

Cough Treatment

- Cough is a symptom of an underlying illness; it is a useful protective reflex elicited by:
 - a- Mechanical stimulation** of large respiratory passages, by foreign bodies or inflammatory debris.
 - b- Chemical stimulation** of alveoli.
After receptor activation, impulses are carried through afferent vagal nerves to a medullary center to initiate deep inspirations, followed by strong expiratory effort against closed glottis leading to increased pressure in the airways. Glottis suddenly relaxes, mouth opened, and the air is released at high pressure.

- Cough is one of the most common reasons patients see physicians, it might indicate:
Exhaustion // Insomnia // Musculoskeletal pain // Hoarseness of voice // Urinary incontinence // Dizziness, headache, syncope // Nausea, vomiting, retching, and anorexia // Fear of cancer, AIDS, or TB.

- **Specific Treatment of Cough**: Directed on the etiology or pathophysiological mechanism:
 - Bronchial Asthma.
 - Postnasal drip due to sinusitis.
 - Postnasal drip due to allergic or perennial non allergic sinusitis.
 - Chronic bronchitis.
 - Gastroesophageal Reflux (GERD).
 - Sarcoidosis.
 - Congestive heart failure.
 - ACEI-induced cough.

- **Nonspecific Treatment of Cough**: Directed at the symptom; indicated when definitive therapy cannot be given either because:
 - a-** The cause is unknown
 - b-** Definitive therapy did not have the chance to work or will not work (e.g. cancer metastatic to lung).

- **Drug treatment is divided into two main categories**: (which we will discuss)
 - a- Antitussive Drugs**: therapy that controls, inhibits or eliminates cough. Useful to suppress intensity and frequency of coughing when it is unproductive and distressing. Can be aimed at:
 - Mucociliary factors.
 - Afferent limb.
 - Cough center.
 - Efferent limb.
 - Respiratory skeletal muscles.
 - b- Protrusive Drugs**: therapy that makes a cough more effective.

1- Antitussive Therapy

a- Drugs that may alter mucociliary factors

Mechanism: Increase the volume of the secretions // Change the consistency of mucus (i.e. Mucolytics) // Increase mucociliary clearance.

Drug	Notes
Ipecacuanha and Squill	<ul style="list-style-type: none"> - Natural products which have direct effects on the CNS and locally to cause emesis, which is preceded by increased secretions.
Volatile oils	<ul style="list-style-type: none"> - They have a direct action on bronchi (e.g. lemon, anise, pine).
Iodinated glycerol	<ul style="list-style-type: none"> - Excreted through the bronchial glands; it stimulates secretions directly. - Widely used but have doubtful efficacy. - It can cause congenital hypothyroidism; therefore, it is contraindicated in pregnancy and during lactation.
Bromhexine	<ul style="list-style-type: none"> - Increases lysosome activity leading to increased enzyme secretion and hydrolysis of mucopolysaccharides.
Carbocisteine	<ul style="list-style-type: none"> - An aerosol that works through its SH group to reduce disulfide bonds in mucoproteins leading to enhancement of flow. - May irritate the airways in some sensitive patients.
Others	<ul style="list-style-type: none"> - Combination of H1-histamine antagonist and a decongestant. - Ammonium chloride. - Hydration: either orally or intravenously. - Ipratropium bromide. - Beta-adrenergic agonists. - Theophylline. - Sodium cromoglycate. - Beclomethasone

b- Drugs acting on the afferent limb

Drug	Notes
Local anesthetics	<ul style="list-style-type: none">- Lidocaine applied topically, has a transient antitussive effect.- Intravenously could have a central effect.
Opioids	<ul style="list-style-type: none">- This is besides their primary central effect

c- Drugs acting on the efferent limb

Drug	Notes
Ipratropium Bromide	<ul style="list-style-type: none">- Given as an aerosol.- Effective for asthma, chronic bronchitis, and persistent cough following URTI.- Can also have effects on cough receptors by altering mucociliary factors

d- Drugs acting on the cough center

Drug	Notes
Narcotics	<ul style="list-style-type: none">- Codeine: Is the standard, it is recently found that it's not more effective than syrup. May have demulcent activity (<i>relieves irritation of the mucous membranes</i>).- Diamorphine.- Morphine.
Non-narcotic	<ul style="list-style-type: none">- Dextromethorphan.- Glaucine.- Diphenhydramine.- Pholcodine

e- Drugs acting on the respiratory skeletal muscles

Drug	Notes
Nondepolarizing blockers	<ul style="list-style-type: none">- Pancuronium: may be considered in patients who cannot be mechanically ventilated because of uncontrollable spasms of coughing.

2- Protrusive Therapy

- This treatment increases cough effectiveness with or without increasing cough frequency.
- They either increase superficial velocity or alter mucus factors.
- Indicated when cough performs a useful function and needs to be encouraged (e.g. bronchiectasis, cystic fibrosis, pneumonia and postoperative atelectasis).

Drug	Notes
Hypertonic Saline Aerosol	- Improves cough clearance but not pulmonary function or subjective assessment.
Amiloride Aerosol	- For cystic fibrosis .
Bronchodilators	- However, with too much relaxation, flow rates may actually decrease .

Mechanical Measures
<ul style="list-style-type: none">- Positive insufflation followed by manual compression of the lower thorax and abdomen.- Abdominal push maneuver to assist expiration.- Combining abdominal binding and muscle training of the clavicular portion of the pectoralis major.- Combination of positive expiratory pressure and chest physiotherapy in patients with chronic bronchitis.