Asthma

- Paroxysmal and reversible obstruction of the airways
- History of recurrent episodes of wheezes, chest tightness, breathlessness, and/or cough, particularly at night/early morning
- Symptoms may be triggered by specific triggers (e.g. pollens, pets, cold air or perfumes)
- Symptoms may worsen after taking beta-blockers, aspirin or NSAIDs (BAN) → ***Paracetamol*** *is safe*
- Evidence of variable airflow obstruction seen on tests such as peak expiratory flow measurement

Acute asthma

- Bronchospasm (smooth muscle spasm narrowing airways)
- Excessive production of secretions (plugging airways)

Risk factors

- A combination of genetic & environmental factors
  - Personal history of atopy (genetic tendency to develop allergic diseases) such as eczema
  - Family history of asthma or atopy
  - Inner city environment
  - Prematurity and low birth weight
  - Smoking
  - Maternal smoking

- **SE of Atenolol** → wheezing
- **SE of Ramipril** → cough

Presentation

- Cough
- SOB
- Wheezes
- Chest tightness

Mild attack	Acute severe attack	Life-threatening attack
○ Slight tachypnea, tachycardia ○ Classically, expiratory wheeze is heard (widespread wheeze)	○ Use of accessory muscles of respiration ○ Inability to complete a sentence in one breath ○ Intercostal retractions *In children* • *HR >125 (>5 years) or >140 (2-5 years)* • *RR >30 or >40*	○ Silent chest (no wheeze at all) ○ Exhaustion ○ Altered consciousness ○ Cyanosis ○ Arrythmia ○ hypotension ○ Poor respiratory effort ○ PEF <33% best or predicted ○ RR >26 ○ SpO2 <92% ○ PaO2 <8 kPa *Normal PaCO2 (4.6-6 kPa)*

Diagnosis

- Symptoms of asthma
- **Pulmonary function tests (SPIROMETRY)** → *Initial diagnostic tool* → Reversible obstructive pattern
- **Day-to-day peak flow** variability showing diurnal cycle → *Treatment **monitoring** and **adjustment***
- **Post-dilator improvement** of **>12%** in FEV1/FVC
- Unexplained peripheral blood eosinophilia

Long-term management

Asthma in adults	Asthma in children
1. **Low dose inhaled steroid** (preventer) + **SABA** when needed (reliever) 2. Add **LTRA** (e.g. Montelukast) 3. **Increase** the dose of inhaled steroids OR add **LABA** (Salmeterol) 4. In severe cases → **Short-term oral steroid**	1. **Very low dose inhaled steroid** (preventer) + **SABA** when needed (reliever) 2. >5 years → **LABA** or **LTRA** // <5 years → **LTRA** 3. **Increase** the dose of inhaled steroid 4. In severe cases → **SR Theophylline**

Management of acute exacerbation

Immediate treatment [OSTHP]

1. Start **O_2** if saturation < 92%, aim for 94-98%
2. Salbutamol 5mg (or terbutaline 10mg) nebulized with O2
3. IV Hydrocortisone 100mg OR oral prednisolone 40-50 mg

If life threatening features present: [SIM]

1. Give salbutamol nebulizers *every 15 minutes*, or 10 mg *continuously*
2. Add in ipratropium 0.5mg to nebulizers
3. Give single dose of MgSO4 (1.2-2g IV) over 20 minutes

If improving within 15-30 minutes [SP]

1. Nebulized salbutamol *every 4 hours*
2. Prednisolone 40-50 mg PO OD for 5-7 day

- Where diagnosis is uncertain but with demonstration of airway obstruction (FEV1/FVC < 0.7), **reversibility testing** and/or **a trial of treatment** are suggested
- Chest X-ray is not a routine assessment but it's useful for exclusion
- Only benefit for IV hydrocortisone over oral prednisolone if patient is **vomiting** or having **severe dyspnea** where they cannot consume oral medication
- If immediate TTT is not working, add **ipratropium → MgSO4 → IV aminophylline** + **IV salbutamol** (ICU)
- In children
  - **OSIPH**
  - **IV Salbutamol** or **IV Aminophylline**
  - **MgSO4** comes last
- SE of B2 agonist: palpitation, tachycardia

Exercise-induced asthma

- It's a sign of poorly controlled asthma
- Choice of medication: **Short acting beta 2 agonist** (used before exercise)
- Review of the regimen including inhaled corticosteroids should be done

