

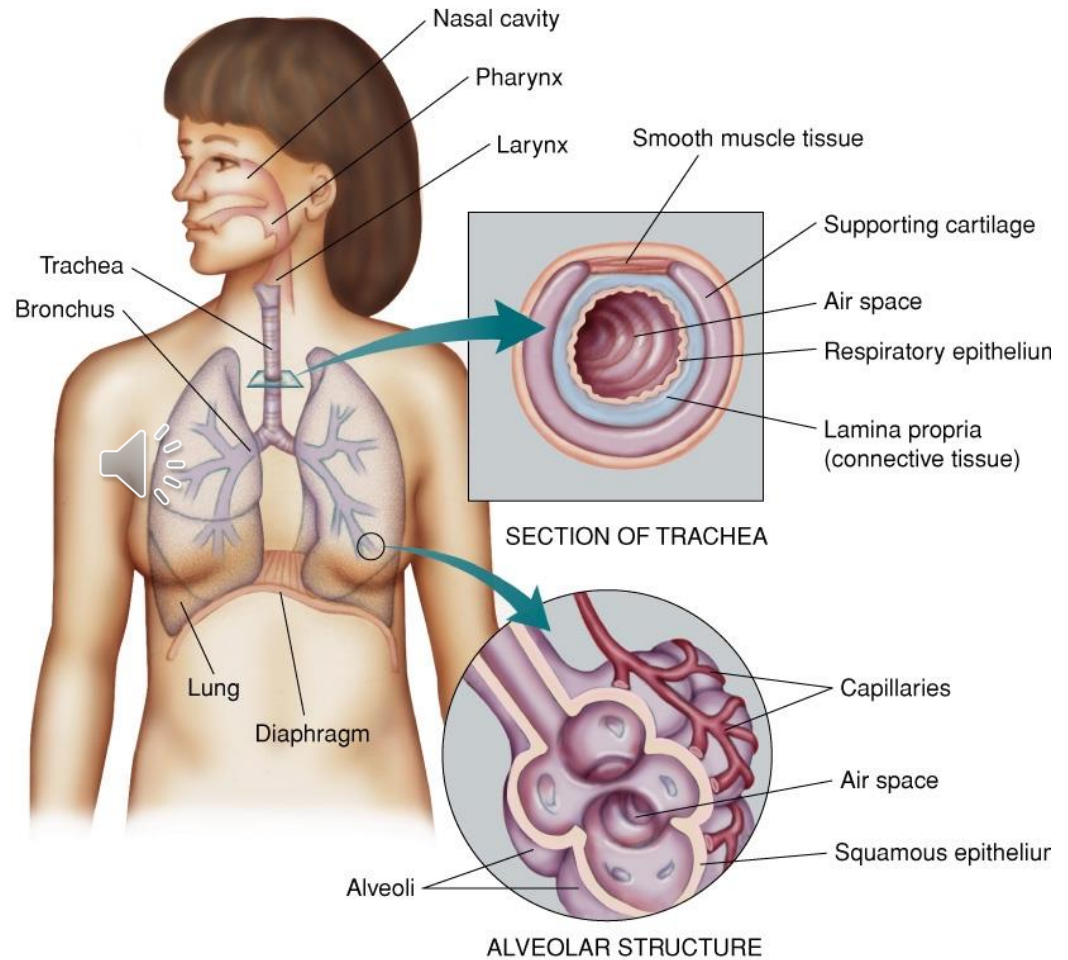


—BELMATT—
HEALTHCARE TRAINING

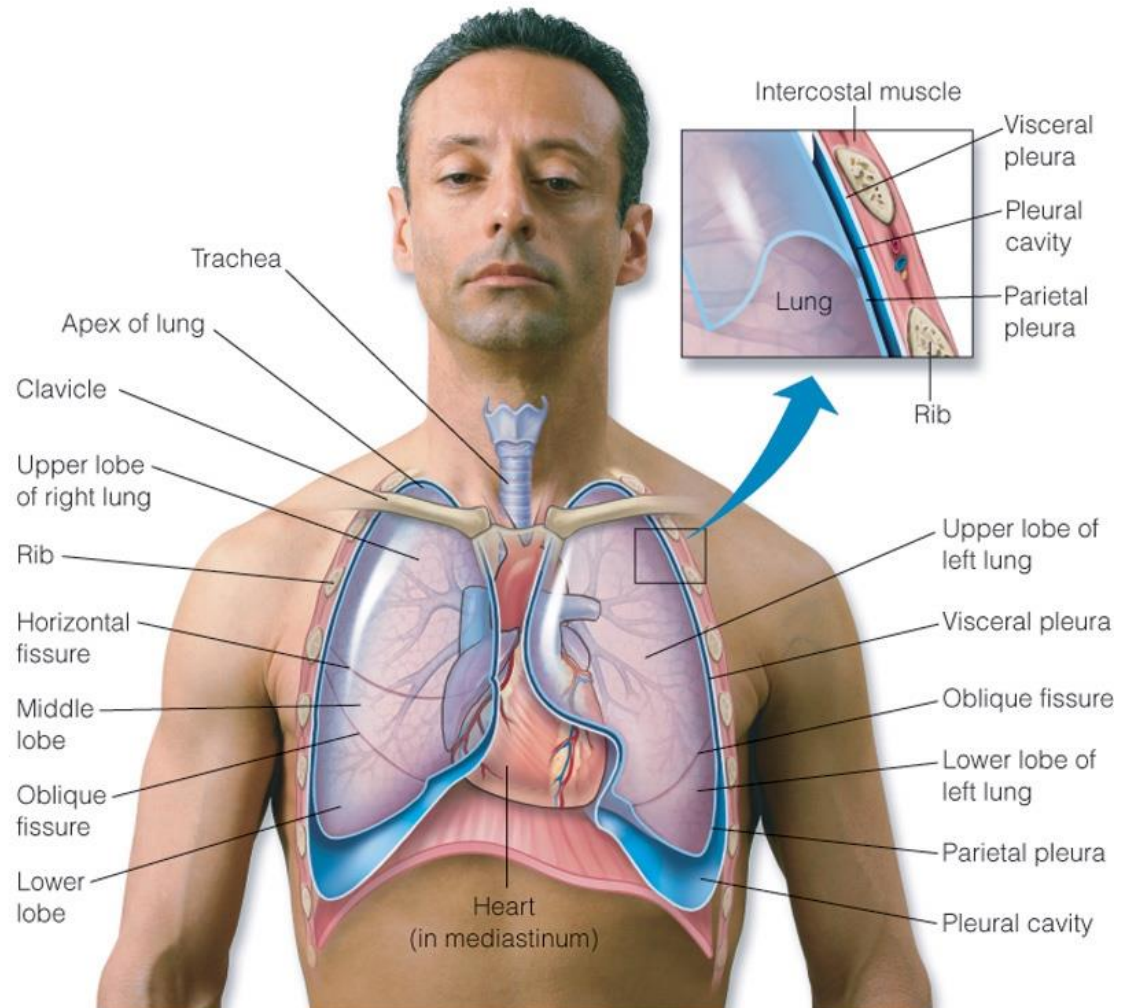
Respiratory Presentations in Primary Care

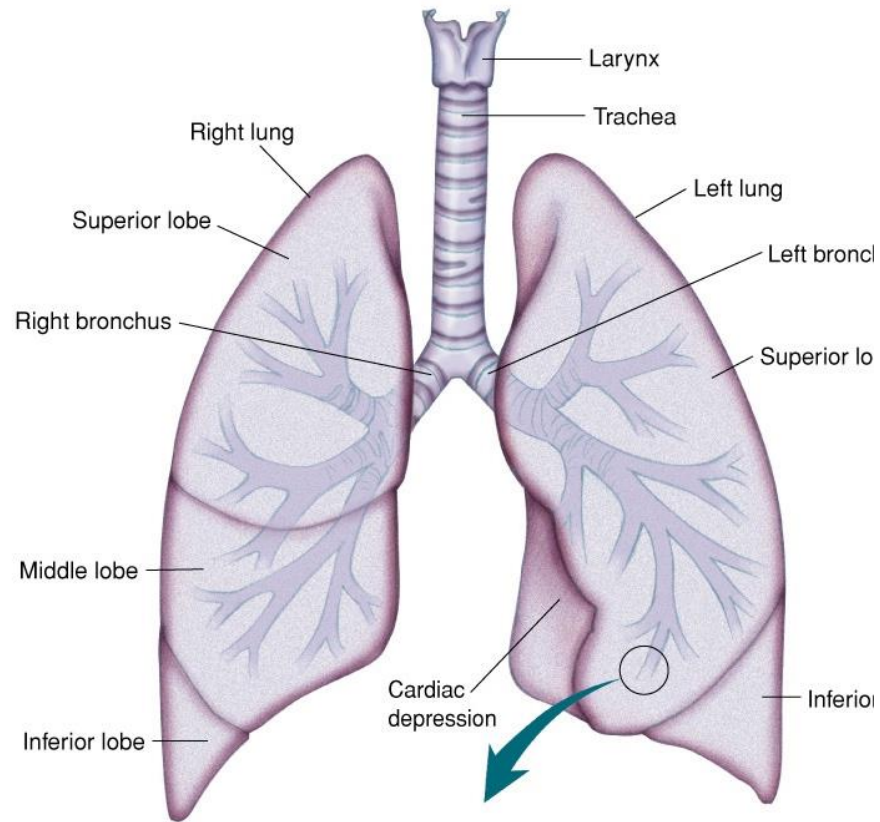
Respiratory System

- Study the anatomy that you see in this diagram and consider what could go wrong.
- Think of normal and abnormal findings



Lungs & Surrounding Structures





The Lungs

History Taking in a respiratory condition- consider these areas

- Presenting Complaint
- The history of Presenting Complaint
- Past Medical History, Surgical History and Gynae/sexual History (if relevant)
- JAMITHREADSCMH
- Allergies : Drugs, Food, Other. Consider latex
- Medication History
- Immunisations

Auscultation- you can always call these 'added sounds' or think of these

- **Stridor**

- High pitched, “crowing”
- Upper airway restriction

- **Wheezing**

- “Whistling”
- Usually more pronounced on exhalation
- Generalized: narrowing, spasm of the smaller airways
- Localized: foreign body aspiration

Crackles (Rales)

Fine, “crackling”

Fluid in smaller airways,
alveoli

Rhonchi

Coarse, “rumbling”

Fluid, mucus in larger
airways

Common near patient tests

- **Pulse oximetry**
 - Why is this important. What factors can affect readings.
 - Is it relevant in patient with smoke inhalation. Why?
- **Peak Flow Meter**
 - Why?
 - When should it be done?
 - How?
 - Are paed and adults the same?
- **Spirometry-the Gold standard**
 - What is the relevance of spirometry?
 - How does it help in asthma and COPD?
 - What is the relevance of FEV1,FVC,VC?



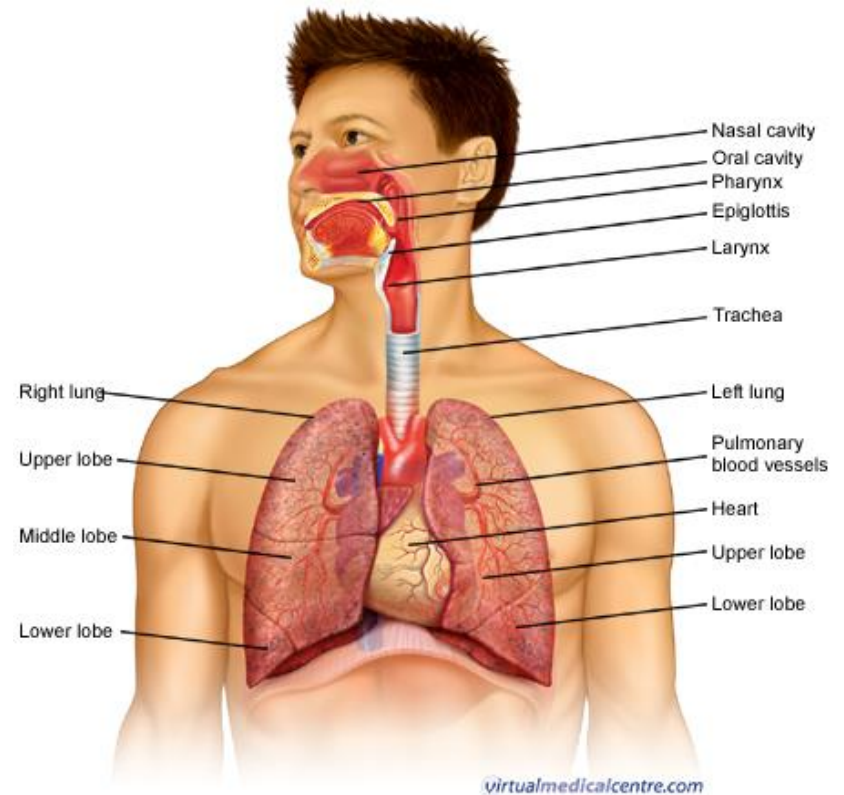
- **Don't just go through the motions of doing the examination**
- Think about
 - WHAT you're looking for
 - - And WHAT it means
- at each stage of the examination
- Be methodical

Four main stages for all examinations:

1. Inspection
 2. Palpation
 3. Percussion
 4. Auscultation
- Don't always need to progress in a linear way

Respiratory anatomy:

- Image courtesy of www.myvmc.com



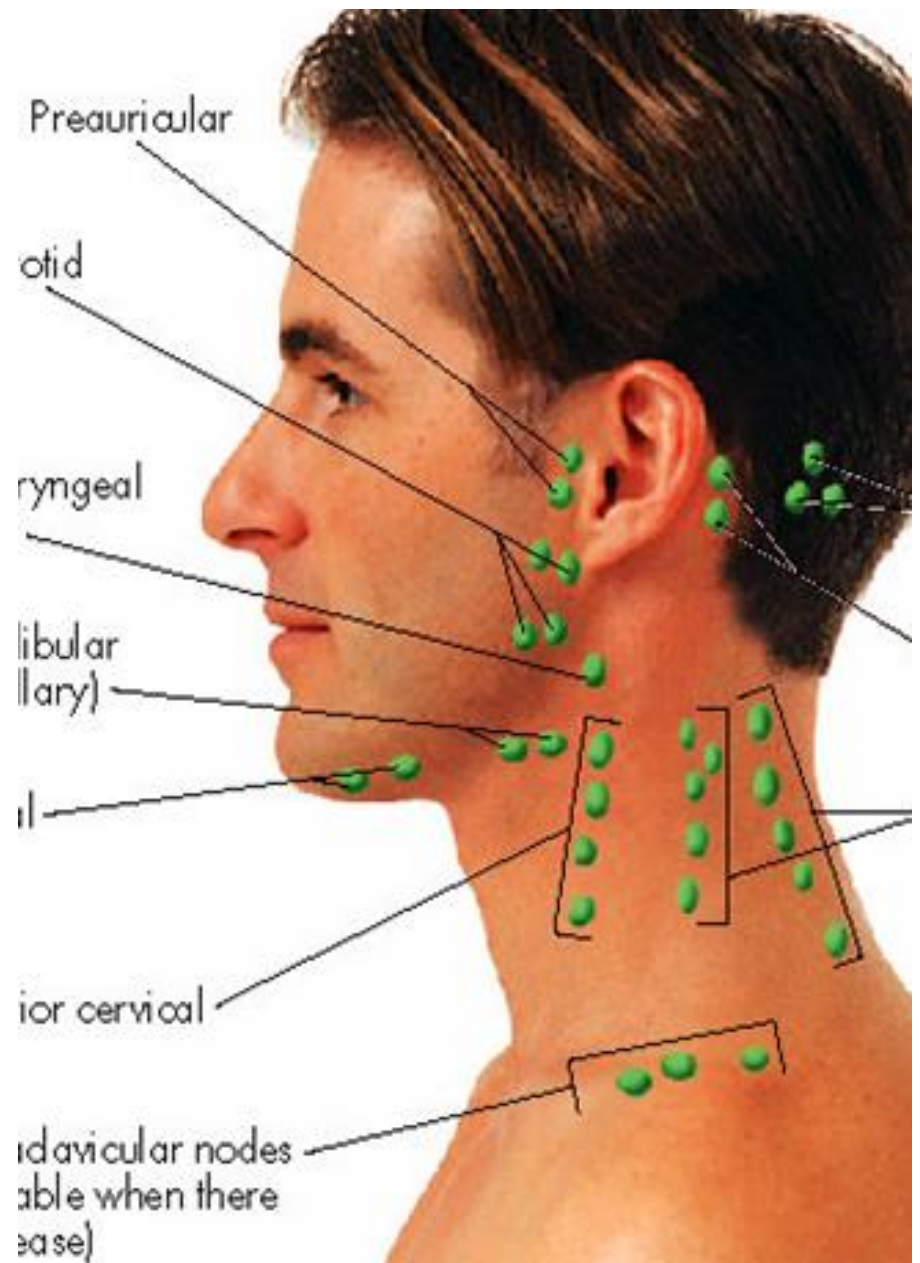
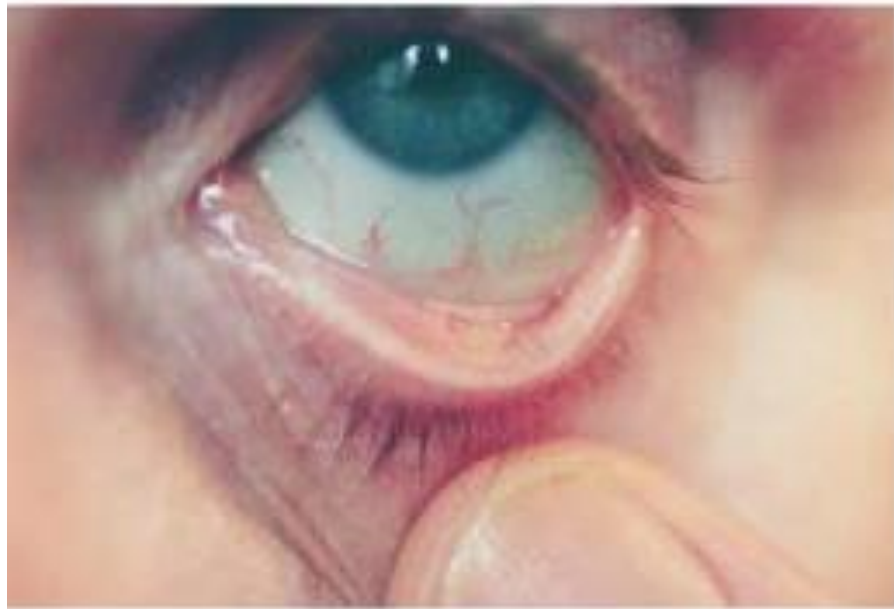
Hands and nails:

