Cough

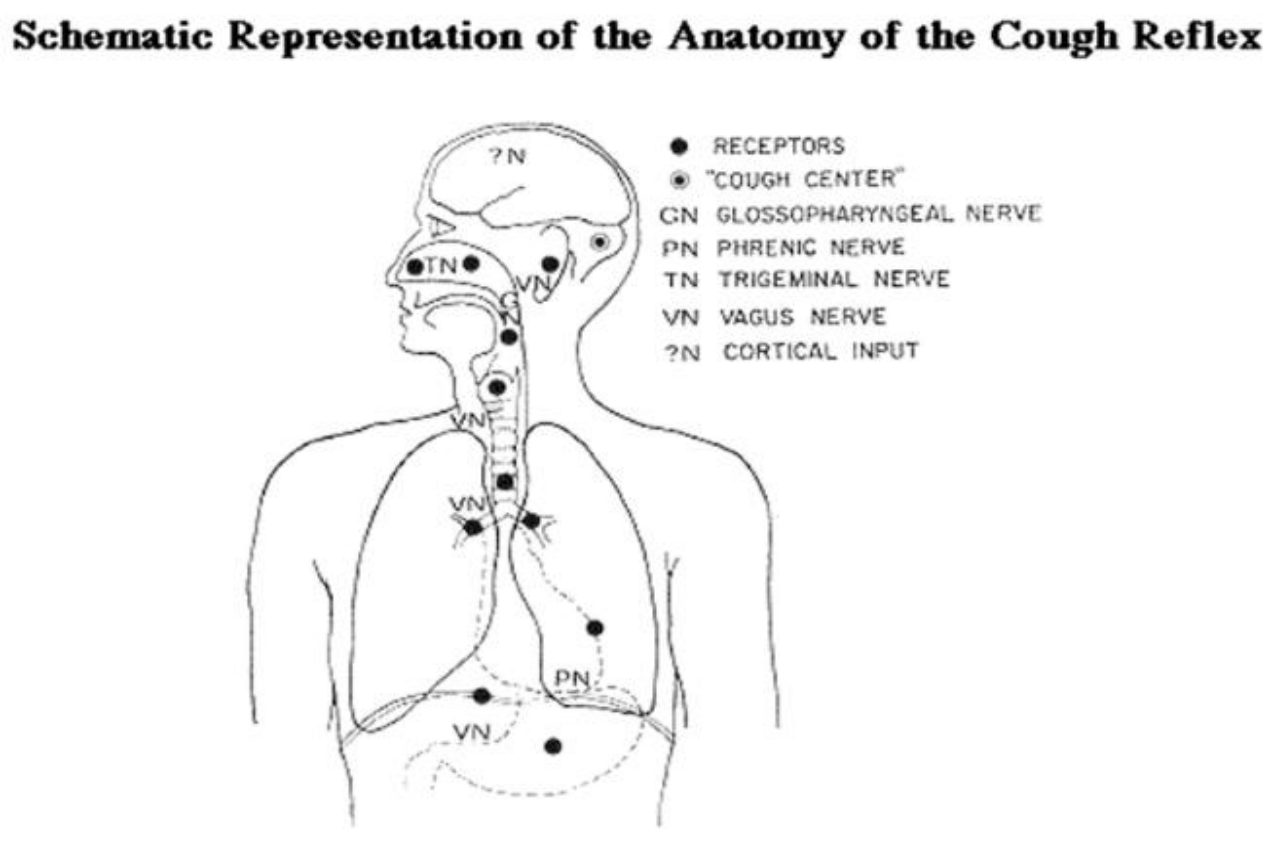
I’m Coughing my lungs up Doc.

Areas To Cover

- Why do we Cough?
- Classification and Causes of Cough
  - Acute
  - Sub acute
  - Chronic
- When and How to Investigate
- Management
- Case Study

What is Cough?

