



Coughing Physiology

By: Majid Ravanbakhsh PhD,PT

Jundishapour Ahvaz University of Medical Sciences

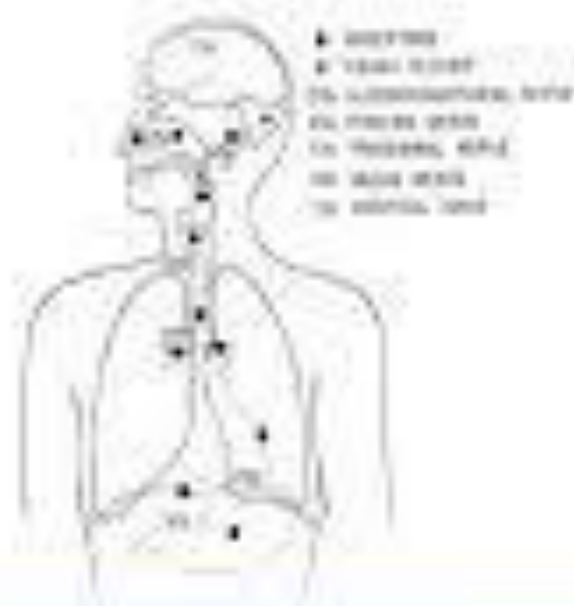


What is Cough?

‘A Cough is a forced expulsive manoeuvre, usually against a closed glottis and which is associated with a characteristic sound’



Schematic Representation of the Anatomy of the Cough Reflex



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

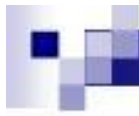


Increased contraction of diaphragmatic, abdominal & intercostal (ribs) muscles \Rightarrow **noisy expiration (cough)**



Concept

- ✓ A protective reflex act
- ✓ clean excessive secretion & foreign material
- ✓ Initiated by miscellaneous stimuli or by voluntary exertion.
- ✓ The most common respiratory symptom.
- ✓ Severe cough is a serious clinical problem.



Cough reflex

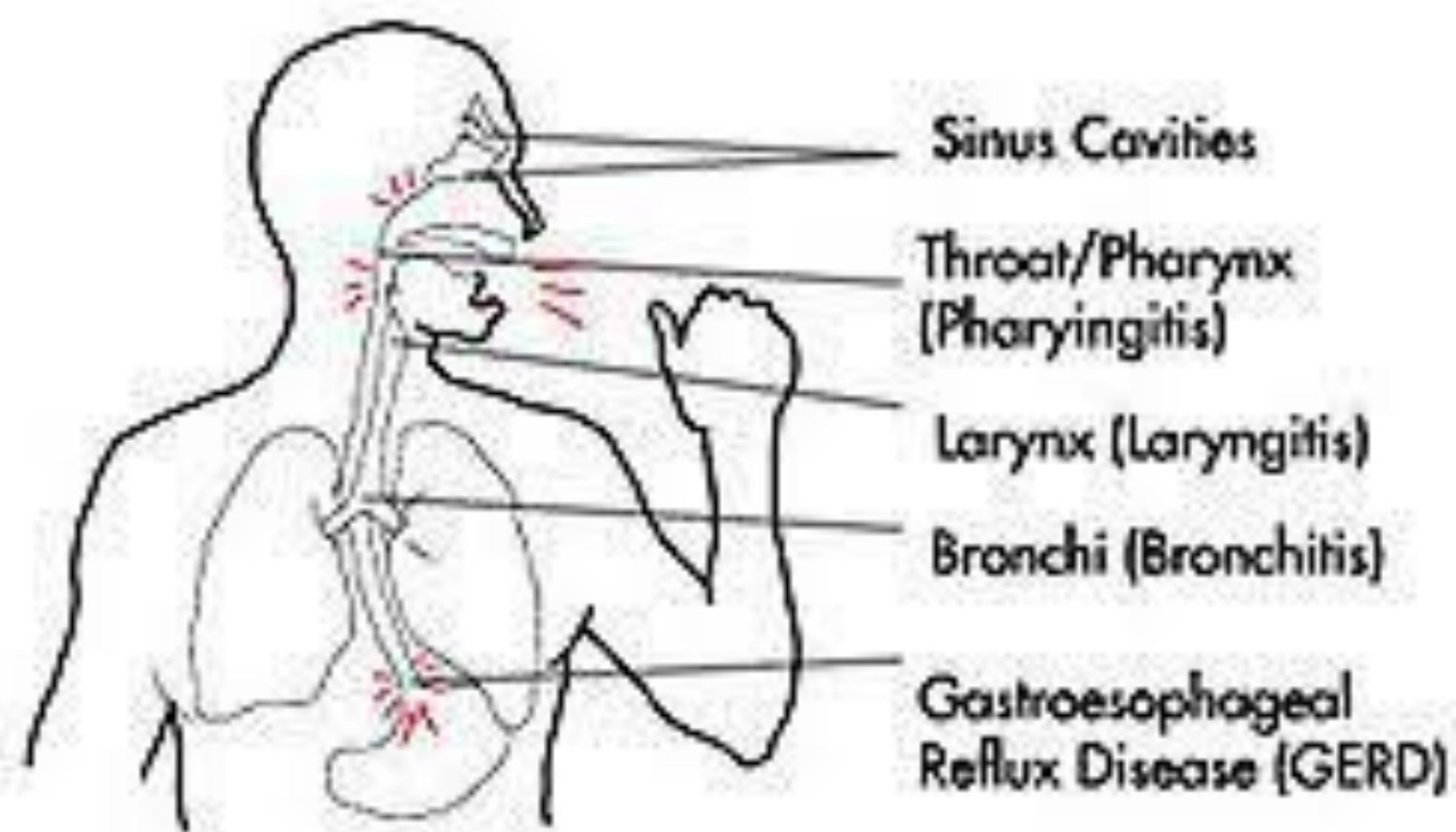
- Afferent inform.from: larynx, trachea, bifurcation of the bronchi
- Irritant type: mechanical, chemical, inflammation
- Afferent fibers are in the vague nerve