- Nicotine stains
- Clubbing
- Peripheral cyanosis
- Muscle wasting
- Flapping tremor
- CRT
- Pulse rate, volume, rhythm, character



Face and neck:

- Pallor
- Central cyanosis
- Horner's syndrome
- Pursed lip breathing
- JVP
- Lymph nodes – palpate
- Trachea - palpate



Chest wall:

- Shape of the chest
- Scars
- Deformities
- Kyphosis and scoliosis
- Radiotherapy tattoos
- Prominent veins
- Movement of chest wall
- Accessory muscles and intercostal withdrawing



- Palpate the lymph nodes and trachea at some stage in your examination
- Move on to the chest wall
- Can start at front or back of chest but more likely to find signs at the back
- Chest expansion
- Tactile vocal fremitus

Chest
expansion:



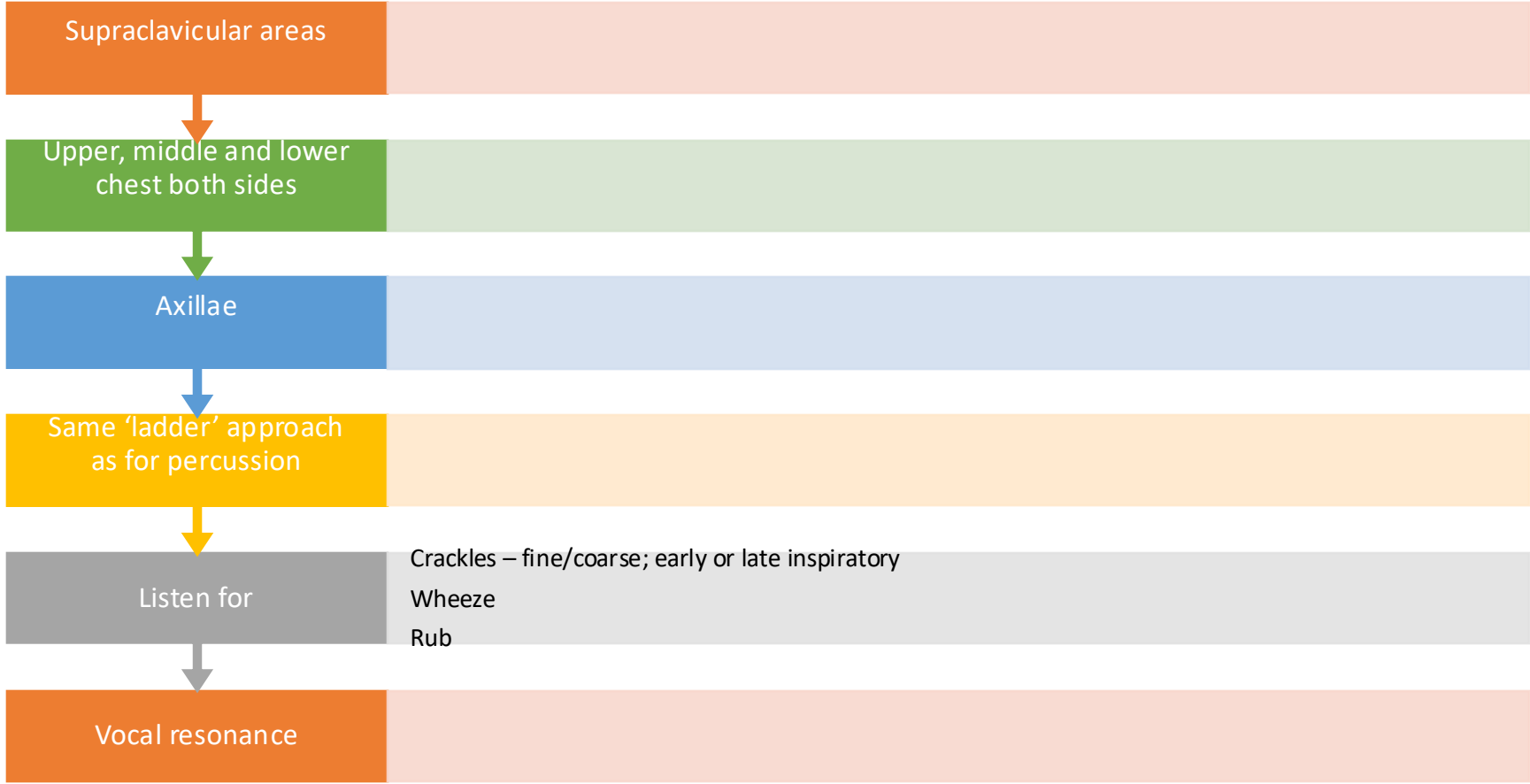


Percussion:

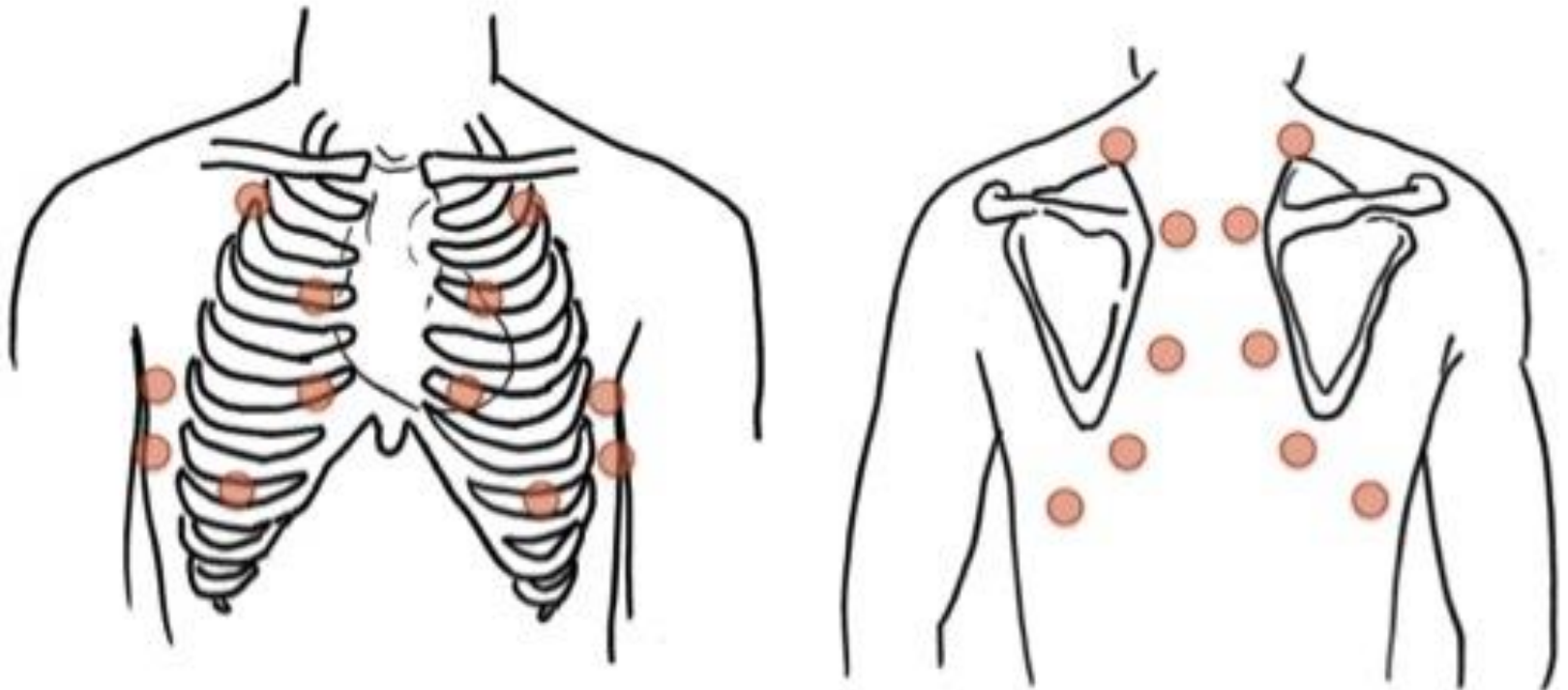
- Resonant = normal!
- Hyperresonant vs resonant
- Resonant vs dull
- Dull vs stony dull
- Fluid
- Consolidation
- Collapse
- Pneumothorax

Auscultation

[https://www.youtube.com/
watch?v=nokZ5sNt3fA&list=
PLKSV1ibO86qgE2y9cMq
NFmh6LfOa8RM&index=8](https://www.youtube.com/watch?v=nokZ5sNt3fA&list=PLKSV1ibO86qgE2y9cMqNFmh6LfOa8RM&index=8)

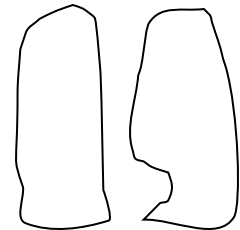


Stethoscope placement for lung auscultation



Writing it down:

- To document in the notes, you need to make it clear what you examined and what you did or didn't find
 - Develop your own system, no hard and fast rules
- For example, a normal examination:
 - No pallor, clubbing, cyanosis or lymphadenopathy
 - Trachea central
 - Chest expansion normal
 - Percussion resonant throughout
 - Biventricular breath sounds both lung fields
 - nil added



Try and put it all together...

- Form a differential diagnosis

Chest X-ray:



Structured approach

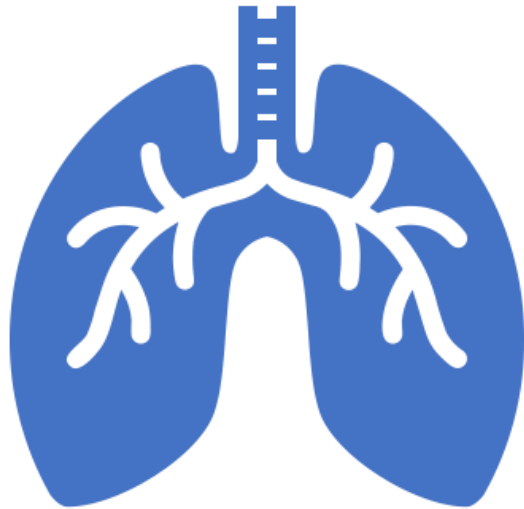
- **A - Airway** - trachea central, ET tube
- **B - Breathing** - lung fields, lung markings, masses
- **C - Cardiac** - Aortic arch, heart size, heart borders, pulmonary vessels
- **D - Diaphragm** - right higher than left, cardiophrenic & costophrenic angles ? Blunted.
- **E – Everything Else** - ? Pacemaker, electrodes, bones, breast shadows

Scenario

- **A 67yr old female presents complaining of a troublesome cough for past few weeks. Chest X ray is normal. She is afebrile.**
- What other history would you obtain from this patient?
- Which investigations would you consider?
- What is your differential diagnosis?
- What treatment would you consider?



- John, 37 presents to you with a 3 week history of a cough. He had a cold with a fever about 4 weeks ago and after a week of the cold developed this cough which is dry, irritating and non productive. He has no significant PMH or FH but how can you be sure of this? Document your systematic history taking sequence. Following history taking you take his vital signs which are T 36.5, RR 14, B/P 125/90, P62. You listen to his chest –there are no added sounds – what 4 techniques would you use in this examination to check his chest?
- What other types of the examination or near patient testing should you include? All is normal – what are your conclusions and management/recall of this patient?



Types of cough

- Acute <3weeks
 - Sudden onset, brief episodes, self limiting
 - Viral infection
 - Subacute – 3-8 weeks
- Chronic
 - Prolonged period of more than 3 weeks
 - Asthma, chronic bronchitis, bronchiectasis ,heart failure, bronchogenic cancer , sarcoidosis & ACE inhibitors.
 - Non asthma eosinophilic bronchitis – inflammation of bronchi driven by eosinophils.
 - GORD

Causes of cough



C – COPD

O – OEDEMA

U – Upper airway cough syndrome

G – GORD

H – Hypertension medication

I – Infections or irritants

N – Non asthmatic eosinophilic bronchitis

G - GORD

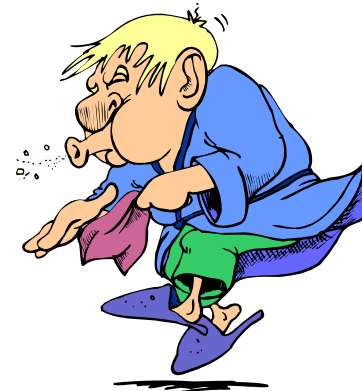
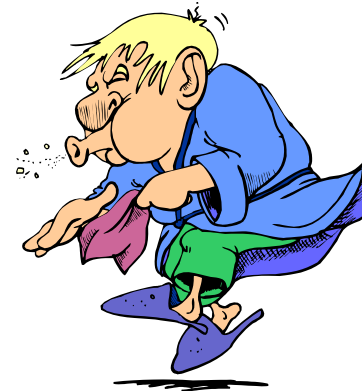
<https://www.youtube.com/watch?v=zf7mPgRCzf8>

Coughs can be described as:

- Productive
- Dry
- Barking
- Brassy
- Hoarse
- Croupy

Wheezy

Hacking



Acute cough

- Acute cough is defined as one lasting less than 3 weeks.
- Acute cough is the commonest new presentation in primary care and is most commonly associated with viral upper respiratory tract infection.
- In the absence of significant co-morbidity, an acute cough is normally benign and self-limiting.
- It is the commonest symptom associated with acute exacerbations and hospitalisations with asthma and COPD.
- The cost of acute cough to the UK economy was considered to be £1 billion in lost productivity and healthcare costs!!

- **Chronic cough**

- is defined as one lasting more than 8 weeks.

- It is reported by 10–20% of adults, commoner in females and obese.

- Cough accounts for 10% of respiratory referrals to secondary care.

- Most patients present with a dry or minimally productive cough.

- The presence of significant sputum production usually indicates primary lung pathology eg COPD

- In chronic cough a heightened cough reflex is the primary abnormality.

Causes of Chronic Cough

Condition	History	Physical findings
Nasopharyngitis	Acute onset, low grade fever, rhinorrhoea, cough	Red swollen nasal mucosa, pharynx mildly red
COPD exacerbation	Worsening dyspnoea, increased wheeze and cough, smoker	Purulent sputum, fever, increased HR and resps
Pertussis	Persistent hacking cough, inspiratory whoop, vomiting	Fever absent, coryza
Pneumonia	Cough, dyspnoea, pleuritic chest pain, sputum prodn, fever	Fever, tachycardia, tachypnoea, insp crackles, percussion dull, , asynchronous breathing
Viral URTI	Cough, nasal congestion, sore throat, fever, myalgia	Fever, pharyngitis, enlarged anterior cervical nodes, normal TMs, normal chest
Bronchiolitis	Grunting, sneezing, cough, anoxia, exposure to passive smoke	Fever, wheeze, prolonged exp. Phase, tachypnoea

COVID19 COUGH

- COVID 19 – Post COVID cough
 - Sensory neuropathic cough
 - Cough initiated by a sudden sensory disturbance e.g. dripping sensation, dry patch
 - Cough out of proportion to mucus
-
- Watch utube video
<https://www.youtube.com/watch?v=MWxbFiiQPj0>

COVID19 Cough

How is it different from a wet or dry cough. What are the causes of each?

Types of Coughs

<https://www.youtube.com/watch?v=nbCbOis-mwo>

Other Causes of Cough

Condition	History	Physical findings
Post Nasal Drainage	Cough, sore throat	Mucoid secretions, normal chest exam
Asthma	Dry hacking cough especially at night	End expiratory wheeze, prolonged expiratory phase
GORD	Worse at night, heart burn, Hx of oesophagitis, smoker, alcohol abuse, overweight, cough after lying down	Normal chest and abdo exam. Possible epigastric pain on palpation
Chronic bronchitis	Cough, mild dyspnoea, Hx COPD, smoker,	Rasping cough, normal breath sounds or rhonchi that clear with coughing, resonant to dull chest, possible wheeze

Managing acute cough

Be aware that an [acute cough](#):

- is usually self-limiting and gets better within 3 to 4 weeks without antibiotics
- It is most commonly caused or preceded by a viral upper respiratory tract infection, such as a cold or flu
- And can also be caused by [acute bronchitis](#), a middle to lower respiratory tract infection, which is usually a viral infection but can be bacterial
- There can also have other infective or non-infective causes.
- Do not offer an antibiotic to treat an acute cough associated with an upper respiratory tract infection in
 - people who are not systemically very unwell or at higher risk of complications.
- Give advice about why an antibiotic is not needed.

General Advice for Acute Cough

- the usual course of acute cough (lasts up to 3 or 4 weeks)
- Tell patients how to manage their symptoms with self-care when to seek medical help,
- for example if symptoms worsen rapidly or significantly, do not improve after 3 to 4 weeks, or the person
- becomes systemically very unwell.