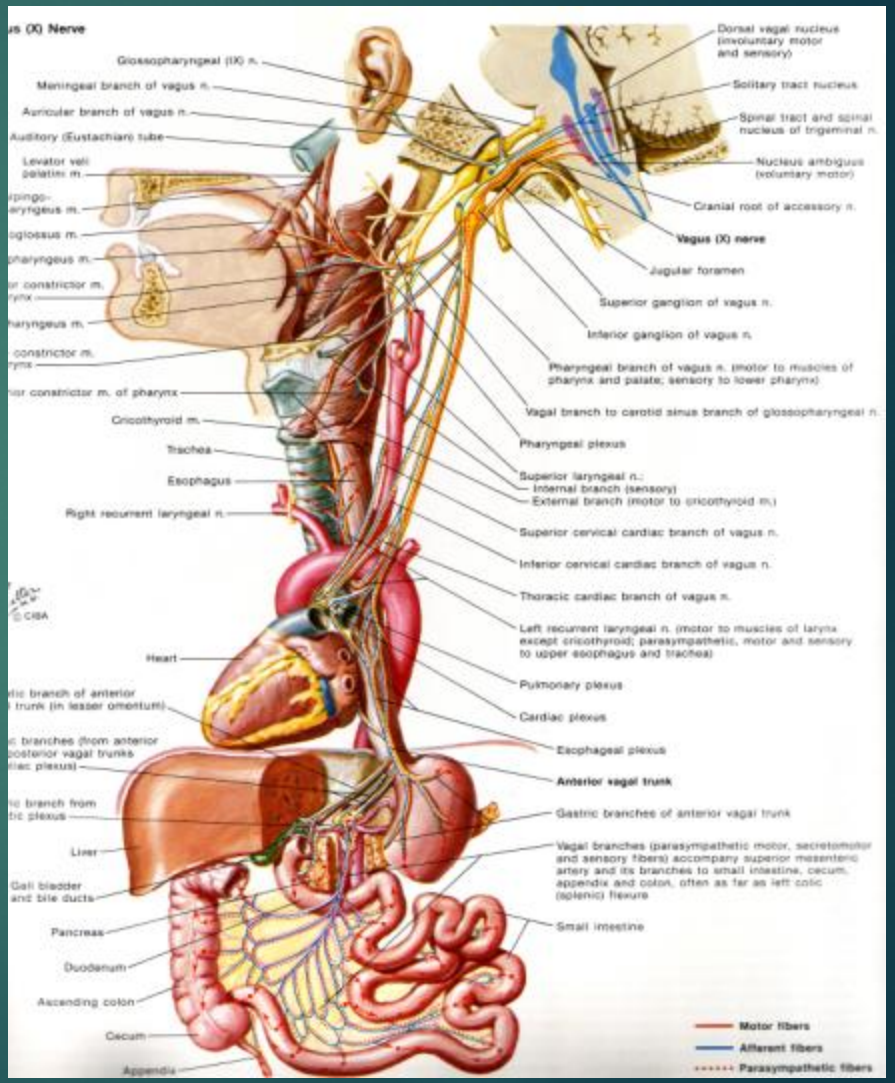
'A Cough is a forced expulsive manoeuvre, usually against a closed glottis and which is associated with a characteristic sound'



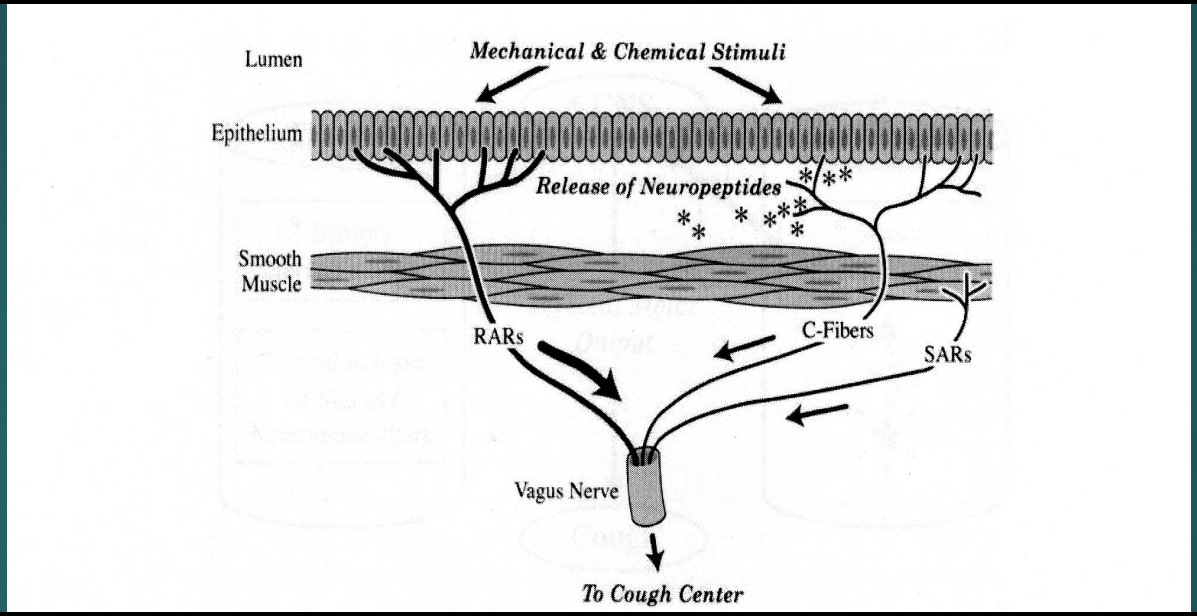
Cough Reflex: Afferent Pathway

- Vagus nerve is major afferent pathway

- Stimuli arise from:
  - Ear
  - Pharynx
  - Larynx
  - Lungs
  - Tracheobronchial tree
  - Heart
  - Pericardium
  - Esophagus