→ cough center.



Cough reflex

- Efferent signals →
larynx, muscles of diaphragm, chest wall, abdomen
- A coordinated series of movement complete the cough. Deep **inspiration** – **expiration effort** with **glottis closed-glottis open abruptly** – high velocity of **airflow** brings out screations from airways.



Causes of Cough



Influencing factors

- **Suppressed afferent or efferent nerve function**
- **Failed glottis function (laryngopharynx dis)**
- **Diminished muscle force**
- **Obstructed airway seen in severe COPD**
- **Trachea intubation**
- **Chest or abdominal pain limit cough movement**

Chronic cough causes



Smoking



Postnasal drip



GERD or Acid reflux



Asthma



COPD or Chronic
bronchitis



Pneumonia or
Acute bronchitis



Medications for controlling the
high blood pressure such as ACE Inhibitors



Causes

- **Airway stimulation by chemicals & foreign material (smoker & occupational exposure)**
- **Airway infection & inflammation**
- **Lung parenchyma disorders**
- **Pleural & chest wall disorders**
- **Cardiovascular abnormalities**
- **Other causes Psychiatric cough**

Reasons for cough



**Allergy/
asthma**


**Smoking &
GERD**

**Exposure to
pollution**

**Respiratory
tract infections**



classify

- Non production (dry cough)
 - Production (with sputum)
- 
- Acute
 - Chronic or acute on chronic

Causes of Dry and Wet Coughs

Dry Cough

- Asthma
- Cold
- GERD
- Sleep apnea
- Vocal cord dysfunction
- Allergies
- COVID



Wet Cough

- Cold
- Flu
- Lung infection
- Cystic fibrosis
- COPD
- Acute bronchitis
- Bronchiectasis





Clinical appearance in common diseases

- **Acute respiratory infection or exacerbation of chronic infectious illnesses**
- **Neoplasms**
- **Pleural disease**
- **Cardiovascular diseases**
- **General disease affecting the respiratory system**
- **Chronic cough: postnasal drip syndrome, cough type asthma, smoker, occupational exposure**