**** Do not offer the following treatments to people for an acute cough associated with an upper respiratory tract infection or acute bronchitis unless the person has an underlying airways disease, such as asthma:**

- an oral or inhaled bronchodilator (for example, salbutamol) **or**
- an oral or inhaled corticosteroid.
- Do not offer a mucolytic (for example acetylcysteine or carbocisteine) to treat an acute cough associated
- with an upper respiratory tract infection or acute bronchitis
- EXCEPTION – sometimes viral wheeze in children – but current evidence suggests low dose ICS in newer
- guidelines

Be aware that
people with an
acute cough may
be at higher risk of
complications if
they:

- have a pre-existing comorbidity, such as significant heart, lung, renal, liver or neuromuscular disease, immunosuppression or cystic fibrosis
- are young children who were born prematurely
- are older than 65 years with 2 or more of the following criteria, or older than
- 80 years with 1 or more of the following criteria:
- Have had a hospitalisation in previous year- especially asthma
- type 1 or type 2 diabetes
- history of congestive heart failure
- current use of oral corticosteroids.

COUGH

- Chronic cough can contribute to fatigue, especially in elderly patients, in such situations the physicians should use a drug that will reduce the frequency or intensity of the coughing.
- Cough reflex is complex, involving the central and peripheral nervous systems as well as the smooth muscle of the bronchial tree.
- It has been suggested that irritation of the bronchial mucosa causes bronchoconstriction, which in turn, stimulates cough receptors(which probably represent a specialized type of stretch receptor) located in the tracheobronchial passages.
- cough may be the first or only symptom in bronchial asthma or allergy, and in such cases bronchodilators(e.g., β_2 -adrenergic receptor agonists have been shown to reduce cough without having any significant central effects, other drugs act primarily on the central or the peripheral nervous system components of the cough reflex.

1) Antitussives (cough centre suppressants)

Drugs suppress cough & produces symptomatic relief

MOA

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

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

Opioid = most effective for cough



i) Codeine

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

ii) Noscapine & Pholcodeine

- Related to papaverine Do not have addictive , analgesic & constipating properties
- Do not interfere with mucocilliary movement
- Noscapine (15 mg) & pholcodeine (10 mg)=syrup

iii) Dextromethorphan

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

Classification of Expectorants

Classified into

b) Directly acting

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

b) Reflexly acting

E.g., 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

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

MOA of Bromhexine

- a) Thinning & fragmentation of mucopolysaccharide fibers
- b) ↑ volume & ↓ viscosity of sputum

ii) Acetylcysteine

Given directly into respiratory tract

cont.

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) Antihistamines

- 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*

5) Bronchodilators

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

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

6) Pharyngeal demulcents

- Soothe the throat (directly & also by promoting salivation)
- ❖ ▼ afferent impulses from inflamed/irritated pharyngeal mucosa
- ❖ Provide symptomatic relief in dry cough arising from throat

E.g. lozenges, cough drops, glycerine, liquorice, honey العسل

Specific treatment approach to cough

Etiology of cough

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

Treatment

Appropriate antibiotics tract infections

Cessation of smoking

Antibiotics

Inhaled β 2-agonists/ipratropium/corticosteroid

Antibiotics, nasal decongestants, antihistamines

Sputum

- Amount
 - Copious
- Colour
 - Black, brown, green, red, rusty yellow, greyish
- Consistency
 - Thin, thick, viscous, tenacious, frothy, mucoid, mucopurulent.
- Time of day
- Odour (foetid)
- Presence of matter e.g. blood
- <https://www.youtube.com/watch?v=tdrOIMXdeD4>

Sputum

- ↑ amount of sputum ⇒ infection or inflammation
- Thick green or brown ⇒ pneumonia or infection
- Yellow or grey ⇒ allergic or inflammatory response
- Haemoptysis ⇒ tuberculosis , carcinoma or TRAUMA
- Pink, frothy - severe often acute pulmonary oedema/MI

Green Sputum

- Nearly always a sign of infection
- Why is sputum green?
- White blood cells contain a protein, **myeloperoxidase**
- Only present in white blood cells
- As more white blood cells accumulate in sputum in response to bacteria
- Their green colour becomes more obvious



Sputum- colour

- Rusty can be a sign of pneumococcal Pneumonia
- Rusty sputum is defined as "a reddish-brown, blood-stained expectoration"
- Internal micro-bleedings
- Foamy and Pink tinged-pulmonary oedema

Coughing up brown sputum is a common sign of smoking. It's due to **resin** sticking to the viscous texture of the sputum and being ejected by body.

BROWN sputum nearly always sign of infection

Dyspnoea

- Assessment tools:
- Modified Borg scale
 - Uses 0-10 grading scale
- American Thoracic Society SOB Scale
 - uses descriptive terms as well as numeric grading scale
 - MRC scale useful in UK
- UCSD SOB questionnaire
- ROTH scale is unreliable
- **Description**
- SOB during activities of daily living
- Asthmatic – tightness in the chest
- CHF – sensation of suffocating
- COPD – complain of increased effort to breath

SYSTEM**CAUSE OF DYSPNOEA**

Respiratory

Asthma, COPD, pulmonary fibrosis, pleural effusion

Cardiac

CHF, pericardial effusion

Haematological

Severe anaemia, carbon monoxide poisoning

Neurological

Space occupying lesion, increased intracranial pressure, stroke/cva

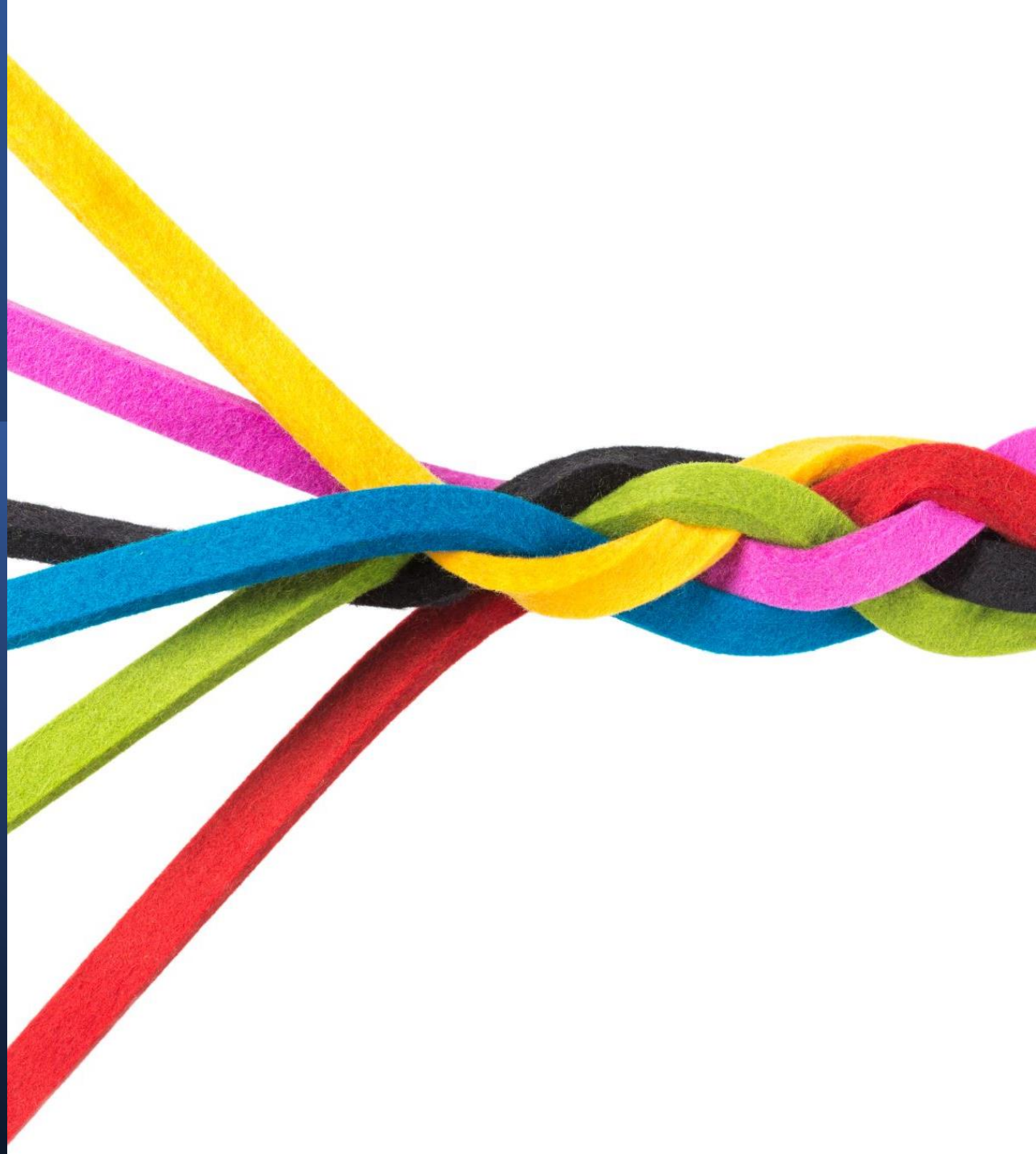
Metabolic

Uraemia, hepatic coma, thyrotoxicosis, myxoedema

Mechanical
Factors

Chest wall deformities, diaphragmatic paralysis, hepatosplenomegaly

Common
Presentations
in Primary
Care



- A 23-year-old college student comes to the surgery with a 2 day history of a non-productive cough, feeling feverish and “feeling sick” for 2 days. She says she has a final exam tomorrow and wants some medicine so she feels better during the test. Her temperature is 37.2°C, P87/min, RR18/min, and BP 117/78 mm Hg. Examination shows clear lung sounds bilaterally in all fields. There is no cervical lymphadenopathy. She has some pharyngeal erythema with neither exudates nor vesicles.
- **Which of the following is the most appropriate next step in the management of this patient?**
 - a) Refer to emergency department for intravenous antibiotics
 - b) Refer for chest x-ray
 - c) Discharge with oral antibiotics
 - d) Reassure and discharge
 - e) Give oral steroids



62 year old female presents with 2 day history of fever, body aches, sore throat and runny nose with nasal congestion, cough and headache.

PMH: HPT and Type 2 Diabetes No imms history.

She is a pre school teacher and 2 of the children in her class had similar symptoms. Taking over the counter treatment with no relief. 2 sets of covid tests were negative.

On examination she has a t: 38.6, P:90 and BP: 132/82 with spo: 97%. Not in acute distress. Erythema of the pharynx but no tonsillar enlargement or exudate.

How would you treat?

Case Study

- 22year old male states he has been experiencing worsening sore throat, fatigue, and swollen lymph nodes over the past 10-days. In addition, he has been experiencing a mild cough. His symptoms have not been relieved with over the counter cold and flu meds or with the amoxicillin prescribed by his GP. He developed an erythematous, maculopapular rash after taking the antibiotics.
- Past medical history is nad. Not on any medications
Vital signs normal
- . Physical examination demonstrates tender submandibular and posterior cervical lymphadenopathy. Oropharyngeal examination reveals bilateral tonsillar swelling with exudate.
- Differentials/

Pharyngitis

↓
PHARYNGITIS
↓

ASSESS for GROUP A STREP:
CENTOR CRITERIA

1 POINT to each CLINICAL FINDING:



ABSENCE of a COUGH



FEVER $\geq 38^{\circ}\text{C}$ or 100.4°F



TENDER ANTERIOR CERVICAL
LYMPHADENOPATHY



TONSILLAR EXUDATES or SWELLING



b/w 3-14 YRS

- rare in patients < 3

- les

Case Scenario

- Susan, a 21yr old university student complains of a runny nose and headache. No lymphadenopathy. No abnormal physical signs. Concerned as she has exams in one week in June.
- What is the likely diagnosis?
- What advice would you give her about the likely course of her problem.
- What possible complications could occur.
- Are any vaccinations advised?

Histamines

First chemical mediator to be released in immune and inflammatory response.

Antihistamines

- Antihistamines block the effects of histamine at the H1 receptor.
- They do not block histamine release, antibody production or antigen-antibody reactions.
- Most antihistamines have anticholinergic properties and may cause constipation, dry eyes, dry mouth and blurred vision.
- In addition, many antihistamines cause sedation.

Certirizine

- Brand name: Zyrtec
- Therapeutic: Allergy, cold and cough remedies, antihistamine
- Action: Antagonizes the effects of histamine at H1 receptor sites; does not bind to or inactivate histamine.
- Anticholinergic effects are minimal and sedation is dose related.
- Generally does not make client sleepy.

Brand name: Benadryl or Diphenhydramine

Classification Pharmacologic: H1 antagonist

Classification Therapeutic: allergy, cold and cough remedies, antihistamines, antitussive.

Action: Antagonizes the effects of histamine at H1 receptor sites; does not bind to or inactivate histamine. Significant CNS depressant and anticholinergic properties.

High incidence of drowsiness

Well absorbed after oral administration

Acts within 15 minutes and lasts for 8 to 12 hours

Available in combination drugs

Decongestants

Analgesics

Allergy

Cold remedies

Other anti histamines

The Common Cold

- The most common viral pathogens for the “common cold” are rhinovirus, parainfluenza virus,
- respiratory syncytial virus, adenovirus and coronavirus.
- These viruses tend to have seasonal variations in their peak incidence.
- They gain entry to the body through the nasal mucosa and the surfaces of the eye. They are readily spread
- from person to person via respiratory secretions.
- Manifestations of the common cold include:
 - Rhinitis: Inflammation of the nasal mucosa
 - Sinusitis :Inflammation of the sinus mucosa
 - Pharyngitis : Inflammation of the pharynx and throat
 - Headache
 - Nasal discharge and congestion

Influenza and other respiratory viruses

- Influenza is a viral infection that can affect the upper or lower respiratory tract.
- Three distinct forms of influenza virus have been identified: A, B(2 types) and C with type A the most common and causes the most serious illness.
- The influenza virus is a highly transmissible respiratory pathogen.
- Because the organism has a high tendency for genetic mutation, new variants of the virus are constantly arising in different places around the world. Serious pandemics (spread of infection across a large region) of influenza are seen every 30-40 years as a result of this change eg swine flu H1N1.
- Consider atypical viruses eg SARS MERS and Covid 19

Symptoms of influenza infection:

- Headache
 - Fever, chills
 - Muscle aches
 - Nasal discharge
 - Non productive cough
 - Sore throat
- Influenza infection can cause marked inflammation of the respiratory epithelium leading to acute tissue
- damage and a loss of ciliated cells that protect the respiratory passages from other organisms.
- As a result, influenza infection may lead to co-infection of the respiratory passages with bacteria eg secondary
- bacterial infection.
- It is also possible for the influenza virus to infect the tissues of the lung itself to cause a viral pneumonia
- eg primary influenza pneumonia

CURB criteria

Characteristic	Positive variable	Points
Confusion	Disoriented to person, place or time	1
Uremia	BUN > 20 mg / dL	1
Respiratory rate	> 30 breaths / min	1
Blood pressure	Systolic < 90 mm Hg or Diastolic < 60 mm Hg	1
Age	> 65 years	1

- Cyanosis?
- Pallor
- Sweating?
- Level of consciousness
- Confused?
- Chest pain? radiation- jaw?
- Respiratory rate/BP, pulse
- Blood in sputum ??
- Oxygen saturation

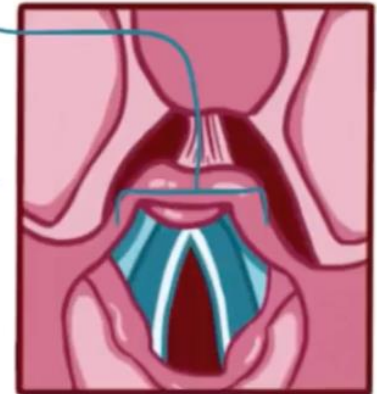
- Unexplained weight loss
- Cough- productive?
- Othopnoea
- Swollen ankles
- Persistent hoarseness
- Smoking history
- PMH eg. COPD
- Medication
- Allergy
- Social Hx.