Cough Reflex: Afferent Pathway

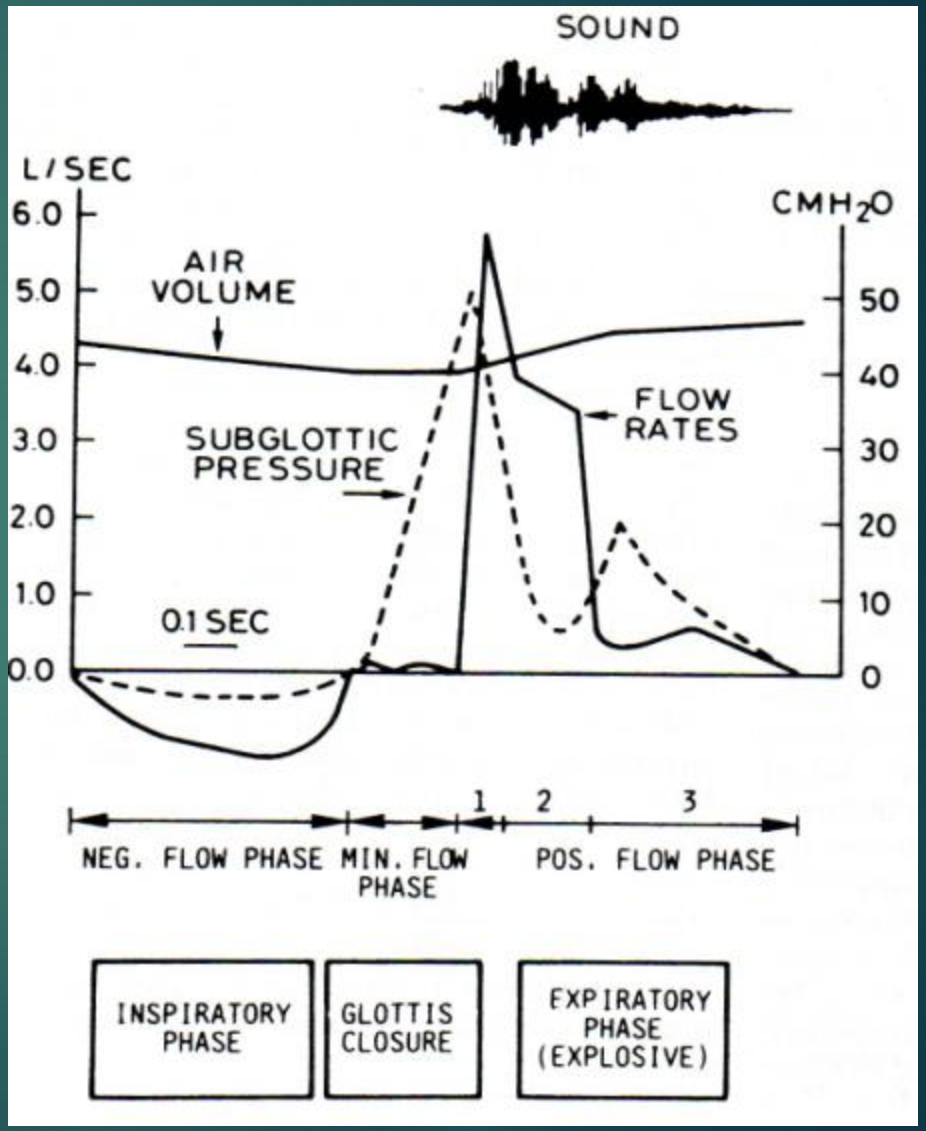


Mechanical stimuli:

Chemical stimuli

Efferent Pathway: 4 Phases

1. Inspiratory Phase
2. Compressive Phase
3. Expiratory Phase
4. Relaxation Phase



Cough

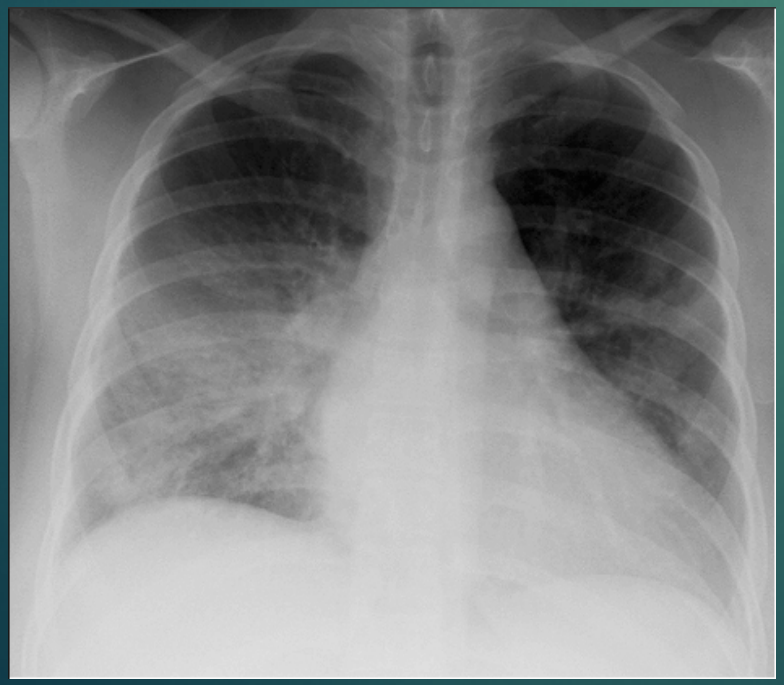
- Vital protective mechanism
- Four steps:
  - inspiratory gasp
  - Valsalva maneuver
  - expiratory blast as cords abduct
  - post-tussive prolonged inspiration

Cough: What's it good for?

- Attract attention
- Signal displeasure
- Protect the airway from pathogens, particulates, food, other foreign bodies
- Clear the airways of accumulated secretions, particles

Impaired Cough: Consequences

- Aspiration of oropharyngeal or stomach contents (bacteria, food, other)
- Acute airway obstruction
- Pneumonia



- Lung abscess
- Respiratory failure/ ARDS
- Bronchiectasis
- Pulmonary fibrosis

Cough. Complications

- Intrathoracic pressure increases up to 300mmHg
- Expiratory velocity reaches 500mph.
- Helps to clear mucous
- BUT can cause complications

COMPLICATIONS

- headache
- dizziness
- musculoskeletal pain
- syncope
- urinary incontinence
- Rib fracture

- …….drives patient and everyone else crazy.