- Patients who are well controlled on inhaled corticosteroids but complains of exercise being the specific problem, then consider ADDING either:
  - Leukotriene receptor antagonist (**LTRA**) = Montelukast
  - A long-acting beta 2 agonist (**LABA**) = Salmeterol
  - **Sodium cromoglicate**
  - An oral **beta 2 agonist**
  - **Theophylline**

- This would be taken 2h before an exercise and will prevent symptoms for approximately 12h

COPD

- History of smoking and progressive dyspnea
- Evidence of irreversible airflow obstruction on spirometry
  - **FEV1** < 80% predicted
  - **FEV1/FVC** < 0.7 (Post-dilator)
- All spirometry findings are increased (TLC, RV) except for **DLCO** & **VC**

Presentation

- Cough + sputum production
- Dyspnea
- Low-grade fever (mostly afebrile)
- Wheezes

Investigation

- Raised hematocrit
- **Chest X-ray** is *not recommended* but if ordered
  - Hyperinflated lung fields
  - Flattened diaphragm
  - Prominent posterior ribs markings (>7 posterior ribs seen)
  - Small heart
  - May see bullae

Chronic Bronchitis

- Productive cough (**TABLESPOON** of mucus) that lasts for three months or more per year for at least two years
- COPD is now the preferred term for patients with airflow obstruction who were previously diagnosed with chronic bronchitis or emphysema

Asthma Vs COPD

- Reversibility distinguishes asthma from COPD
- COPD is almost refractory to medication
- Almost all COPD patients do smoke or have smoked in the past
- COPD tend to be in **old age** (>35 years)

- Asthma patients can develop COPD later in life
- Venturi mask doesn't create +ve pressure unlike non-invasive ventilation

Management [APBOS ANIV]

- **Antibiotics** → If sputum is purulent or clinical signs of pneumonia
- **Prednisolone** 30mg/day for 7-14 days
- **Nebulized normal saline** → to clear out mucus
- Inhaled or nebulized **bronchodilators**
- Controlled **O2 therapy 24%** via Venturi face mask, with oximetry Maintain saturations between 88% and 92%
- **IV aminophylline** Beneficial if the patient is wheezy and has not improved with nebulizers alone
- **Non-invasive ventilation** → RR> 30, pH< 7.34, falling PaO2 or rising PaCO2 despite medical treatment

Invasive mechanical ventilation

Indications

- **Failed** NIV
- **Contraindicated** NIV in scenarios such as: respiratory arrest, high aspiration risk or impaired mental status

Complications

- Pneumonia
- Barotrauma
- Failure to wean to spontaneous ventilation

Doxapram

- A respiratory stimulant, given IV
- Used to drive respiratory rate if >20 breaths/minute
- Been replaced by NIV

Pulmonary function test

- **TLC:** amount of air in the lungs after maximal inspiration
- **RV:** amount of air that remains in the lungs after maximal expiration
- **VC:** amount of air that is pushed out of the lungs after maximal inspiration
- **FVC**: amount of air pushed out of the lungs after forced maximal expiration
- **FEV1**: amount of air pushed out of the lungs in 1sec during maximal expiration

	Obstructive	Restrictive
FEV1	↓ Less than 80% of predicted	↓ Less than 80% of predicted
FVC	N More than 80% of predicted	↓ Less than 80% of predicted
FEV1/FVC	↓ Less than 0.7	N 0.7-0.8 OR ↑ More than 0.8

Obstructive lung disease	Restrictive lung diseases
• COPD • Asthma • Cystic fibrosis • Bronchiectasis	• Pulmonary fibrosis • Interstitial lung disease • Other causes: obesity, deformities or neuromuscular disorders
➢ Obstructed airways → patient struggles to breathe out → decreased FEV1 ➢ Decrease FEV1 → decreased FEV1/FVC ratio	➢ Restricted lung expansion → decrease in the amount of air that lungs can hold → decrease in VC → decreased FVC ➢ Restrictive lung disease → decrease in lung elasticity → becomes harder to fore out air → decreased FEV1

Long-term oxygen therapy (LTOT)

- Prescribed to patients with **COPD** and **severe chronic hypoxemia**
- Once started, it's likely to be life-long
- Usually given over a minimum of 15h a day
- Add-ons to improve breathlessness → **Prednisolone** or **Nebulized normal saline**