RED FLAGS in respiratory disease

LARYNGITIS

VOCAL CORDS

AIR PRESSURE
BUILDS UP BELOW

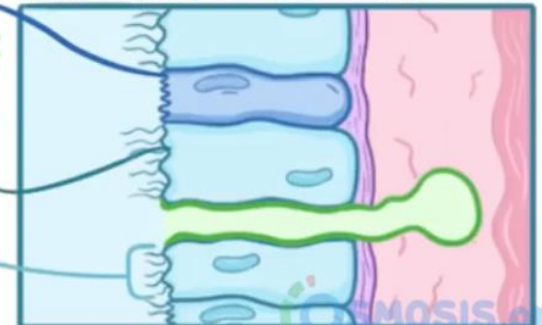



LARYNX
(VOICE BOX)

MUCOSAL EPITHELIUM

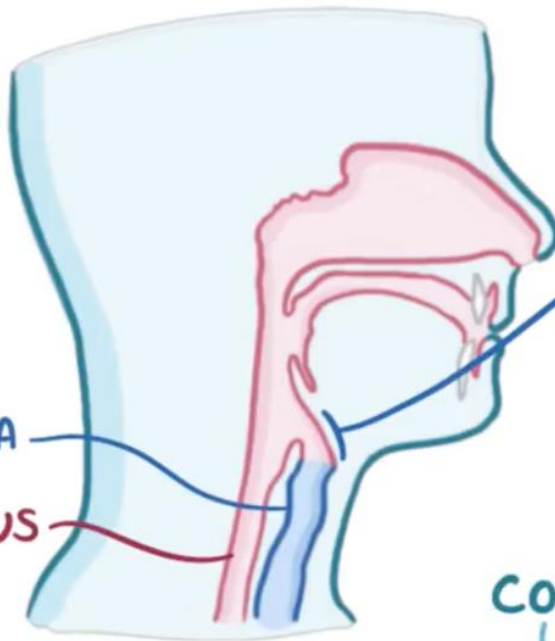
GOBLET CELL
↳ PRODUCE MUCUS
↳ TRAPS PARTICLES

COLUMNAR CELLS
↳ CILIA



TRACHEA

ESOPHAGUS



LARYNGITIS

*INFLAMMATION OF THE VOCAL CORDS



DYSPHONIA, DYSPHAGIA + DYSPNEA

ACUTE LARYNGITIS

L < 3 WEEKS

L USUALLY RESOLVES ITSELF
(ANTIBIOTICS = HELPFUL
for BACTERIAL INFECTIONS)

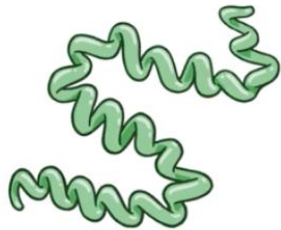
CHRONIC LARYNGITIS

L > 3 WEEKS

L ALLERGIES
L EXPOSURE to IRRITANTS
L GASTROESOPHAGEAL REFLUX

Rhinovirus

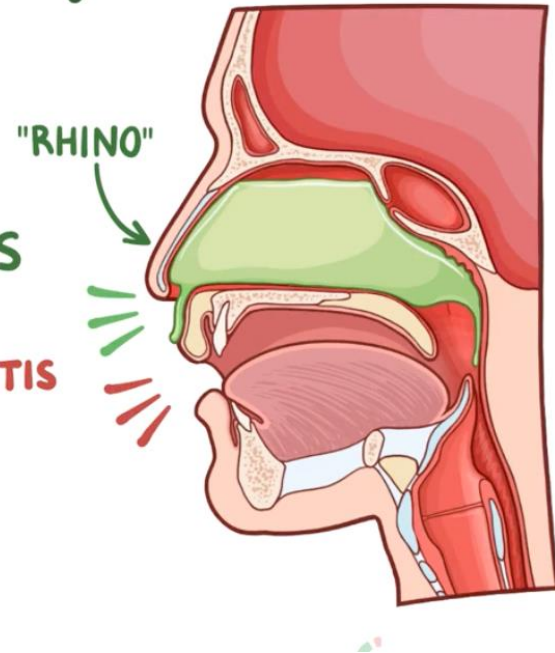
HUMAN RHINOVIRUS (HRV) = "COMMON COLD"!



- └ COMMUNICABLE
- └ INFECTIOUS
- └ 100+ KNOWN TYPES

* INFLAMMATION of **NASAL MUCOSA** = **RHINITIS**

* UPPER RESPIRATORY TRACT INFECTIONS



Adenovirus

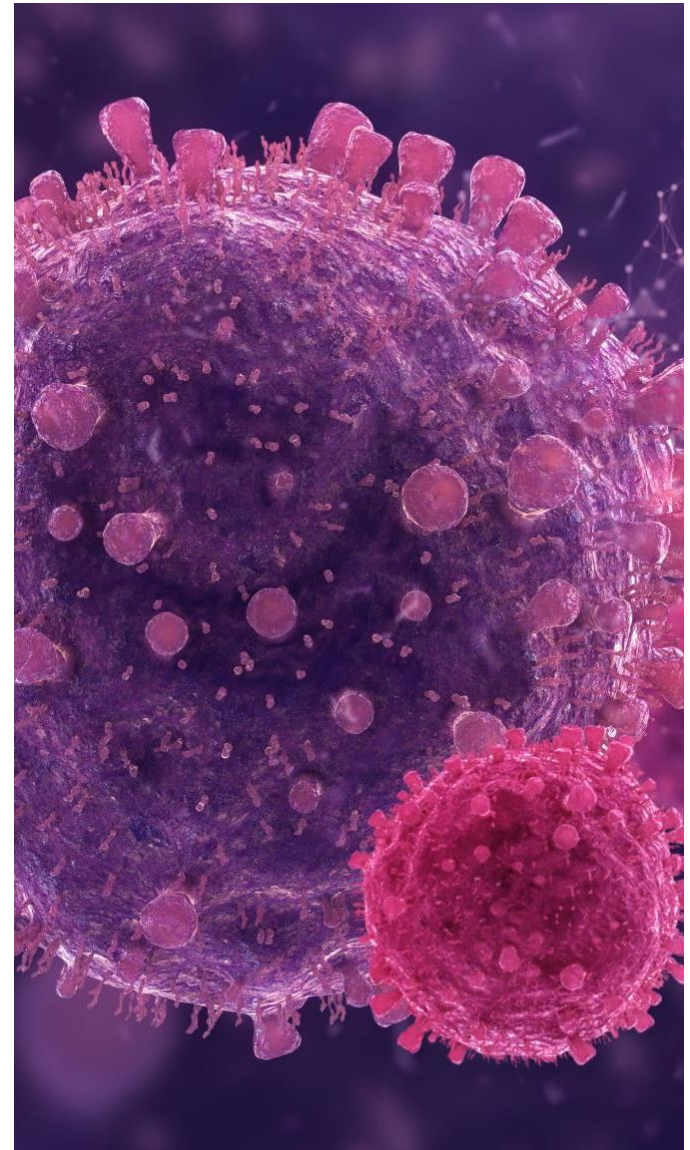
- Adenoviruses infects epithelial cells, where it causes structural changes that result in cell death from lysis and prompts an inflammatory response by the host.
- It's transmitted by respiratory droplets, the faecal-oral route, cervical fluid, and via organ transplants.
- It can affect the respiratory system, causing pharyngitis, rhinitis, and pneumonia, the gastrointestinal system, causing gastroenteritis, the genitourinary system, causing haemorrhagic cystitis, and the eyes, causing conjunctivitis.
- Symptoms vary based on which system is infected.
- Treatment is usually supportive, except in severe cases or for immunocompromised individuals, when antivirals and immunotherapy might be given.

Cytomegalovirus

- Cytomegalovirus (CMV), also known as human herpes 5, is a double-stranded DNA virus. It is usually asymptomatic in immunocompetent individuals, but can present with severe diseases in immunocompromised individuals such as those with HIV/AIDS. It can cause retinitis, esophagitis, and retinitis pneumonia. On microscopic examination, infected cells can present with characteristic "owl eye" inclusion bodies. CMV is spread through body fluids such as saliva, urine, and sexual contact but can also be spread via transplanted organs.

Epstein-Barr Virus

- Epstein-Barr virus (EBV) also known as human herpesvirus-4, is an enveloped double-stranded DNA virus of the Herpesviridae family, commonly known to be the cause of infectious mononucleosis (IM).
- It is also associated with other diseases such as Burkitt's lymphoma, Hodgkin's disease, and gastric carcinoma.
- Most people are infected with EBV at some point in their lives. In most cases, the virus produces no symptoms and goes away on its own.
- However, in some people, EBV can cause serious health problems. People with IM present with fever, sore throat, swollen lymph nodes, and liver problems.



Case Study

52 year old female presents with a tongue lesion. She states it is occasionally painful and has impacted her ability to eat. Her history is significant for active IV drug use and homelessness.

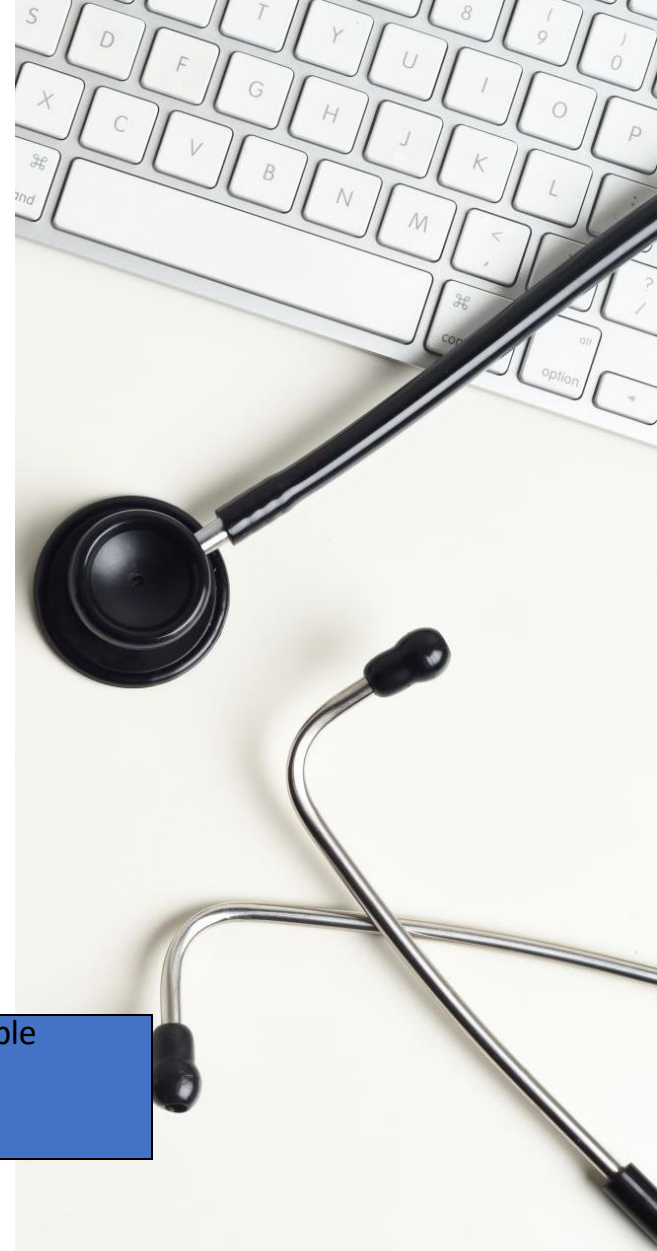
She was recently hospitalised and treated for *Pneumocystis* pneumonia six months ago. She takes no medications and has not visited a primary care physician in over ten years. Vitals are within normal limits.

Physical examination reveals a thin woman with temporal wasting and minimal muscle mass. Oral examination reveals a white lesion on the lateral margin of the tongue with “feathery” projections. The lesion is not easily scraped away with a tongue depressor. There are track marks and scars present in the bilateral antecubital fossa. The rest of the physical examination is non-contributory. The pathogen implicated in this patient’s tongue lesion is also associated with which of the following diseases?

Mrs Parsons

- Diagnosed with community acquired pneumonia
- Admitted to hospital
- IV antibiotics, fluids , rest

Local services: what is available
Early discharge planning!



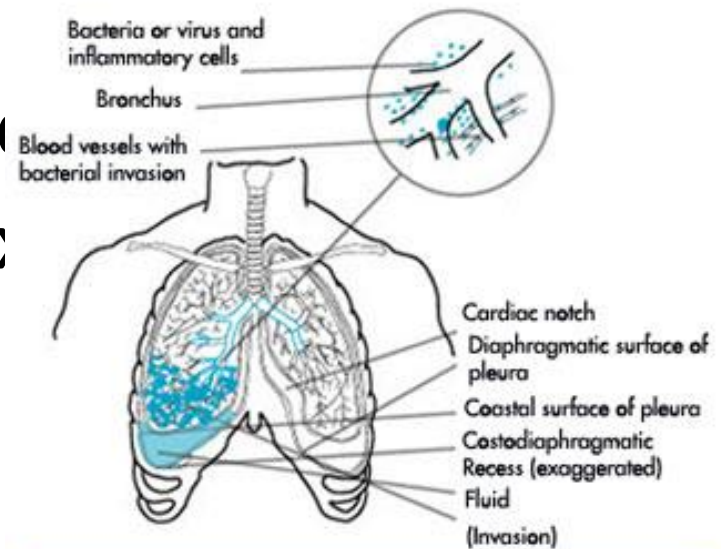


Pneumonia: what is it

- Pneumonia is inflammation and infection of the terminal bronchioles and alveoli causing consolidation.
- Consolidation- fluid and other inflammatory substances fill the alveolar and small airways instead of air.

Pneumonia

- The alveoli become inflamed and fill with liquid/matter
- Gas exchange is impaired and
- body becomes starved for oxygen



Pneumonia accounts for approximately 2.56 million deaths per year worldwide

Those that are admitted for community-acquired pneumonia spend an average 11 days in hospital

- One in ten patients with pneumonia will be admitted to intensive care.
- The majority of patients can be successfully treated in the community

Pneumonia

At Risk Patients

- Those with existing chest illness- cancer, asthma, COPD.
- Those with diabetes, renal impairment, liver disease, pregnant
- Those who are immuno-compromised; HIV, splenectomy
- Those over the age of 65
- History of alcohol, substance misuse, smoking
- Homeless
- In close communities or institutions eg. Nursing homes
- Prolonged bed rest
- malnutrition

Classification of Pneumonia

Anatomical

Lobar
Bronchial

Organism

Bacterial
Viral incl COVID
Fungal

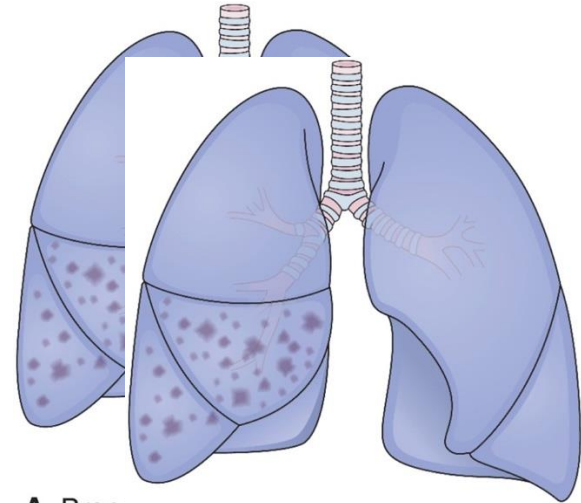
Where?

Hospital-Acquired
Community acquired

Other

Legionnaires
Aspiration
Ventilator-associated
SARS MERS

- Bronchopneumonia
 - patchy inflammation
 - involves alveoli of more than 1 lobe
 - usually in basilar parts
- Lobar pneumonia
 - consolidation of an entire lobe
 - almost always caused by *S. pneumoniae*

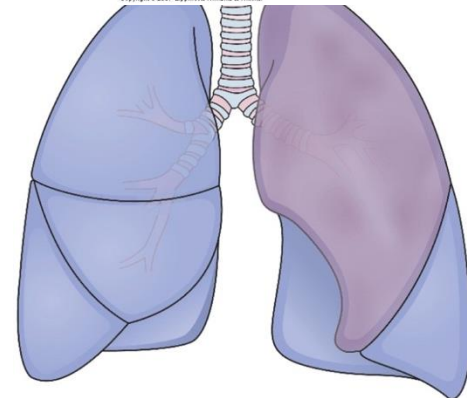


A Bronchopneumonia

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A Bronchopneumonia

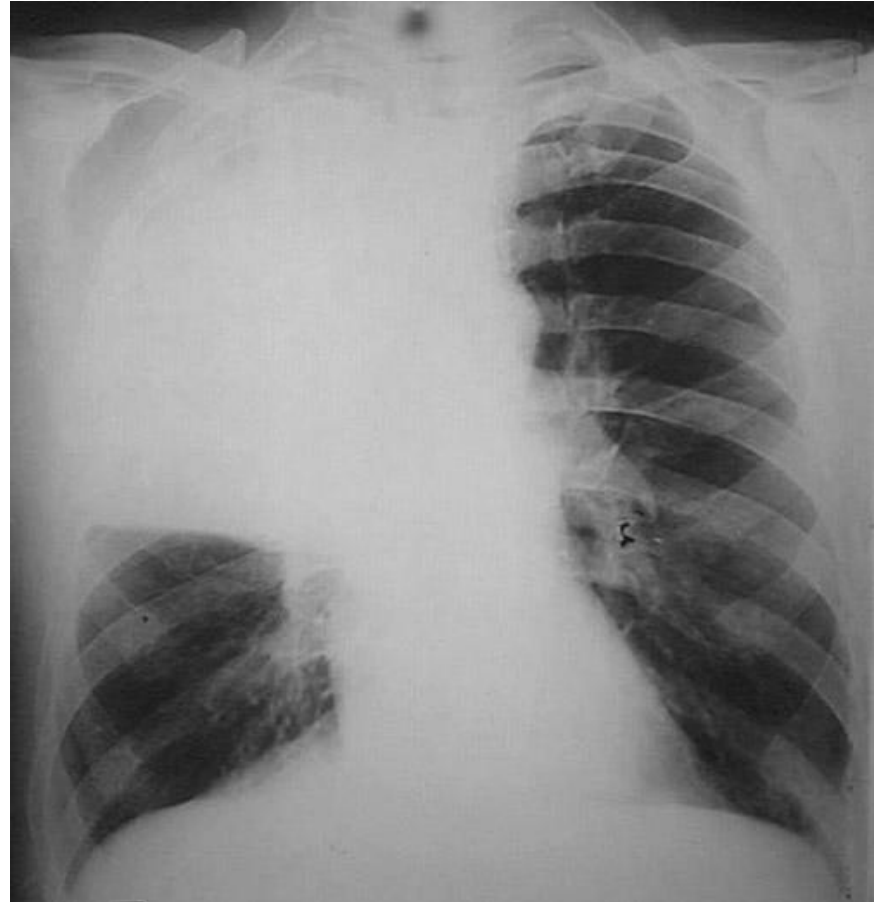
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B Lobar pneumonia

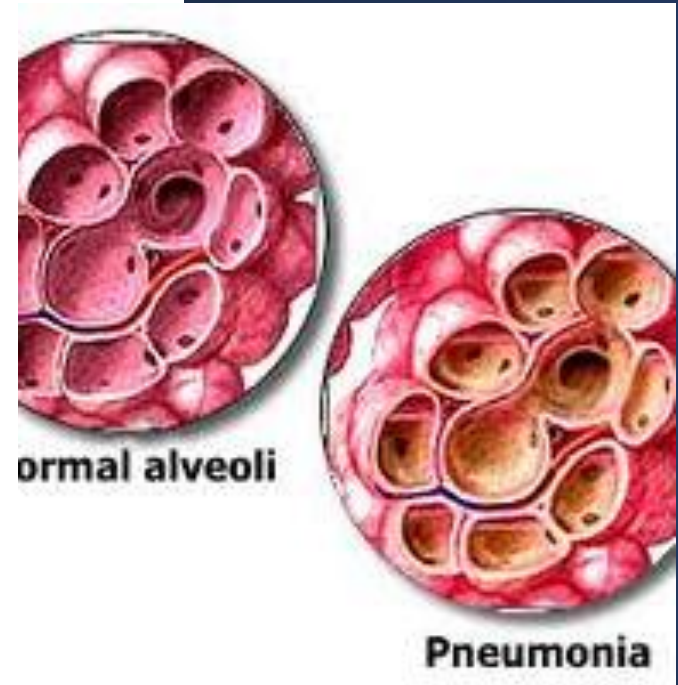
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- Lobular pneumonia affects a lobe of the lungs (see x-ray), and bronchial pneumonia can affect patches throughout both lungs.



