

THE CHEST FILM

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CONSULTANT RADIOLOGIST



WHY BOTHER WHEN YOU HAVE RADIOLOGY?

No matter which department you will end up working in, you will need to know how to interpret chest x-rays yourself!



VIEWING ROUTINE

- Whole film including soft tissue and bone
 - And the boring stuff!
- Compare with old films!
- Practice makes perfect!



TIP!

ALWAYS USE THE SAME ORDER

VIEWING ROUTINE



Request form
Technical quality
Trachea
Mediastinum
Heart
Hilum
Lungs
Diaphragm
Bones
Soft Tissues

VIEWING ROUTINE

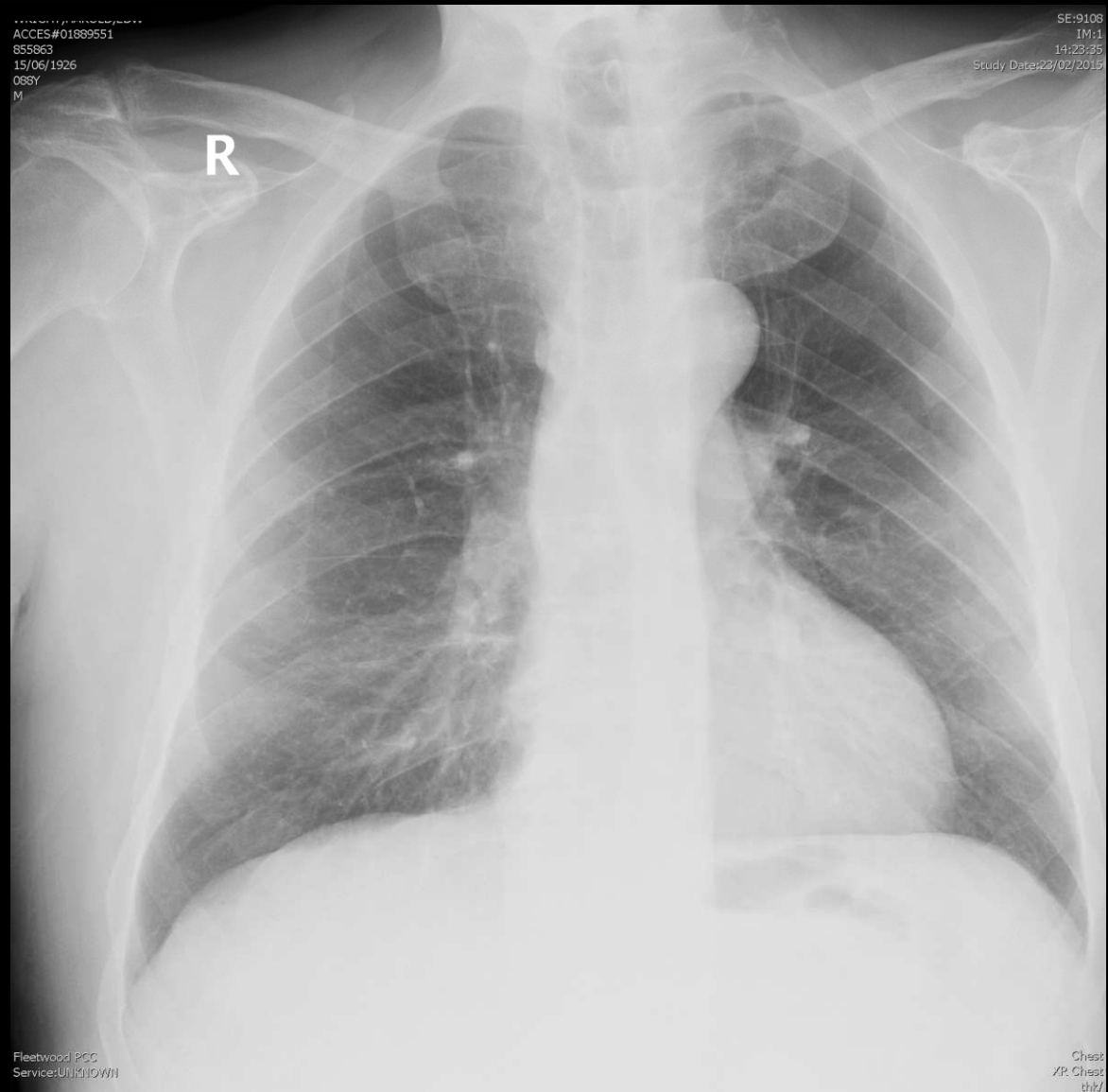
Request form

(boring but important stuff)

- Name
- Age
- Sex
- Clinical details
- Foreign objects

Technical Quality

- Centering
- PA or AP
- Side markers
- Penetration/Exposure
- Degree of inspiration



SIMPLE!



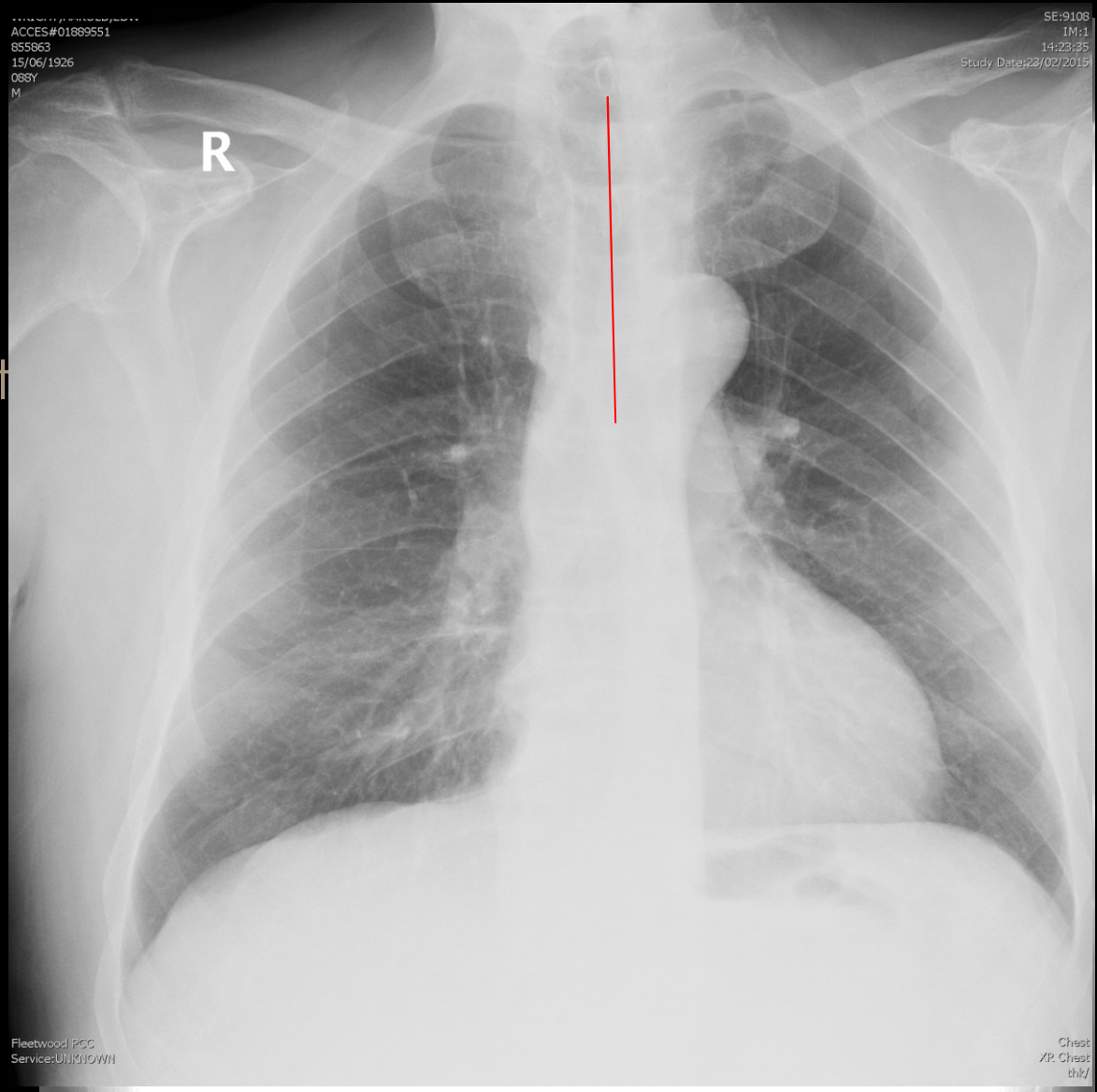
VIEWING ROUTINE

Trachea

- Central or shifted to one side
- Slight deviation to the right is normal
- Narrowing
- Intra-luminal lesion
- Paratracheal line

Mediastinum

- Central
- Widened
- Clear outlines
- Masses



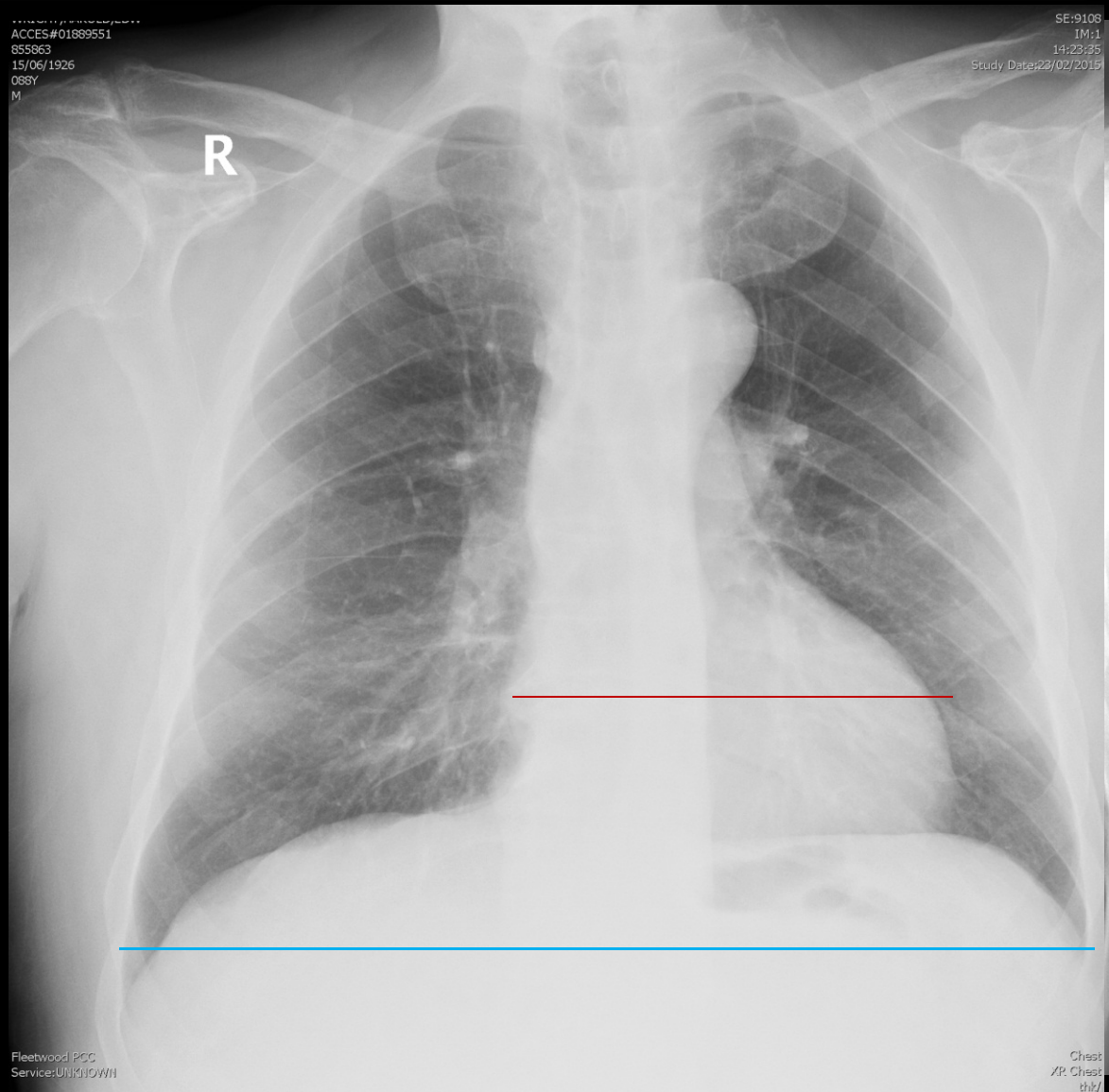
VIEWING ROUTINE

Heart

- Shape and size
- Cardio-thoracic ratio less than 0.5
- Abnormal shadows projected over heart

Hilum

- Formed by upper lobe veins and inferior pulmonary arteries
- Left higher than right < 2.5 cm
- Compare shape and density



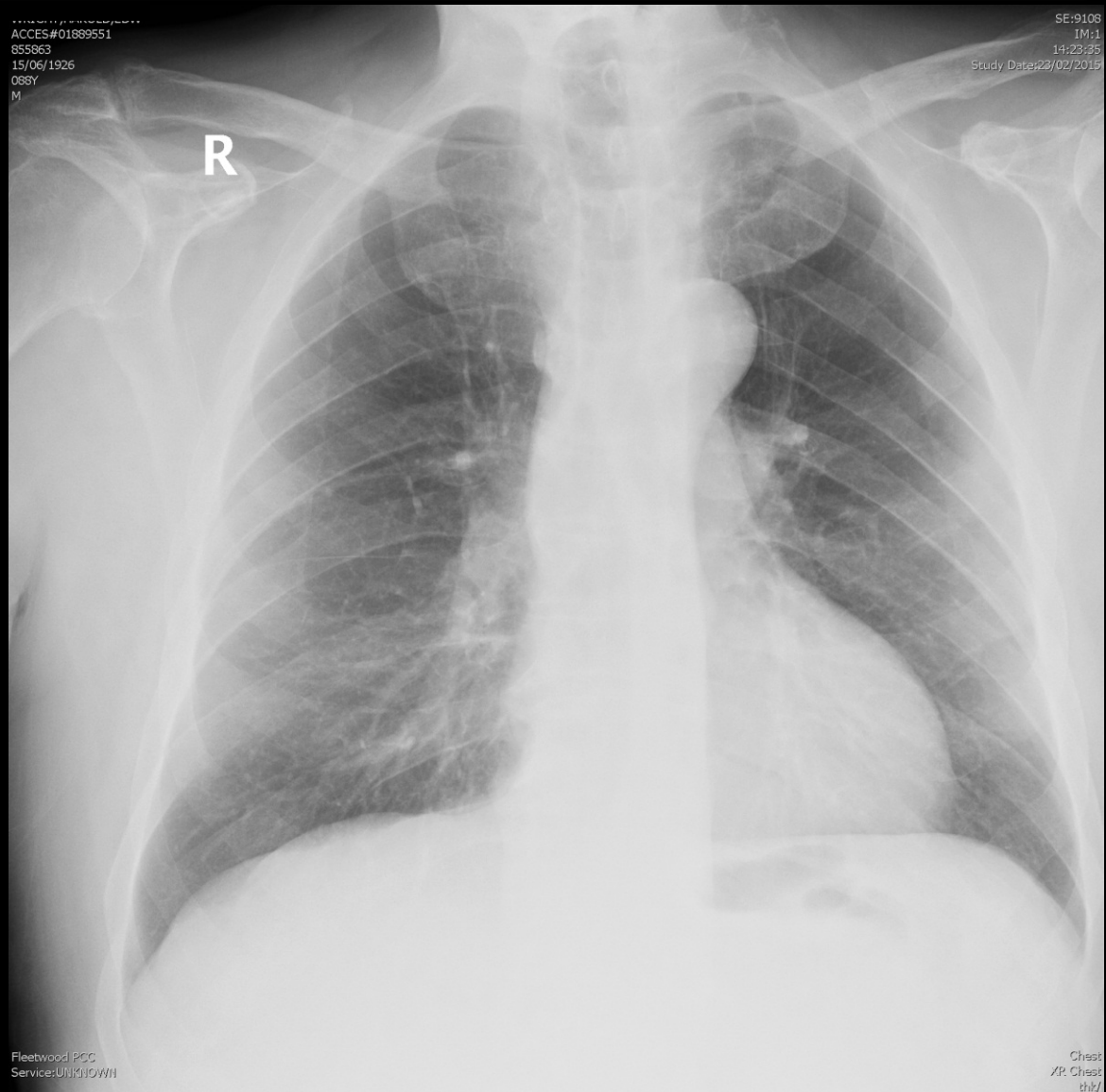
VIEWING ROUTINE

Lungs

- Normally equal density
- Compare sides
- Lung markings
- Abnormal shadows or density
- Apices, costophrenic angles