Possible candidates

- Very severe airflow obstruction → FEV1 < 30% predicted
- Polycythemia
- Cyanosis
- Peripheral swelling
- Raised JVP
- Oxygen saturation 92% or less on room air

Conditions for assessment

- Patient should be stable and >5 weeks have passed since last exacerbation of COPD
- On a fully optimized treatment for COPD
- 2 sets of ABG are taken 3 weeks apart to ensure the patient is sufficiently hypoxic

Indications

- pO2 <7.3 kPa
- pO2 = 7.3 kPa + one of the following
  - 2ry polycythemia (raised hematocrit)
  - Peripheral edema
  - Pulmonary hypertension

Non-invasive ventilation

Indications

1. Acidosis (pH <7.35)
2. Rising PaCO2
3. Falling PaO2
4. PR >30

- All of these despite medical management (steroids, nebulized bronchodilators & standard O2 therapy) is an indication of non-invasive ventilation

Pulmonary embolism

Risk factors

1. Surgery
2. Pregnancy (including the post-natal period)
3. Obesity
4. COCP
5. History of prolonged immobility (such as **airplane travel**)
6. LL injury
7. Malignancy
8. Previous VTE (venous thromboembolism)

Pulmonary embolism is suspected with normal X-ray & normal chest examination

Presentation [non-specific]

Symptoms

- Respiratory alkalosis + Hypoxia = **PE**
- Respiratory alkalosis + NO hypoxia = **Panic attack**

- Dyspnea
- Pleuritic chest pain or retrosternal chest pain
- Cough and hemoptysis

Signs

- Tachypnea, tachycardia
- Hypoxia, anxiety, restlessness, agitation and impaired consciousness
- Pyrexia
- Elevated JVP
- Gallop heart rhythm, a widely split-second heart sound, tricuspid regurgitant murmur
- Pleural rub
- Systemic hypotension and cardiogenic shock

Diagnosis

- **CTPA** (CT pulmonary angiogram) → *Gold standard*

Management

- Immediate administration of **LMWH** once PE is suspected (even prior to CTPA)

Panic attacks

- Results in hyperventilation which causes a **respiratory alkalosis**
- There would be no metabolic compensation as panic attacks resolve rapidly
- We would not expect any metabolic compensation as it takes the kidneys days to conserve acid
- PaO2 would be normal

Pulmonary embolism in pregnancy

- **Chest X-ray** should be requested **first** before deciding whether a V/Q scan or CTPA should be done, in order to exclude other pulmonary diseases such as pneumonia, pneumothorax or lobar collapse
  - Abnormal X-ray + clinical suspension of PE → **CTPA**
  - Normal X-ray + clinical suspicion of PE → **V/Q scan**

CTPA	V/Q scan
• Lower risk of radiation to fetus • Higher radiation to the mother → High risk of breast cancer for the mother • Advantages: - Faster - Easier to perform - Reduced need for further imaging - If CTPA is -ve → NO further investigations needed	• More risk of radiation to fetus → High risk of childhood cancer • Lower radiation to the mother • Only used when: - Patient is allergic to the dye - Renal impairment - In pregnancy if the initial X-ray is normal

**Note that the absolute risk of complications for both is very small*

Two-level PE well's score

[**C**an **N**ot **T**reat **I**f **P**E **H**elp **M**e]

- **>4** points → PE likely
- ≤4 points → PE not likely

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 for more than 3 days or surgery in the previous 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Malignancy (on treatment, treated in the last 6 months, or palliative)	1

Approach

- >4 → Immediate **CTPA**
- ≤4 → **D-dimer** test, if +ve → Immediate **CTPA**
- If there's a delay in getting the CTPA → **LMWH** until the scan is performed
- If the patient has an allergy to contrast media or renal impairment → **V/Q** scan should be used instead

- D-dimer may be elevated due to surgery

Pneumonia

Pneumocystis carinii pneumonia (PCP) (Pneumocystis jiroveci pneumonia)

- **HIV patient** + **desaturation on exercise** while normal during rest
- HIV is an important risk factors especially if CD4 <200/mm^3 → should receive PCP prophylaxis (***co-trimoxazole***)

Features

- Exertional dyspnea
- Gradual onset of dry cough
- Fever
- Tachypnea
- May be signs of AIDS (e.g. Thrush)
- Chest examination is typically normal
- Could present with Herpes labialis