Cough: Public Health Concern

Classification of Cough

Three Categories of Cough

- Acute Cough = < 3 Weeks Duration
- Sub acute Cough = 3 – 8 Weeks Duration
- Chronic Cough = > 8 Weeks Duration

Acute Cough

Acute Cough <3/52 Duration
Differential Diagnosis

- Upper Respiratory Tract infections:
  Viral syndromes, sinusitis viral / bacterial

- URTI triggering exacerbations of Chronic Lung Disease e.g. Asthma/ COPD

- Pneumonia
- Left Ventricular Heart Failure
- Foreign Body Aspiration

Acute Cough
Epidemiology

- Symptomatic URTI
  - 2-5 per adults per year
  - 7-10 per child per year
- 40-50% will have cough
- Self medication common -£24million per year
- 20% consult GP (2F:1M)
- Most resolve within 2 weeks

Duration of Cough in URTI

Primary Care Setting
No antecedent or chronic lung disease

End of Week	% Coughing
3	58
4	35
5	17
6	8

***Jones FJ and Stewart MA, Aust Family Physician Vol. 31, No. 10, October 2002**

Sub-acute Cough

-Post viral cough

Managing Acute Cough

"Don't just do something stand there."

Alice in Wonderland

Managing Acute Cough

Identify High Risk groups

Acute Cough Can be 1st Indicator of Serious Disease

eg Lung ca, TB, Foreign Body, Allergy, Interstitial Lung disease

'Chronic cough always preceded by acute cough'.

Red Flags in Acute Cough

Symptoms

- Haemoptysis
- Breathlessness
- Fever
- Chest Pain
- Weight Loss

Signs

Tachypnoea

Cyanosis

Dull chest

Bronchial Breathing

Crackles

THINK pneumonia, lung cancer, LVF

GET a CHEST X-Ray

Treatment of Simple Acute Cough

- Benign course -reassure
- Cough can distress
- Patients report OTC medication helpful
- Voluntary cough suppression -linctuses/ drinks
- Suppression of cough - dextromethorphan, menthol, sedating antihistamines & codeine

Which Anti-tussive?

Dextromorphan

eg Benilyn non-drowsy

1 meta-analysis

high dose 60mg

beware combinations eg paracetomol

Menthol

Steam inhalation. Effect on reflex short lived

Sedating Antihistamines

danger sleepy - nocturnal cough

Codeine or Pholcodeine

No better than dextromorphan

but more side-effects. Not recommended

Sub-Acute Cough

Sub-acute Cough *3-8 weeks*

Likely Diagnoses

- Post infectious
- Bacterial Sinusitis
- Asthma
- Start of Chronic Cough

- Don't want to miss lung cancer

ACTIONS

- Examine Chest
- Chest X-Ray if signs or smoker
- Measure of airflow obstruction

  i.e. peak flow -one off

  peak flow -serial

  spirometry

Post Infectious Cough

A cough that begins with an acute respiratory tract infection and is not complicated* by pneumonia

*Not complicated = Normal lung exam and normal chest X-ray

Post Infectious cough will resolve without treatment

Cause = Postnasal drip or Tracheobronchitis

Chronic Cough

Case Study -CP 2007

- 60yr retd Nurse
- Chest infection 2002 in Spain -mild SOB since
- Chest infection 2006 - hospitalised for 4/7 antibiotics / steroids
- SOB and dry cough since
- No variation
- 4 lots of AB and steroids from GP plus tiotropium & oxis -no help for cough
- Wt climbing
- More SOB over 9/12

- Ex-smoker 30 pack yrs
- FEV1 0.97 43%

What else would you like to know?

What causes can you think of?

Chronic Cough
Epidemiology

Epidemiology difficult -acute vs chronic

Cullinan 1992 Respir Med 86:143-9

n=9077

16% coughed on >50% days of year

13% coughed sputum on >50% days of year

54% were smokers

Chronic Cough
Epidemiology

Associations with:

Smoking (dose related)

Pollutants (particulate PM_{10}) -occupation

Environmental irritants (e.g. cat dander)