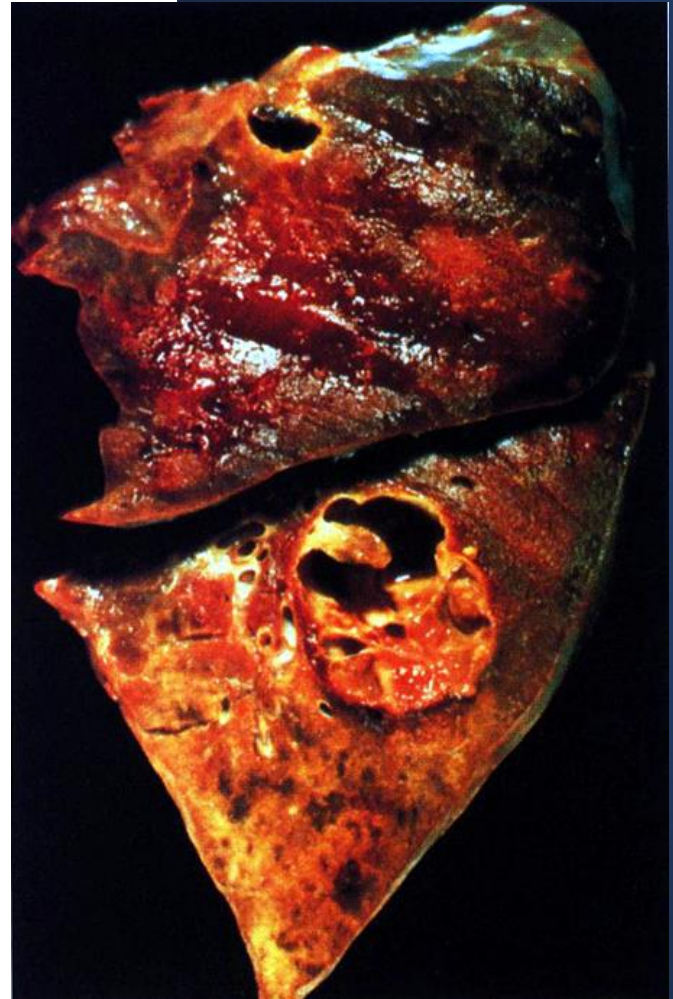
Potential complication:

- Lung abscess
- Pleurisy
- Empyema
- Septicaemia or IPD
- Death-especially if pt has co-morbidities



Lung Abscess

- Purulent inflammation with tissue necrosis & liquefaction
- There can be several types of bacteria with anaerobic and aerobic presentations
- Most commonly due to aspiration of gastric contents
- Foul-smelling sputum

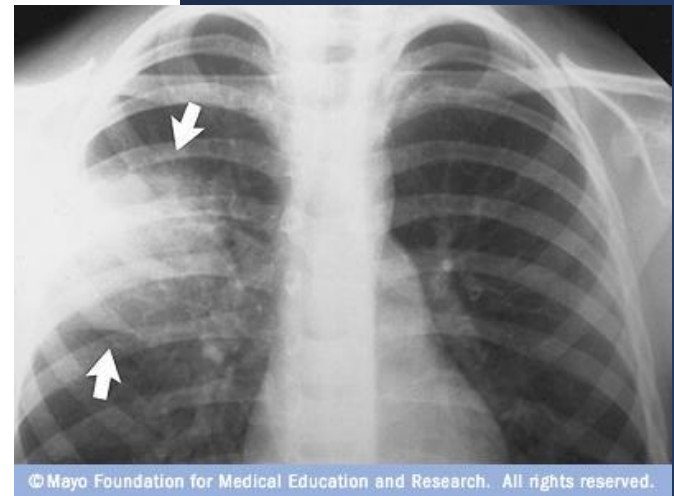


Physical examination: Findings

- Fever
- Increased Respiration : Note rate, depth, rhythm
- tachycardia
- Increased Fremitus
- Rales, crackles- or added sounds
- Bronchial sounds rather than vesicular sounds
- Pleuritic chest pain and/or pleurisy
- Hypoxia
- Oxygen Saturation level changed
- Confusion/rigors
- Rusty coloured sputum

Investigations

- Patient has pneumonia in the right lung (note – white mass = fluid)
- Lungs should appear black on an x-ray
- Which lobe??



Community Acquired Pneumonia

- Causative pathogens:

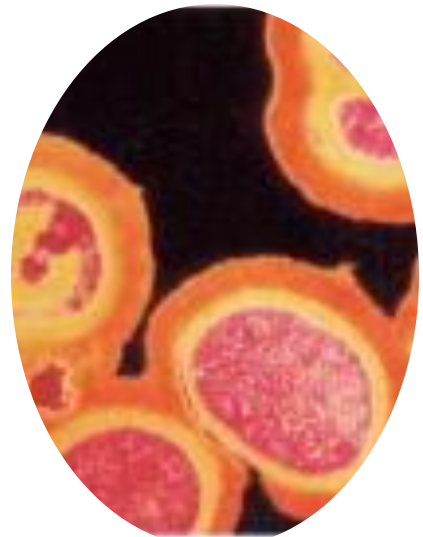
Bacterial- *Streptococcus pneumoniae*, *Haemophilus Influenzae*,

Mycoplasma pneumoniae,

Chlamydia pneumoniae, *Legionella pneumophila*

Viral- *Respiratory Syncytial Virus (RSV)*, *Cytomegalovirus*, *Influenzae Virus*,

COVID



Hospital Acquired Pneumonia

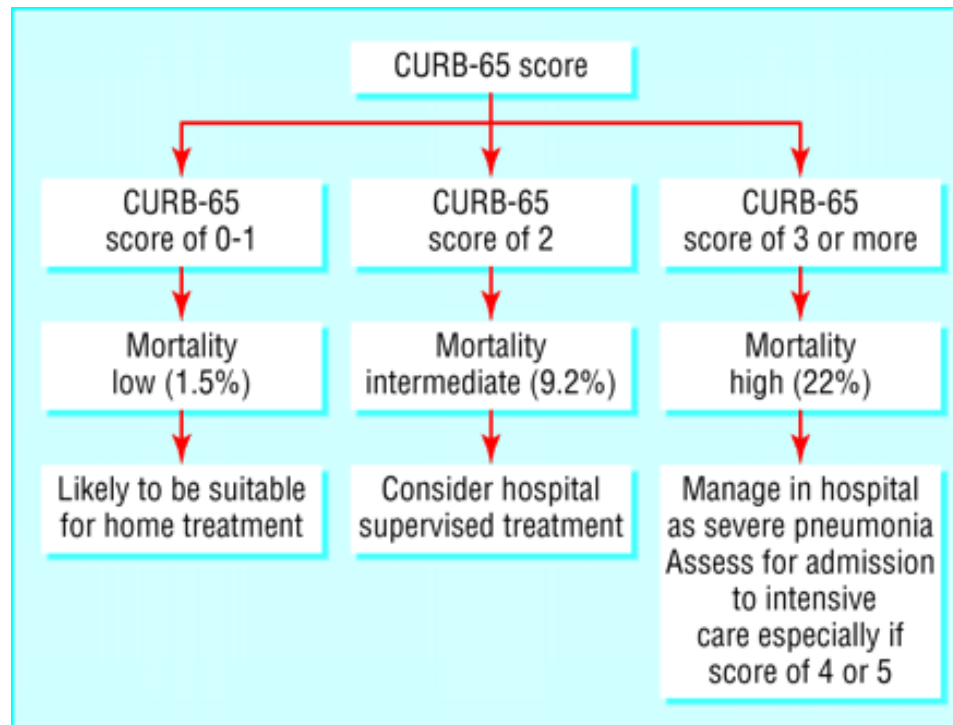
- Occurs > 48 hrs following admission
- Reason: aspiration, cross infection
- Compromised immune system
- Prolonged user of ventilatory support
- Poor oral hygiene
- Elderly and those with existing lung disease

Causative Organism

- Gram-negative Enterobacteria, *Pseudomonas Aeruginosa*, *Acinetobacter* species,
- Methicillin –resistant *Staphylococcus Aureus* (MRSA)



Assessing Risk



Confusion
Urea >7mmol/l
Respiratory rate ≥ 30
Blood pressure: systolic <90mmHg or diastolic ≤ 60 mmHg
Age ≥ 65 years
(Give score of 1 for each feature present)



CURB-65 score	Severity	Where to treat
0	Low	Home
1	Low	Home
2	Moderate	Hospital
3-5	High	Hospital: assess for ITU admission

Important:
Pneumonia severity scores (such as the CURB-65) must be used in conjunction with **clinical judgement** when assessing the severity of a pneumonia case.

Figure 4: CURB-65 score.

Treatment

- Determine severity; Pneumonia severity index tool
- Chest X-ray
- Check for leukopenia, leukocytosis
- Sputum cultures
- Antibiotic therapy
- Monitor SpO2 levels
- Hydration
- Anti-pyretics
- Breathing exercises

Vaccinate

- In risk groups eg those with LTC such those with diabetes, COPD, CHD etc ensure
- pneumovax and annual 'flu
- vaccine (to prevent secondary bacterial pneumonia)
- Also eligible if over 65
- Once in a lifetime

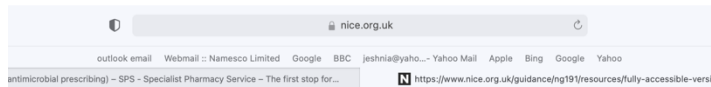
SYMPTOMS IN SEVERE COVID19

- Use the following signs and symptoms to help identify people with COVID-19 with the most severe illness:severe shortness of breath at rest or difficulty breathing
- reduced oxygen saturation levels measured by pulse oximetry (see the [recommendation on pulse oximetry levels that indicate serious illness](#))
- coughing up blood
- blue lips or face
- feeling cold and clammy with pale or mottled skin
- collapse or fainting (syncope)
- new confusion
- becoming difficult to rouse
- reduced urine output.

Chart 1: The NEWS scoring system

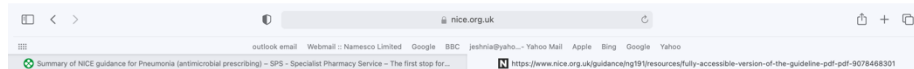
Physiological parameter	3	2	1	Score 0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO ₂ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO ₂ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

COVID19 AND COUGH



: treatments for managing cough in people 18 years and over

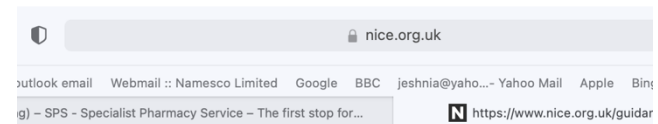
	Dosage
Initial management: use simple non-drug measures, for example, taking honey	A teaspoon of honey
First choice, only if cough is distressing: codeine linctus (15 mg/5 ml) or codeine phosphate tablets (15 mg, 30 mg)	15 mg to 30 mg every 4 hours as required, up to 4 doses in 24 hours If necessary, increase dose to a maximum of 30 mg to 60 mg four times a day (maximum 240 mg in 24 hours)
Second choice, only if cough is distressing: morphine sulfate oral solution (10 mg/5 ml)	2.5 mg to 5 mg when required every 4 hours Increase up to 5 mg to 10 mg every 4 hours as required If the person is already taking regular morphine, increase the regular dose by a third



Practical info: treatments for managing cough in people 18 years and over

Treatment	Dosage
Initial management: use simple non-drug measures, for example, taking honey	A teaspoon of honey
First choice, only if cough is distressing: codeine linctus (15 mg/5 ml) or codeine phosphate tablets (15 mg, 30 mg)	15 mg to 30 mg every 4 hours as required, up to 4 doses in 24 hours If necessary, increase dose to a maximum of 30 mg to 60 mg four times a day (maximum 240 mg in 24 hours)
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ANXIETY AND COVID19



tical info: treatments for managing anxiety, delirium and agitation in people 1

atment	Dosage
xiety or ation and allow: lorazepam tablets	Lorazepam 0.5 mg to 1 mg four times a day as required (maximum 4 mg in 24 hours) Reduce the dose to 0.25 mg to 0.5 mg in older people who are debilitated (maximum 2 mg in 24 hours) Oral tablets can be used sublingually (off-label use)
xiety or ation and ble to allow: midazolam ction	Midazolam 2.5 mg to 5 mg by subcutaneous injection every 2 hours as required If needed frequently (more than twice daily), a subcutaneous syringe driver may be considered (if available) starting with 1 mg over 24 hours Reduce dosage to 5 mg over 24 hours if estimated glomerular filtration rate is less than 30 ml per minute
delirium and able allow: haloperidol tablets	Haloperidol 0.5 mg to 1 mg at night and every 2 hours when needed Increase dose in 0.5 mg to 1 mg increments as required (maximum 4 mg daily, or 5 mg daily in older people) The same dose of haloperidol may be administered by subcutaneous injection as required rather than orally, or as a subcutaneous infusion of 5 mg to 10 mg over 24 hours Consider a higher starting dose (1.5 mg to 3 mg) if the person is distressed or causing immediate danger to others Consider adding a benzodiazepine such as lorazepam or midazolam if the person remains agitated (see dosages above)
delirium and ble to allow	Levomepromazine 12.5 mg to 25 mg as a subcutaneous injection starting dose and then hourly as required (use 6.25 mg to 12.5 mg in older people) Maintain with a subcutaneous infusion of 50 mg to 200 mg over 24 hours

Pulse Oximetry and NEWS2 tool

- When pulse oximetry is available, use oxygen saturation levels below 94% for adults (or below 88% for adults with known type 2 respiratory failure) and below 91% for children in room air at rest to identify people who are seriously ill
- The NEWS2 tool may be used in adults in addition to clinical judgment to assess a person's risk of deterioration. Note that use of NEWS2 is not advised in children or pregnant women. Although the NEWS2 tool is not validated for predicting the risk of clinical deterioration in prehospital settings, it may be a helpful adjunct to clinical judgement in adults. A face-to-face consultation should not be arranged solely to calculate a NEWS2 score.

AVPU is now ACVPU – disorientation, confusion or new altered mental state signifies potential deterioration

CASE STUDY

25YR OLD female presents with shortness of breath in past week. States she often has to catch her breath

and pain when turning neck. There is no history of recent flights, no sputum but does have a dry cough,

no pyrexia, no temperature. Complaining of pain in groin and in shoulders as well.

Pmh- Nil Allergies Nil Medication : Contraceptive pill Yasmin.

Social History : Secretary Travel Hx: No flights. 6 hr drive to Scotland last weekend. Quite sporty. Eats

healthily. Lives with boyfriend.

FH – Nil

What further questions will you ask?

What is the likely diagnosis?

How would you treat?