Diaphragms

- Right slightly higher than the left < 3cm
- Smooth
- Free gas
- Calcifications



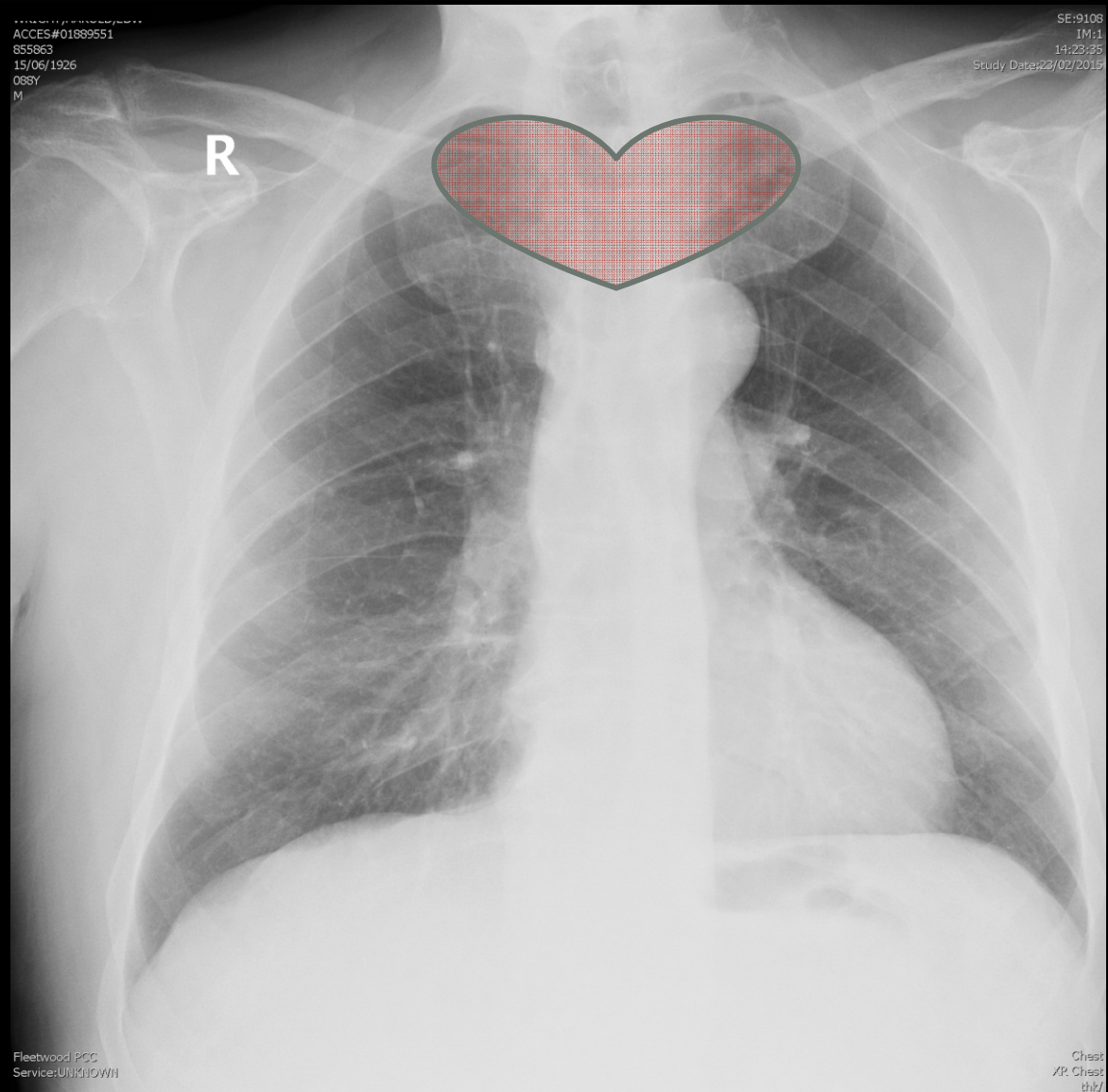
VIEWING ROUTINE

Bones

- Ribs, scapulae ,vertebrae
- Clavicles
- Fractures
- Abnormal density

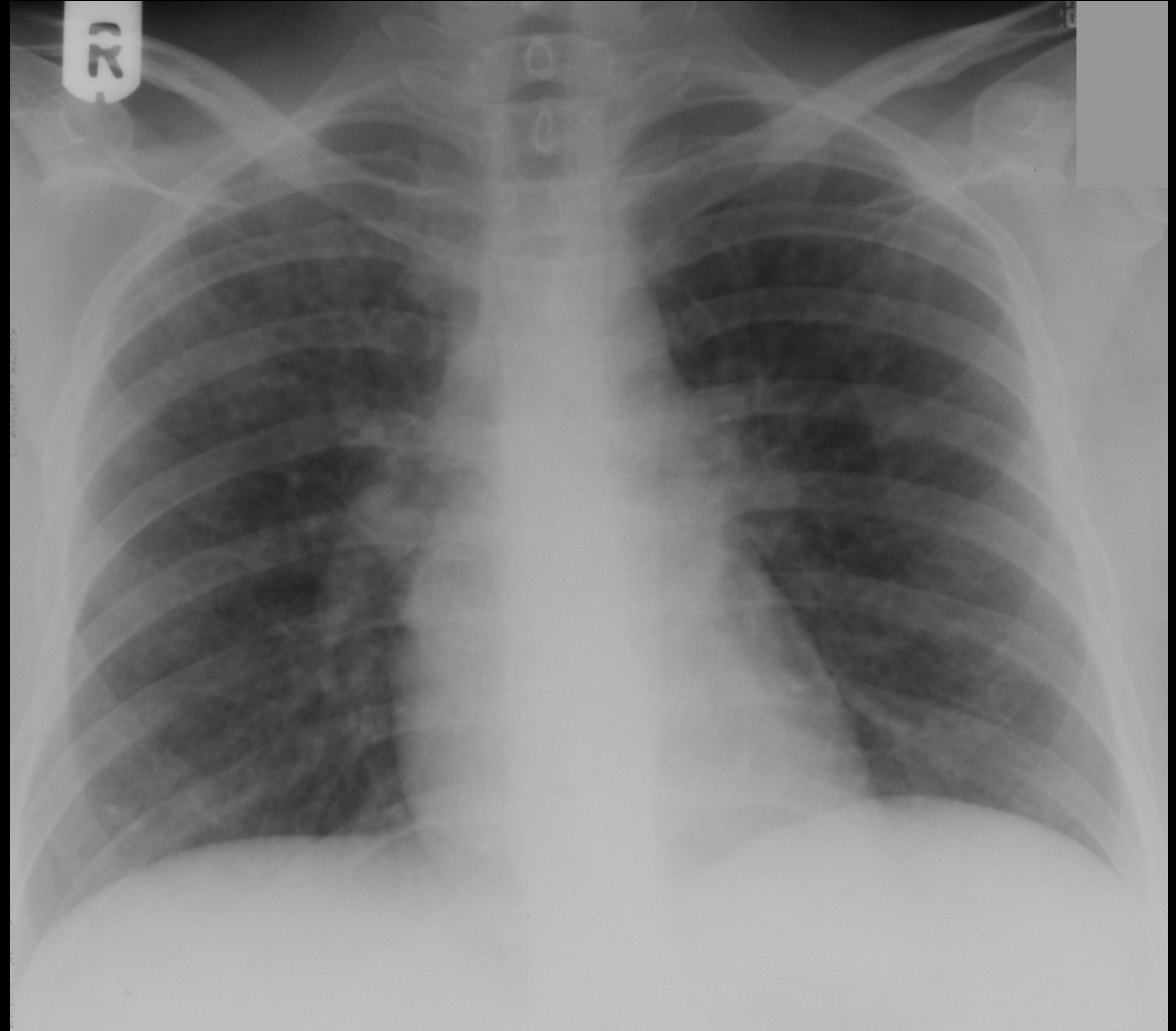
Soft tissues

- Chest wall
- Neck
- Abnormal masses



AP FILM

- Same viewing routine as PA
- Used in patients unfit for PA
- Mediastinum and heart magnified
- Cannot assess heart size accurately
- Scapulae overlie lungs
- Should be marked AP Supine or erect



VIEWING LATERAL FILMS

- May define lesion more clearly
- Lesion localisation
- Check identification and film quality as PA film

VIEWING LATERAL FILMS

Lungs

- Localise lesion or abnormal density
- Retrosternal space
- Position of fissures pass through hilum

Hilum

- Density
- Mass



VIEWING LATERAL FILMS

Diaphragms

- Sharp borders
- Costophrenic angles
- Pleural effusion
- Right higher than left
- Left merges with heart

Vertebrae

- Increased translucency caudally
- Shape, size, density



ABNORMAL FINDINGS

- Lungs
- Hilum
- Mediastinum
- Heart

VIEWING ROUTINE

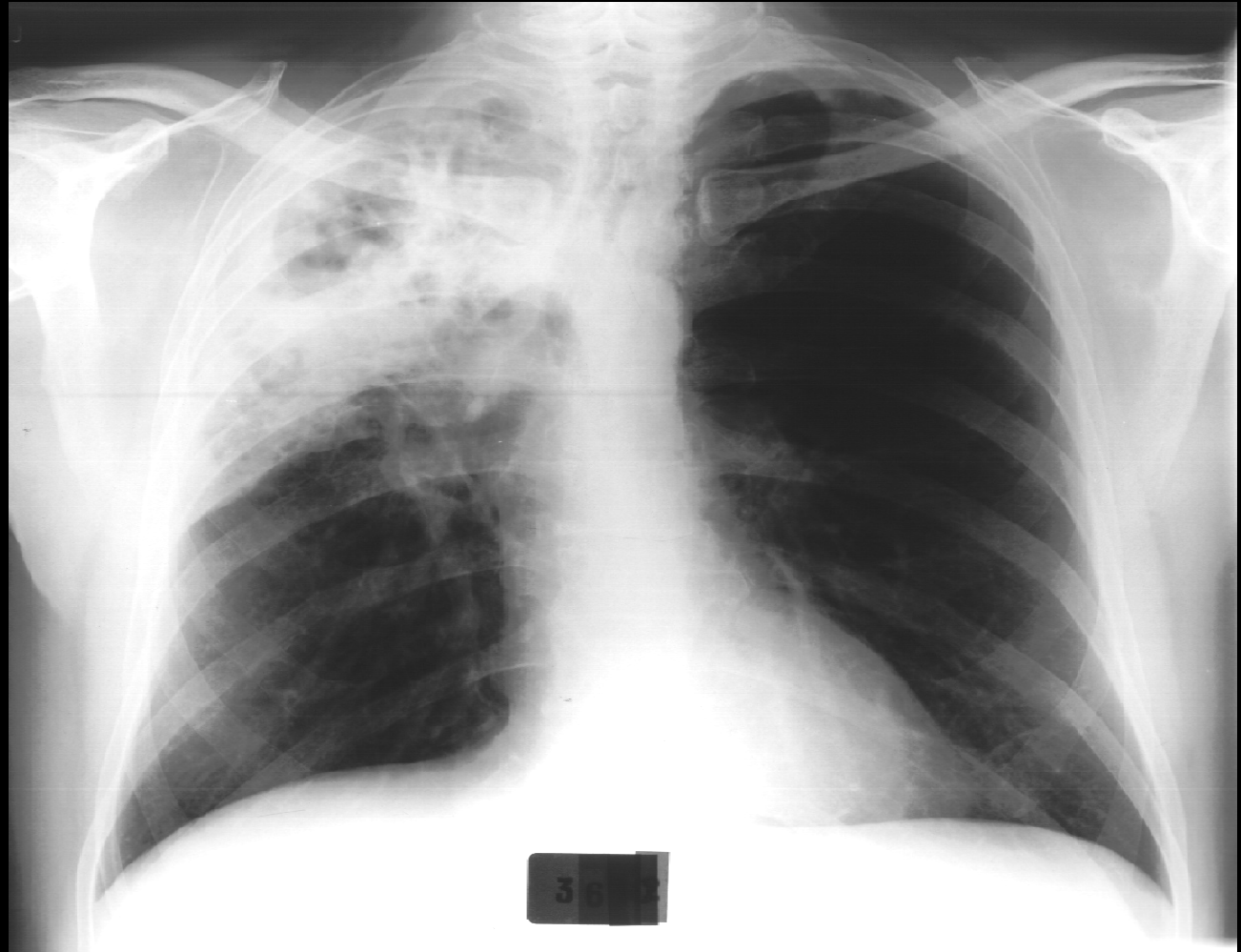


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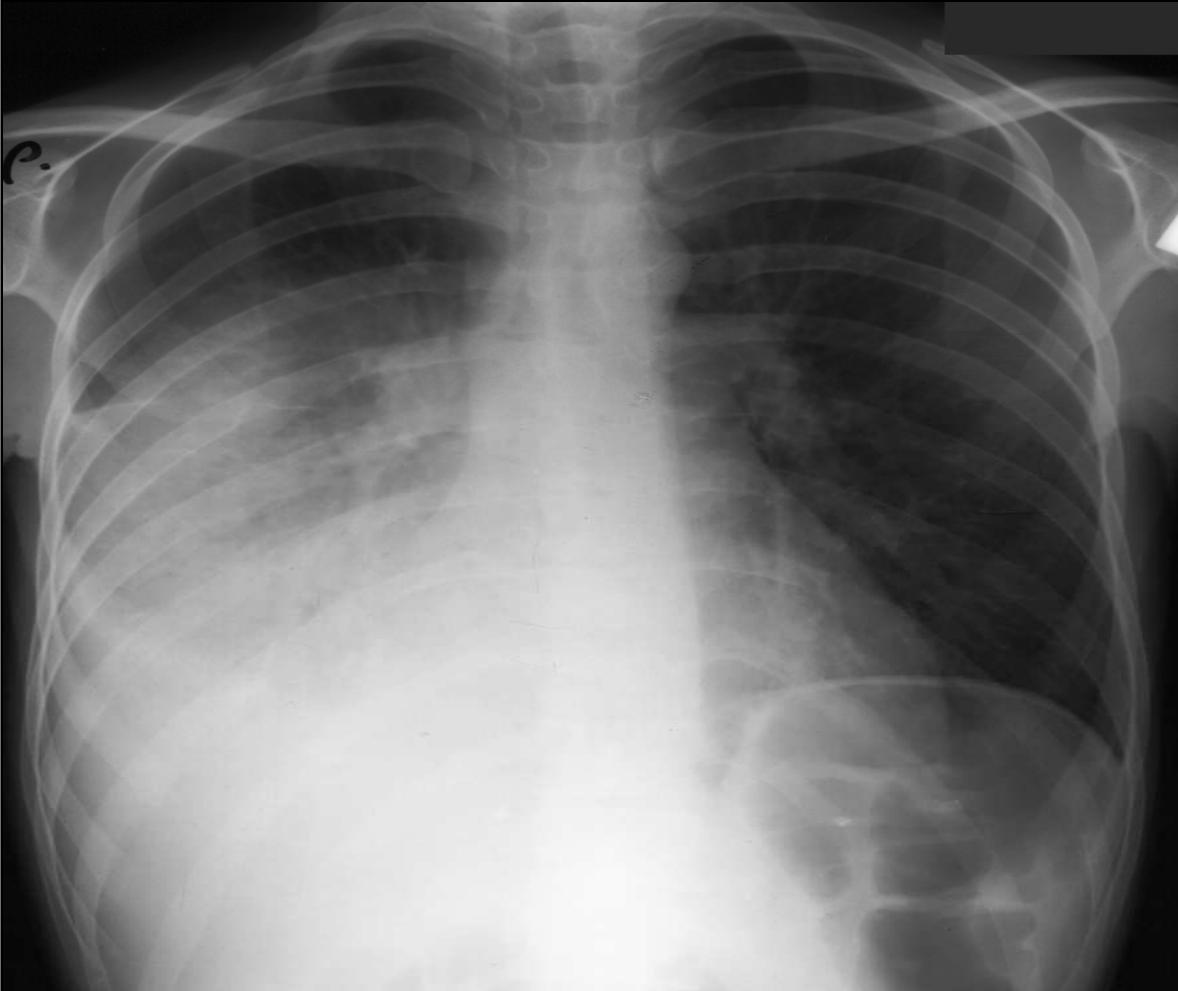
CAVITING RIGHT UPPER LOBE PNEUMONIA

Lungs too White Most Common Causes

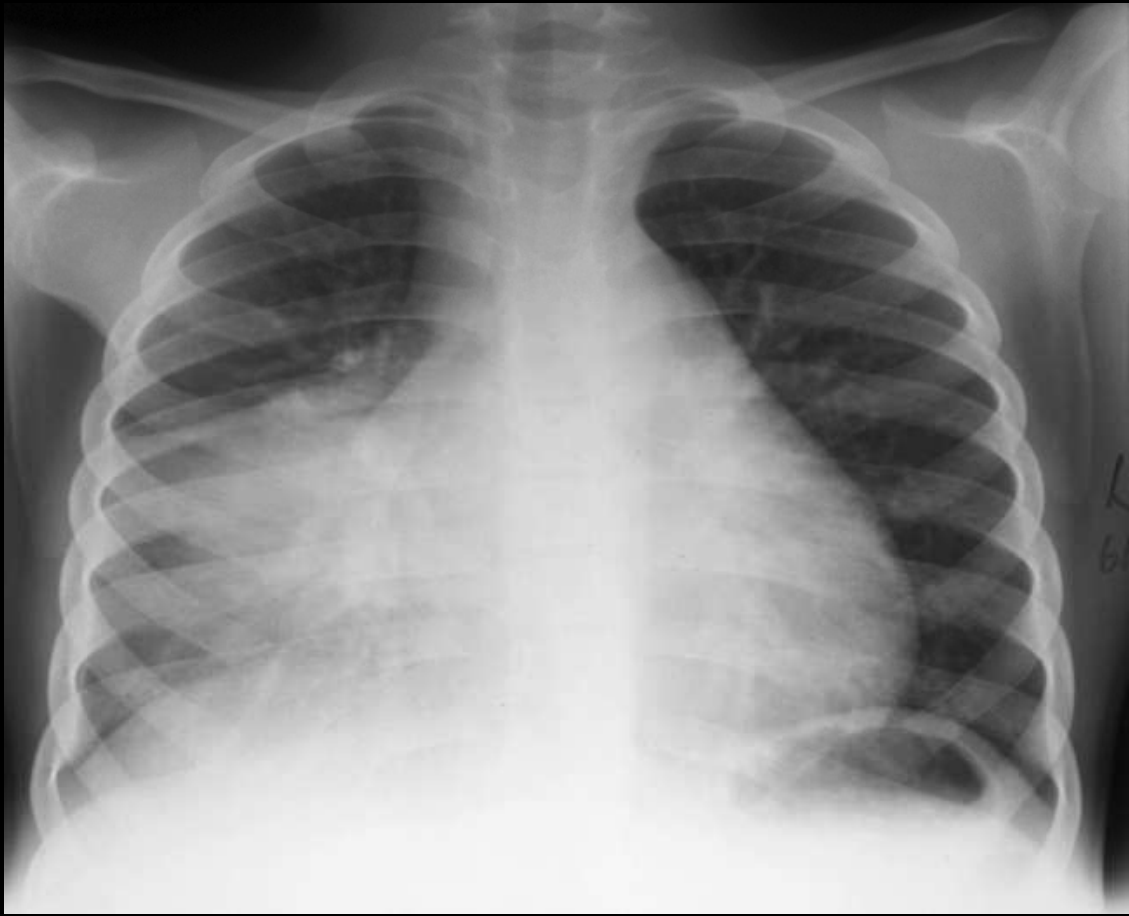
- Consolidation
- Collapse
- Effusion



RIGHT LOWER LOBE PNEUMONIA



RIGHT MIDDLE LOBE PNEUMONIA



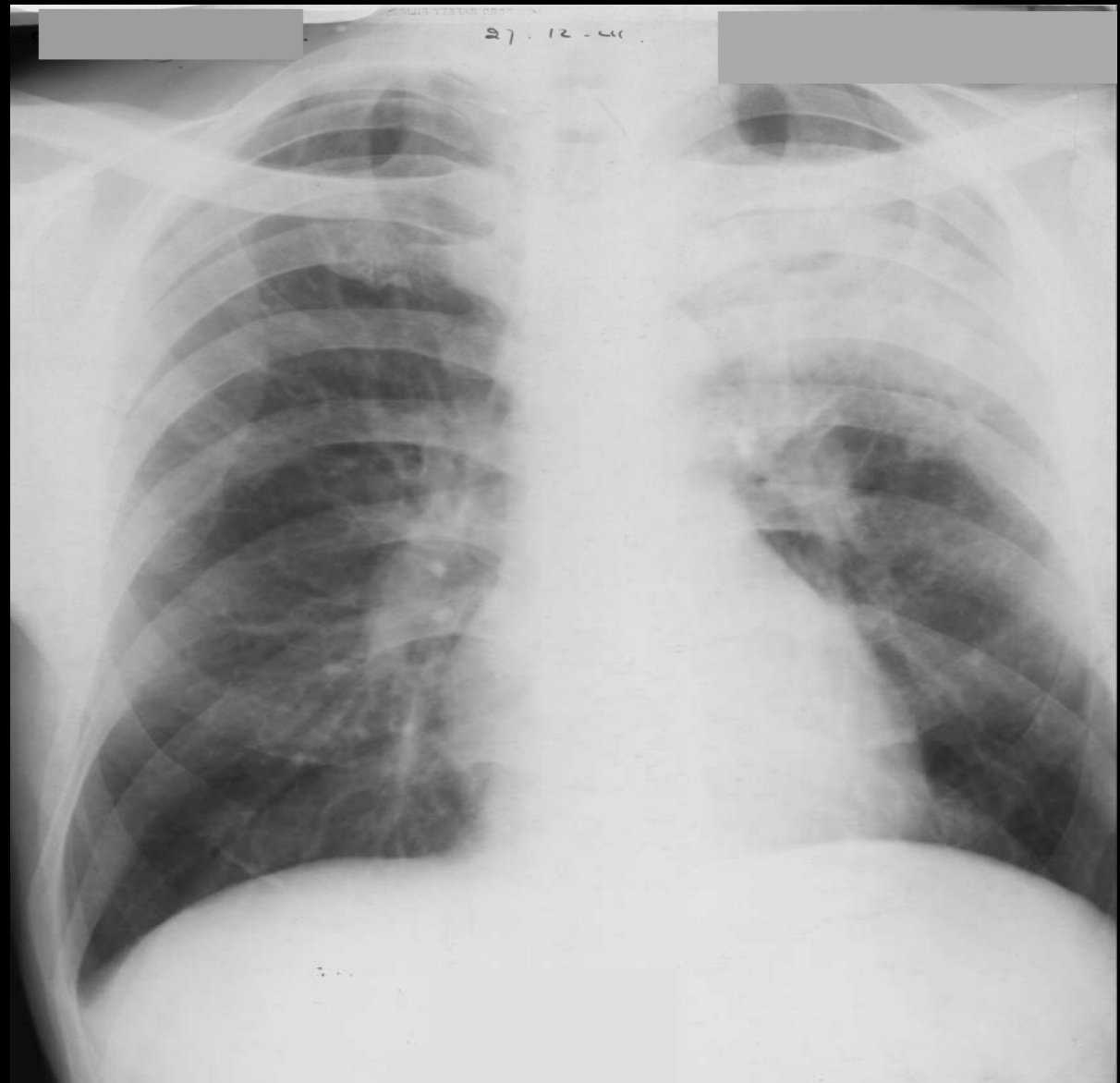
Other causes of increased density:

- Fibrosis
- Mass lesion
- Cavity
- Pleural disease
- Miliary shadowing

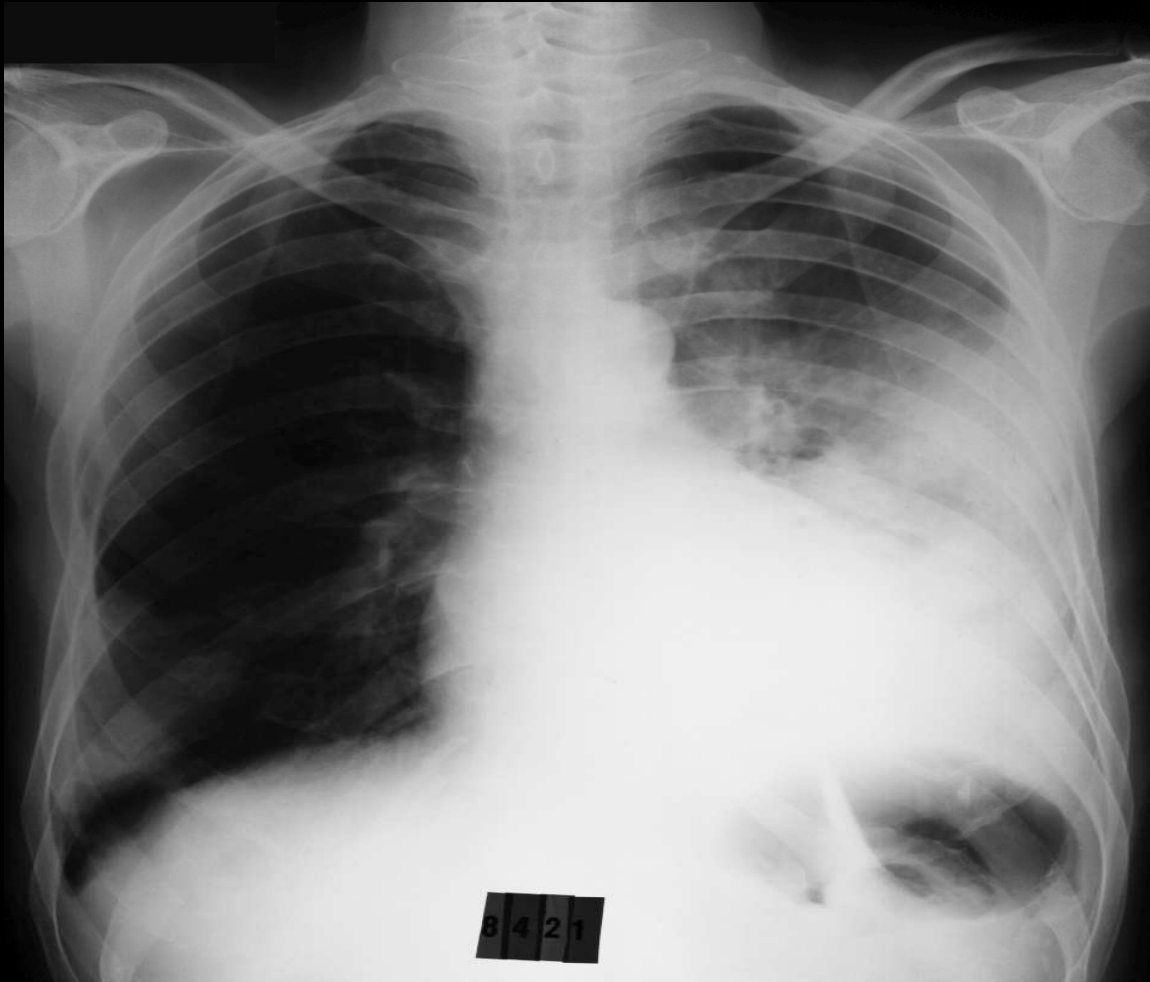
LEFT UPPER LOBE PNEUMONIA

Consolidation

- Alveolar shadowing
- Alveoli fill with fluid, pus, blood
- Non uniform shadowing
- Border not well demarcated
- Air bronchogram



LEFT LOWER LOBE PNEUMONIA



Causes

- Pneumonia
- Pulmonary oedema
- ARDS
- Infarction
- Tumour

TUBERCULOSIS



VIEWING ROUTINE

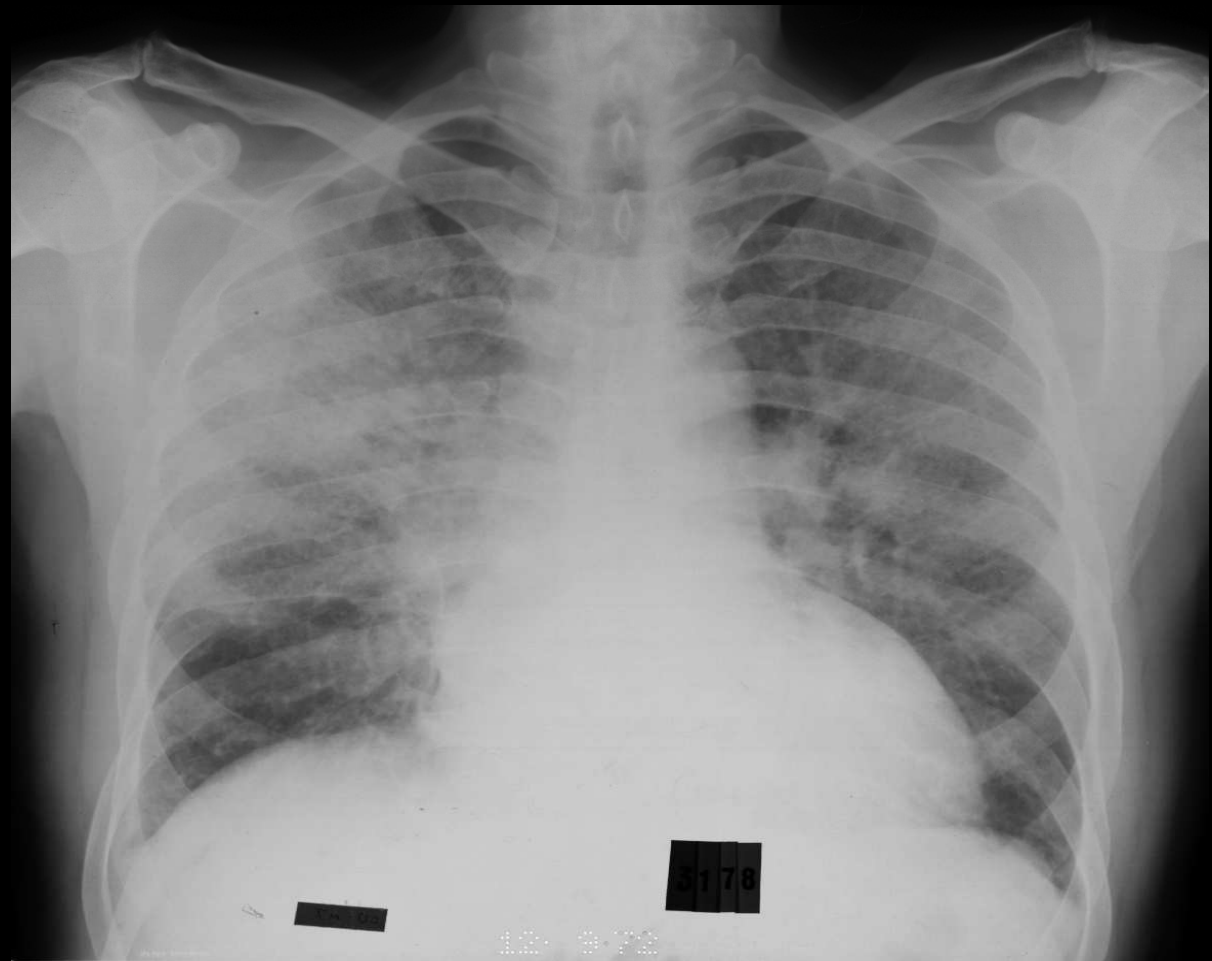


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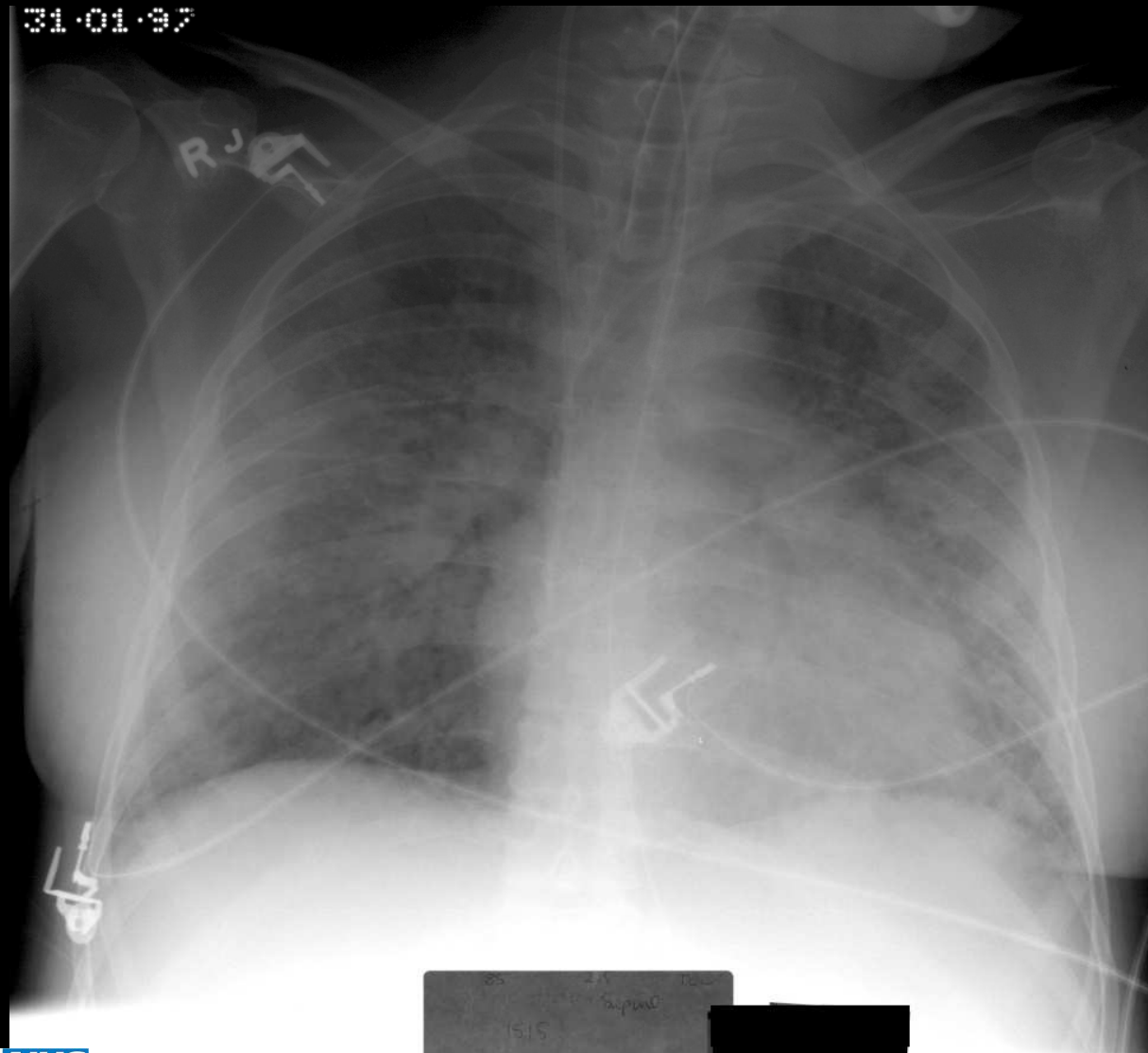
PULMONARY OEDEMA

Pulmonary Oedema

- Enlarged heart
- Upper lobe blood diversion
- Interstitial oedema
- Kerley B lines
- Bat's wing oedema



ARDS



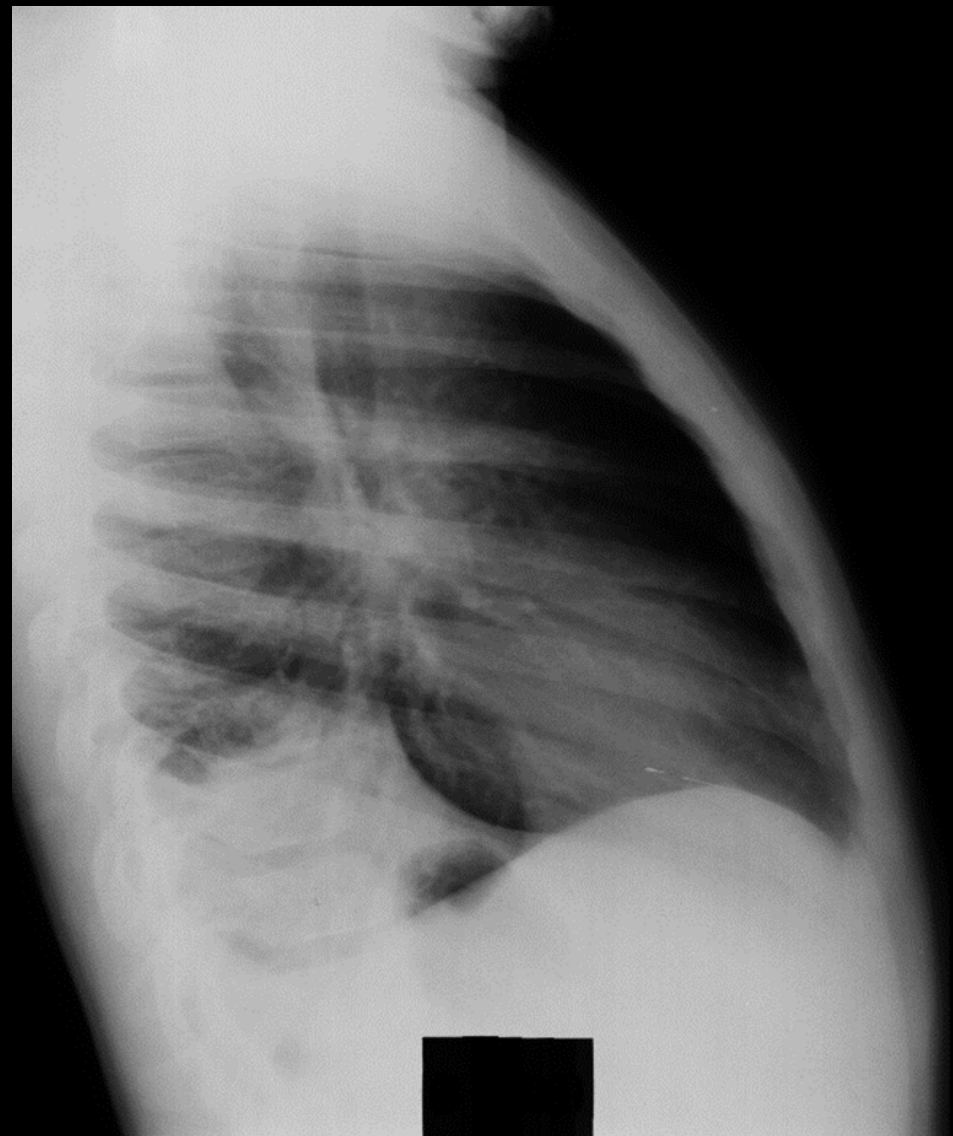
Collapse

- Loss of volume
- Raised diaphragm, Horizontal fissure
- Mediastinal shift towards
- Loss of heart borders or diaphragm
- No air bronchogram
- Location

