

TREATMENT OF COUGH



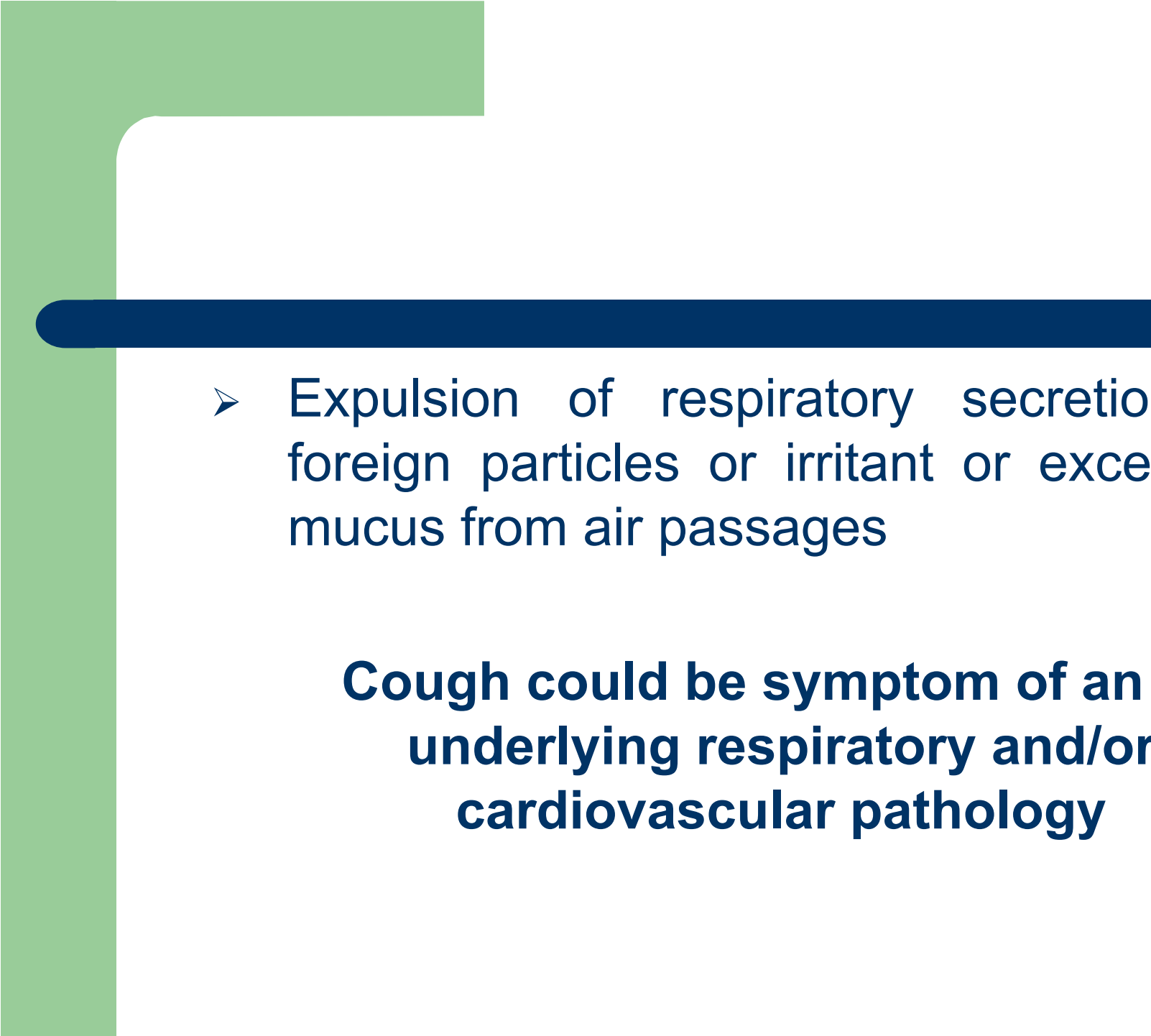
COUGH

**Forceful release of
air from lungs**

Sudden, often
involuntary
(protective) reflex
and major
defensive
mechanism

Cont.....



