a vest/jacket, which vibrates secretions from peripheral airways towards the mouth.	Expensive for home use.
	IPV (Intrapulmonary Percussive Ventilator)	Superimposes high-frequency bursts of air on a patient's intrinsic breathing pattern. Creates internal vibration in lungs.	Must use mouthpiece or artificial airway.
Combined secretion movement & volume expansion/PEEP	Oscillatory Positive Expiratory Pressure (PEP), ie: Acapella	Combines PEP with high-frequency oscillations. Uses resistance to open the airways and loosens secretions, and moves secretions from smaller to larger airways.	Easy, inexpensive, needs cleaning.
Secretion clearance/cough augmentation	Cough Assist	Applies positive pressure to the airway and rapidly shifts to negative pressure. Stimulates or simulates natural cough.	Best when patient can cough on demand.
Lung recruitment and overall increase in capacity	Incentive Spirometry	Trains patients to take slow, deep breaths.	Often preventative.
	Stacked Breaths	Patient repeatedly inhales and is unable to exhale.	<i>Not available at UC.</i>

Medications:

- Albuterol: Bronchodilator, can be used for bronchoconstriction or bronchospasms (often scheduled AND prn)
- Normal saline: Thins secretions by diluting mucus
- Hypertonic saline: Thins secretions by adding salt to the airways and moving water into the mucus (3% or 7%, although 7% may make secretions too thin to suction)
 - *Pre-treat with bronchodilator to avoid bronchospasms*
 - *Overuse may cause irritation to the airways. Alternate hypertonic and normal saline to avoid irritation.*

Contraindications to airway clearance:

- Post-op patient (ie: recent GT or JT placement): vest may cause irritation
- May not be tolerated in a patient with frequent vomiting

Adapted from the Cincinnati Children's Complex Care Team Resource Guide, CCHMC "Antibiotic Treatment and Airway Clearance Management in Patients with Neurologic Impairment" (Warniment, Smith, Gronauer), UpToDate

Ordering Airway Clearance at UCMC

How do I order?

Clearance Technique	Order Name (UCMC)	Typical Starting Freq
Chest Physiotherapy	Chest physiotherapy	BID
Postural Drainage and Percussion	Chest percussion (aka Postural Drainage and Percussion), P&PD	BID
Vest Therapy	Vest Therapy	BID
IPV	Int Percussive Ventilation (aka Secretion Clearance)	BID
Oscillatory PEP	Acapella treatment (aka Secretion Clearance Treatment)	BID
Cough Assist	Inexsufflator (aka Cough Assist)	TID
Incentive Spirometry	Incentive spirometry	At bedside

Medication	Typical Dose	Typical Starting Freq	Notes
Albuterol nebs	2.5 mg	RT every 4-6 hours scheduled or PRN	Can cause tachycardia. Can also use an inhaler with a spacer instead of a neb.
NaCl 0.9% nebs	3mL vs. 5mL vs. 15mL	RT every 6-12 hours	Every 12 hours if alternating with hypertonic saline nebs.
NaCl 3% nebs	4mL	RT 2 times daily	Currently 3.5% d/t national shortage. Can be irritating if used too frequently.
NaCl 7% nebs	4mL	RT 2 times daily	Search "Misc Medication to be administered by RT"

General rule of thumb: If a patient has underlying airway clearance, typically start home airway clearance at TID (minimum). Can increase from home airway clearance with acute illness. If no underlying airway clearance AND has ineffective cough, significant secretions, difficulty mobilizing secretions, and/or persistent atelectasis, generally initiate new AC at BID.

Work with RTs in making these decisions!