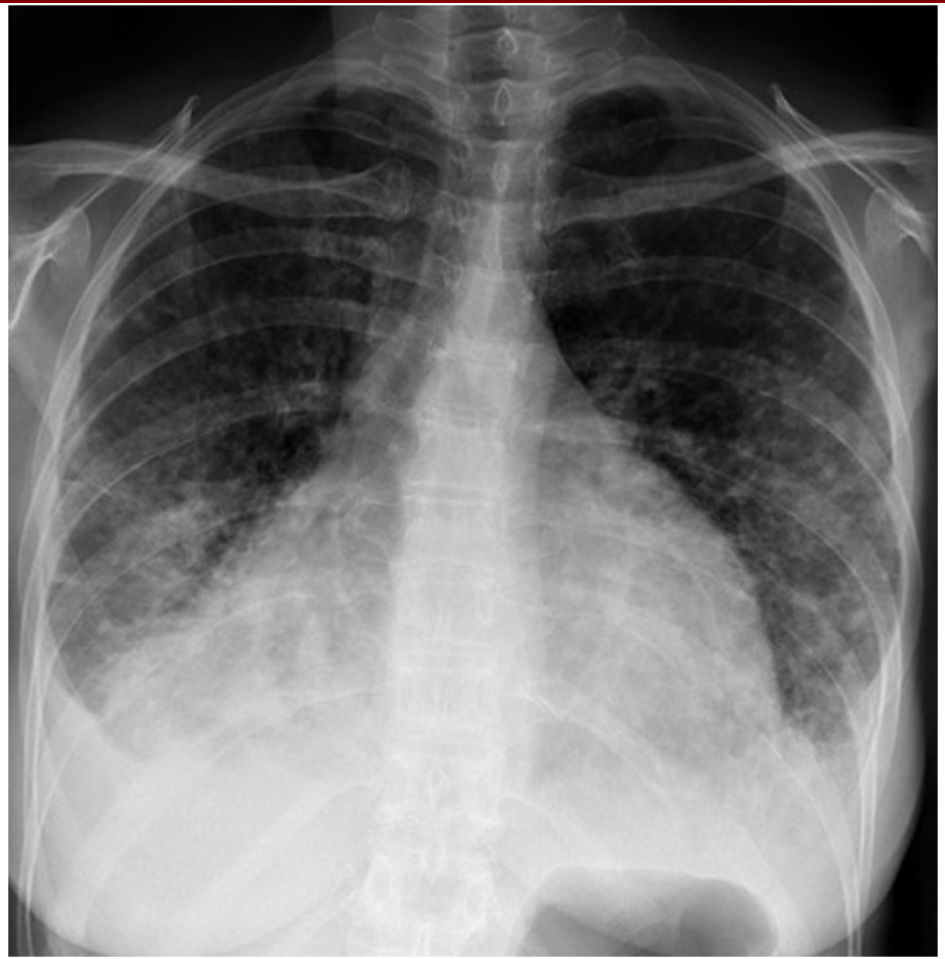
CXR #12

WAMSS SGR 2022

Trigger

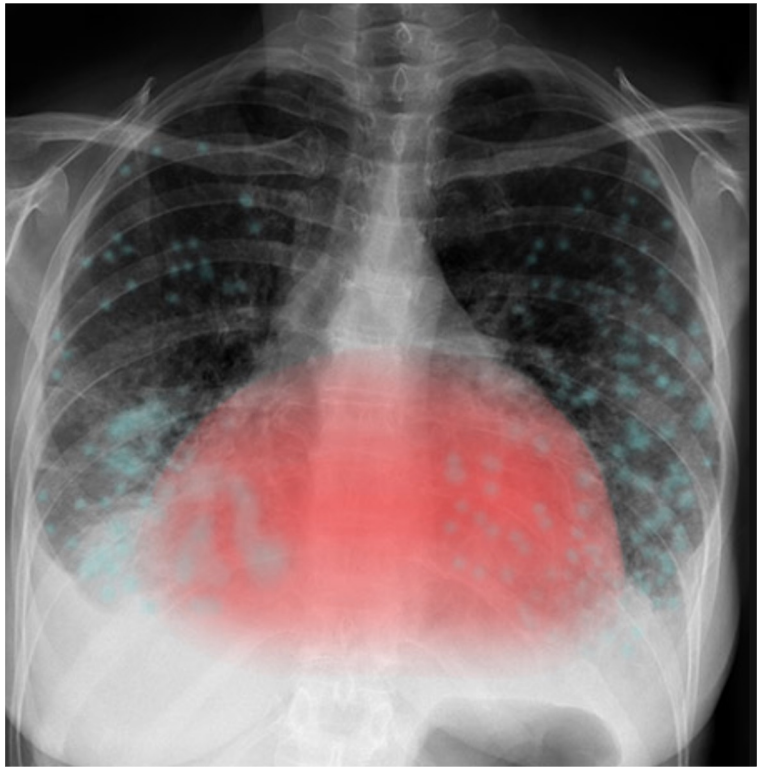
Yinka, a 68F with a known diagnosis of colorectal cancer presented to oncology clinic to discuss starting chemotherapy. Yinka was very against chemotherapy initially and was scared of the side effects. She presents very cachectic with night sweats, fatigue and dyspnoea. Given her recent deterioration, she has decided to reconsider chemotherapy. She is a non-smoker and non-drinker but eats bacon every morning. Yinka is estranged from her parents and her family history is unknown. She is not on any medications as she believes it is unnatural. A routine CXR was done prior to commencing chemotherapy.

Task: Interpret the PA CXR and provide a differential.



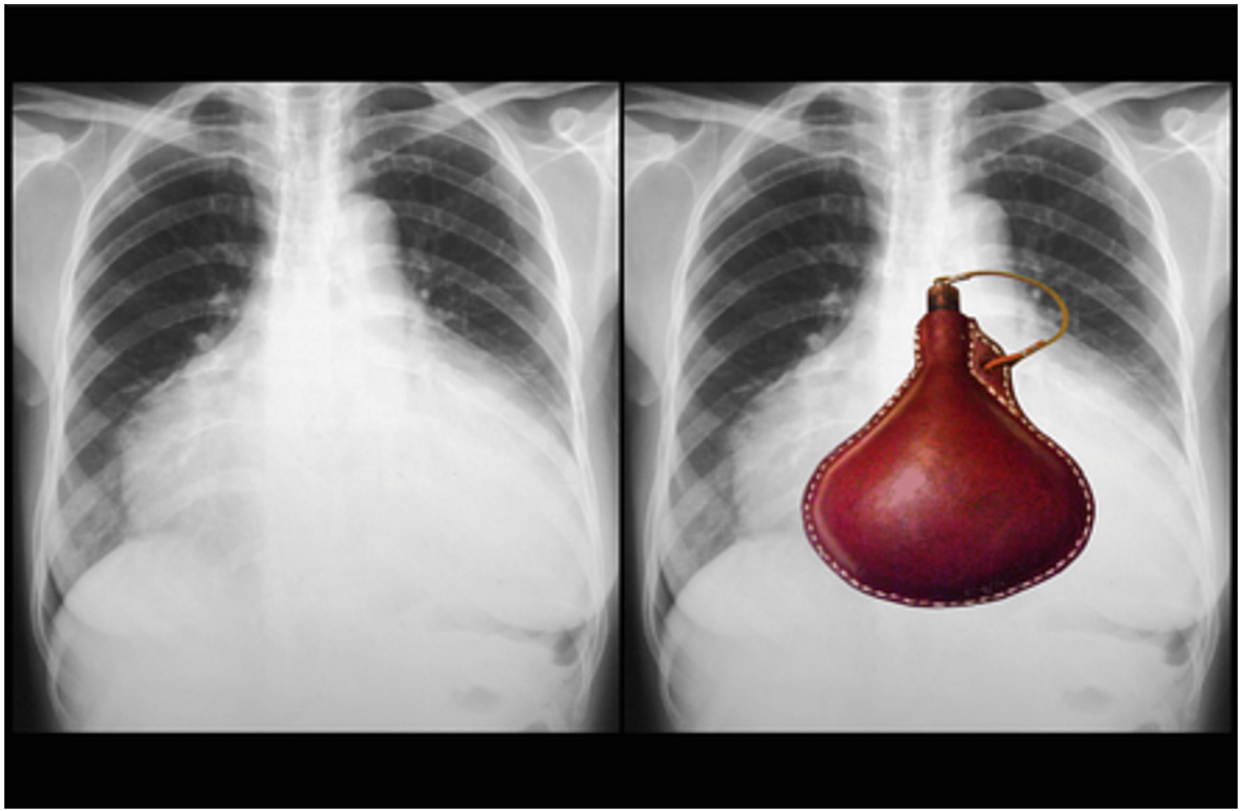
Details and demographic	PA CXR of a 68F with a known diagnosis of colorectal cancer
RIPE/Quality	Rotation: Rotational artefact to the right
	Inspiration: Adequate inspiratory effort with 6 anterior ribs showing
	Projection: PA
	Exposure: Adequate exposure, vertebrae visible behind heart
Airways and lung fields	Difficult to say if tracheal deviation is present given the rotation to the right Widespread, radiopaque nodules bilaterally, most prominently in the middle and lower zones
Bones and soft tissue	No obvious fractures or soft tissue abnormalities
Cardo-mediastinum	Mediastinum not shifted Cardiothoracic ratio approximately 0.7 (a normal measurement is 0.42 to 0.50) Enlarged cardiac silhouette (water bottle sign). This indicates a large pericardial effusion
Diaphragm	Bilateral costophrenic angle blunting, suggestive of bilateral pleural effusions
Everything else	No free gas under the diaphragm, no subcutaneous emphysema is noted.
Interpretation	In summary, this is a PA CXR of a 68F with a known diagnosis of colorectal cancer. An enlarged cardiac silhouette with a water bottle sign is is present, suggestive of a large pericardial effusion. Bilateral costophrenic angle blunting indicates pleural effusions. Widespread nodules are visible in the lungs bilaterally. Given the clinical picture, my working diagnosis is **metastatic colorectal cancer with malignant pericardial and pleural effusions.**