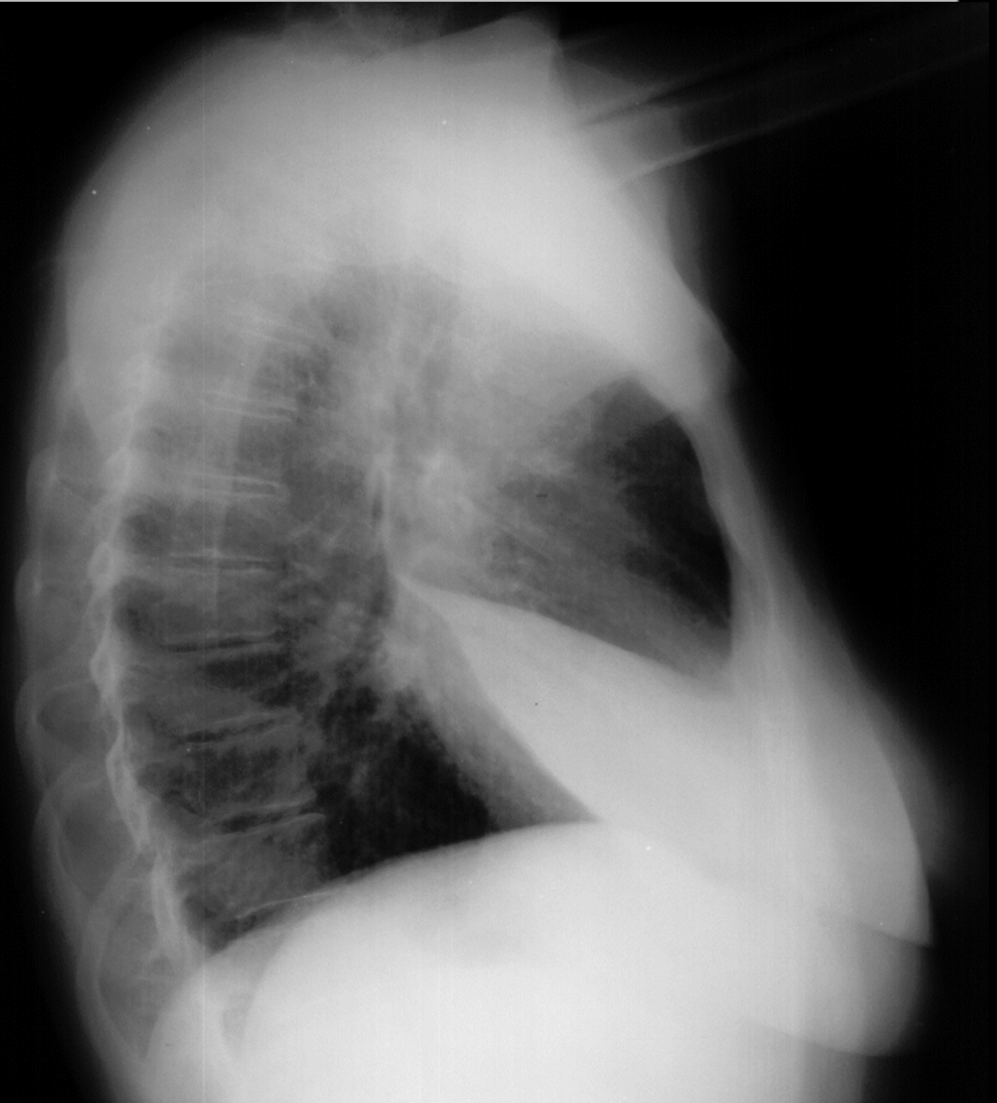
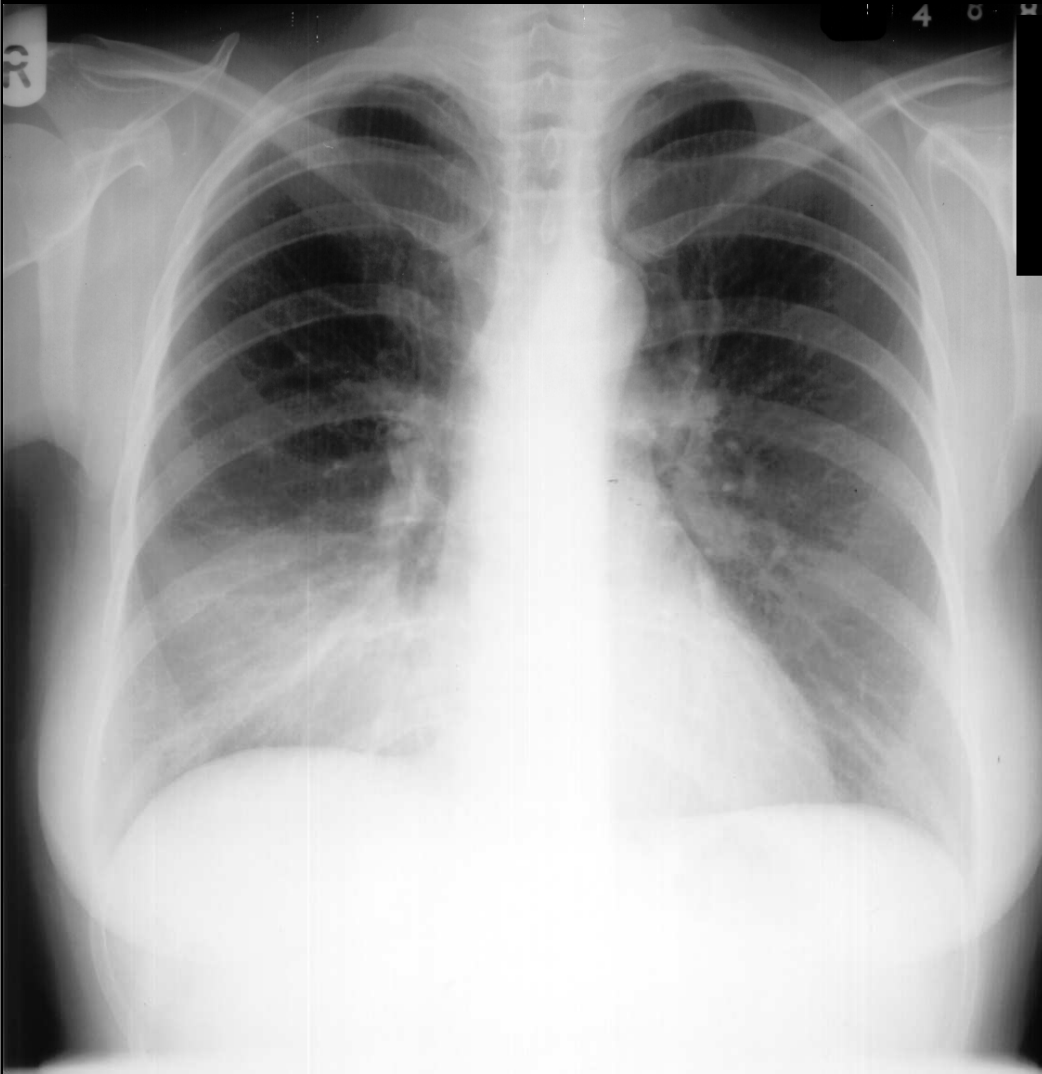
Causes

- Bronchial obstruction
- Pneumothorax
- Pleural effusion
- Fibrosis
- PE

LEFT LOWER LOBE COLLAPSE



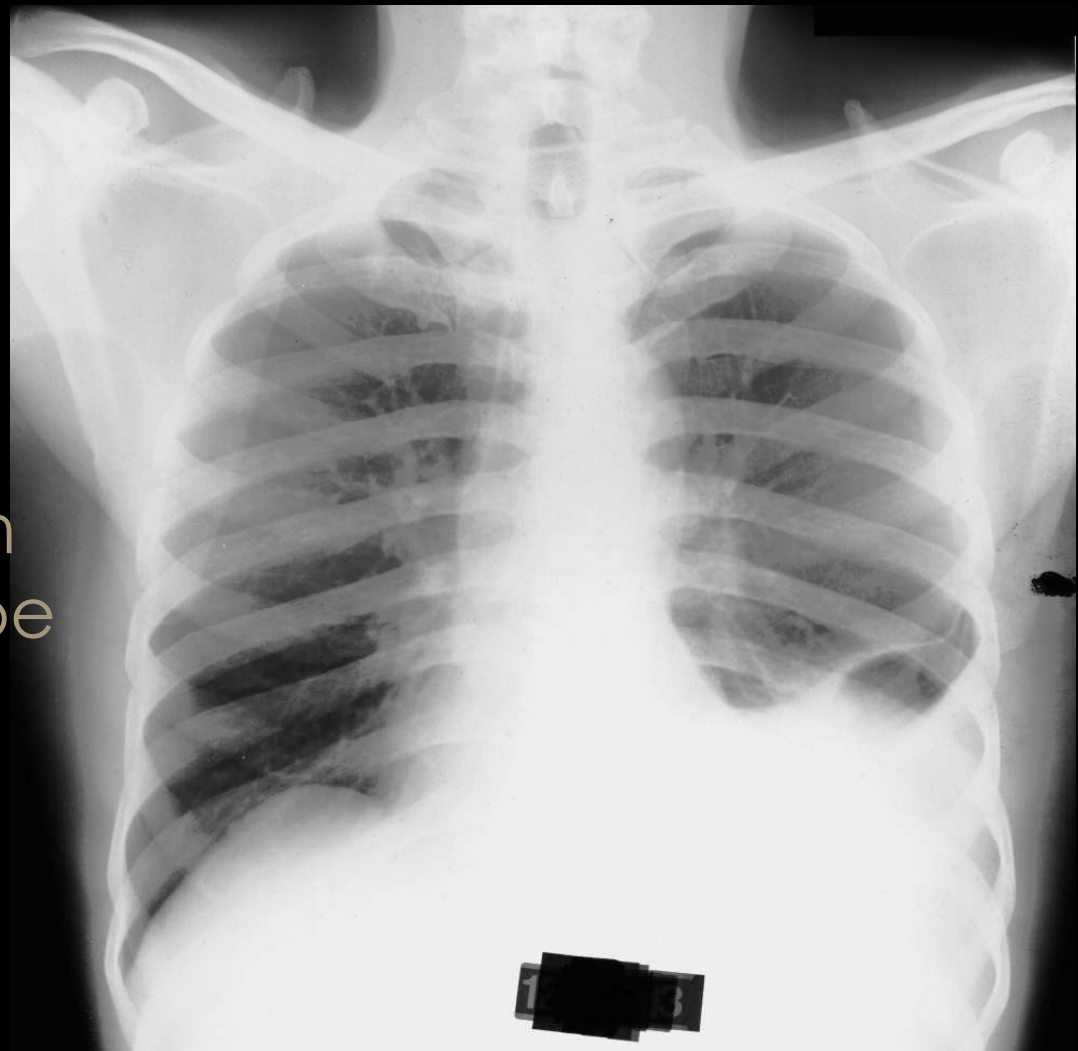
RIGHT MIDDLE LOBE COLLAPSE



PLEURAL EFFUSION

Pleural effusion

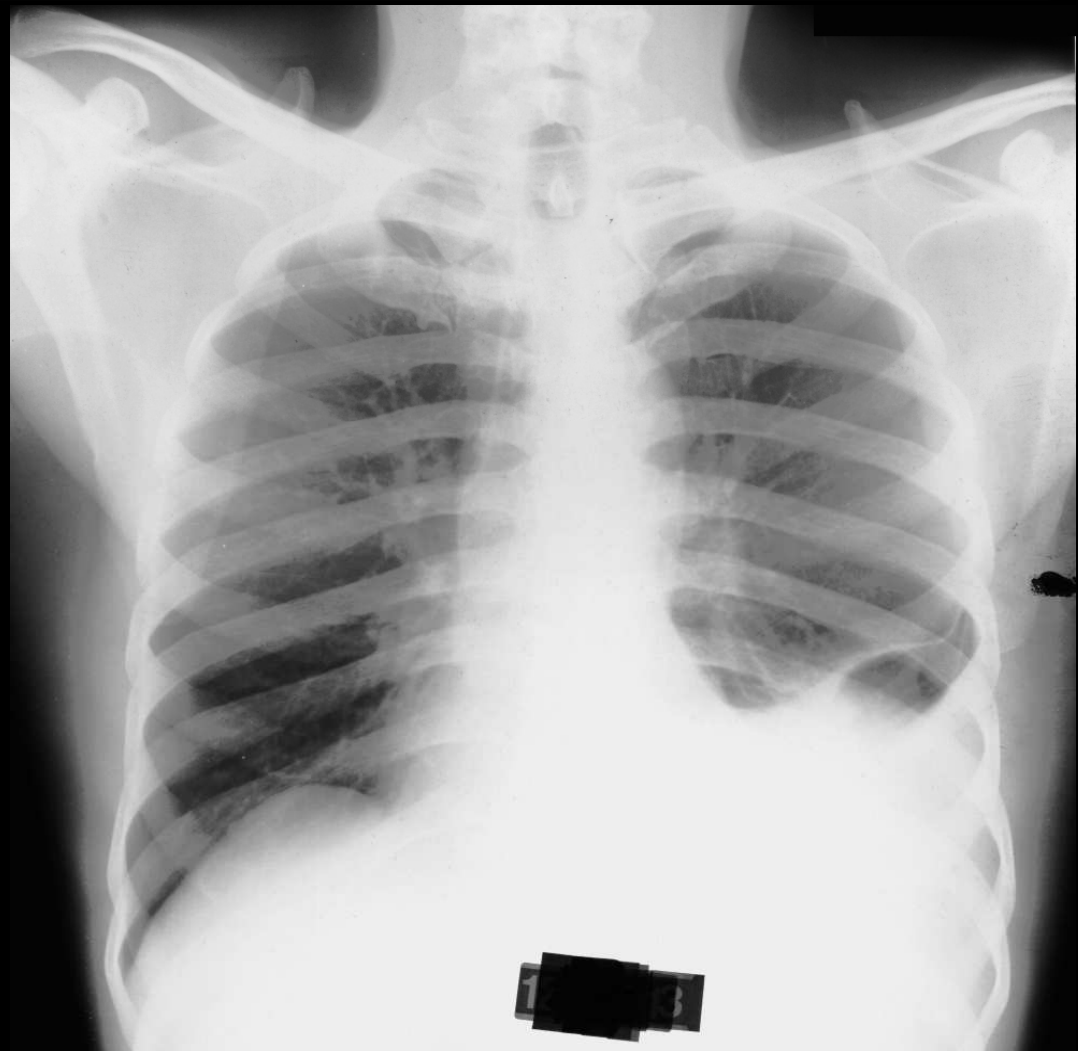
- Basal density
- Upper border concave
- Can be associated with collapse or consolidation
- Loss of diaphragm can be confused with raised diaphragm
- Mediastinum central or shifted away



PLEURAL EFFUSION

Causes

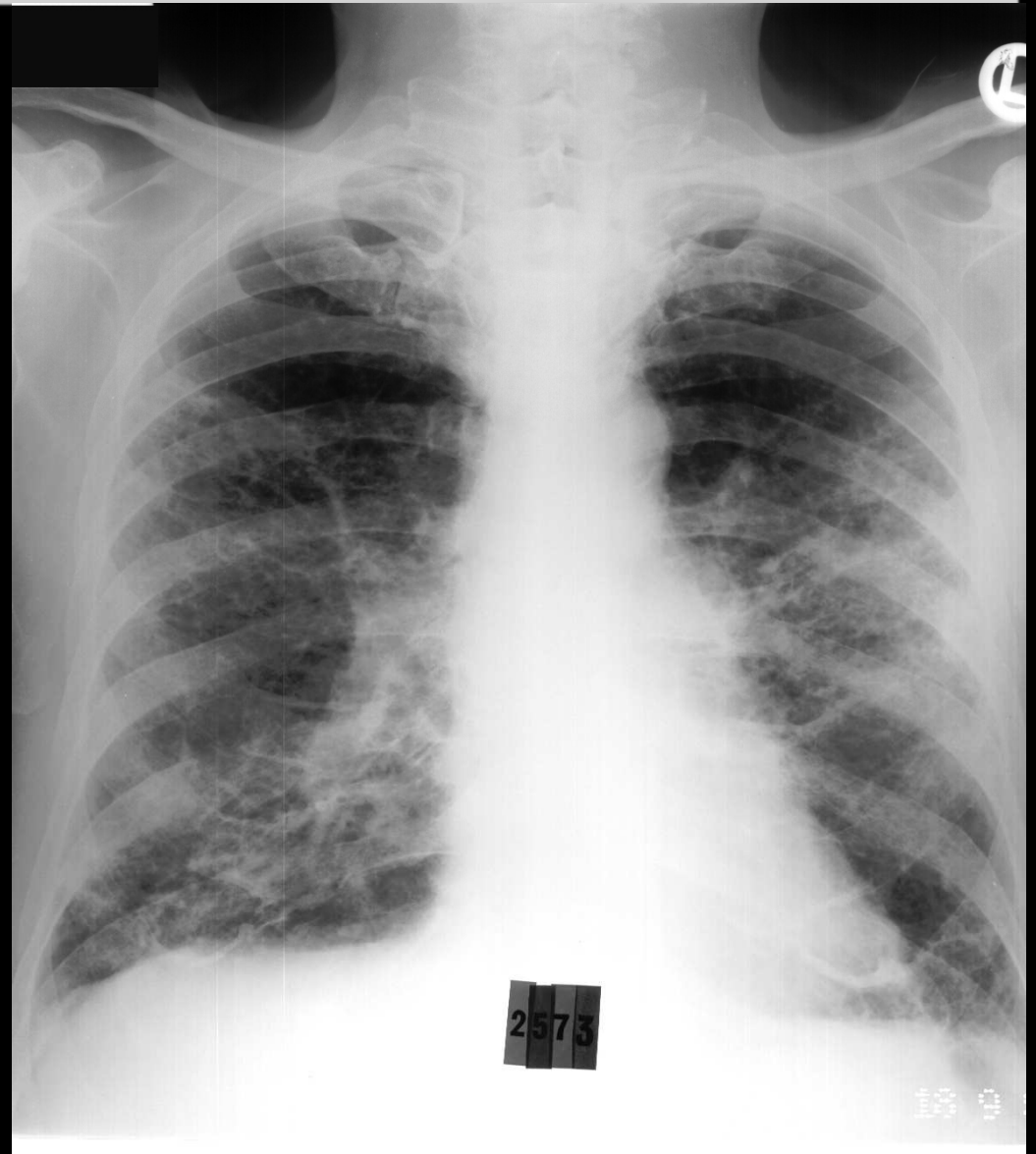
- Transudate
 - Heart failure
 - Liver failure
 - Protein loss e.g. nephrotic
 - malnutrition
- Exudate
 - Pneumonia
 - Malignancy
 - Collagen vascular
 - Surgery



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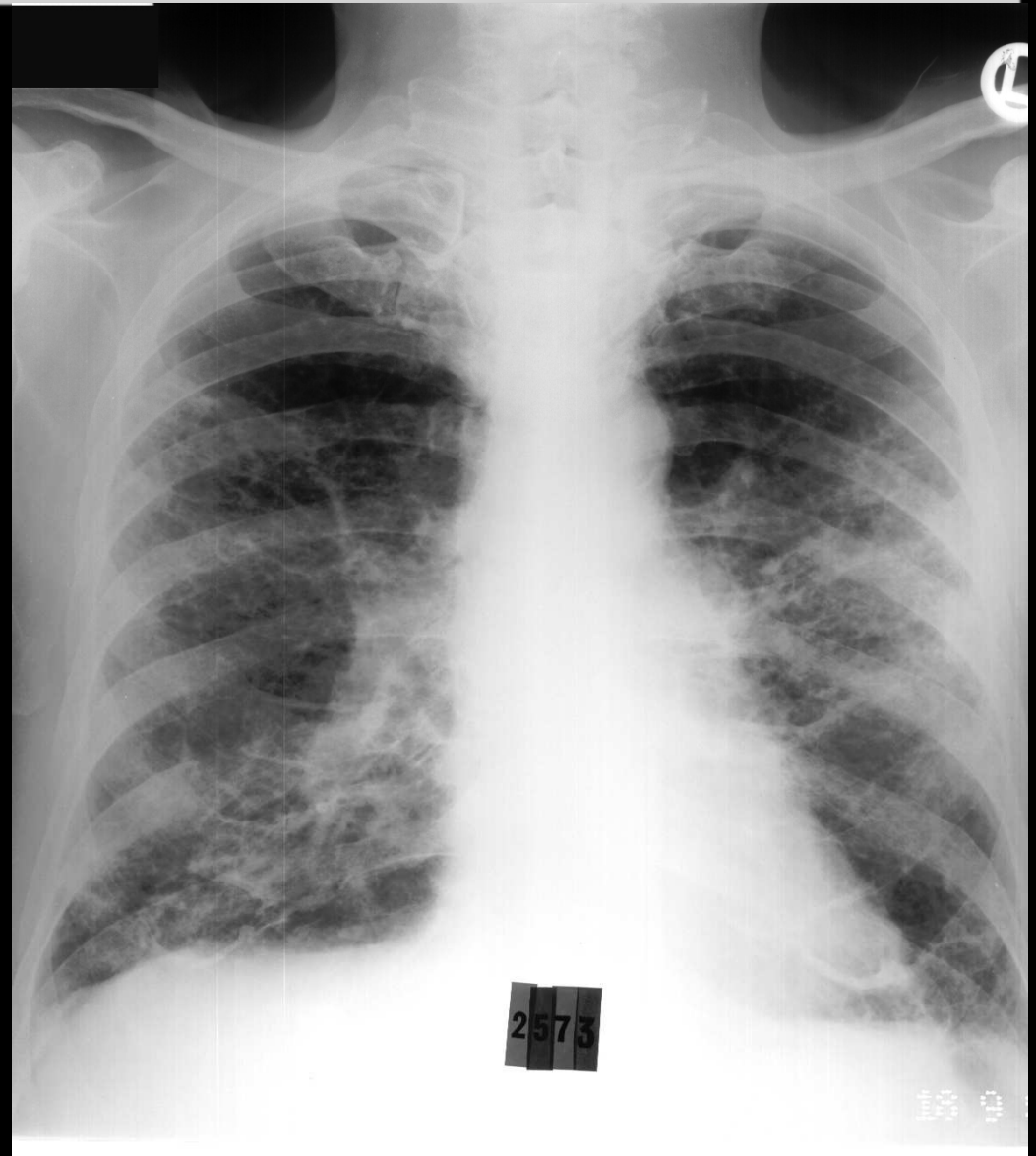
TIP!

AT A LOSS FOR WORDS? DESCRIBE!