Pulmonary Embolism (PE)

- A disorder of perfusion
- Combination of factors increase probability of occurrence
 - Hypercoagulability
 - Platelet aggregation
 - Deep vein stasis
- Embolus usually originates in lower extremities or pelvis

Background

- Thrombus (blood clot) forms in a vein
- Deep vein thrombosis - in deep veins of leg or pelvis
- Pulmonary embolism - thrombus dislodges and travels to pulmonary arteries
- Term 'venous thromboembolism' includes DVT and PE
- Risk factors include: thrombophilia, history of DVT, surgery, obesity, acute illness, cancer and immobility
- Incidence is 7-8 per 10,000 people in the UK (lifetime).
- In Europe 544,000 VTE related deaths annually (NICE)

VTE risk 2017 eIFH

- Incidence of VTE - The incidence of VTE is 1-2 per 1,000 of the population and the risk
- increases with age. One in 20 people will have a VTE at some time in their life.
- Approximately half of patients presenting with VTE have been hospitalised in the
- previous eight weeks
- Given that 10% of hospital deaths are due to PE then even with an optimistic hospital
- inpatient mortality rate of 1%, the risk of dying from PE due to hospitalisation is at least
- 1,000 times greater than dying from PE as a consequence of air travel

History

- Acute onset of dyspnoea
- Cough
- Mild to severe chest pain
- Haemoptysis
- History of DVT
- Recent surgery
- Oral contraceptive use
- Smoker
- Risk eg malignancy

Physical Findings

Restlessness/agitation

Fever

Tachycardia

Tachypnoea

Diminished breath sounds

Crackles/Wheeze/Rub

Diagnostic investigations

In patients presenting with signs or symptoms of PE, carry out the following to exclude other causes:

- an assessment of their general medical history
- a physical examination and
- a chest X-ray
- Check for anti trypsin deficiency

If PE suspected use the two-level PE Wells score

also check
<https://www.nice.org.uk/guidance/cg144>

Two-level PE Wells score

- **NICE GUIDELINES 2013**

Clinical feature	Points
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3
An alternative diagnosis is less likely than PE	3
Heart rate > 100 beats per minute	1.5
Immobilisation more than 3 days/surgery in previous 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Malignancy (on treatment/treated in the past 6 months/palliative)	1
Clinical probability simplified scores	
PE likely	More than 4
PE unlikely	4 or less
^a Adapted with permission from Wells PS et al. (2000) Derivation of a simple clinical model to categorize patients' probability of pulmonary embolism: increasing the model's utility with the SimpliRED D-dimer. Thrombosis and Haemostasis 83: 416–20	

Investigations

Offer all patients with **unprovoked DVT or PE**, who are not known to have cancer :

- physical examination (guided by patient's full history) **and**
- chest X-ray **and**
- blood tests (full blood count, serum calcium and liver function tests) **and**
- urinalysis

Patient information: self- management

Information and advice

- Anticoagulant information booklet
- Anticoagulant alert card
- Heparins of animal origin may be of concern to some patients

Self monitoring of INR

- Do not routinely offer to PE or DVT patients
- <https://www.nice.org.uk/guidance/NG158> for guidance

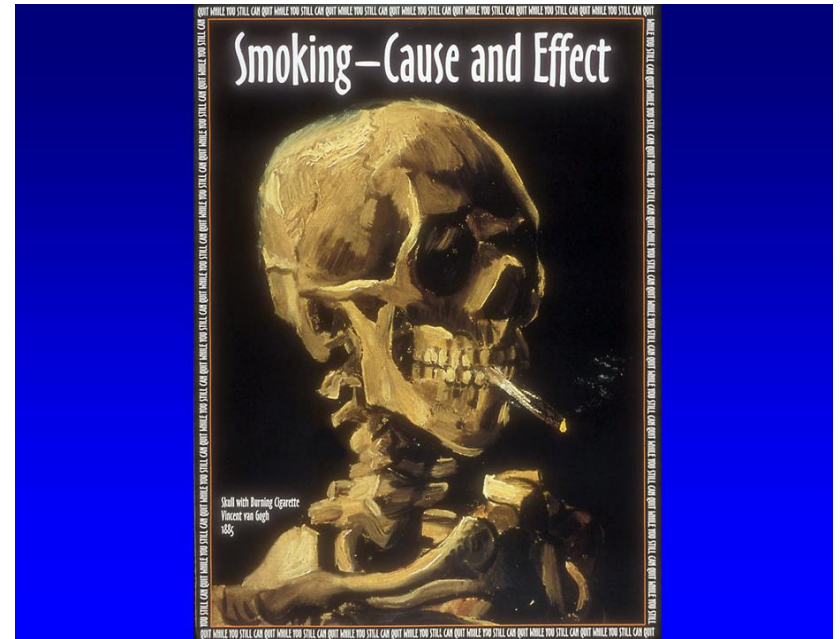
55-year-old man comes to the surgery with 3 day history of shortness of breath and increasing difficulty in breathing. He has a productive cough with green and yellow phlegm, with dyspnea that worsens with minimal exertion. He has experienced no fever, chills or chest pain. He is otherwise generally well except from a morning cough that brings up white sputum which he has been for many years. He has a 40 pack year history of smoking. No immunization history. SPO2 88% on room air and no cyanosis. Prolonged expiratory phase and bilateral expiratory wheeze on auscultation

• **What is the most likely diagnosis?**

- a) Acute exacerbation of COPD
- b) Bronchial pneumonia
- c) Bronchiectasis
- d) Congestive cardiac failure
- e) Viral pneumonia

Case Study

- Dermot, a 57yr old male is admitted with increasing dyspnoea, non productive cough which has become worse. He is housebound because of breathlessness. He smokes 20-30 cigarettes a day. He is on a thiazide diuretic for his hypertension.
- Differential diagnosis
- What advice would you give him?
- What other tests would you consider?



COPD Definition

- Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

Definition and Overview

- Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.
- The most common respiratory symptoms include dyspnea, cough and/or sputum production. These symptoms may be under-reported by patients.
- The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute.

Definition and Overview

Besides exposures, host factors predispose individuals to develop COPD. These include genetic abnormalities, abnormal lung development and accelerated aging.

COPD may be punctuated by periods of acute worsening of respiratory symptoms, called exacerbations.

In most patients, COPD is associated with significant concomitant chronic diseases, which increase its morbidity and mortality.

Factors that influence disease progression

- Genetic factors
- Age and gender
- Lung growth and development
- Exposure to particles
- Socioeconomic status
- Asthma & airway hyper-reactivity
- Chronic bronchitis
- Infections

Diagnosis and Initial Assessment

- **OVERALL KEY POINTS (1 of 2):**
- COPD should be considered in any patient who has dyspnea, chronic cough or sputum production, and/or a history of exposure to risk factors for the disease.
- Spirometry is required to make the diagnosis; the presence of a post-bronchodilator $FEV_1/FVC < 0.70$ confirms the presence of persistent airflow limitation.
- The goals of COPD assessment are to determine the level of airflow limitation, the impact of disease on the patient's health status, and the risk of future events (such as exacerbations, hospital admissions, or death), in order to guide therapy.

▶ PATHWAYS TO THE DIAGNOSIS OF COPD

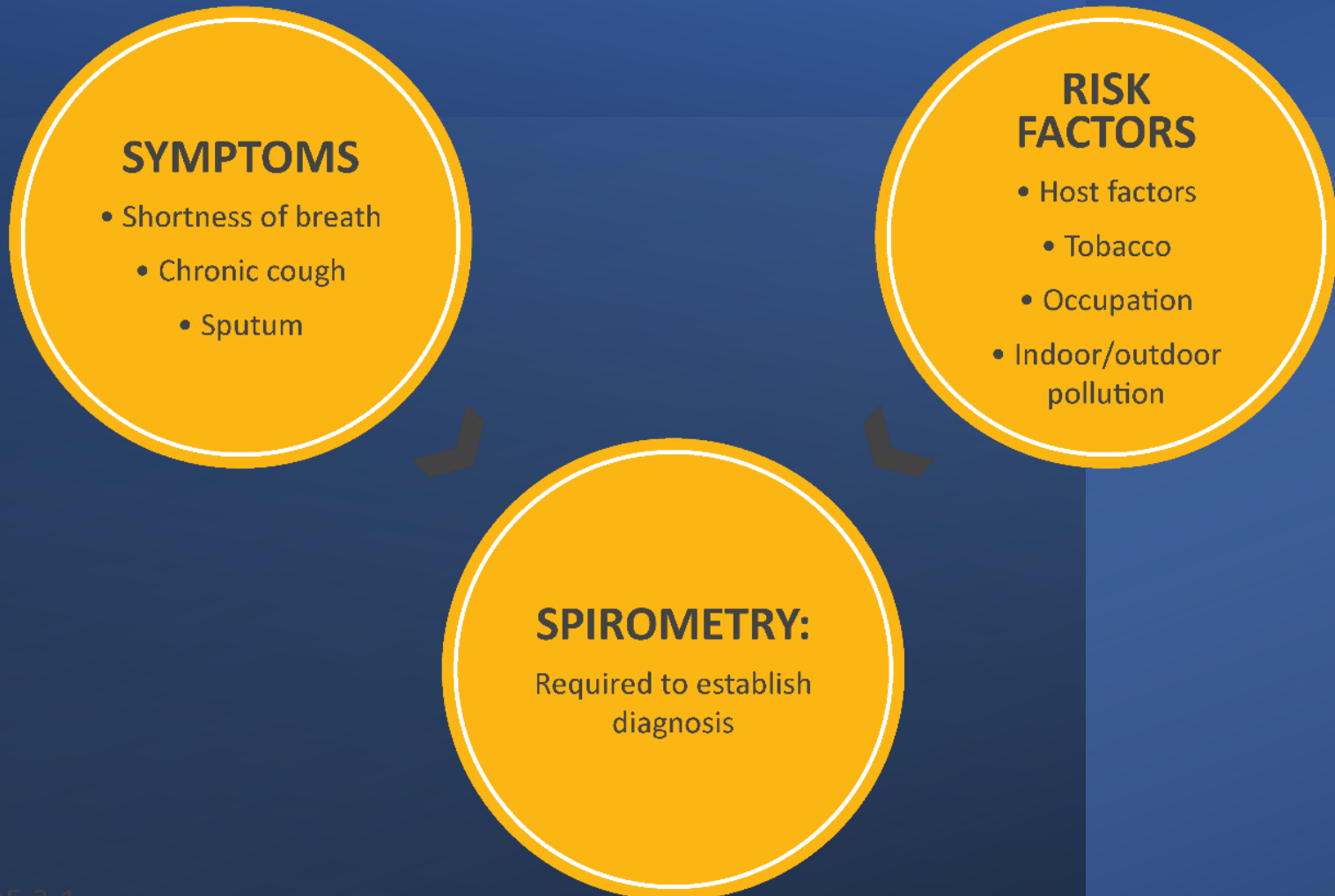


FIGURE 2.1

Diagnosis and Initial Assessment

- **Symptoms of COPD**
 - Chronic and progressive dyspnea
 - Cough
 - Sputum production
 - Wheezing and chest tightness
 - Others – including fatigue, weight loss, anorexia, syncope, rib fractures, ankle swelling, depression, anxiety.

Assessment of Exacerbation Risk

- COPD exacerbations are defined as an acute worsening of respiratory symptoms that result in additional therapy.
- Classified as:
 - Mild (treated with SABDs only)
 - Moderate (treated with SABDs plus antibiotics and/or oral corticosteroids) or
 - Severe (patient requires hospitalization or visits the emergency room). Severe exacerbations may also be associated with acute respiratory failure.
- Blood eosinophil count may also predict exacerbation rates (in patients treated with LABA without ICS).

► DIFFERENTIAL DIAGNOSIS OF COPD

DIAGNOSIS	SUGGESTIVE FEATURES
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/early morning. Allergy, rhinitis, and/or eczema also present. Family history of asthma. Obesity coexistence.
Congestive Heart Failure	Chest X-ray shows dilated heart, pulmonary edema. Pulmonary function tests indicate volume restriction, not airflow limitation.
Bronchiectasis	Large volumes of purulent sputum. Commonly associated with bacterial infection. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.
Tuberculosis	Onset all ages. Chest X-ray shows lung infiltrate. Microbiological confirmation. High local prevalence of tuberculosis.
Obliterative Bronchiolitis	Onset at younger age, nonsmokers. May have history of rheumatoid arthritis or acute fume exposure. Seen after lung or bone marrow transplantation. CT on expiration shows hypodense areas.
Diffuse Panbronchiolitis	Predominantly seen in patients of Asian descent. Most patients are male and nonsmokers. Almost all have chronic sinusitis. Chest X-ray & HRCT show diffuse small centrilobular nodular opacities & hyperinflation.

These features tend to be characteristic of the respective diseases, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in the developing world where other risk factors may be more important than cigarette smoking); asthma may develop in adult and even in elderly patients.

TABLE 2.7

Prevention & Maintenance Therapy

- **OVERALL KEY POINTS (1 of 3):**
- Smoking cessation is key. Pharmacotherapy and nicotine replacement reliably increase long-term smoking abstinence rates. Legislative smoking bans and counselling, delivered by healthcare professionals improve quit rates.
- The effectiveness and safety of e-cigarettes as a smoking cessation aid is uncertain at present.
- Pharmacologic therapy can reduce COPD symptoms, reduce the frequency and severity of exacerbations, and improve health status and exercise tolerance.
- Each pharmacologic treatment regimen should be individualized and guided by the severity of symptoms, risk of exacerbations, side-effects, comorbidities, drug availability and cost, and the patient's response, preference and ability to use various drug delivery devices.

Prevention & Maintenance Therapy

OVERALL KEY POINTS (2 of 3):

- Inhaler technique needs to be assessed regularly.
- Influenza vaccination decreases the incidence of lower respiratory tract infections.
- Pneumococcal vaccination decreases lower respiratory tract infections.
- Pulmonary rehabilitation improves symptoms, quality of life, and physical and emotional participation in everyday activities.
- In patients with severe resting chronic hypoxemia, long-term oxygen therapy improves survival.

Smoking Cessation

- Smoking cessation has the greatest capacity to influence the natural history of COPD.
- If effective resources and time are dedicated to smoking cessation, long-term quit success rates of up to 25% can be achieved.

BRIEF STRATEGIES TO HELP THE PATIENT WILLING TO QUIT	
• ASK:	Systematically identify all tobacco users at every visit. <i>Implement an office-wide system that ensures that, for EVERY patient at EVERY clinic visit, tobacco-use status is queried and documented.</i>
• ADVISE:	Strongly urge all tobacco users to quit. <i>In a clear, strong, and personalized manner, urge every tobacco user to quit.</i>
• ASSESS:	Determine willingness and rationale of patient's desire to make a quit attempt. <i>Ask every tobacco user if he or she is willing to make a quit attempt at this time (e.g., within the next 30 days).</i>
• ASSIST:	Aid the patient in quitting. <i>Help the patient with a quit plan; provide practical counseling; provide intra-treatment social support; help the patient obtain extra-treatment social support; recommend use of approved pharmacotherapy except in special circumstances; provide supplementary materials.</i>
• ARRANGE:	Schedule follow-up contact. <i>Schedule follow-up contact, either in person or via telephone.</i>

TABLE 3.1

Vaccination

- Influenza vaccination can reduce serious illness (such as lower respiratory tract infections requiring hospitalization) and death in COPD patients.
- Pneumococcal vaccinations, PCV13 and PPSV23, are recommended for all patients ≥ 65 years of age.

VACCINATION FOR STABLE COPD

- Influenza vaccination reduces serious illness and death in COPD patients (**Evidence B**).
- The 23-valent pneumococcal polysaccharide vaccine (PPSV23) has been shown to reduce the incidence of community - acquired pneumonia in COPD patients aged < 65 years with an FEV₁ $< 40\%$ predicted and in those with comorbidities (**Evidence B**).
- In the general population of adults ≥ 65 years the 13-valent conjugated pneumococcal vaccine (PCV13) has demonstrated significant efficacy in reducing bacteremia & serious invasive pneumococcal disease (**Evidence B**).

TABLE 3.2

Pharmacological therapy



COMMONLY USED MAINTENANCE MEDICATIONS IN COPD*

DELIVERY OPTIONS

Generic Drug Name	Inhaler Type	Nebulizer	Oral	Injection	Duration Of Action
BETA₂-AGONISTS					
SHORT-ACTING (SABA)					
Fenoterol	MDI	✓	pill, syrup		4-6 hours
Levalbuterol	MDI	✓			6-8 hours
Salbutamol (albuterol)	MDI & DPI	✓	pill, syrup, extended release tablet	✓	4-6 hours 12 hours (ext. release)
Terbutaline	DPI		pill	✓	4-6 hours
LONG-ACTING (LABA)					
Arformoterol		✓			12 hours
Formoterol	DPI	✓			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
ANTICHOLINERGICS					
SHORT-ACTING (SAMA)					
Ipratropium bromide	MDI	✓			6-8 hours
Oxitropium bromide	MDI				7-9 hours
LONG-ACTING (LAMA)					
Acclidinium bromide	DPI, MDI				12 hours
Glycopyrronium bromide	DPI		solution	✓	12-24 hours
Tiotropium	DPI, SMI				24 hours
Umeclidinium	DPI				24 hours

Management of Exacerbations

OVERALL KEY POINTS (1 of 3):

- An exacerbation of COPD is defined as an acute worsening of respiratory symptoms that results in additional therapy.
- Exacerbations of COPD can be precipitated by several factors. The most common causes are respiratory tract infections.
- The goal for treatment of COPD exacerbations is to minimize the negative impact of the current exacerbation and to prevent subsequent events.
- Short-acting inhaled beta₂-agonists, with or without short-acting anticholinergics, are recommended as the initial bronchodilators to treat an acute exacerbation.

Treatment COPD

Oral mucolytic therapy

- Consider mucolytic drug therapy for people with a chronic cough productive of sputum.
- Only continue mucolytic therapy if there is symptomatic improvement (for example, reduction in frequency of cough and sputum production).
- Do not routinely use mucolytic drugs to prevent exacerbations in people with stable COPD.

Oral anti-oxidant therapy

- Treatment with alpha-tocopherol and beta-carotene supplements, alone or in combination, is not recommended. –
- **no evidence or poor evidence**

Oral anti-tussive therapy

- Anti-tussive therapy should not be used in the management of stable COPD.

Oral prophylactic antibiotic therapy

- Before starting prophylactic antibiotic therapy in a person with COPD, think about whether respiratory specialist input is needed.
- Consider azithromycin (usually 250 mg 3 times a week) for people with COPD if they: do not smoke **and** have optimised
- non-pharmacological management and inhaled therapies, relevant vaccinations and (if appropriate) have been referred for
- pulmonary rehabilitation **and** continue to have 1 or more of the following, particularly if they have significant daily sputum production:



Key recommendations

For primary care

- If a patient has a **co-diagnosis of asthma and COPD**, ensure the rationale is **documented**.
- Use **Read codes/recording systems** consistently.
- At **annual review**, ask the patient about **breathlessness** and **tobacco use**, assess **quality of life**, and record **exacerbations**.

For respiratory specialists

- **Communicate** results to **GPs** using **agreed terminology** to avoid duplication.
- Work with **primary care health professionals** to develop **respiratory symptom assessment processes** for COPD that are applicable **regionally**.

For system managers

- Work with **providers** of PR to ensure that **PR referral** takes place and that there is suitable **resource** to deliver it.
- Work with local and primary care specialists to select and use **metrics to drive continuous improvement**.