Pulmonary metastasis = blue



https://www.radiologymasterclass.co.uk/gallery/chest/cardiac_disease/pericardial_effusion

Water bottle sign



https://radiopaedia.org/articles/water-bottle-sign-heart

Follow-up Questions

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1. Outline Light's criteria for pleural effusion and list aetiologies of a pleural effusion.

2. What are the aetiologies of a pericardial effusion.

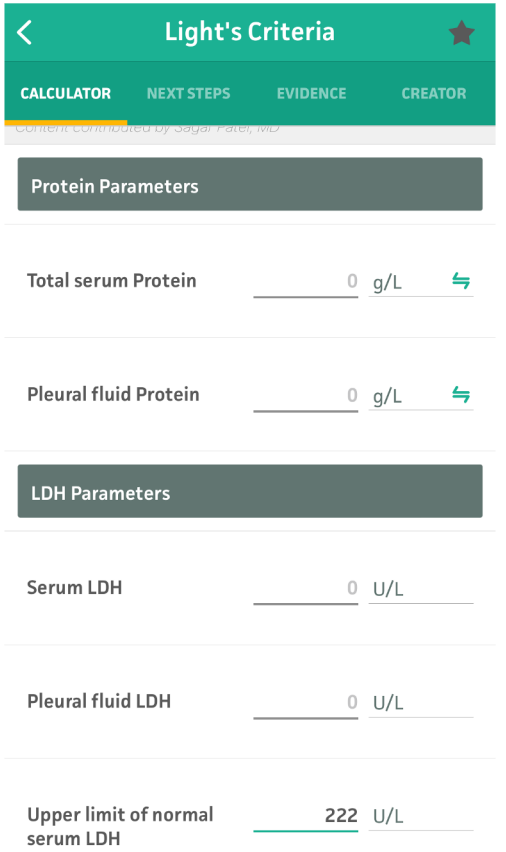
3. List 3 factors that decrease the risk of colorectal cancer.