COAL WORKERS

Fibrosis

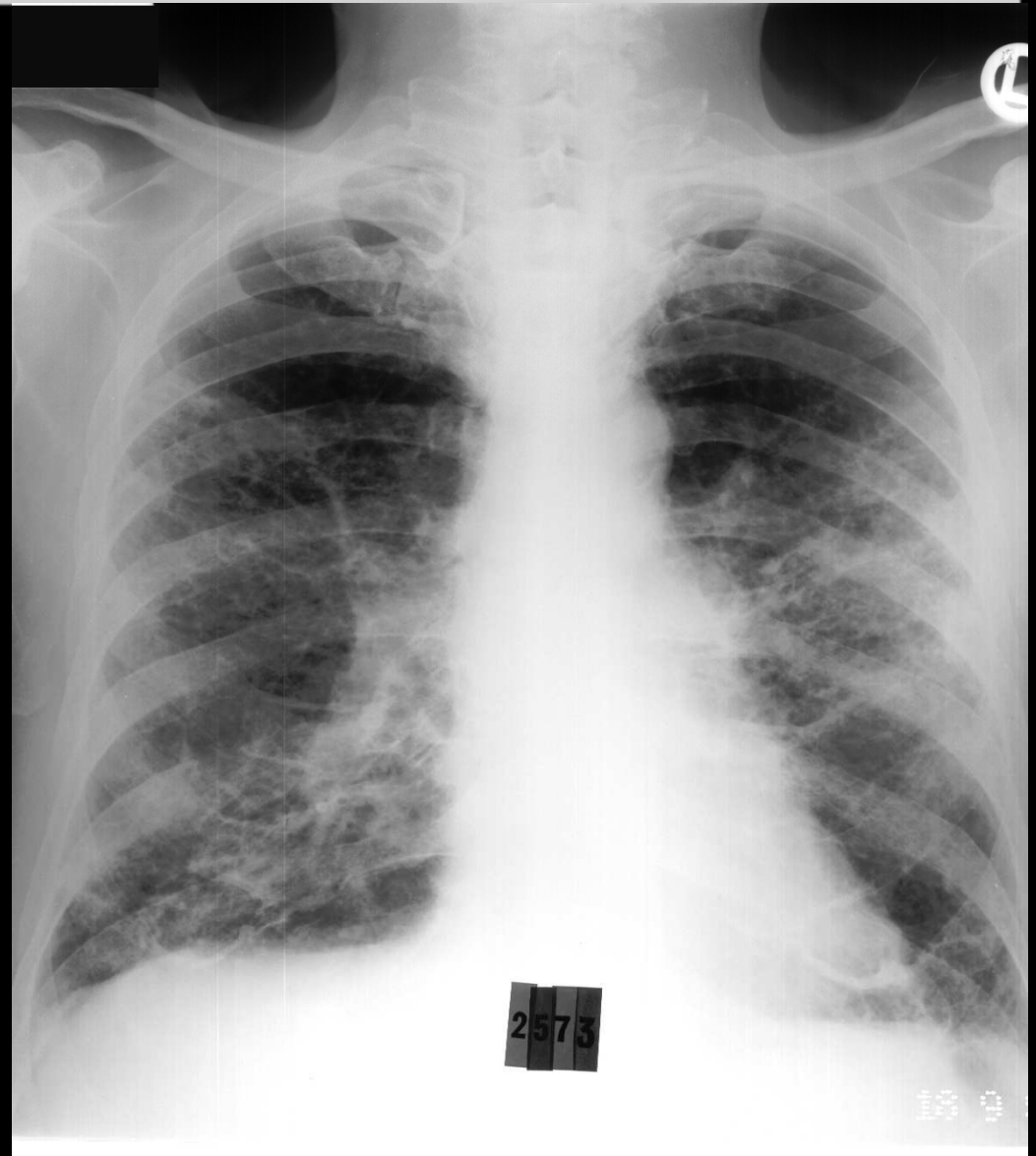
- Volume loss, mediastinal shift
- Distribution localised, apical or basal
- Fine meshwork of linear lines
- Later more coarse and honeycomb like



FIBROSING ALVEOLITIS

Causes

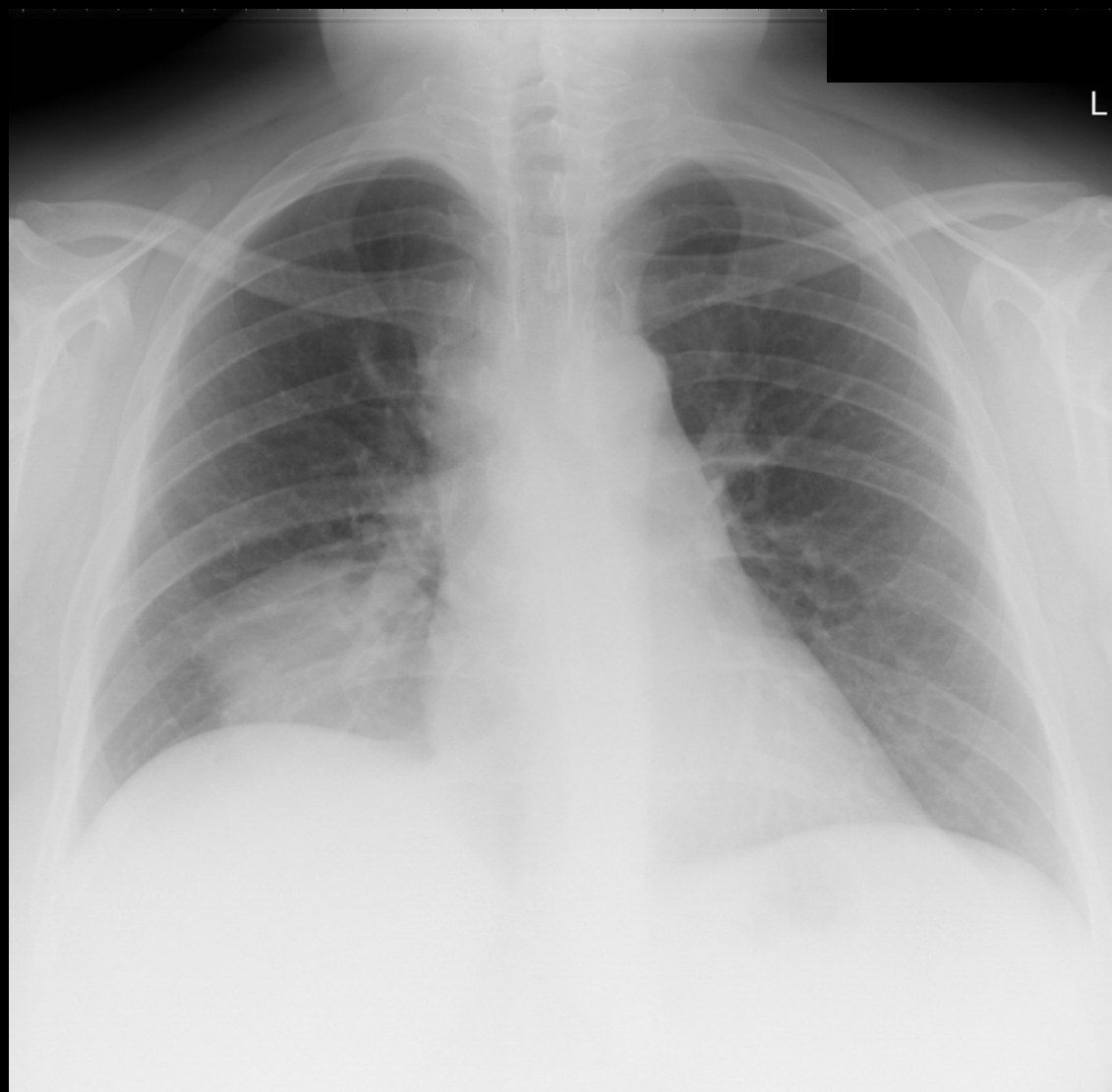
- Fibrosing alveolitis
- External /Occupational
 - e.g. EAA, asbestosis
- Post infective
 - e.g. TB
- Sarcoid
- Drug and radiotherapy



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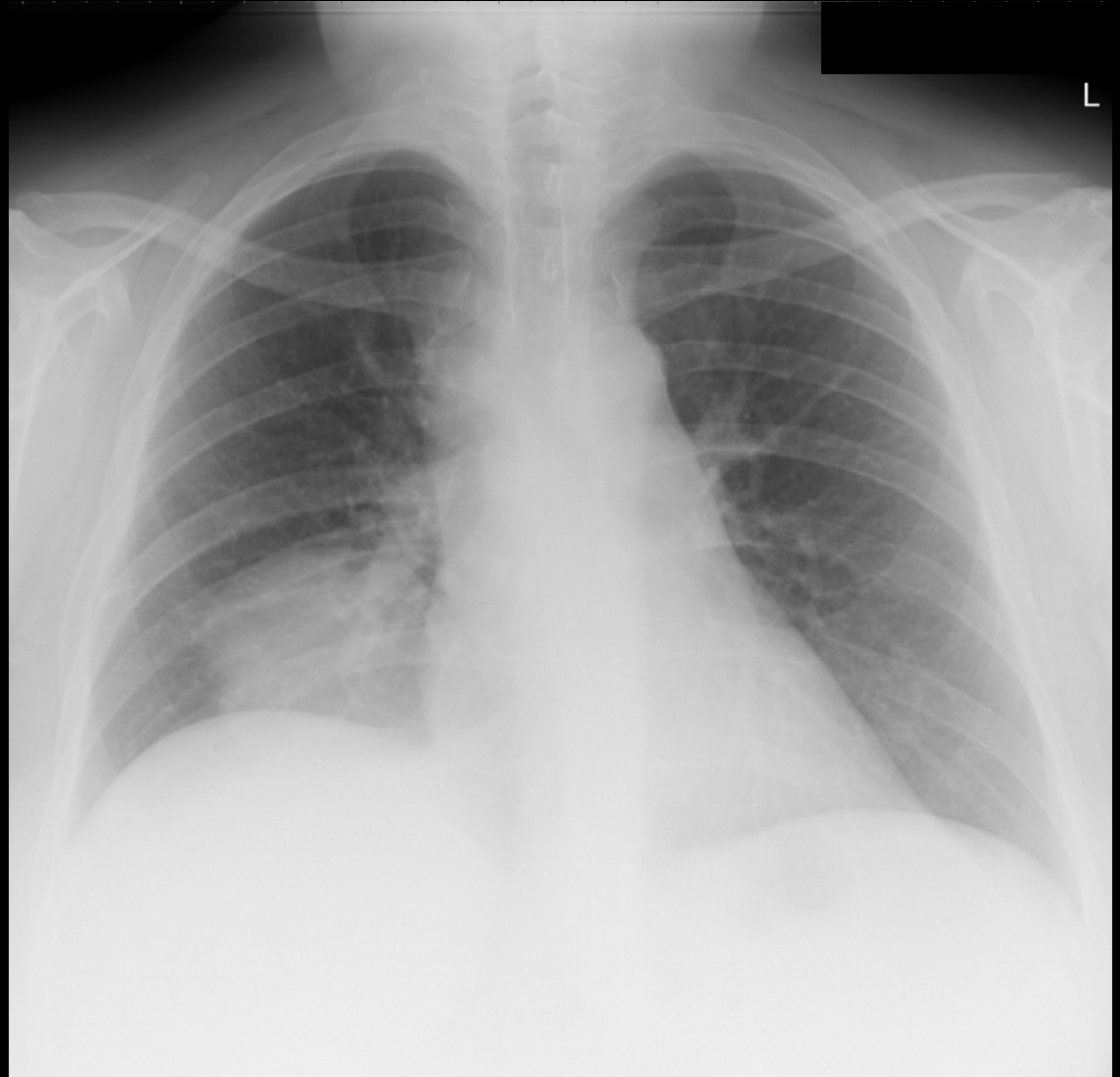
TIP!

THERE'S AN OPACITY!
KEEP CALM AND CARRY ON!

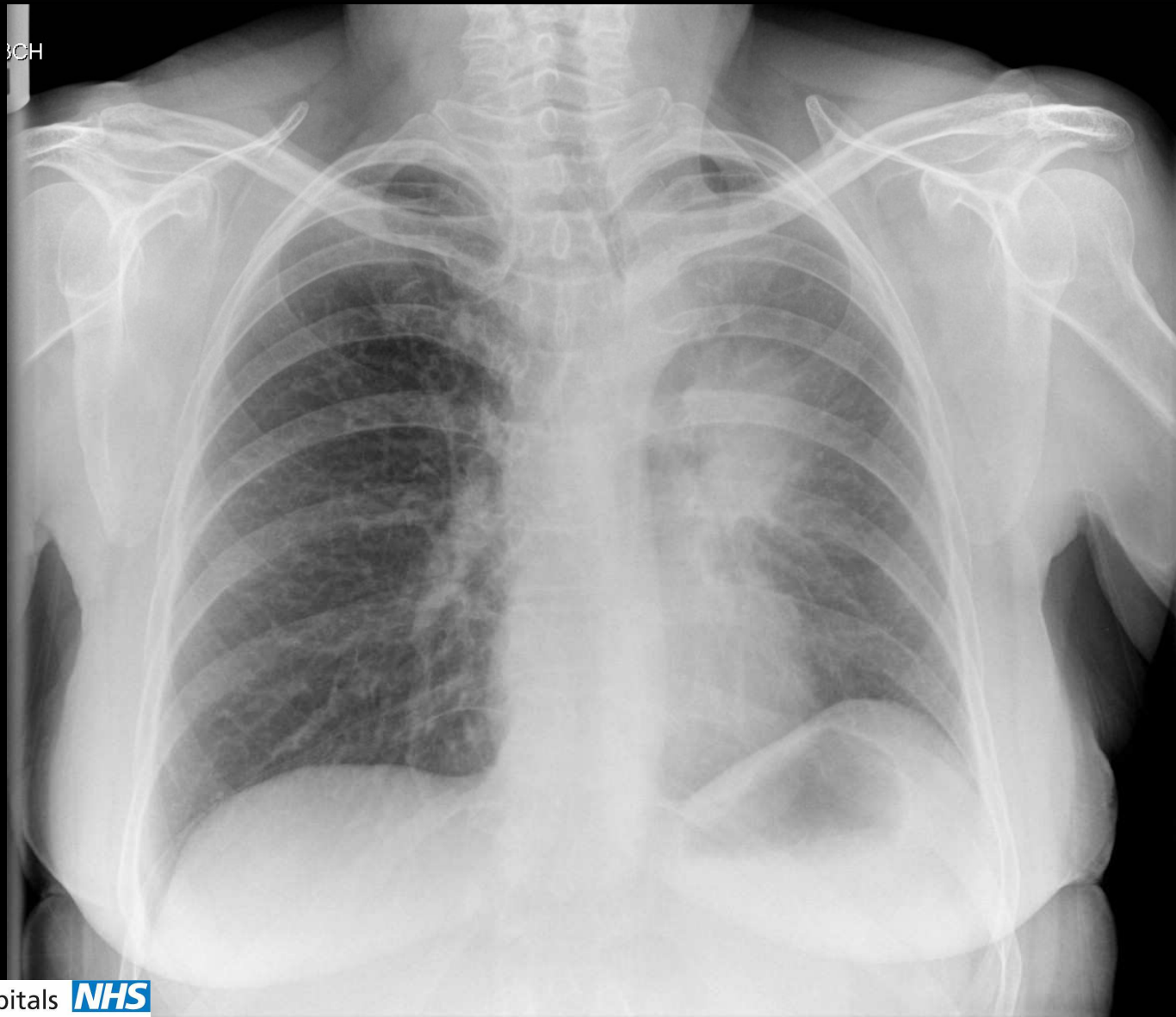
MASS LESION

Mass lesion

- Spiculated edge suggests malignancy
- Calcification suggests benign
- Cavitation benign or malignant
- Air bronchogram suggests infection
- Multiple - ?metastasis