Asthma

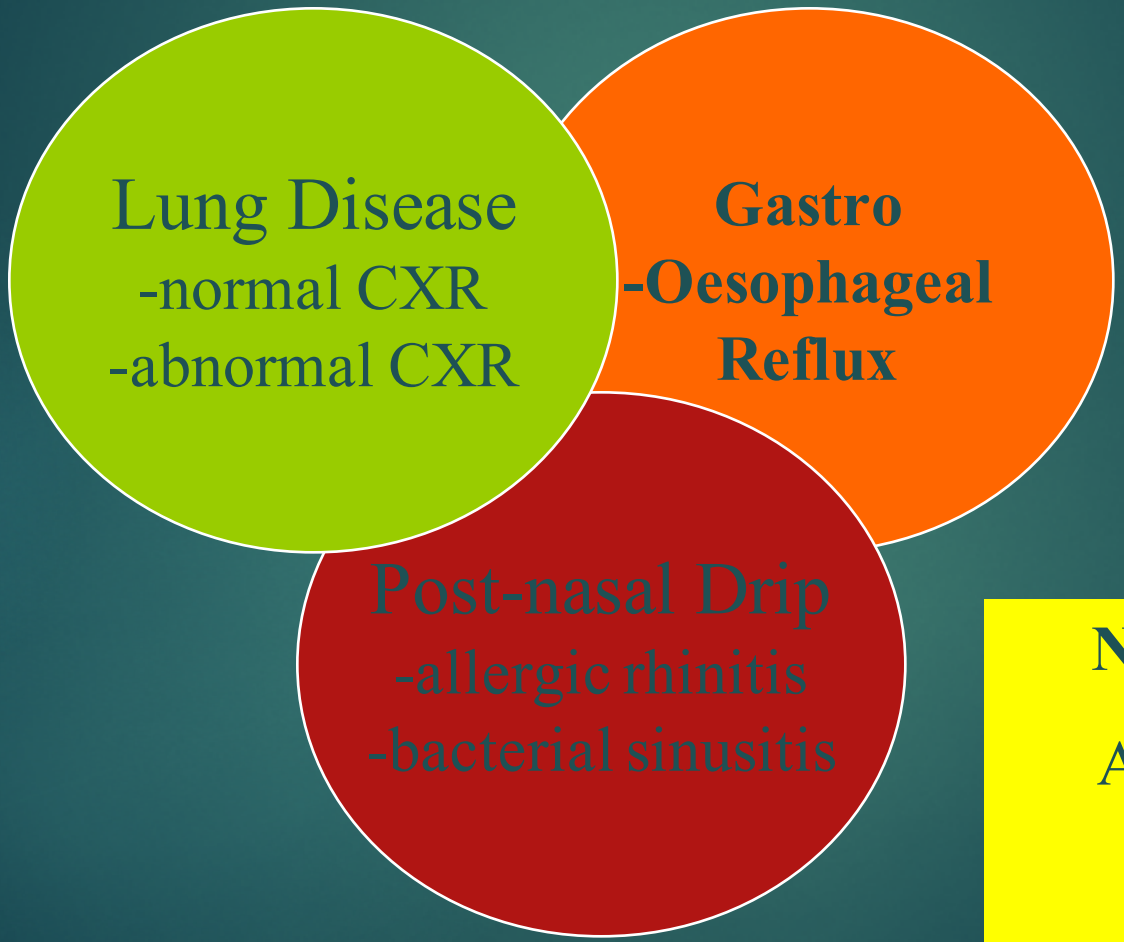
Reflux

Obesity

Irritable bowel syndrome

Female

Making the Diagnosis
Common Differentials



Non-structural

ACE-Inhibitors

Tobacco

Habit Cough

Chronic Cough

Investigating Chronic Cough

Purpose:

- To exclude structural disease
- To identify cause

How

History & Examination inc occupation

& Spirometry

ALWAYS GET A CHEST X-RAY

IN CHRONIC COUGH

Beware

Cough triggered by:

change in temperature

scent, sprays, aerosols and exercise

indicate

Increased cough reflex sensitivity

and Not just seen in Asthma.

Esp. GORD, infection and ACEI

ACE-Inhibitors and Chronic Cough

Incidence: 5-20%

Onset: one week to six months

Mechanism

Bradykinin or Substance P increase

Usually metabolized by ACE)

PGE2 accumulates and vagal stimulation.

Treatment: switch to Angiotensin II Receptor Blockers (ARBs)

Gastro-oesophageal Reflux

GORD accounts alone or in combination for 10-40% of chronic cough

Two Mechanisms

a. Aspiration to larynx/ trachea

b. Acid in distal oesophagus stimulates vagus and cough reflex

Gastro-oesophageal Reflux *Symptoms*

Cough Features

Throat clearing

Worse at night / rising

On eating

Reflex hypersensitivity

CXR -normal or hiatus hernia

Spirometry normal

GI Symptoms

If Aspiration main mechanism

Heart burn

Waterbrash/ Sour taste

Regurgitation

Morning Hoarseness

If Vagal - NO GI symptoms

Gastro-oesophageal Reflux

Reflux may be due to Medications or Foods

Drugs and foods that <u>reduce</u> lower esophageal sphincter (LES) pressure and can cause increased reflux include:

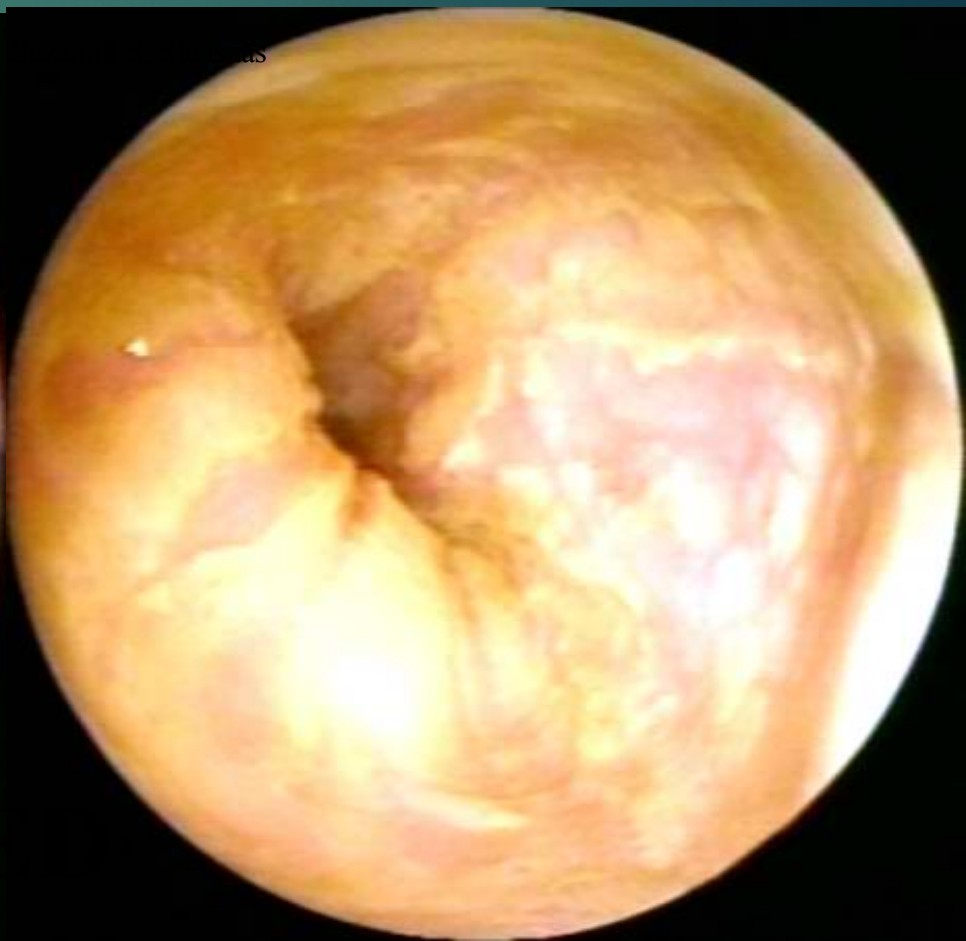
Theophylline
Oral β adrenergic agonists
NSAIDs
Ascorbic acid
Calcium Channel Blockers

Chocolate
Caffeine
Peppermint
Alcohol
Fat

Gastro-oesophageal Reflux *Investigation*

- **Esophageal pH monitoring for 24 hours (+diary)**
  - **95% sensitive and specific 95%**
- **Ba swallow not sensitive enough**
- **Endoscopy - may confirm but false -ve rate**

Endoscopy can show GORD, but cannot confirm GORD as the cause of cough.



Gastro-oesophageal Reflux

Treatment

Trial of Therapy

- High dose twice daily PPI for min 8weeks
- ± prokinetic e.g. domperidone or metoclopramide
- Eliminate contributing drugs.
- Baclofen rarely

Improves in 75-100% of cases

Post-Nasal Drip

Symptoms:

- 'something dripping'
- frequent throat clearing
- nasal congestion / discharge
- posture

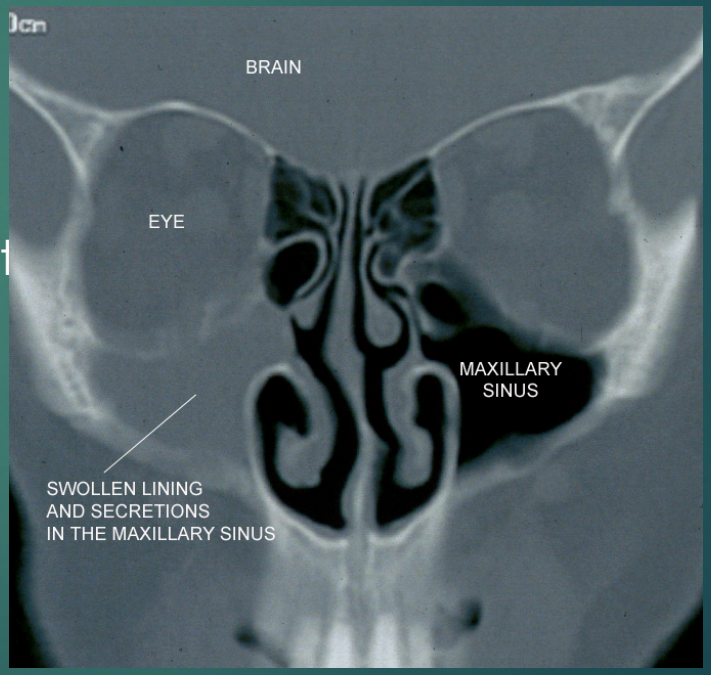
Causes

- Allergic rhinitis
- Non-allergic rhinitis
- Vasomotor rhinitis
- Chronic bacterial sinusitis

Post Nasal Drip Treatment

Options:

1. Exclude /treat infection
2. Nasal steroid for 8/52
3. Sedating antihistamines
4. Antileukotrienes eg montelukast
5. Saline lavage
6. ENT opinion