Cough - History



Richard Irwin, NEJM, Volume 343, Dec 7, 2000

CLASSIFICATION

Acute cough

~ maximum of
3 weeks

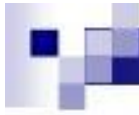
Subacute cough

~ 3 to 8
weeks

Chronic Cough

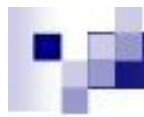
~ more than 8
weeks

De Blasio et al. Cough 2011, 7:7



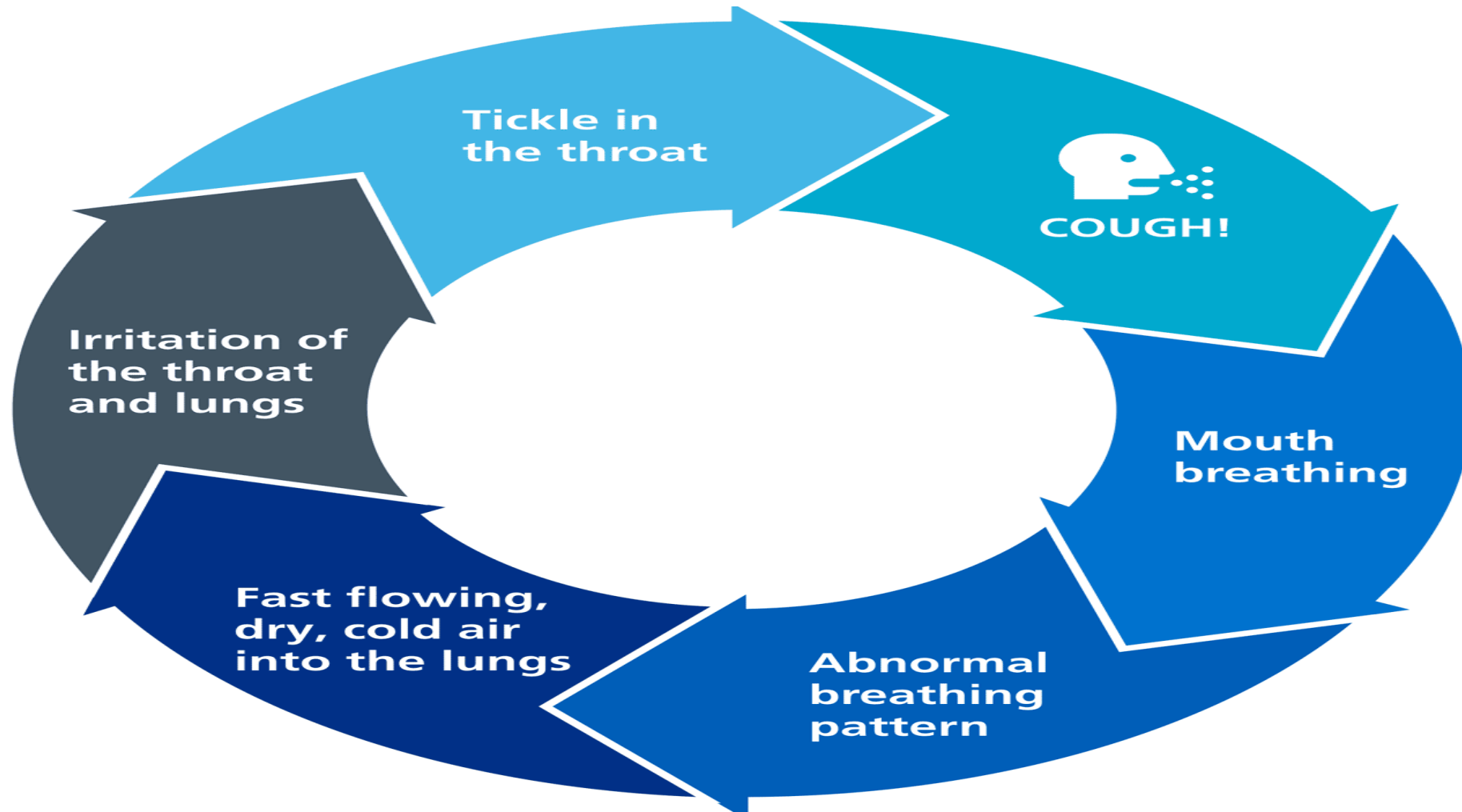
complication

- Cough syncope syndrom
- Fatigue
- Fractures due to severe persistent cough
- Pneumomediastinum, pneumothorax, and subcutaneous emphysema due to high intrathoracic pressure during cough.



Investigation

- General condition of the patient
- Time specialties
- Voice specialties
- Productive or not
- In relation with posture
- Accompany with chest pain; with dyspnea, or other complications



Thank
You