- **What is your differential diagnosis for a patient who presents to you with: cough, shortness of breath ± fever?**
  - **Asthma:**
    - ✓ Auscultation: bilateral ↓air entry and wheezing with expiration.
    - ✓ Investigations:
      - ❖ *CBC*: to rule-out the presence of an infection; there will be ↑eosinophils (notice that eosinophils are also increased in helminthic infections).
      - ❖ *Chest X-ray*: it will show hyperinflation of lungs (> 7 anterior ribs), flat diaphragm, tubular heart, dark lung fields (due to trapped air) and wide intercostals space (notice that all of these features are seen bilaterally).
      - ❖ *Electrolytes*: due to mild dehydration and acidosis.
      - ❖ **ABG** is only done with severe cases.
      - ❖ You have to diagnose what precipitates for asthma in your patient via allergy test (looking for the presence of IgE) → followed by RAST test (measuring elevated IgE toward a specific antigen).
    - ✓ Management:
      - ❖ Acute asthma (emergency): ABC; IV fluids; oxygen and salbuterol (short acting bronchodilator) + steroids → if there is no improvement → adrenaline drip.
      - ❖ Treatment depends on severity (mild, moderate or severe).
      - ❖ Notice that after the acute attack, a prophylactic treatment must be provided to prevent further attacks.
  - **Pneumonia:**
    - ✓ Characterized by: fever, cough, shortness of breath and the patient will be sick-looking.
    - ✓ Percussion: dullness at site of consolidation.
    - ✓ Auscultation: ↓air entry localized to one area and crepitations (at the affected site).
    - ✓ Investigations:
      - ❖ *CBC*: ↑WBCs (leukocytosis) and mainly ↑neutrophils (bacterial pneumonia).
      - ❖ *Chest X-ray*: haziness of area of consolidation (notice that if heart right heart border is not clear this indicates that the middle lobe is affected and this is known as silhouette sign → confirm with lateral view chest X-ray), free costophrenic angles.
      - ❖ *Electrolytes*: due to inappropriate secretion of ADH that results in dilutional hyponatremia.
      - ❖ *ESR and CRP*: elevated (because this is an infection).
      - ❖ *Blood culture.*
      - ❖ Sputum can be obtained for culture or bronchoalveolar lavage (only with intensive cases which don't respond to treatment).
  - **Bronchiolitis:**
    - ✓ Characterized by: patient is < 1 year of age with fever, cough and shortness of breath. Retractions are also seen.
    - ✓ Auscultation: ↓air entry and wheezing.
    - ✓ Investigations:
      - ❖ *CBC*: ↑WBCs (leukocytosis) with ↑lymphocytes.

- ❖ *Chest X-ray*: hyperinflation of lungs (in addition to other characteristics mentioned for X-ray of asthma); some increase of bronchovascular markings.
- ❖ *Electrolytes*: because respiratory distress in young age groups will result in decreased feeding.
- ❖ *NPA (Naso-Pharyngeal Aspirate):* to test for RSV antigen.

✓ Management:

- ❖ Hydration, oxygen, bronchodilators (but not steroids or antibiotics).

- **Foreign body:**
  - ✓ Characterized by: cough, shortness of breath and history of chocking. Notice that if patient is breathing and not cyanosed → DON'T DO BLS (because this might dislodge the foreign body).
  - ✓ Percussion: hyper-resonance at the beginning at site of obstruction then it will become dull.
  - ✓ Auscultation: ↓air entry at one side and harsh air entry to the other side.
  - ✓ Investigations:
    - ❖ *Chest X-ray (most important):* one lung is hyperinflated (the normal lung), other lung has a dark field due to air entrapment with elevated diaphragm at the affected side.
    - ❖ *CBC, electrolytes and urea* must be done because you will admit the patient to theater to remove the foreign body.
  - ✓ Management:
    - ❖ Removal of foreign body through rigid bronchoscopy done by an ENT surgeon. This is followed by 2-3 doses of steroids to decrease inflammation that might remain at the site of foreign body that has been removed.
- **Cystic fibrosis (autosomal recessive disease):**
  - ✓ Characterized by: it is a chronic condition; patient is thin with stunted growth; cough, fever and shortness of breath (are present if there is an infection); history of abnormal bowel motion (3-4 times/day, greasy, not bloody); history of medications (pancreatic enzymes are taken before meals).
  - ✓ Examination shows: respiratory distress, clubbing of fingers, crepitations and reduced air entry.
  - ✓ Diagnosis?
    - ❖ Sweat chloride.
    - ❖ Stool pH (acidic) and reducing substances.
    - ❖ Medication history.
    - ❖ Gene study on chromosome number 7 (CFTR gene).
  - ✓ Investigations:
    - ❖ *CBC*: anemia and leukocytosis when there is lung infection.
    - ❖ *Chest X-ray*: haziness of lungs (if there is an infection). Commonest organisms to cause lung infection in these patients are S.aureus and Pseudomonas.
    - ❖ *Electrolytes, urea and LFT.*
  - ✓ Management:
    - ❖ Pancreatic enzymes.
    - ❖ Fat-soluble vitamins.
    - ❖ Prophylactic antibiotics (life-long!).
    - ❖ Prophylactic antifungals (if needed).
- **Pleural effusion:**
  - ✓ Commonest causative organism: S. aureus.
  - ✓ Investigations:
    - ❖ *CBC*: leukocytosis (bacterial pleural effusion).
    - ❖ *ESR and CRP*: elevated.

- ❖ *Chest X-ray*: lower part of the lung is completely opaque (including costophrenic angle) and the remaining of the lung is hazy.

✓ Management:

- ❖ Aspiration to detect the organism.
- ❖ Antibiotics (vancomycin and 3rd generation cephalosporins).
- ❖ Thoracocentesis (under water seal).

- **URTI:**
  - ✓ Characterized by: fever, cough, no lower signs (no crepitations are heard or reduced air entry is detected). Notice that croup is characterized by stridor.
- **Acute epiglottitis:**
  - ✓ Caused by H.influenzae type B
  - ✓ It is a medical emergency (due to obstruction).
- **Tonsillitis:**
  - ✓ Characterized by: fever, cough, hyperemic tonsils with follicles.
  - ✓ Caused by: bacterial infection (streptococcal).