- 
- Expulsion of respiratory secretion or foreign particles or irritant or excessive mucus from air passages

**Cough could be symptom of an
underlying respiratory and/or
cardiovascular pathology**

Mechanism of cough

Stimulation of mechano-or chemoreceptors (throat, respiratory passages or stretch receptors in lungs)



Afferent impulses to cough centre (medulla)

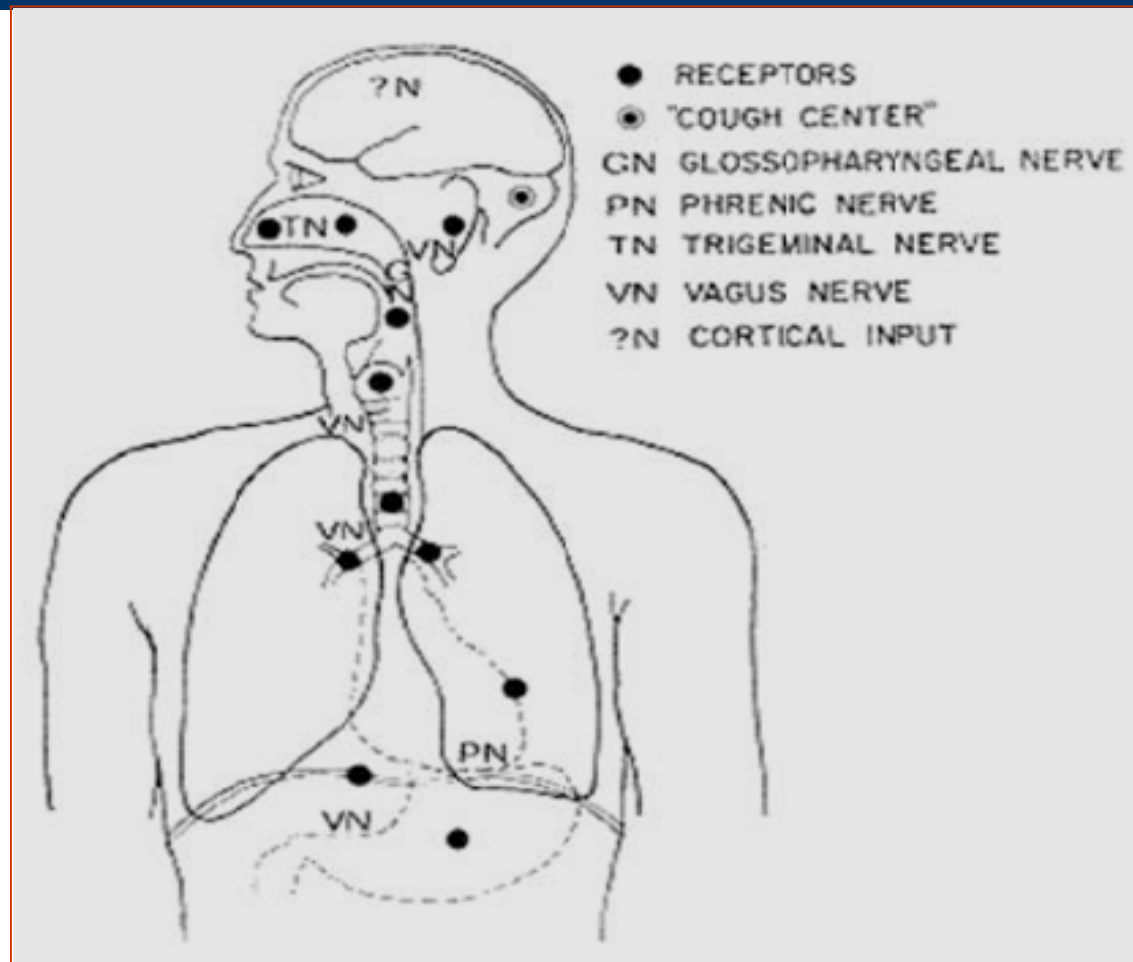


Efferent impulses via parasympathetic & motor nerves to diaphragm, intercostal muscles & lung



Increased contraction of diaphragmatic, abdominal & intercostal (ribs) muscles \Rightarrow **noisy expiration (cough)**

Cough Reflex



Types of cough

- A) Acute cough =lasting<3 weeks
- B) Chronic cough =lasting >8 weeks

Cough may be

- i) Un productive (dry) cough **OR**
- ii) Productive cough (with sputum)

cont.