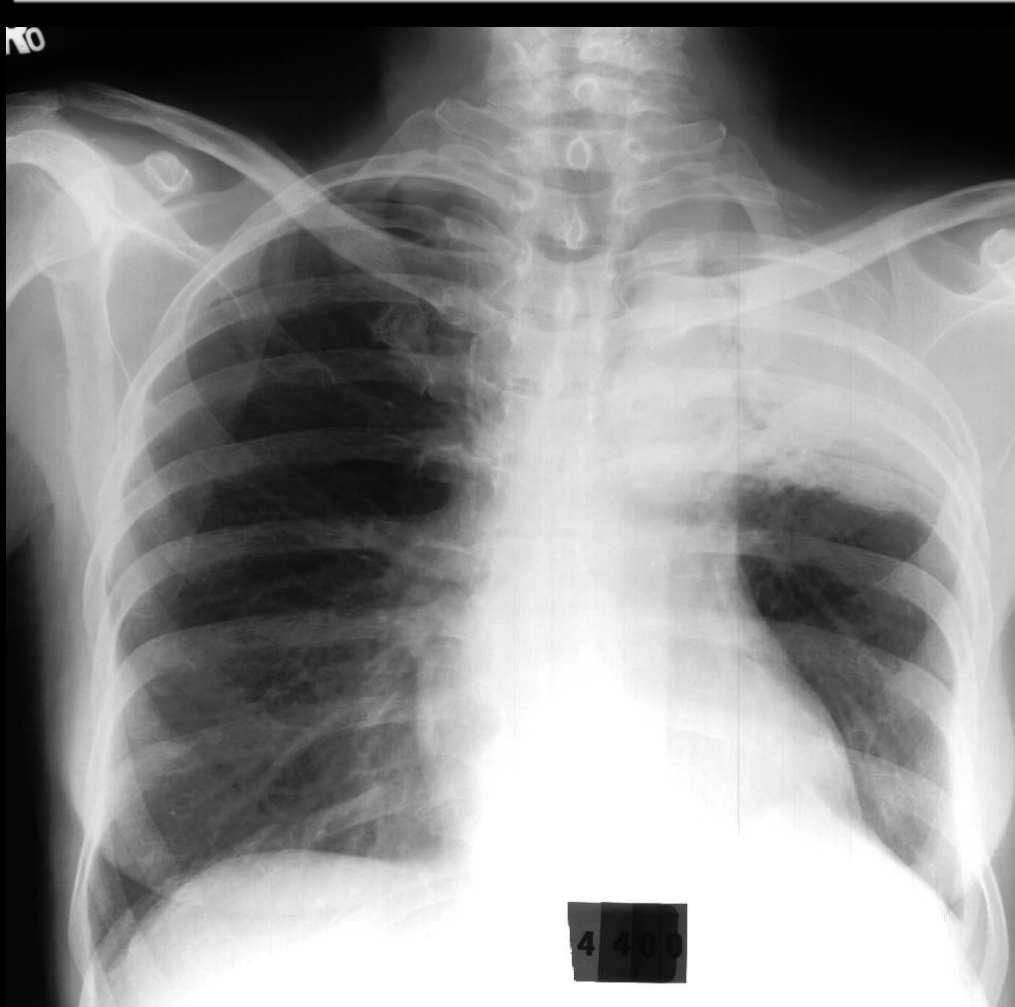
BRONCHIAL CARCINOMA



METASTASES



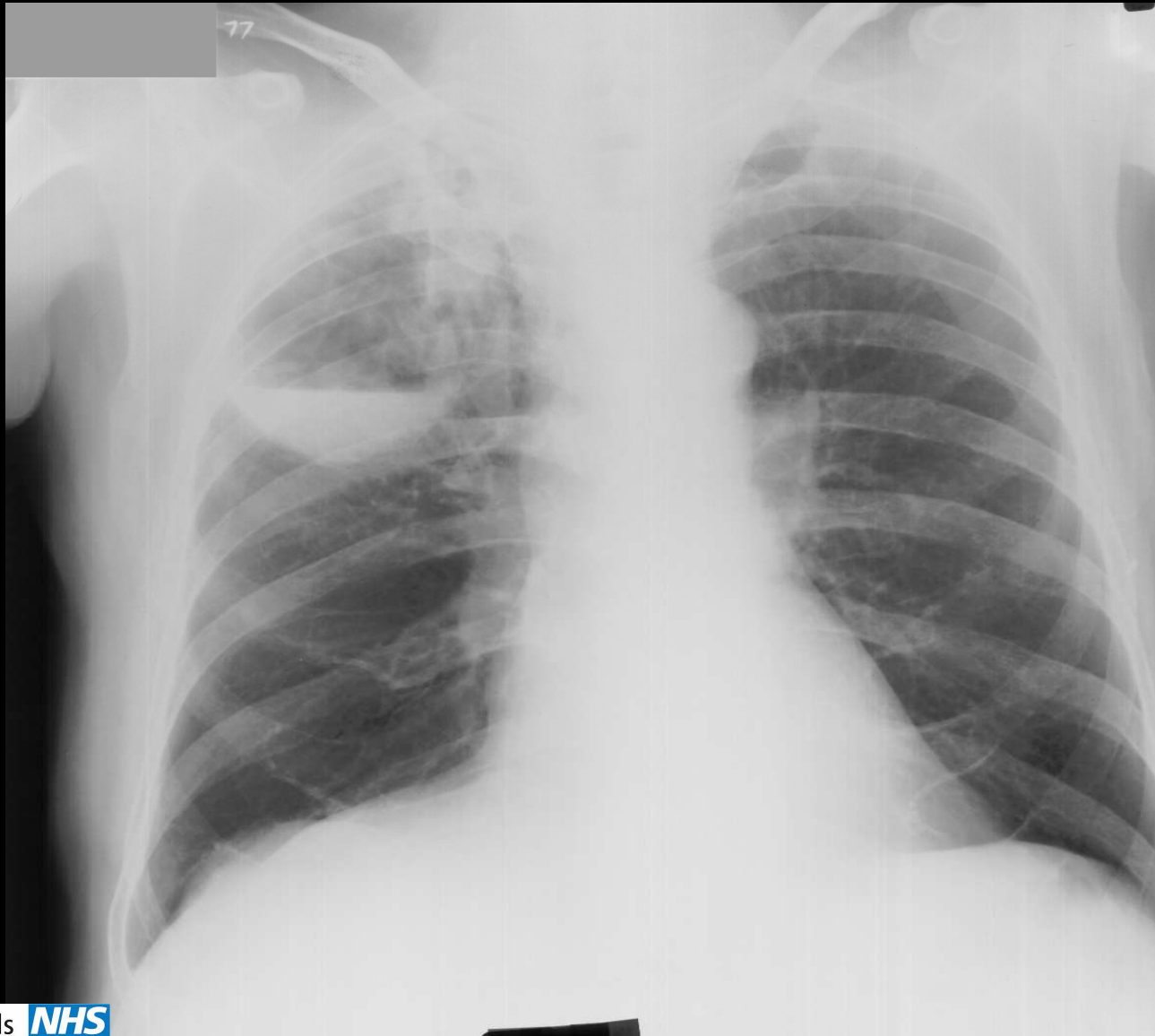
BRONCHIAL CARCINOMA



Causes

- Benign tumour
 - e.g. hamartoma
- Malignant tumour
- Metastasis
- Infection
 - e.g. pneumonia, abscess, TB
- Infarction
- Rheumatoid nodule

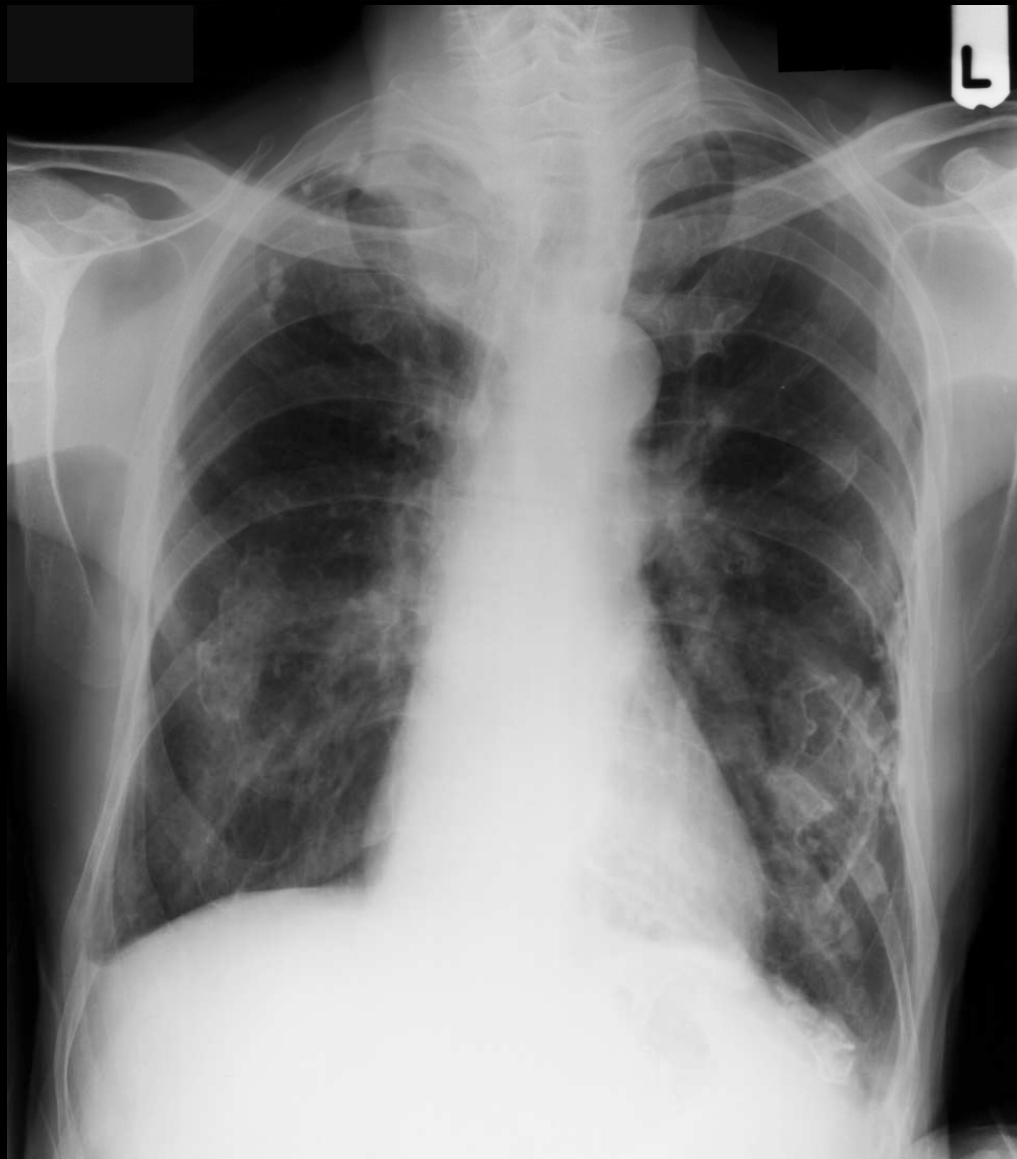
LUNG ABSCESS

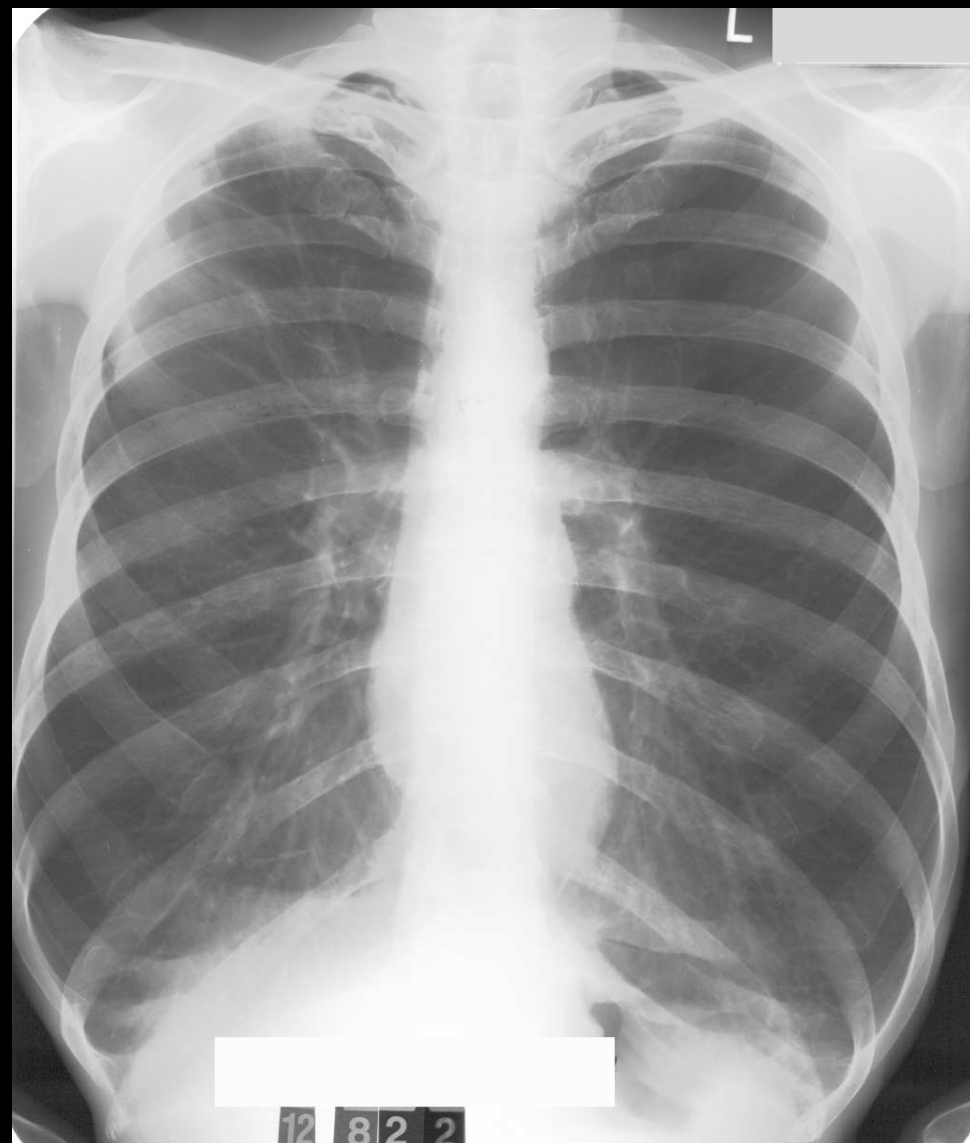
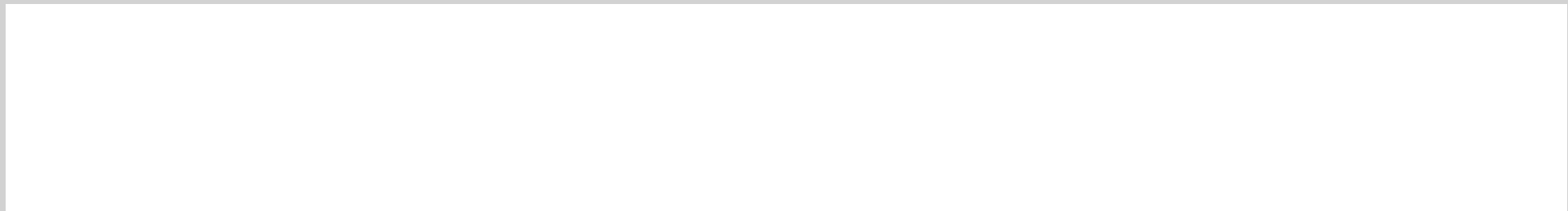


MESOTHELIOMA



PLEURAL PLAQUES





VIEWING ROUTINE

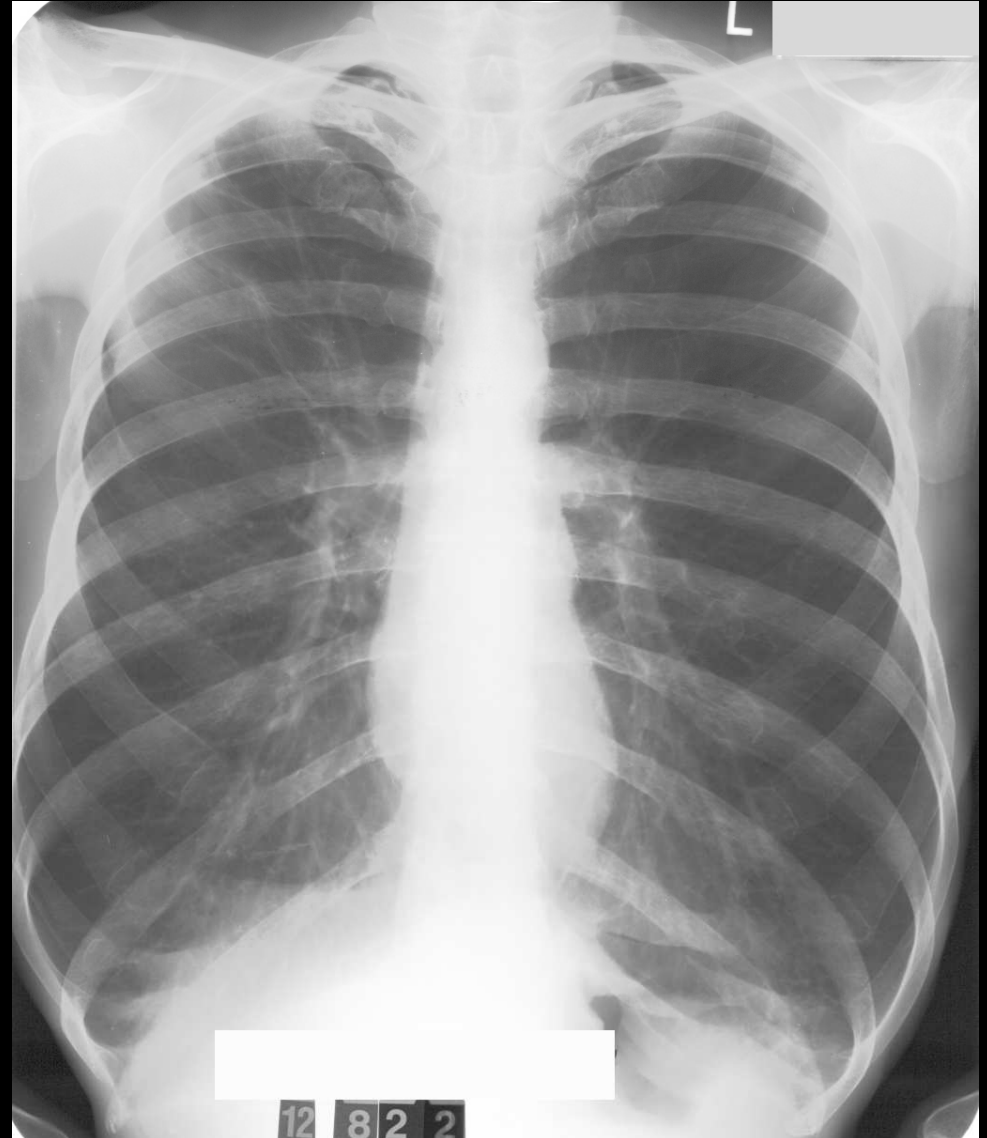


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EMPHYSEMA

COPD

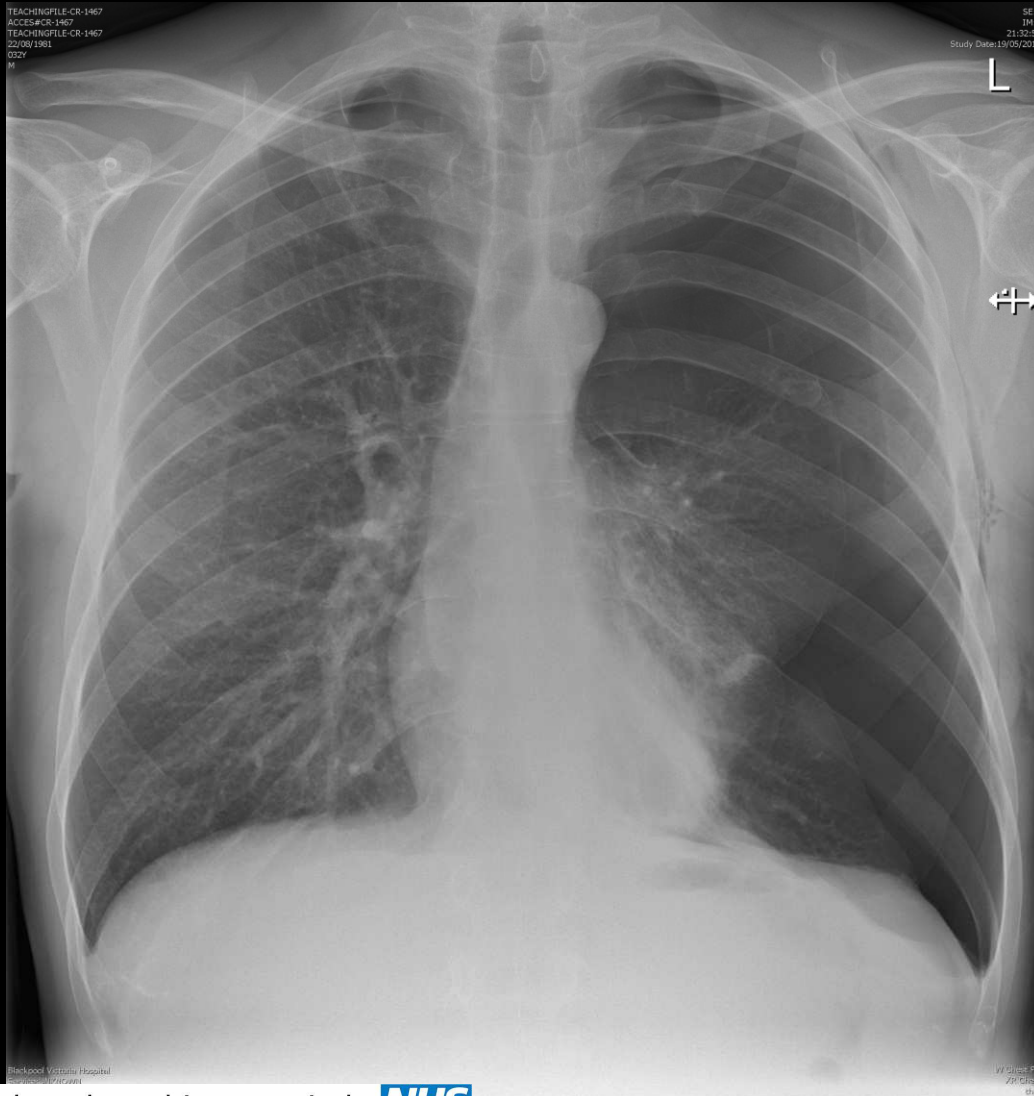
- The Lungs are too black!
- Check film not over penetrated
- Hyperinflation more than 7 ribs
- Flattened diaphragms
- Reduced lung markings
- Bullae