- Think of **flu-like symptoms** in an **immunocompromised** patient

- HIV + dry cough → **PCP**
- HIV + productive cough → **TB**

- Prophylaxis in HIV with Mycobacterium avium & CD4 <50 → ***Azithromycin***

Investigation

- Sputum
- ***Bronchoscopy with bronchoalveolar lavage*** → *Diagnostic*

Management

- ***Co-trimoxazole*** (trimethoprim-sulfa) in severe cases
- Atovaquone in mild to moderate cases

Legionnaires disease

- Caused by **Legionella pneumophila**
- Acquired by droplet inhalation of contaminated water
- Severe, potentially fatal acute pneumonia

- They often mention hints like travelling, hotel spas or hot tubs [**millionaire**]

Features

- Flu-like symptoms
- Cough: dry → productive
- Fever, diarrhea, vomiting, confusion, coma

Investigation

- Sputum → ***Black currant jelly***
- Chest X-ray → ***Bi-basal consolidation***
- Specific blood results:
  - **Low sodium**
  - **Lymphocytopenia** (low WBCs)
  - **L**ow albumin
  - Elevated **L**iver enzymes

- **Chest X-ray** should be arranged as a follow-up **around 6 weeks** after discharge

Management

- **Clarithromycin**/Azithromycin +/- rifampicin or fluoroquinolone
  - Clarithromycin + statin may lead → rhabdomyolysis → pause/decrease statins OR give ***Doxycycline*** instead
  - Clarithromycin + salbutamol can cause → hypokalemia

Mycoplasma (atypical pneumonia)

Features

- Young adults (living in dorms)
- Dry cough
- No SOB
- Joint pain + rash (erythema multiform → **target lesions** on the back of the hand)
- Low grade fever + flu-like symptoms

Chest X-ray → ***perihilar shadowing*** + *bilateral* ***patchy consolidation***

Management → ***Erythromycin***

Klebsiella

- Old / diabetic / alcoholic

Chest X-ray → ***Cavitation*** (especially upper lobe)

Management → ***Cefuroxime*** (Cephal.) (kephlex)

Aspiration pneumonia

- Commonest causative organisms → **Staph**, Strept, H. influenza

CURB-65 → risk factors for predicting mortality

- **C**onfusion
- **U**rea >7mmol/L (>19 mg/dl)
- **R**espiratory rate ≥30/min
- **B**P < 90/60mmHg
- Age ≥ **6**5

Score is also used in case of ***community acquired pneumonia***

CURB = 0
- Prescribe Amoxicillin
- If penicillin allergy Doxy or clarithromycin

CURB = 1 or 2
- Dual amoxicillin + clarithromycin OR monotherapy with Doxy
- Hospital admission for **score 2**

CURB = 3
- IV antibiotics

Pleural empyema

- A complication of pneumonia as well as invasive procedures of the thorax
- Pneumonia → Parapneumonic effusion → Pleural empyema
- **Suspected when pneumonia does NOT improve with antibiotics**
- Empyema usually starts in the lower lobe where sound would be absent
- Pneumonia and empyema share similar symptoms

Other features

- Swinging fever, night sweats
- Weight loss
- Chest pain

Investigation

- **Pleural aspiration**
- Blood and sputum culture
- HIV test

Management

- **Chest drain**, if:
  - pH of the pleural aspirate is <7.2
  - Effusion is causing respiratory compromise

Pneumothorax

Risk factors

- Smoking

Types

1. **Primary spontaneous**
   - Occurs without apparent cause
   - Most commonly in tall, athletic, thin men aged 20-40 years
   - 90% unilateral (commonly at right side)
   - Usually caused by rupture of a small subpleural blebs (collection of air < 2cm)
   - Presented with dyspnea, chest pain, cough & tachypnea
   - Ipsilateral decreased chest wall movement, hyper-resonant hemithorax to percussion
2. **Secondary spontaneous**
   - Occurs in presence of existing lung pathology (e.g. Asthma, COPD)
3. **Simple pneumothorax**
   - Non-expanding collection of air around the lung
4. **Tension pneumothorax [one-way valve]**
   - Expanding collection of air around the lung

Investigation

- **Chest X-ray** → *Diagnostic*
  - Visible lung edge and absent lung markings peripherally
- **ABG** → if patient is dyspneic, cyanosed or there's an underlying condition