Most common causes of cough

- **Common cold**
- **Upper/lower respiratory tract infection**
- **Allergic rhinitis**
- **Smoking**
- **Chronic bronchitis**
- **Pulmonary tuberculosis**
- **Asthma**
- **Gastroesophageal reflux**
- **Pneumonia**
- **Congestive heart failure**
- **Bronchiectasis**
- **Use of drugs** (e.g., Angiotensin-converting enzyme inhibitors)

Treatment of Cough

- 1) **Antitussives** (cough centre suppressants)
- 2) **Expectorants** (Mucokinetics)
- 3) **Mucolytics**
- 4) **Pharyngeal Demulcents**
- 5) **Antihistamines**
- 6) **Bronchodilators**



1) Antitussives (cough centre suppressants)

Drugs suppress cough & produce symptomatic relief

MOA

Mainly suppress cough centre in medulla (but have both central & peripheral effects)

E.g., **Opoid drugs** (codeine, pholcodeine, noscapine, dextromethorphan)

Opoid drugs = most effective for cough

i) Codeine

- Codeine= prodrug \Rightarrow metabolized to morphine
- It is an alkaloid found in
- Has less addiction+
- resp. centre depressant \downarrow
- Has useful antitussive action at low doses (<15 mg)
- Produce drowsiness, thickening of sputum & constipation

Opium poppy



ii) Noscapine & Pholcodeine

- Derived from *Opium poppy*
- Related to papaverine
- Do not have addictive, analgesic & constipating properties
- Noscapine (15 mg) & pholcodeine (10 mg)=syrup \Rightarrow relief for 4-6 h

iii) Dextromethorphan

Antitussive drug; available in syrup, tablets, spray forms

MOA

NMDA receptor antagonist

Uses

Cough suppressant, temporary relief of cough caused by minor throat & bronchial irritation (accompanies with flu & cold), pain relief

Ad Effects= Nausea, vomiting, drowsiness, dizziness, blurred vision

2) Expectorants (Mucokinetics)

- Act peripherally
- Increase bronchial secretion

OR

- Decrease its viscosity \Rightarrow facilitates its removal by coughing
- Loose cough ► less tiring & more productive

E.g., Na^+ & K^+ citrate or acetate, Guaifenesin (glyceryl guaiacolate), Ammonium salt

i) Sodium & potassium citrate or Acetate

- **They act directly**

Actions: ▲ Bronchial secretion by salt action

ii) Guaifenesin

- Expectorant drug usually taken by mouth
- Available as single & also in combination form

MOA

Increase the volume & reduce the viscosity of secretion in trachea & bronchi

3) Mucolytics

Help in expectoration by liquefying the viscous tracheobronchial secretions

E.g., *Bromhexine, Acetylcysteine,*

i) Bromhexine

Synthetic derivative of **vasicine** (alkaloid= *Adhatoda vasica*)

Cont....

MOA of Bromhexine

- a) Thinning & fragmentation of mucopolysaccharide fibers
- b) ↑ volume & ↓ viscosity of sputum (*Adhatoda vasica*)

ii) Acetylcysteine

Has to be given directly into respiratory tract



MOA of acetylcysteine

Opens disulfide bond in mucoproteins of sputum = ↓ viscosity

Uses

- Cystic fibrosis (to ↓ viscosity of sputum)
- Onset of action quick---used 2-8 hourly

Adverse effects Nausea, vomiting, bronchospasm in bronchial asthma

4) Pharyngeal Demulcents

- Soothe the throat (directly & also by promoting salivation)
 - ❖ ▼ afferent impulses from inflamed/irritated pharyngeal mucosa + provide protective coating over irritated pharyngeal mucosa
 - ❖ Provide symptomatic relief in dry cough arising from throat
- E.g. lozenges, cough drops, glycerine, liquorice, honey

5) Antihistamines (H1)

- Added to antitussives/expectorant formulation
- Due to sedative & anticholinergic actions produce relief in cough but lack selectivity for cough centre
- No expectorant action = ▼ secretions (anticholinergic effect)
- Suitable for allergic cough (not for asthma)

E.g., *Chlorpheniramine*, *diphenhydramine*,
promethazine

6) Bronchodilators

- ❑ Bronchospasm or stimulation of pulmonary receptors = induce or aggravate cough + bronchoconstriction
- ❑ e.g. β_2 -agonist (salbutamol, terbutaline) & ipratropium

MOA of bronchodilators in cough

- ❑ ▲ surface velocity of air flow during cough → Clear secretions of airway
- ❑ Not used routinely for every type of cough but only when bronchoconstriction is present

Specific treatment approach to cough

Etiology of cough

- 1) Upper/lower respiratory tract infections
- 2) Smoking/chronic bronchitis
- 3) Pulmonary tuberculosis
- 4) Asthmatic cough
- 5) Postnasal drip (sinusitis)

Treatment

Appropriate antibiotics

Cessation of smoking

Antibiotics

Inhaled β 2-agonists/ipratropium/corticosteroid

Antibiotics, nasal decongestant, antihistamines