4. Outline the clinical presentation of colorectal cancer.

5. Explain why the most common site of metastasis of colon cancer is different to that of rectal cancer.

Question 1

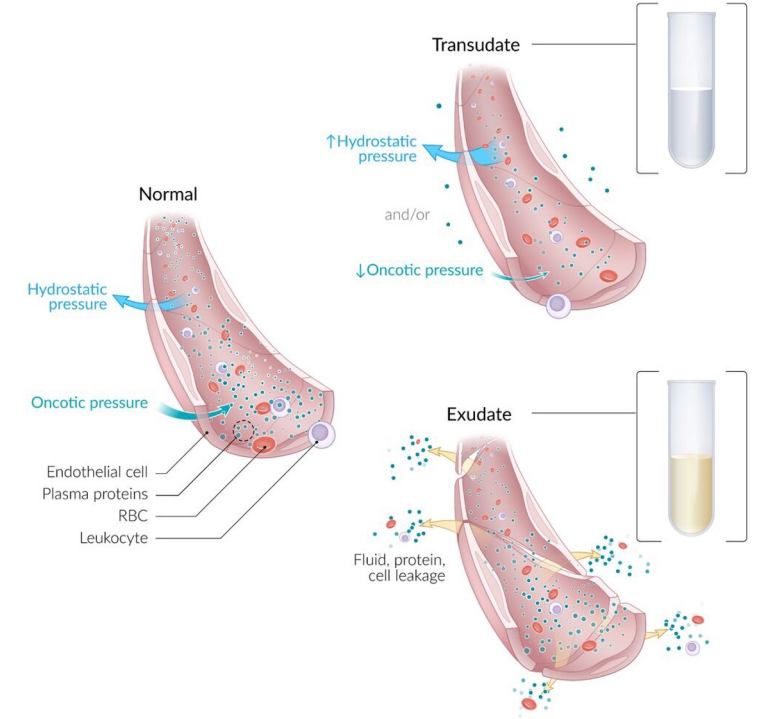
- Light's criteria is used to differentiate between exudative and transudative pleural effusions
- Exudative effusions have:
  - Pleural fluid protein : serum protein ratio >0.5
  - Pleural fluid LDH : serum LDH ratio > 0.6
  - Pleural fluid LDH >2/3 the upper limit of serum LDH
- Light's criteria is more sensitive than specific
  - More useful for ruling OUT exudates



Question 1

- Transudative effusions are caused by increased capillary hydrostatic pressure OR decreased capillary oncotic pressure resulting in fluid leakage into the pleural space

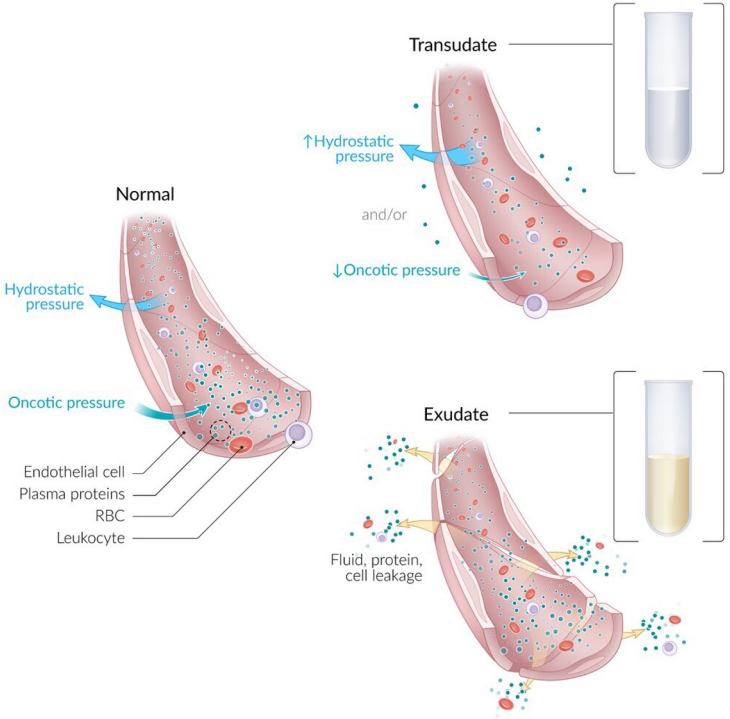
- Common causes include:
  - Congestive heart failure
  - Hypoalbuminaemia
    - Cirrhosis
    - Nephrotic syndrome
  - Chronic kidney disease (CKD)
    - Na^+ retention