Tension pneumothorax

Presentation

- Acute respiratory distress
- Hypotension
- Raised JVP
- Tracheal deviation away from the pneumothorax side
- Reduced air entry on affected side

Hemothorax

- NO distended neck veins
- NO tracheal deviation
- Usually caused by stabbing injuries

Management of **2ry spontaneous pneumothorax**

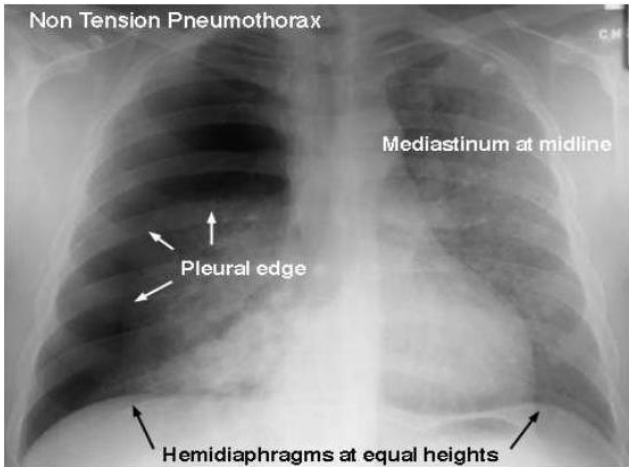
- >2 cm (50%) OR Hypoxic → **Chest drain**
- <2 cm (50%) → **Cannula insertion**

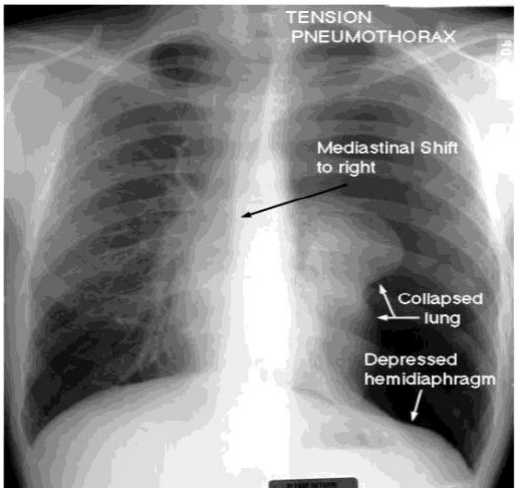
Management

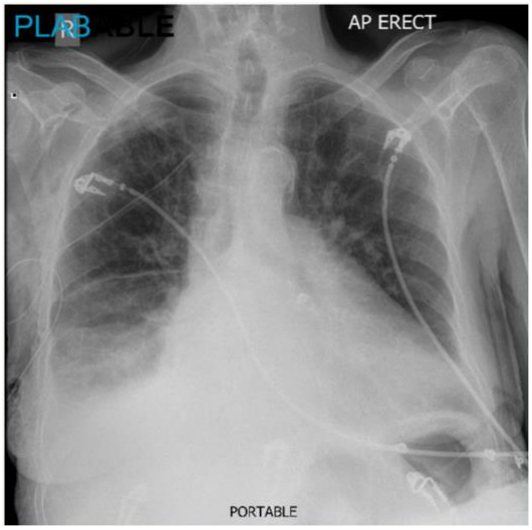
1. Initial → **High flow O2**
2. Insert **large-bore cannula** into 2nd intercostal space in midclavicular line (just above 3rd rib) on side of pneumothorax – hiss sound is from the air escaping and confirms the diagnosis
3. Do NOT wait for chest X-ray if the patient is seriously compromised or cardiac arrest has occurred or if the diagnosis is clinically certain
4. Air should be aspirated until the patient is less distressed, then insert a **chest drain** in mid-axillary line, leaving the cannula in place until you've finished and the underwater seal is bubbling satisfactorily
5. Always perform **a chest X-ray** post chest drain insertion to ensure the drain is appropriately placed

- Engorged neck veins indicate high pressure in the right ventricle, seen in both **tension pneumothorax** and **cardiac tamponade**

- **Beck's triad** for **cardiac tamponade**
  1. Engorged neck veins
  2. Hypotension
  3. Muffled heart sounds (Vs. reduced air entry and tracheal deviation in tension pneumothorax)