EMPHYSEMA BULLA



PNEUMOTHORAX



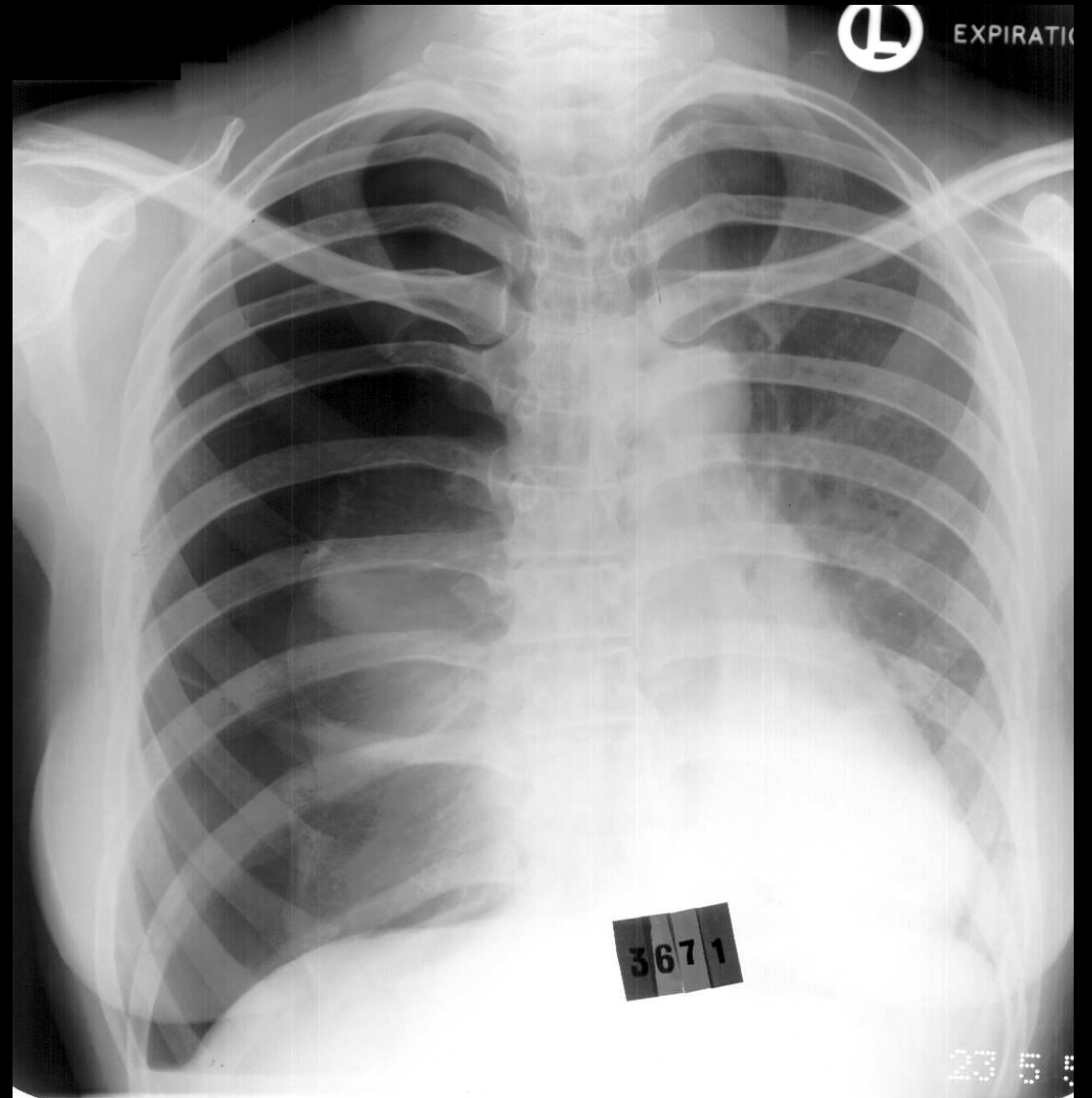
Pneumothorax

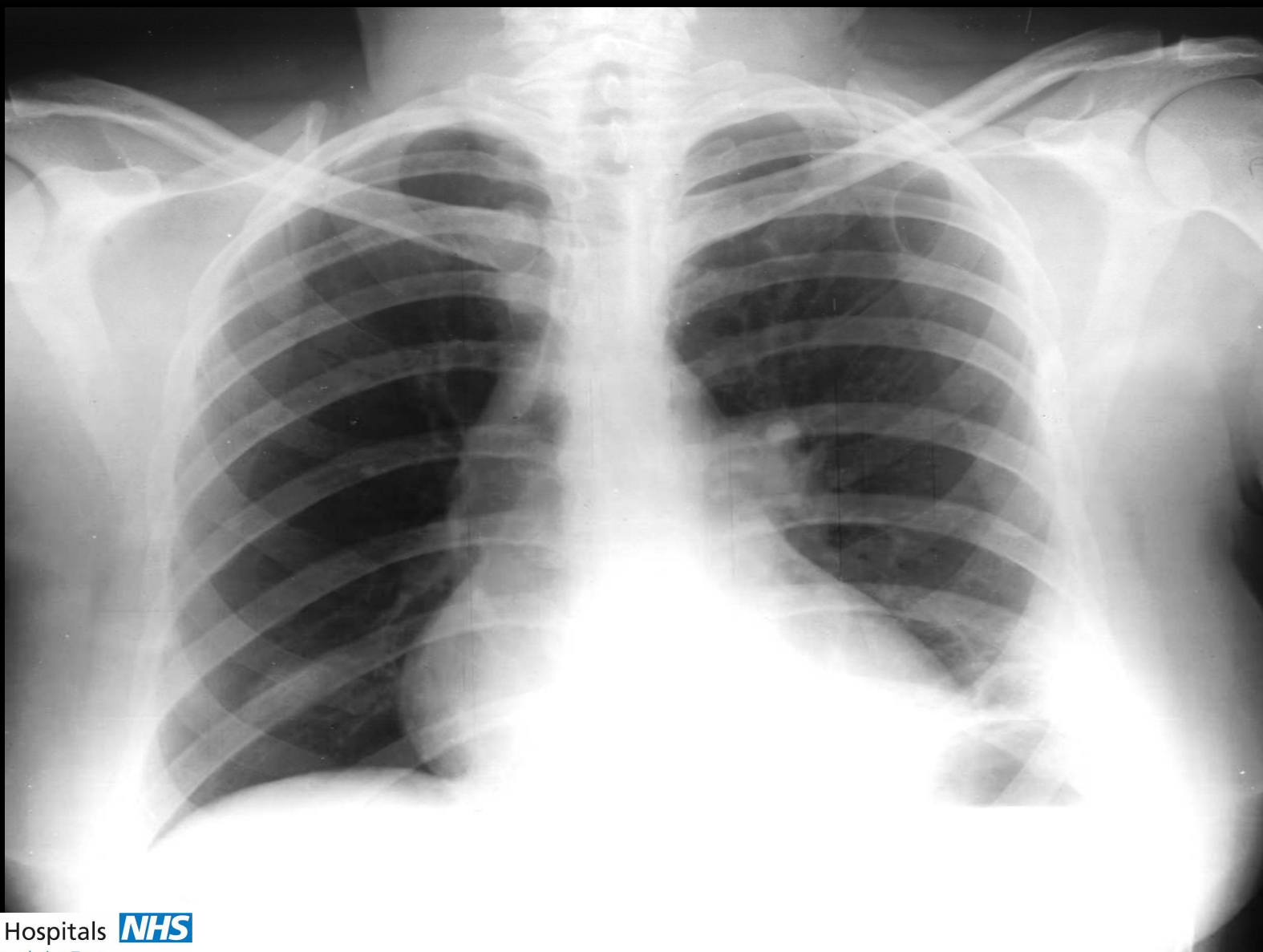
- Unilateral black lung unless bilateral
- Look for lung edge seen first at apex
- Lung markings not seen in pneumothorax but seen through bullae
- Expiratory film increases size of pneumothorax
- Mediastinal shift away indicates possible tension pneumothorax

TENSION PNEUMOTHORAX

Causes

- Spontaneous
- Trauma/iatrogenic
- COPD /Asthma
- Infection
- Connective tissue disorders







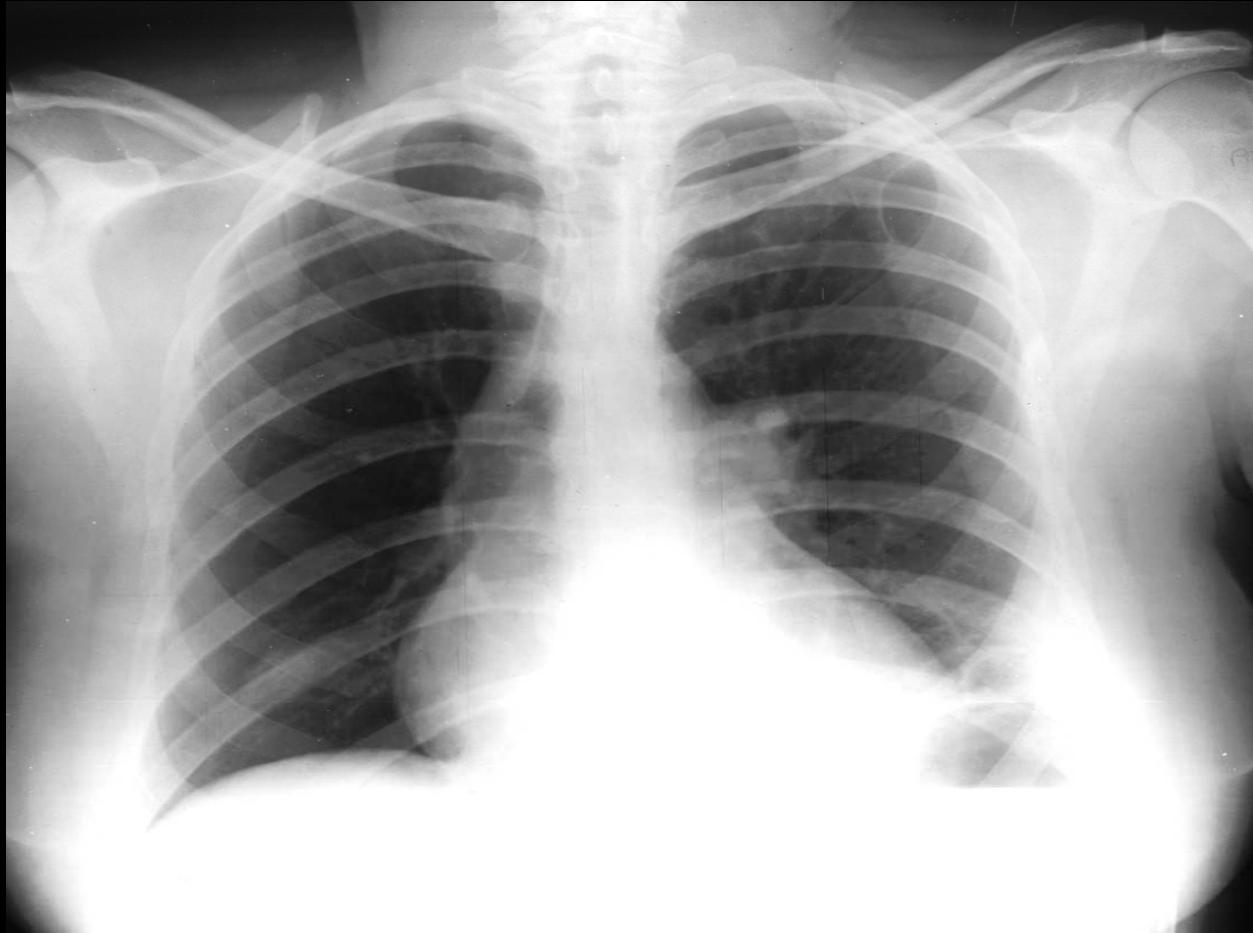
TIP!

I HAVE NO IDEA!
CLINICAL DETAILS MAY HELP!

PE

Pulmonary embolus

- Commonly normal x-ray
- Oligoemia due to vascular occlusion makes lung black
- May also see enlarged heart and pulmonary artery



LYMPHOMA

Enlarged Hilum

- Unilateral or bilateral
- Increased density
- Loss of concavity
- Border smooth or irregular
- Usually lymph nodes or vascular
- Check film for cause



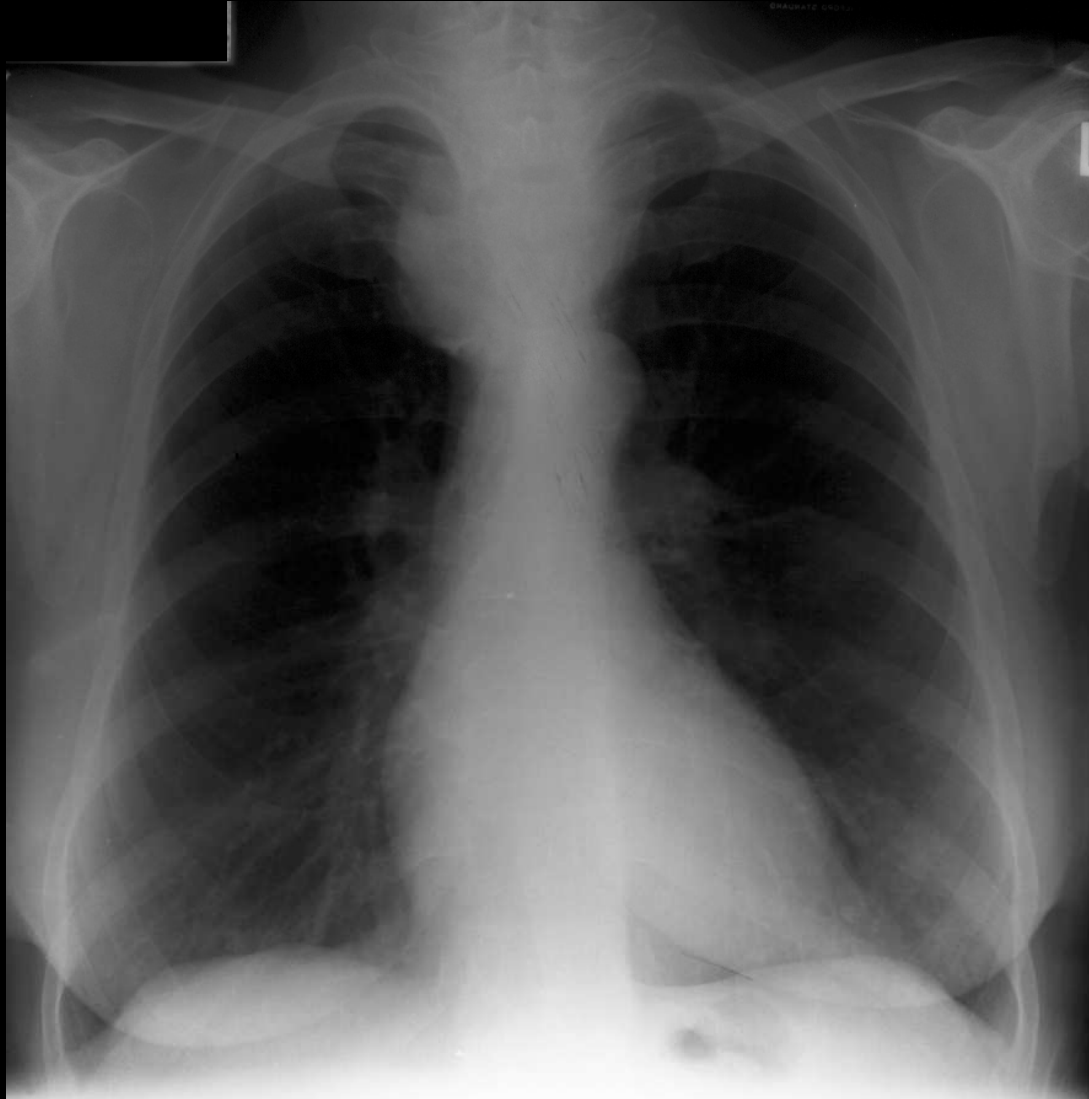
SARCOID



Causes of Enlarged Hilum

- Lymph nodes
- Neoplasm Bronchus, lymphoma
- Infective
 - e.g. TB
- Sarcoidosis
- Vascular
 - Pulmonary artery hypertension
 - Pulmonary artery aneurysm

GOITRE



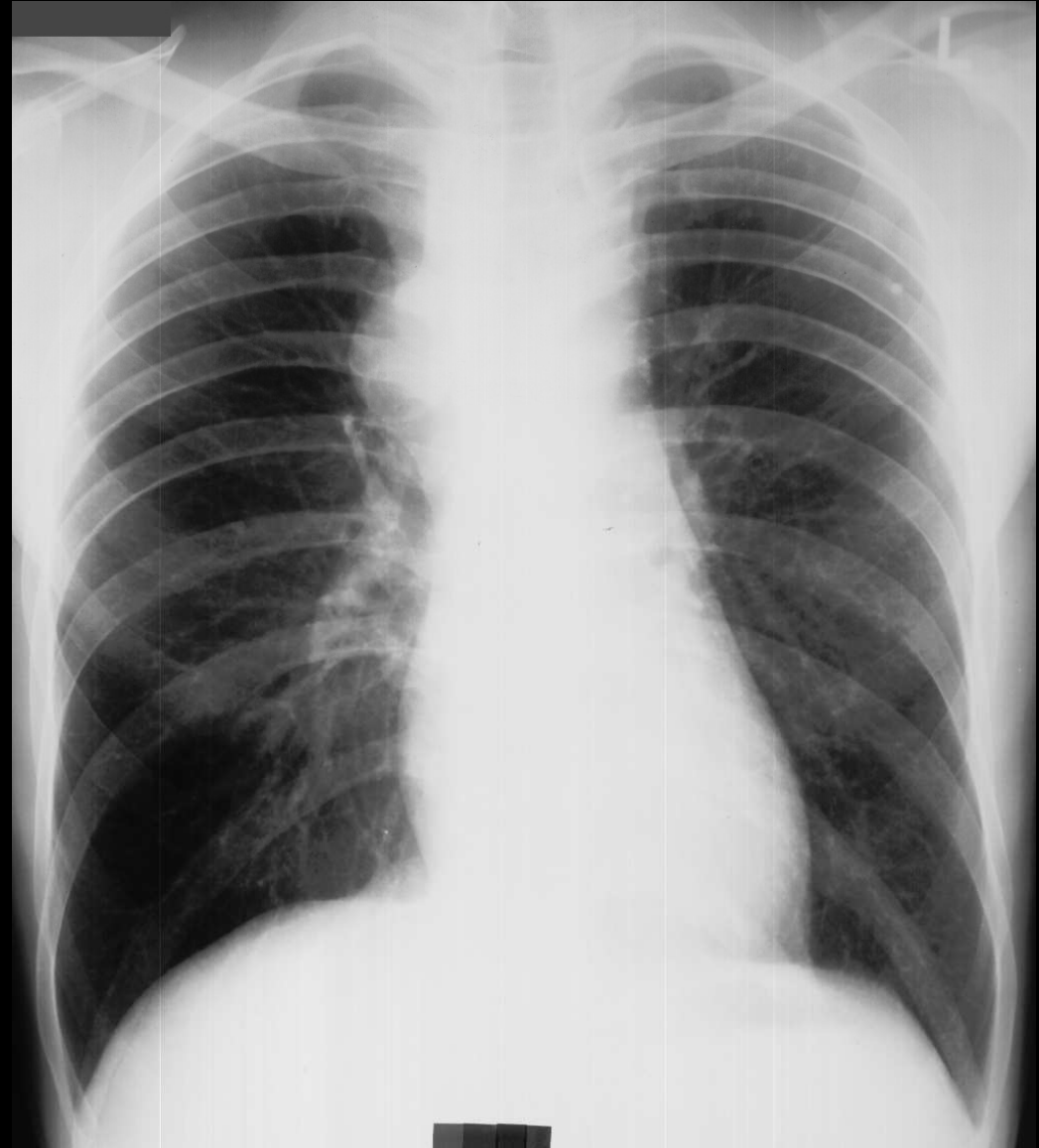
Wide Mediastinum

- Can look wide on AP even if normal
- Top, middle or bottom
- Trachea
- Right paratracheal line
- Aorta