Lung Diseases inc Tobacco

<u>Favouring Lung Disease</u>

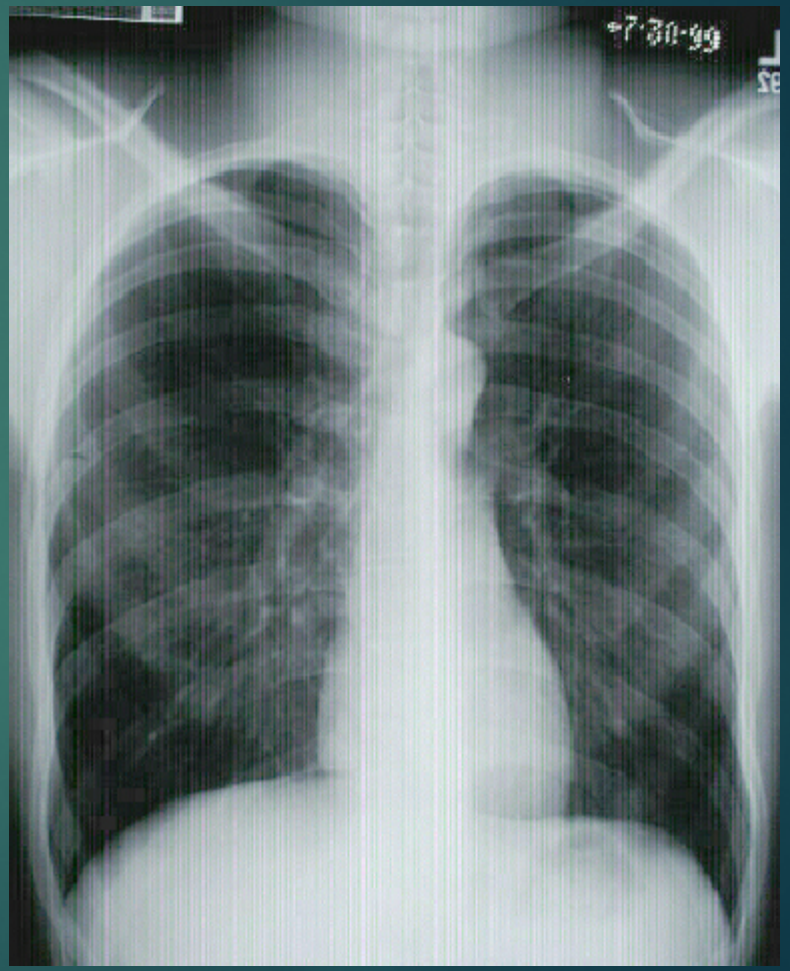
Shortness of breath

Wheeze

Sputum production

Haemoptysis

Chest signs eg crackles



Chest X-Ray and Differential of Cough

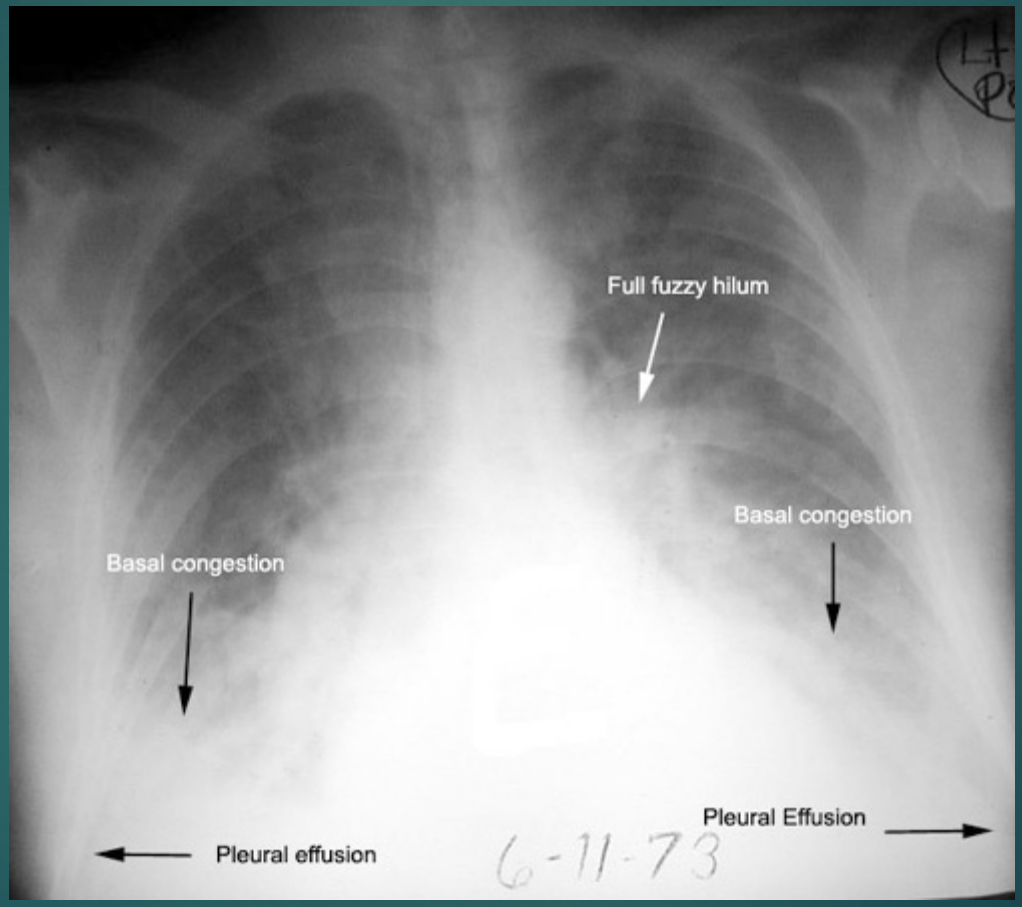
Normal CXR

- Gastro-oesophageal reflux
- Post-nasal Drip
- Smokers cough/ Chronic Bronchitis
- Asthma
- COPD
- Bronchiectasis
- Foreign body