Causes of post-operative breathlessness

- **Infection/atelectasis**
  - Occurs early (within hours)
  - Common in smokers
- **Pulmonary embolism**
  - Occurs early (within hours/days)
- **Left ventricular failure (LVF) (fluid overload)**
- **Exacerbation of underlying disease such as COPD**
- **Tension pneumothorax**

Atelectasis

- The collapse or closure of a lung resulting in reduced or absent gas exchange (Reduced air entry)
- History of smoking

Management

- Analgesia → To encourage expectoration
- Nebulized saline
- Chest physiotherapy
- Deep breathing and coughing
- Postural drainage
- Incentive spirometry
- If lung doesn't re-inflate → Bronchoscopy to suction out secretions

- **Atelectasis** → Alveoli either deflated or filled with alveolar fluid
- **Pneumonia** may happen in about 3 days if atelectasis is not resolved. If this happens, fever will persist and X-ray will show infiltrates

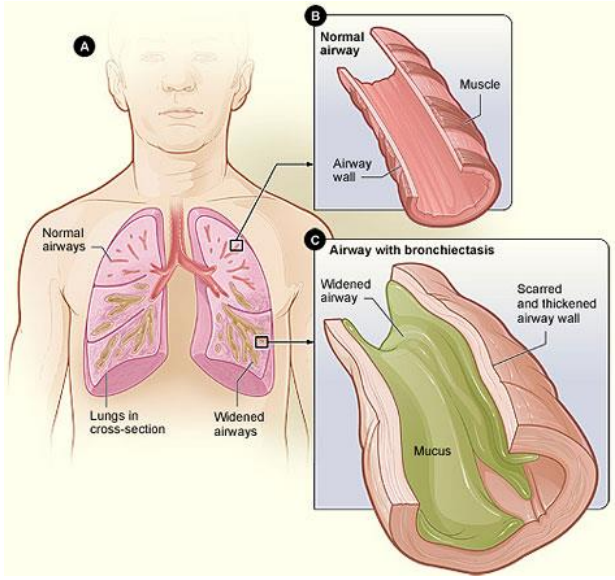
Bronchiectasis

- Irreversible dilatation of small and medium sized bronchi, with chronic airway inflammation destroying their elastic and muscular structure
- It's associated with chronic sputum production, chronic cough, recurrent acute chest infections and airflow obstruction

> - **Bronchial obstruction** and **bronchopneumonia** are more likely to cause a focal bronchiectasis, whereas other causes are more likely to result in diffuse disease

Etiology

- **Infection** → *Most common*
  - Childhood respiratory viral infections (e.g. measles, pertussis, influenza, respiratory syncytial virus)
  - TB
  - Bacterial pneumonia → Look out for history of recurrent pneumonia
- **Immunodeficiency**
  - HIV → Serious, persistent or recurrent infections
- **Connective tissue diseases**
  - RA
  - Sjogren's $
  - Systemic sclerosis
  - SLE
  - Ehlers-Danlos $
  - Marfan's $
- **Toxic insults**
  - Gastric aspiration
  - Inhalation of toxic gases
- **Congenital defects**
  - Cystic fibrosis → Most important to exclude



Features

- **Persistent cough** with **purulent COPIOUS/CUP sputum production (with specks of blood)**
- Nonspecific respiratory symptoms including dyspnea, chest pain and hemoptysis. It may progress to respiratory failure and cor pulmonale
- **Coarse crackles** (early inspiration and often in the lower zones) → *Most common finding*
- Large airway rhonchi (low-pitched snore-like sounds)
- Wheezes
- Clubbing

Diagnosis

- Usually made clinically, with **High-resolution computed tomography** (**HRCT**) → *Gold standard*
- A baseline **chest X-ray** should be done for all patients
  - Mainly for exclusion
  - Tramlines + hx of lung infection
  - In advanced cases, it may show 1-2cm cysts

Management

*Damaged lungs cannot be repaired, so the aim is to **prevent** or at least **slow down** any further deterioration*

- **Bronchodilators**, **chest physical therapy** and **postural drainage**
- Cessation of smoking
- Immunization against influenza and pneumococcus
- Long-term oral antibiotics
  - For patients having 3 or more exacerbations per year
  - Patients with significant morbidity

Mesothelioma

- Malignant mesothelioma is a tumor of mesothelial cells that usually occurs in the pleura, rarely in peritoneum
- Associated with occupational exposures to **asbestos** *(history of being a builder)*
- Latent period between exposure and development of the tumor may be up to 45 years
- Deaths are reported to the coroner as it's an industrial disease