Question 1

- Exudative effusions are caused by increased capillary permeability resulting in fluid leakage into the pleural space

- Common causes include:
  - Infections
    - e.g. pneumonia
  - Malignancies
    - e.g. lung cancer
  - Pulmonary embolism (PE)
  - Autoimmune disease
    - e.g. vasculitis
  - Trauma
  - Pancreatitis
  - Haemothorax
  - Chylothorax



Question 2

- Pericardial effusion can be classified into transudate, exudate, blood or purulent fluid

Fluid Type	Aetiology
Transudate	• Heart failure • Renal failure • Hypoalbuminaemia e.g. cirrhosis, nephrotic syndrome
Exudate	• Viral infection • Inflammation • Malignancy (usually metastases) • Autoimmune disease
Blood	• Cardiac rupture (post MI) • Post-cardiac surgery • Trauma • Aortic dissection • Malignancy (usually metastases)
Purulent	• Bacterial infection • Tuberculosis (TB)

Question 3

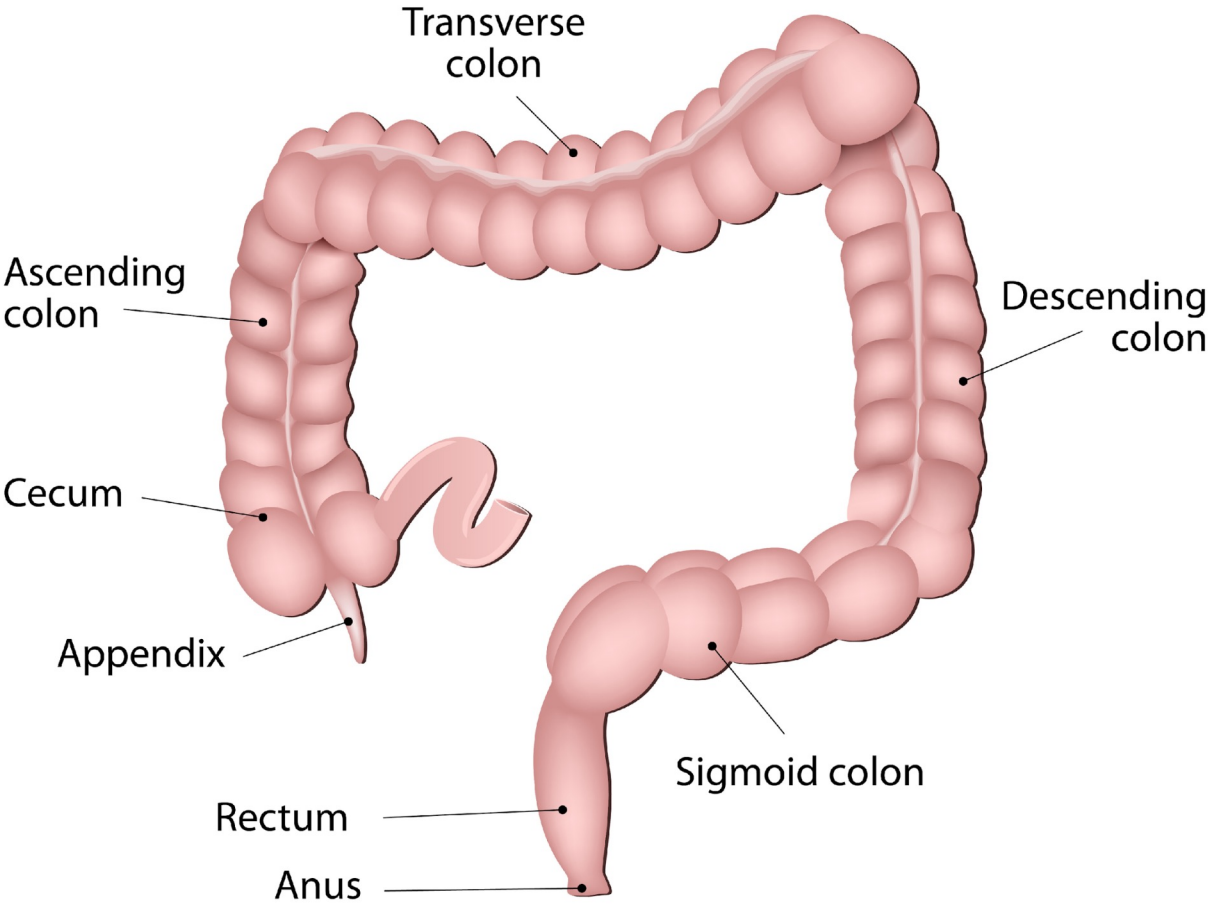
- Physical activity

- Diet: high fibre, low red meat/processed meat
  - Processed meat is an IARC Group 1 carcinogen (causes cancer)
  - Red meat is an IARC Group 2a carcinogen (probable carcinogen)

- Long term NSAID use (e.g. aspirin)
  - COX-2 overexpression occurs in a carcinogenesis pathway associated with colorectal cancer
  - The mechanism of action of NSAIDs involves inhibiting COX-1 and/or COX-2