- A 66-year-old man presented to his primary care practitioner with a headache, fever, and cough for the previous 3 days, and recent bouts of confusion. The patient had smoked cigarettes (approximately 1 pack per day) since age 17, had had type 2 diabetes mellitus for 15 years, and had coronary artery bypass surgery 12 years ago. He was treated with a macrolide (azithromycin) for sinusitis 8 weeks before presentation. Vital signs were as follows: temperature, 100.8°F (38.2°C); pulse, 110 beats per minute, respiratory rate, 28 breaths per minute. Auscultation of his lungs revealed rhonchi in the right lower lobe.

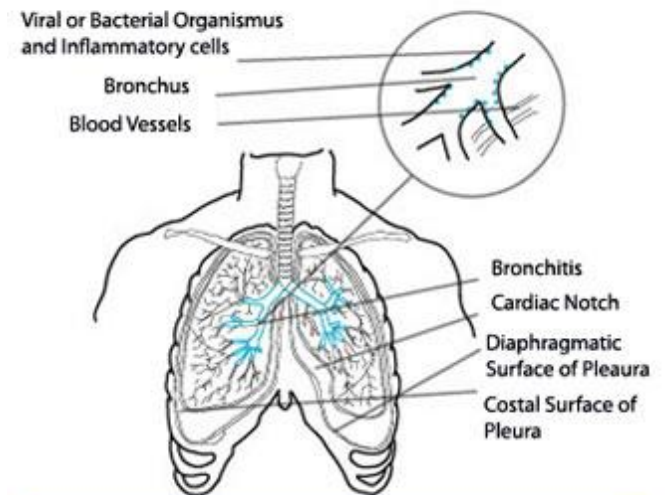
- A 58-year-old man with a BMI of 32 comes to the surgery. He states he gets very short of breath after climbing a flight of stairs. His SOB is associated with a cough and productive green sputum. He has had symptoms like these for at least four months out of the year over the past decade, but they have been consistently present for the past 6 months and seem to be worsening in severity. The patient admits to smoking about a pack of cigarettes a week for the past 20 years. He has never received flu vaccine. He is worried that this could be related to his family history of cardiac issues. He is afebrile, there is no sign of oedema and heart sounds appear to be normal.

• **Which of the following findings is most likely to be observed on physical examination?**

- a) COPD
- b) Asthma
- c) Obstructive sleep apnoea
- d) Heart Failure
- e) Emphysema

Bronchitis

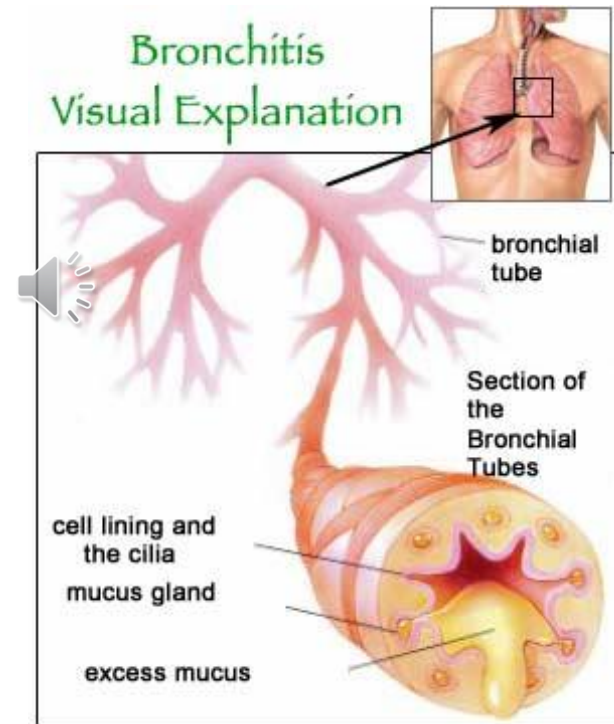
- An infection of the bronchi
- 2 types:
- Acute – caused by a bacteria or virus



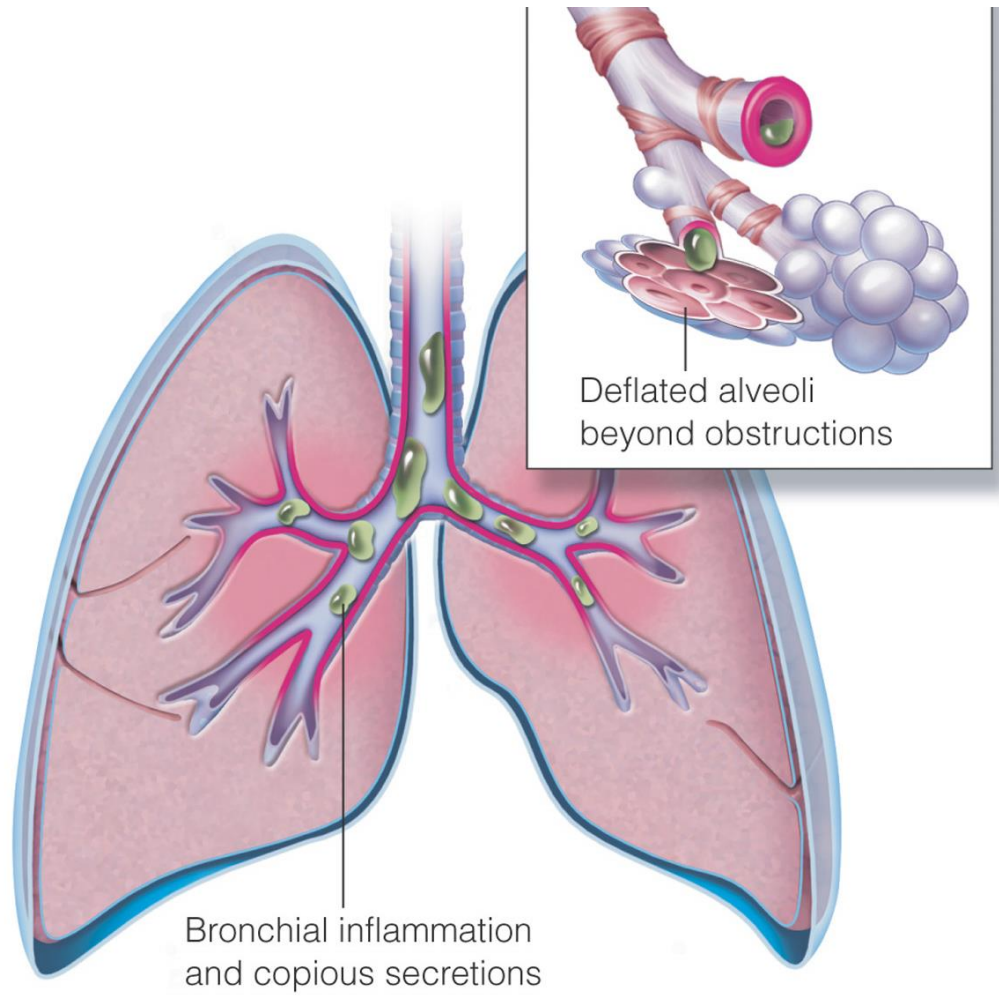
ACTUTE BRONCHITIS

Chronic – long term

- usually caused by an irritant – ie smoking
- cilia become damaged and can't clear debris
- treatment – quit smoking



Bronchitis



Bronchiectasis can be a result of COPD

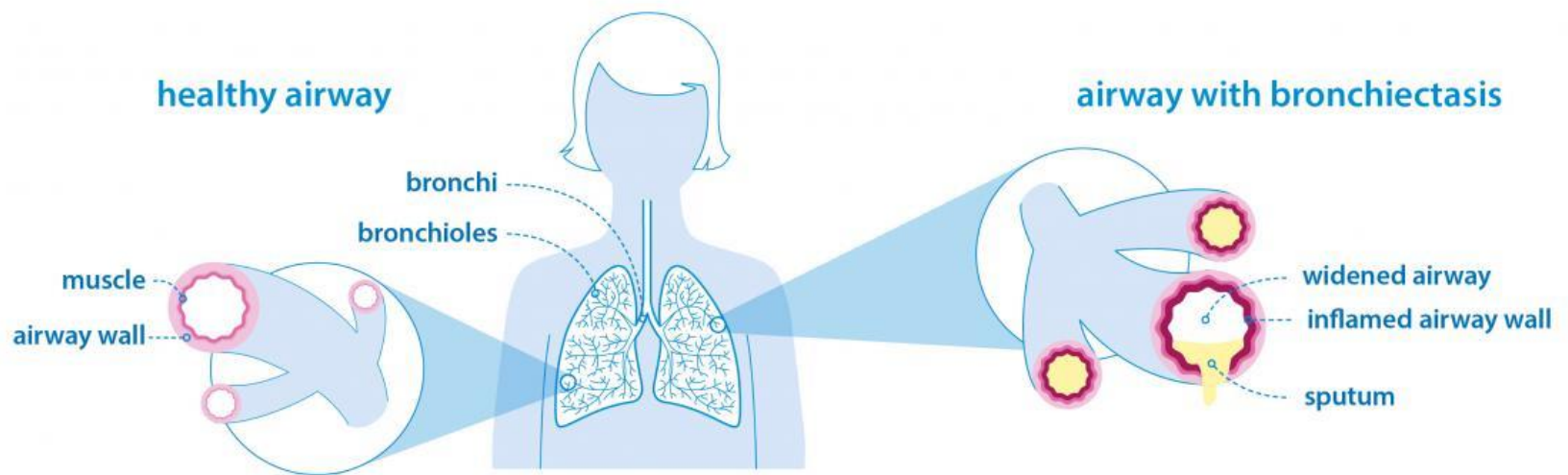
Marked, permanent dilation of small bronchi

- Destruction of smooth muscle & elastic supporting tissue
- Must have obstruction & infection
 - obstruction causes mucus retention
 - infection damages bronchial walls which causes excess mucus production
- Not a primary condition
- Typically involves lower lobes
- Persistent cough

Bronchiectasis

- It is a condition that results from prolonged injury or inflammation of respiratory airways and bronchioles.
- It is characterized by abnormal dilation of the bronchus or bronchi. It is most frequently
 - associated with chronic respiratory disease, infections, cystic fibrosis, tumor growth or exposure to respiratory toxins.
- The major manifestations of bronchiectasis are impaired ventilation of the alveoli,
 - chronic inflammation and possible fibrosis of the areas.

Bronchiectasis

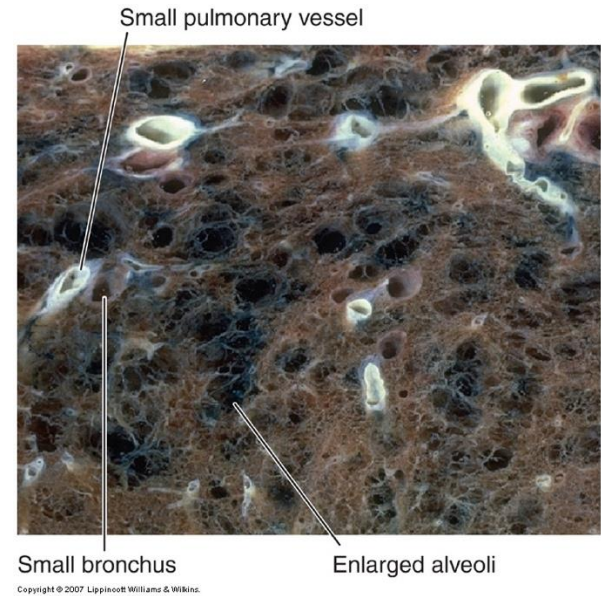


Management Bronchiectasis

- Obtain a sputum sample from people with an acute exacerbation of bronchiectasis and send for culture and susceptibility testing.
- Offer an antibiotic to people with an acute exacerbation of bronchiectasis. When choosing an antibiotic previous exacerbation and hospital admission history, and the risk of developing complications previous sputum culture and susceptibility results.
- When results of sputum culture and susceptibility testing are available:
 - review the choice of antibiotic **and**
 - only change the antibiotic according to susceptibility results if bacteria are resistant and symptoms are not already improving (using a narrow-spectrum antibiotic wherever possible).
- With an antibiotic, give advice about: possible adverse effects of antibiotics, particularly diarrhoea
- seeking medical help if symptoms worsen rapidly or significantly at any time, or the person becomes systemically very unwell.

Emphysema

- Destruction of alveolar walls, alveoli merge to form large air spaces
- Loss of surface area affects diffusion
- 90% of cases are smokers



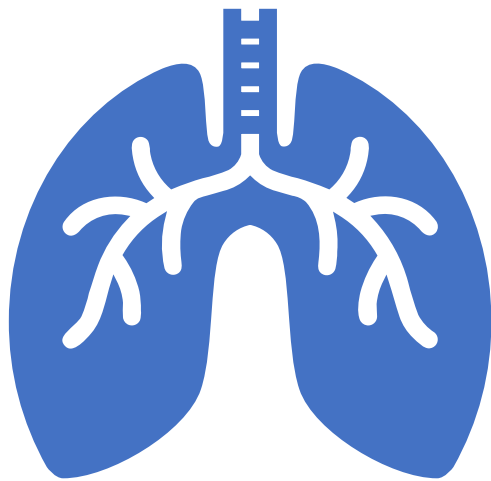
A 30-year-old man presents to the clinic complaining of fatigue and daytime sleepiness. His past medical, family, and social histories are unremarkable. His wife reports that he snores very loudly during sleep and has recently observed that he stops breathing momentarily multiple times throughout the night. His SpO₂ is 90%. He has a BMI of 33 kg/m², having gained 5.4 kg over the past year without any significant changes in lifestyle or diet. You advise the patient to lose weight and refer him to an appropriate specialist.

• **Which is the most likely cause of this patient's condition?**

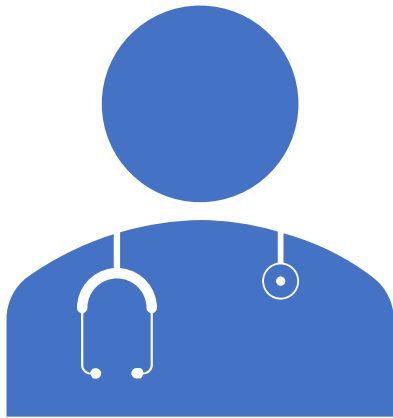
- a) Anaemia
- b) Obstructive sleep apnoea
- c) Orthopnea
- d) Diabetes Mellitus
- e) Heart failure

Mr Andrews is a 23-year-old male seeking advice. Although he is generally in good health, he has recently been developing a mild wheezing and tightness in his chest after exercising and playing soccer. He does not smoke and has not had any respiratory illnesses recently. However, he does recall using an inhaler as a child for asthma but was told that he had outgrown the condition.

What are your next steps?



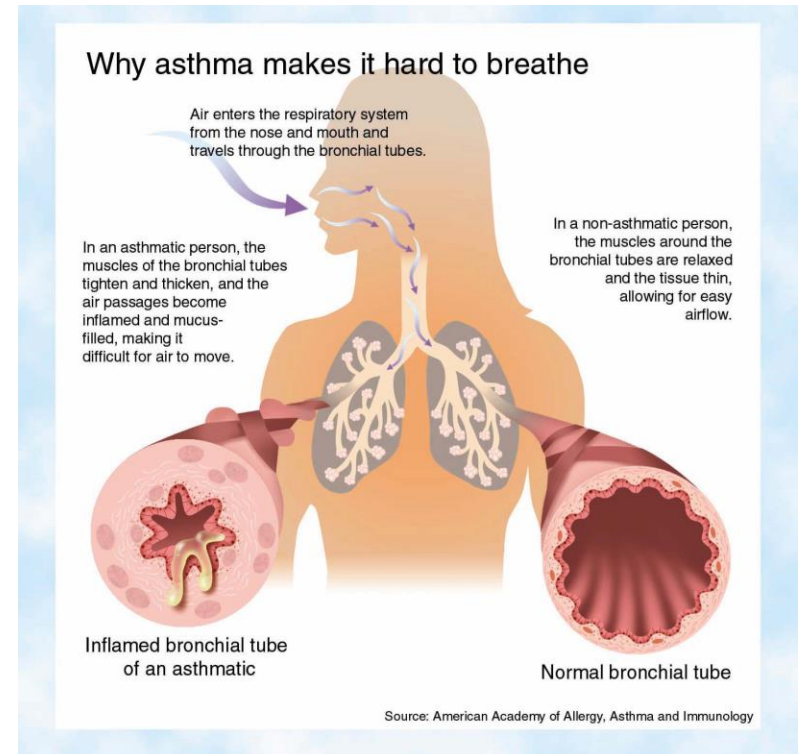
- A 29-year-old man presents to the primary care clinic due to two months of mild intermittent dyspnea and dry cough. The patient was diagnosed with mild intermittent asthma as a child based on symptoms and used to use an albuterol inhaler when playing outside or playing sports. The patient has not used an inhaler in ten years. Vital signs are within normal limits. Lung auscultation demonstrates diffuse wheezing and decreased air movement bilaterally.



- A 42-year-old man is evaluated in the pulmonology clinic for a follow-up visit for asthma that was diagnosed one month ago after spirometry showed an FEV_1/FVC ratio of 0.6 and an increase in FEV_1 of 15% after albuterol administration. The patient was started on a daily low-dose inhaled corticosteroids (ICS)-long-acting beta-agonists (LABA) inhaler and has noticed an improvement in his symptoms. The patient wakes up short of breath several times weekly and needs to use a short-acting albuterol inhaler several times a day. Physical exam reveals diffuse bilateral wheezing. Serum IgE is 10 IU/mL, and eosinophils are 50 cells/ μ L. High-resolution CT of the chest is within normal limits. Which of the following is the most appropriate next step in management?