Features

- **SOB**, **chest pain**, **weight loss** → *Most common symptoms*
- Finger clubbing
- Recurrent pleural effusion

Signs of metastasis

- Lymphadenopathy
- Hepatomegaly
- Bone pain and tenderness
- Abdominal pain or obstruction (peritoneal malignant mesothelioma)

Investigation

- **Chest X-ray** → *Pleural thickening* or *effusion*
- **Thoracoscopy** under local anesthetic:
  - **Pleural fluid aspiration** and **cytological analysis** → very sensitive
  - **Pleural biopsy** → *Most definitive*
  - It also enables drainage of pleural fluid, and pleurodesis
- The diagnosis is often made post-mortem

Management

- Usually symptomatic
- Cure is only possible with surgery for localized (stage I)

Deaths reported to the coroner first:

- Deaths due to (accidents, suicide, violence, neglect, industrial disease)
- Sudden deaths within 24h after admission
- Deaths of a person who hasn't seen a doctor with 14 days before death
- Unknown deaths
- Deaths during a surgical operation or before recovery from anesthesia
- Deaths during police custody

- Approximately 95% of all primary lung tumors are **bronchial carcinomas**
- 1ry bronchial carcinoma
  - SCLC
  - NSCLC
- **Adenocarcinoma** accounts for 39% of NSCLCs and is the most common bronchial carcinoma associated with **asbestosis** and is more common in non-smokers, compared with other all types
- Investigation for central tumors → **Bronchoscopy + biopsy**

Paraneoplastic syndromes

- When cancer-fighting antibodies (WBCs) mistakenly attack normal cells in the nervous system
- Often associated with **SCLC**
- **SCLC** → **Lambert-Eaton** $ (proximal muscle weakness, depressed tendon reflexes & autonomic changes) + **Hyponatremia** due to SIADH + **Hypokalemia** (increased mineralocorticoid activity)
- **Sq.** cell → **Hypercalcemia** due to PTH like action

Extrinsic allergic alveolitis/Hypersensitivity pneumonitis

- Due to repeated inhalation of organic antigens in dusts (e.g. from dairy or grain products, animal dander and protein and water reservoir vaporizers)
- Occupational risk: farmers, vets, bakers and people dealing with chemicals
- **Chest X-ray** → Diffuse micronodular interstitial shadowing
- There are 3 forms of extrinsic allergic alveolitis
  1. **Acute**
     - Symptoms start 4-8h after exposure to the sensitizing antigen and resolve quickly, within days
     - Flu-like illness with fever, chest tightness, dry cough, dyspnea
     - Associated symptoms: malaise, chills, headache, generalized aches and pains. Sometimes wheezes
     - Signs: fever, tachypnea and bi-basal fine respiratory crackles
  2. Subacute
  3. Chronic

Sarcoidosis

- A systemic disease of unknown cause
- Characterized histologically by the presence of non-specific non-caseating granulomas in the lungs and other organs

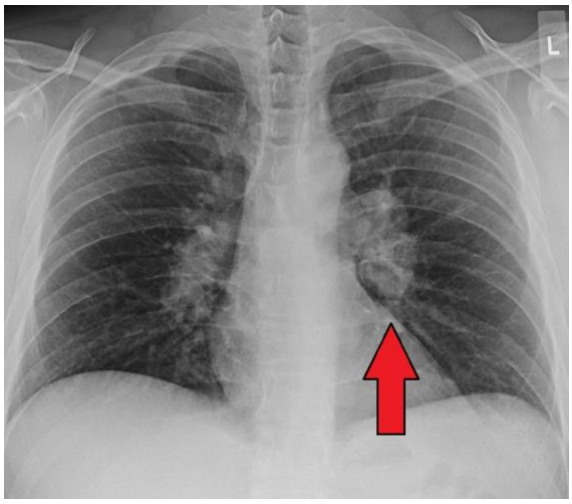
Presentation

- Up to 50% are asymptomatic (discovered accidently by chest X-ray → Hilar adenopathy)
- Involves almost any organ system but **pulmonary** is the most common
- Fever, Fatigue
- **Skin**: erythema nodosum
- **Eyes**: Uveitis
- **Kidneys**: Stones
- Lymphadenopathy