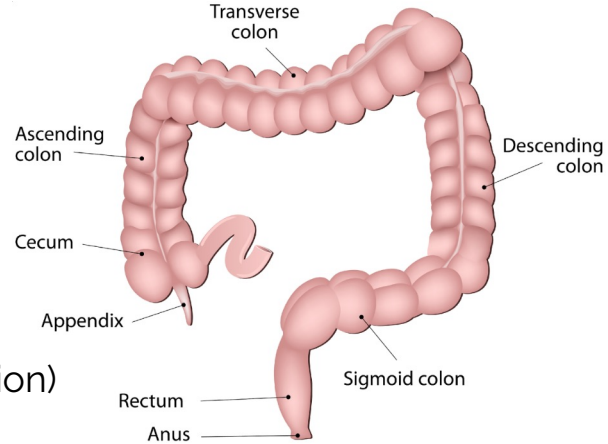
Question 4

- Clinical presentation varies based on the anatomical location of the neoplasm



Question 4

- Constitutional symptoms
  - Weight loss, fever, night sweats, fatigue
- Right sided (caecum, ascending colon or transverse colon)
  - Occult bleeding/blood mixed in with the stool
  - Iron deficiency anaemia symptoms e.g. fatigue, SOB, palpitations
- Left sided (splenic flexure, descending colon, rectosigmoid junction)
  - Signs of bowel obstruction e.g. colicky abdominal pain
  - Altered bowel habit (size, shape, frequency)
  - Blood-streaked stool
- Rectal
  - Haematochezia
  - Tenesmus
  - Rectal pain
  - Pencil-shaped stool
- Signs of metastatic disease e.g. liver mets, lung mets, peritoneal mets, Virchow's node



Question 5

- Colon cancer most commonly metastasises to the liver
  - Drained by superior mesenteric vein + inferior mesenteric vein
  - SMV + IMV -> portal vein -> liver

- Rectal cancer most commonly metastasises to the lungs
  - Drained by the inferior rectal vein
  - Inferior rectal vein -> internal pudendal vein -> internal iliac vein -> common iliac vein -> inferior vena cava (IVC) -> lungs

- Note: rectal cancer is anatomically defined as within 15cm of the anal verge

Thank you!

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