ASTHMA

- Asthma is a chronic respiratory disorder
- Bronchi and bronchioles are affected – bronchiole muscles tighten, mucus is produced – breathing is difficult
- Airway hyper-responsiveness.



Asthma

Airway disorder
characterized by

- Hyper-reactivity to various stimuli
- trigger
- Broncho-constriction
- Inflammation

Associated Symptoms

Common symptoms:
cough, wheeze, shortness
of breath, tight chest &
wheeze

May also have atopic
conditions: eczema and
allergic rhinitis

Family History : asthma or
atopy

Risk factors/triggers for asthma symptoms

- Exposure to allergens eg. ?
- Smoking
- Gender(more common in males in childhood)
- Occupational irritants
- Viral infections
- Exercise
- Cold air
- Strong Emotional expressions eg. Laughing
- Certain drugs eg. Aspirin, beta blockers
- Lower socio-economic groups
- Animals/pets
- House dust mite

Aim of asthma Management

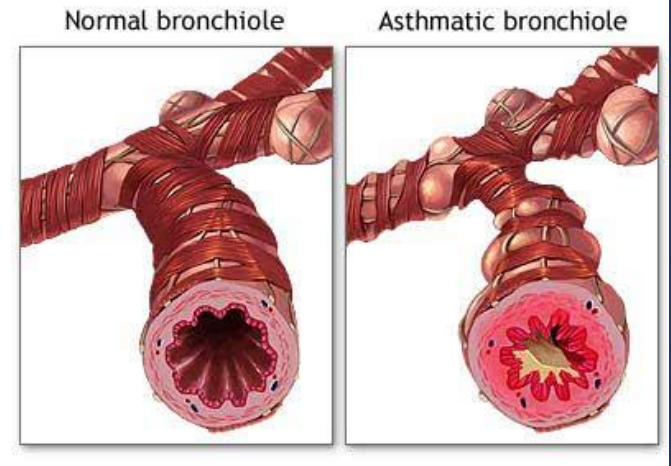
- No daytime symptoms
- No night-time awakening due to asthma
- No need for rescue medication
- No exacerbation
- No limitations on activity including exercise
- Normal lung function (in practical terms FEV₁ and/or PEF > 80% predicted or best).
- Minimal side effects from medication

Symptoms

- Chest tightness
- Wheezing
- Night-time cough
- Restricted breathing

Causes

- Generally it is thought that asthma is familial and related to atopy
- TRIGGERS – include pollen, dust, smoke, pets, exercise
- Hot and windy weather



Beta2 Agonist

- Rescue drug – short acting beta2- adrenergic agonist used for prevention and
- treatment of bronchoconstriction-fine to use but overuse = poor control and needs re
- assesement.
 - Onset 15 to 30 minutes
 - Peak 60 to 90 minutes
 - Duration 3-6 hours
- Mild-intermittent
- Symptoms 2 days/week or less
 - Beta 2 agonist and monitor for increase in symptoms
 - Short course of systemic corticosteroid – prednisone for acute exacerbations



Preventers -ICS

- LONG-TERM preventers—corticosteroid to control spasms and reduce long term inflammation and scarring in the bronchioles (eg – QVAR, Pulmicort, Becloforte, Clenil)
- Patients with severe asthma may take medications such as Prednisolone –also for acute exacerbations
- Also biologics with 'Brittle asthma' or hard to control asthma
- Also dual consider therapy...

Which steroid inhaler??

- BDP (Clenil modulite) and budesonide are approximately equivalent in clinical practice
- Fluticasone provides equal clinical activity to BDP and budesonide at half the dosage
- Qvar* - 200-300mcg (not suitable for children)
- Fostair – over the age of 18
- Budesonide- symbicort can be used in adults and children over the age of 6
- Mometasone- not to be used in children
- Combination inhalers eg Seretide, Symbicort



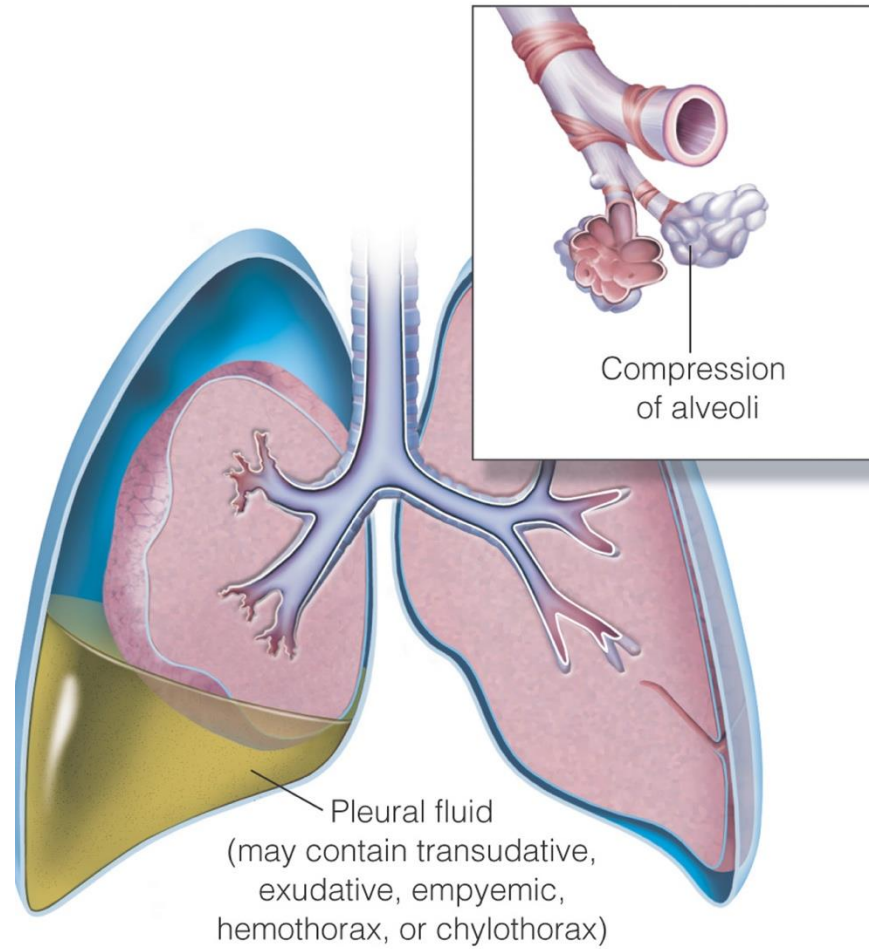
High dose Steroid inhaler

- Changes in bone density ?
- Children- growth failure/ adrenal insufficiency – care with dosing and use spacer-but
- evidence suggest growth reduction is <1 cm annually!!
- Children-Specific written advice about steroid replacement (eg Steroid Alert Card) in
- event of a severe intercurrent illness or surgery should be part of the management plan.

Tuberculosis (TB)

- Tuberculosis is caused by the bacteria from the *Mycobacterium tuberculosis* complex and it is believed that an infectious person will infect an average of 10-15 people every year (Department of Health (DH), 2004)
- Common symptoms-
 - Prolonged cough – dry or productive
 - Fever
 - Weight loss
 - Night sweats
 - Dyspnoea
 - Chest pain
 - Lethargy
 - Loss of appetite
 - Haemoptysis
- Diagnostic tests
 - sputum sampling x 3 early morning (requests acid fast bacilli testing) ; Chest x-ray. Infection control
- Six month course consisting of two months rifampicin, isoniazid, pyrazinamide and ethambutol (initial phase) and a further 4 months rifampicin and isoniazid (continuing phase)

Pleural Effusion



Pleural Effusion



Due to exudates or transudates



Expansion is reduced



Percussion is dull



Vesicular breath sounds with reduced intensity



Apex and trachea may be displaced if effusion is large.

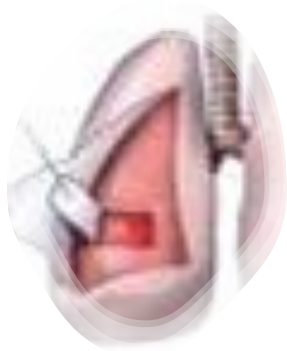


Diaphragmatic excursion can detect this without X ray

PLEURISY



PLEURISY

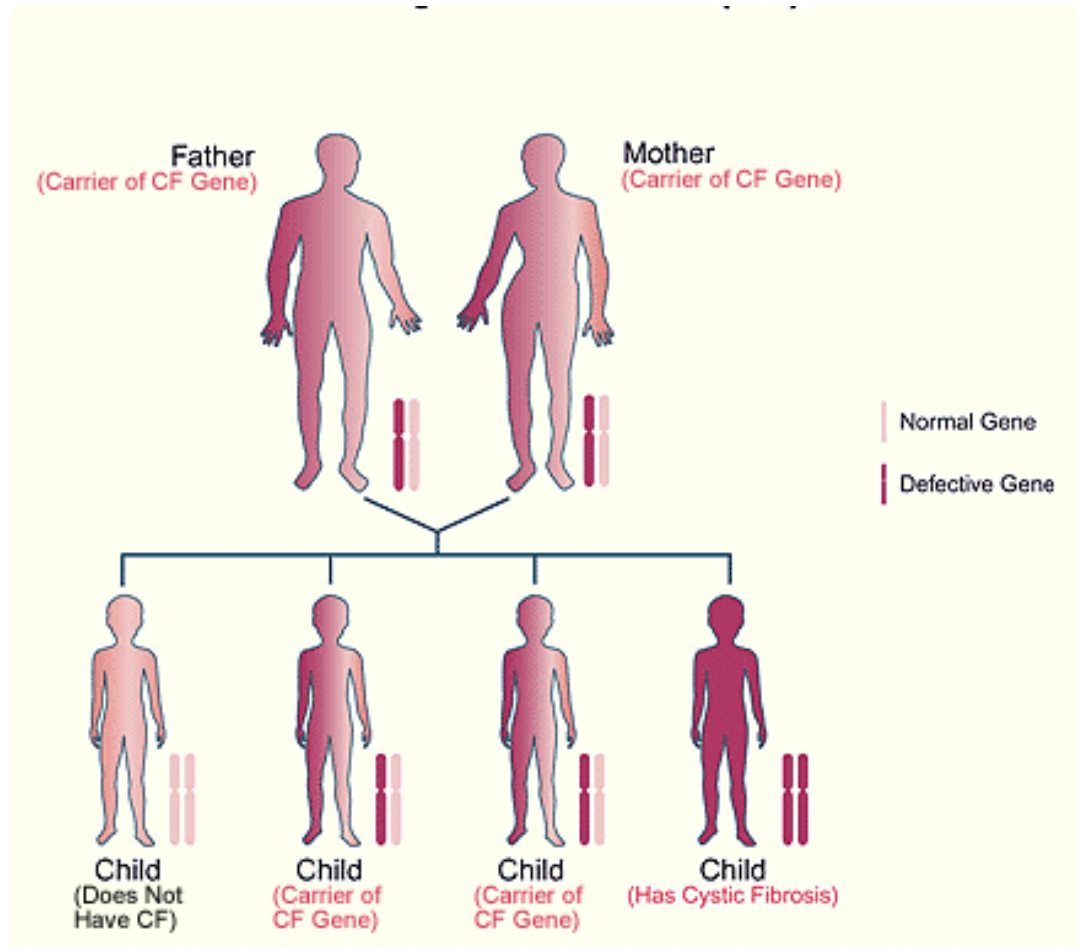


- Pleurisy refers to the inflammation (irritation, swelling, stickiness) of the pleura.
- Pleurisy is not a disease, but a symptom of another condition (e.g. virus or bacterial infection).

Presentation of Pleurisy

- Sharp, sudden and intermittent chest pain with related dyspnea
 - Possibly referred to shoulder
 - May ↑ or ↓ with respiration
 - Pleural “friction rub” may be audible”
 - May have effusion or be dry
 - Inflammation of pleura caused by a friction rub
 - layers of pleura rubbing together
 - Commonly associated with other respiratory disease
 - Consider the rub you may hear -?cardiac or pleural?
-
- Fifth level

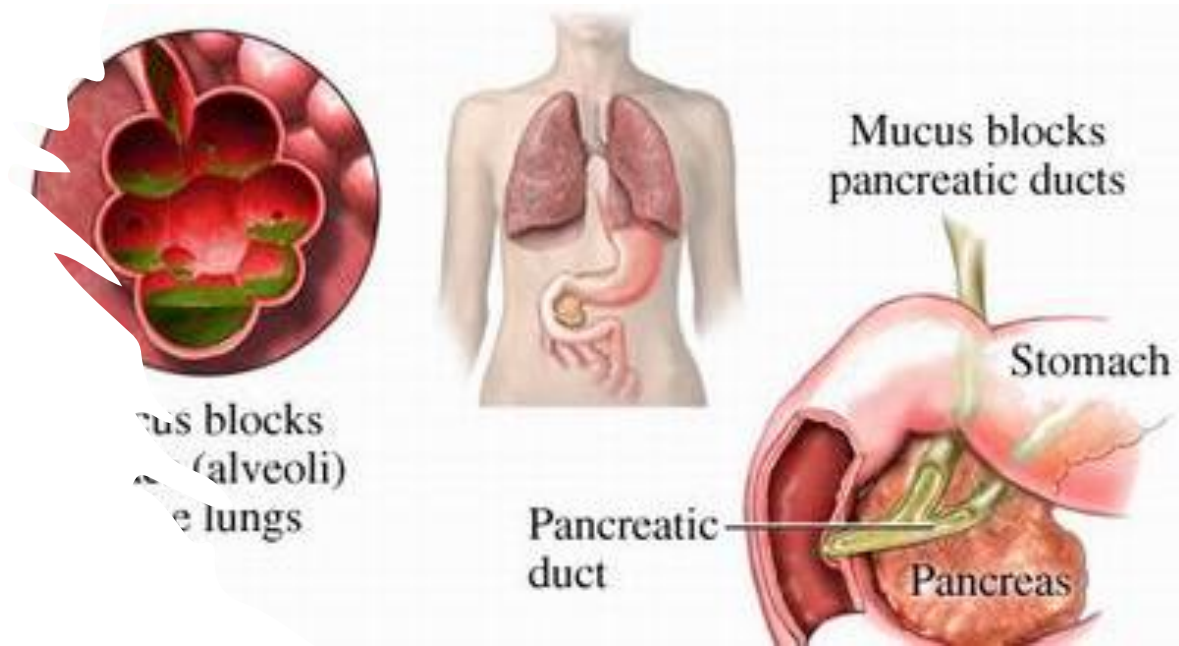
CYSTIC FIBROSIS

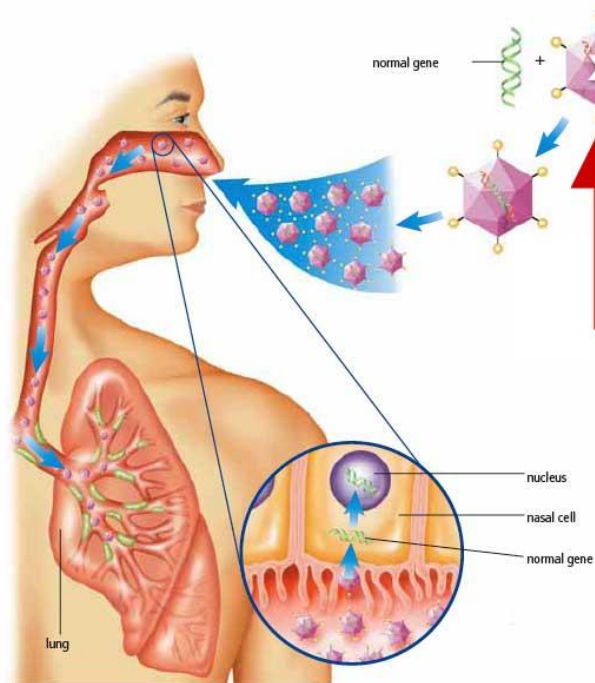


Treatments

<https://www.nice.org.uk/guidance/ng78/chapter/Recommendations#diagnosis-of-cystic-fibrosis>

- There is no cure – life expectancy is usually low – early 30s but is improving
- Medicines are used to thin the mucus
- Antibiotics are given for infections
- New inhaled treatments for CF





CYSTIC FIBROSIS

- New treatments include gene therapy
- An inhaler is used to spray healthy versions of the abnormal gene – the healthy genes can then make proper mucus

Normal Lung vs. Cancerous Lung



Lung Neoplasms

- Often due to metastasis eg prostate and breast consider PMH carefully
- Bronchogenic carcinoma is the most common
 - most common of all cancers
 - about 90% are cigarette smokers

Red Flags Overview for respiratory problems

- Altered mental status or confusion
- Absent signs of ventilation- quiet chest
- Audible stridor or wheezing
- Able to speak in short phrases only
- Sustained Tachycardia
- Pallor / Diaphoresis
- Accessory muscle use / Retraction/tracheal tug
-

Identifying those patients with RTIs who are likely to be at risk of developing complications

- Antibiotics to who?
- if the patient is systemically very unwell
- if the patient has symptoms and signs suggestive of serious illness and/or complications (particularly pneumonia, mastoiditis,
- peritonsillar abscess, peritonsillar cellulitis, intraorbital and intracranial complications)
- if the patient is at high risk of serious complications because of pre-existing comorbidity. This includes patients with significant
- heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis, and young children who were born prematurely
- if the patient is older than 65 years with acute cough and two or more of the following criteria, or older than 80 years with acute
- cough and one or more of the following criteria:^{[1][2]}
 - hospitalisation in previous year
 - type 1 or type 2 diabetes
 - history of congestive heart failure
- current use of oral glucocorticoids.

Summary

- Do not underestimate the importance of a comprehensive history.
- Be aware of red flags
- Keep up to date with current evidence
- Remember to safety net and give worsening care advice.

Any
questions?



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An address is a collection
of information