Heerfordt-Waldenstrom $	Lofgren $
- **P**arotid enlargement - **U**veitis - **F**ever - **F**acial palsy	- **H**ilar adenopathy - **E**rythema nodosum - **A**rthritis

- *Heerfordt tried a **PUFF** of steroid but did not **HEAL***

Investigation



- **Chest X-ray** → Bilateral hilar lymphadenopathy
- **Bloods**
  - Raised ACE (60% of patients, not specific but used to follow the course of the disease)
  - Abnormalities in LFTs (30% of patients)
  - Hypercalcemia (due to increased circulation of vitamin D produced by macrophages)
- **Biopsy** (*definitive diagnosis*) → **Non-caseating granulomas**
  - Can be from skin, LN, conjunctiva or lung

Treatment

- Steroids

- Lung + kidney → **Goodpasture $**
- Lung + GIT → **Cystic fibrosis**
- Lung + eye → **Pancoast tumor**

Pancoast tumor

- A tumor of the pulmonary apex
- Defined primarily by its location situated on top of end of either right or left lung

Presentation

- Ipsilateral invasion of cervical sympathetic plexus → **Horner's $** (ptosis, myosis, anhidrosis + enophthalmos)
- Brachial plexus invasion → **Muscle wasting** of the intrinsic hand muscles and **paresthesia** in the medial side of the arm along with shoulder and arm **pain**
- RLN compression → **HOV**

Notes

- Patient works as a farmer or a baker → **Extrinsic allergic alveolitis/hypersensitivity pneumonitis**
- Pt works at a pet shop → **[Ch]lamydiophilia pisittaci** → Rx with [Cl]arithromycin
- Pt was in anything starts with [H] like Hospital, hostel, hotel, hot tub → **Legionella**
- Bilateral cavitation in the lung (for any reason) + pneumatoceles → **Staph**
- Upper lobe cavitation on CXR → **Klebsiella** → Rx with Cephalosporin (Keflex)
- Bilateral Patchy consolidation, Myalgia + peri-hilar shadowing on CXR, dry cough, target lesions on back of the hands (erythema multiform) → **Mycoplasma**
- Lobar consolidation on CXR → **Strept** (**G +ve cocci**) → *Most common cause of community-acquired pneumonia*
- Bi-basal consolidation → **Legionella**
- Peri-hilar interstitial shadowing → **Carinii**
- Diffuse micronodular interstitial shadowing → **Extrinsic allergic alveolitis**
- Rusty-colored sputum → **Strept**
- Currant jelly → **Klebsiella**
- Green → **Pseudomonas**
- Purulent → **Staph**
- Pneumonia + neurological signs → **Legionella**
- Fever + murmur + pneumonia → **Coxiella burentti**
- Pneumonia + herpes labialis → **Strept** or **Carinii**
- Reticular infiltrations + ground-glass appearance → **Viral/Atypical pneumonia (mycoplasma/legionella)**
- Pneumatoceles → **Staph**
- Asbestoses → **Mesothelioma**
- Coal mining → **Coal worker's pneumoconiosis (CWP)** → *Progressive massive fibrosis*
- **C**entral lung cancers → **Sq. cell** + **Small cell**
- Peripheral lung cancers → **Adenocarcinoma** + **Large cell**
- Keratin pearls + intercellular bridges → **Sq. cell**
- Oat cell + neuroendocrine involvement → **Small cell**
- Glandular + mucin producing → **Adenocarcinoma**
- Anaplastic + undifferentiated sheets/nests of polygonal/multinuclear cells → **Large cell**
- Most common lung cancer in non-smokers → **Adenocarcinoma**
- A lung cancer with a strong smoking history → **Sq. cell**
- **Hemithorax** → One side of the chest
- Erythema nodosum → **Sarcoidosis**
- Erythema multiforme (target lesions at the back of the hand) → **Mycoplasma pneumonia**
- Post-flu illness → **Staph**
- Hyponatremia → **Legionella**
- Terminal case with noisy breathing → **Terminal respiratory secretions (death rattle)** → **Hyoscine SC** (Scopolamine) or Glycopyrronium
- **Pleurodesis** → a procedure that uses medicine to adhere lungs to the chest wall
- Corticosteroid inhalers can lead to oral thrush → **Spacers** help steroids to get straight to the lungs as opposed to the oral cavity
- Non-caseating granulomas → **Sarcoidosis**, Caseating granulomas → **TB**