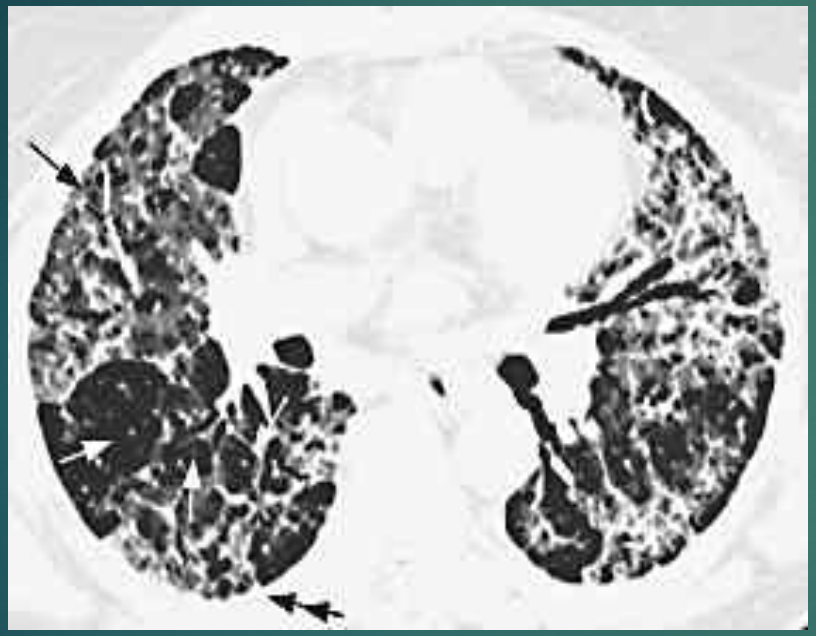
Abnormal CXR

- Left ventricular failure
- Lung cancer
- Infection/ TB
- Pulmonary fibrosis
- Pleural effusion

Left Ventricular Failure



Idiopathic Pulmonary Fibrosis



TB

Lung Cancer

Chest X-Ray and Differential of Cough

Normal CXR

- Gastro-oesophageal reflux
- Post-nasal Drip
- Smokers cough/ Chronic Bronchitis
- Asthma
- COPD
- Bronchiectasis
- Foreign body

A man presents to you with coughing

WHAT WOULD YOU LIKE TO KNOW?

Cough

- Onset?
- Duration?
- Character?
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?

Cough

- **Onset?**
- Duration?
- Character?
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?
- Recent or long standing (Chronic)

Cough

- **Onset?**
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Cough

- Onset?
- **Duration?**
- Character?
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?

- Chronicity
  - Pertussis
  - TB
  - Foreign body
  - Asthma
  - Drugs
  - Bronchiectasis
  - ILD

Cough

- Onset?
- Duration?
- **Character?**
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?

- Brassy?

Pressure on the trachea?

Cough

- Onset?
- Duration?
- **Character?**
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?

Change in character of a chronic cough should make you consider other pathology.

Cough

- Onset?
- Duration?
- Character?
- **Nocturnal?**
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?

- Asthma

Also Early morning

Cough

- Onset?
- Duration?
- Character?
- Nocturnal?
- **Precipitating factors?**
- Relieving factors?
- Sputum?
- Haemoptysis?
- Association?

- Usually in asthma
  - Emotion
  - Weather
    - Wind
    - Rain
    - Cold
  - Dust
  - Allergies
  - Exercise
  - Drugs

Cough

- Onset?
- Duration?
- Character?
- Nocturnal?
- Precipitating factors?
- **Relieving factors?**
- Sputum?
- Haemoptysis?
- Association?

- Avoidance of precipitating factors!

Cough

- Onset?
- Duration?
- Character?
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- **Sputum?**
- Haemoptysis?
- Association?

- Presence?
  - Colour
  - Volume
  - Consistency
  - Pattern
- Consider
  - Infections
  - COPD
  - CF
  - Bronchiectatsis

Cough

- Onset?
- Duration?
- Character?
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- **Sputum?**
- **Haemoptysis?**
- Association?
- Presence?
  - **Colour**
  - Volume
  - Consistency
  - Pattern
- Will be covered elsewhere!

Cough

- Onset?
- Duration?
- Character?
- Nocturnal?
- Precipitating factors?
- Relieving factors?
- Sputum?
- Haemoptysis?
- **Association?**

- Breathlessness
- Sputum
- Chest pain
- Wheeze
- Hoarseness
- Post nasal drip

CHRONIC COUGH

Useful pneumonic

G A S P S A N D C O U G H

Gastroesophageal reflux disease
Asthma
Smoking/chronic bronchitis
Post-infection
Sinusitis/post-nasal drip

Ace-inhibitor
Neoplasm/lower airway lesion
Diverticulum (esophageal)

Congestive heart failure
O uter ear
U pper airway obstruction
G I-airway fistula
Hypersensitivity/allergy