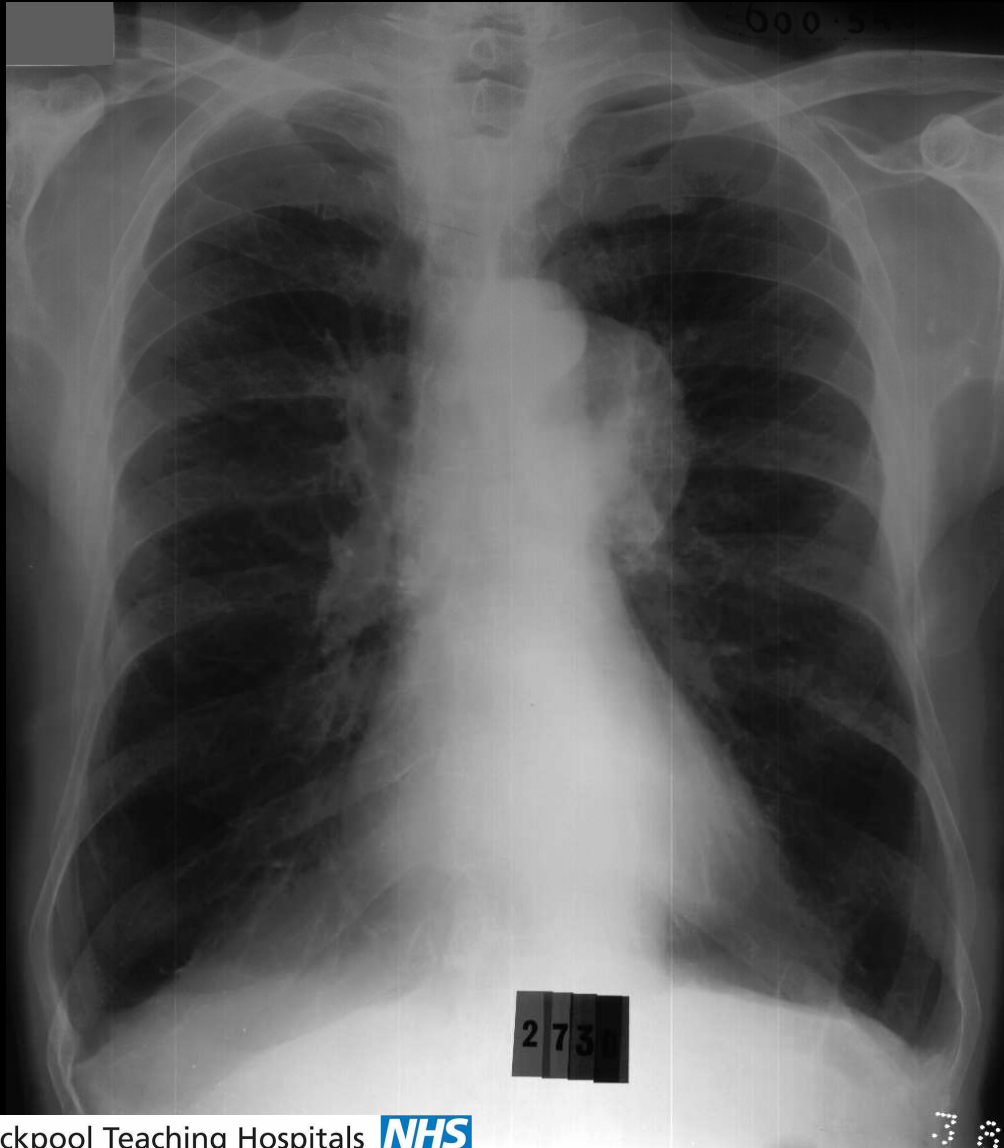
LYMPHOMA

Causes of a Wide Mediastinum

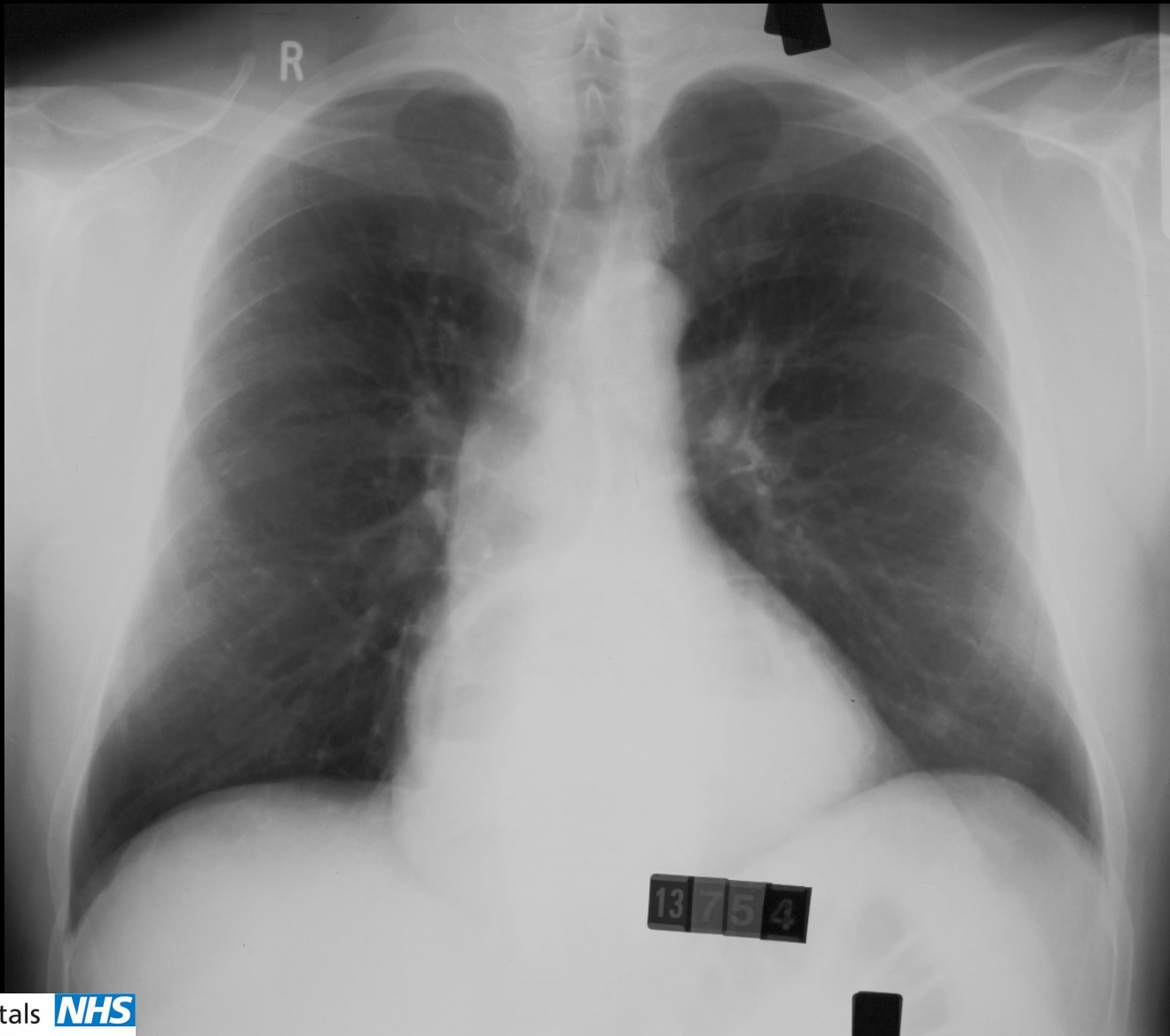
- Top
 - Thyroid
 - Thymus
 - Lymph nodes
- Middle and bottom
 - Lymph nodes
 - Aorta
 - Oesophagus
 - Hiatus hernia



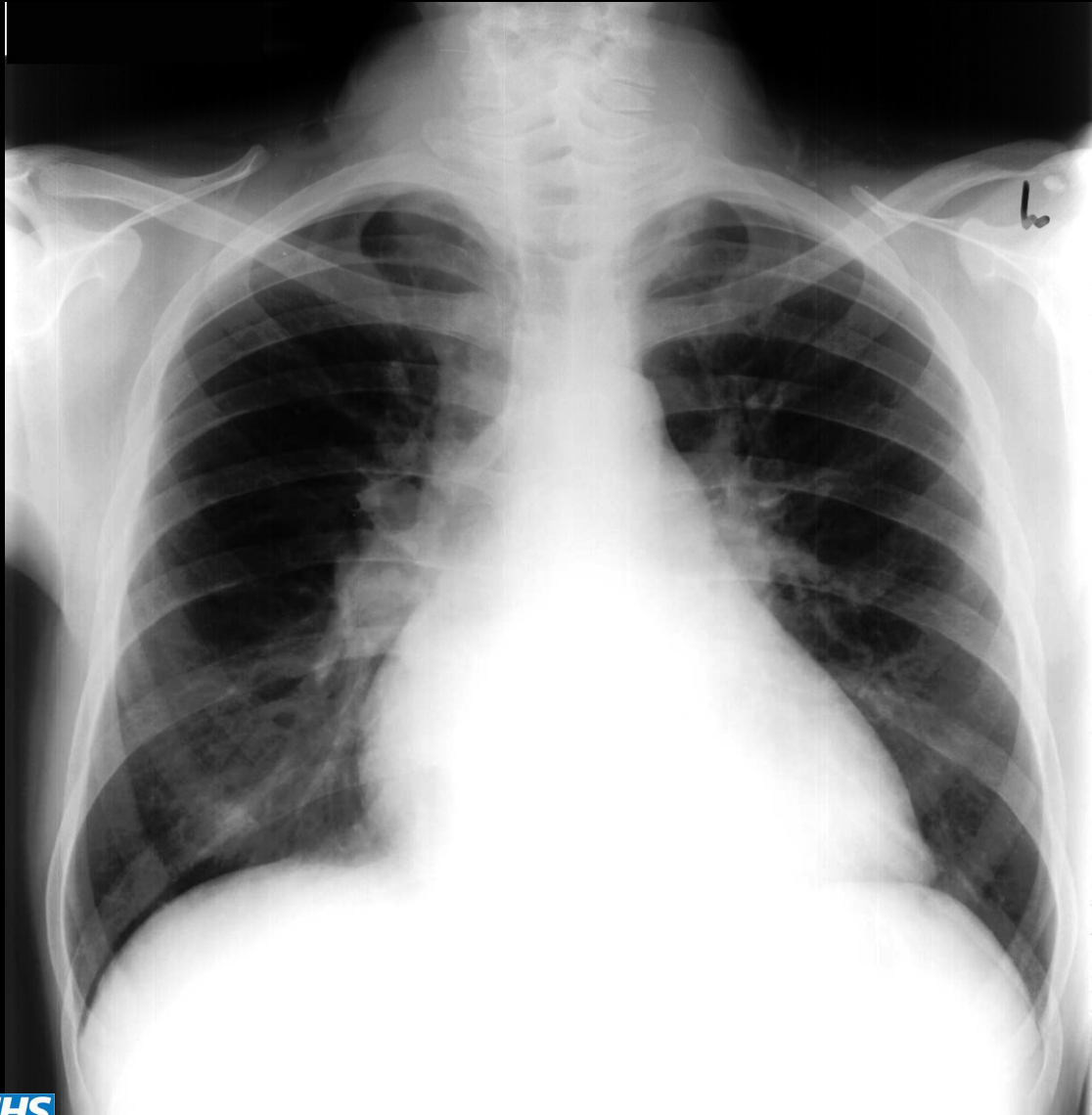
DERMOID



HIATUS HERNIA



CARDIOMEGALY

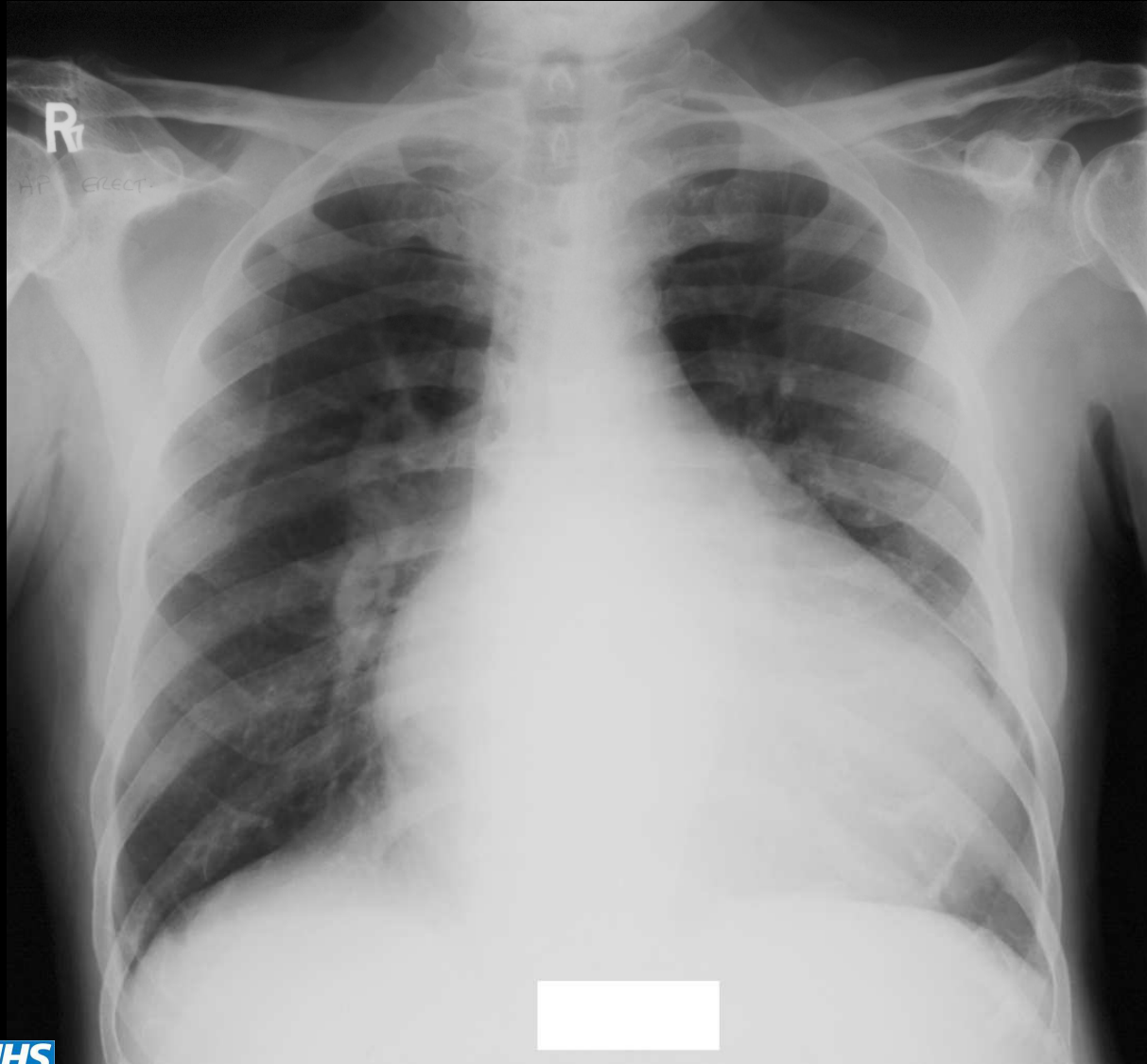




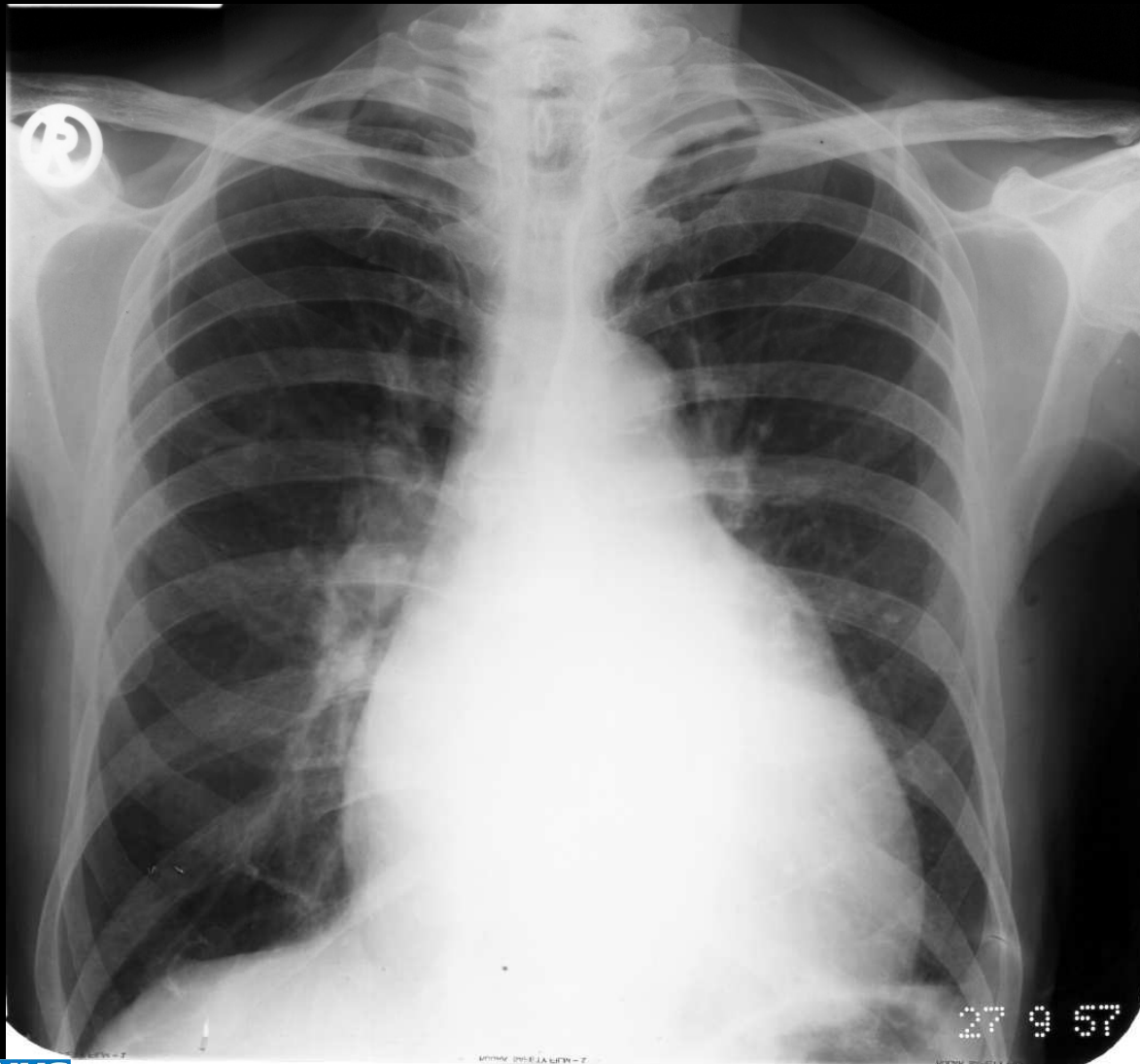
TIP!

THERE ARE MUCH NEWER AND MORE ACCURATE WAYS OF MEASURING CARDIAC SIZE, BUT TAKE A LOOK ANYWAYS!

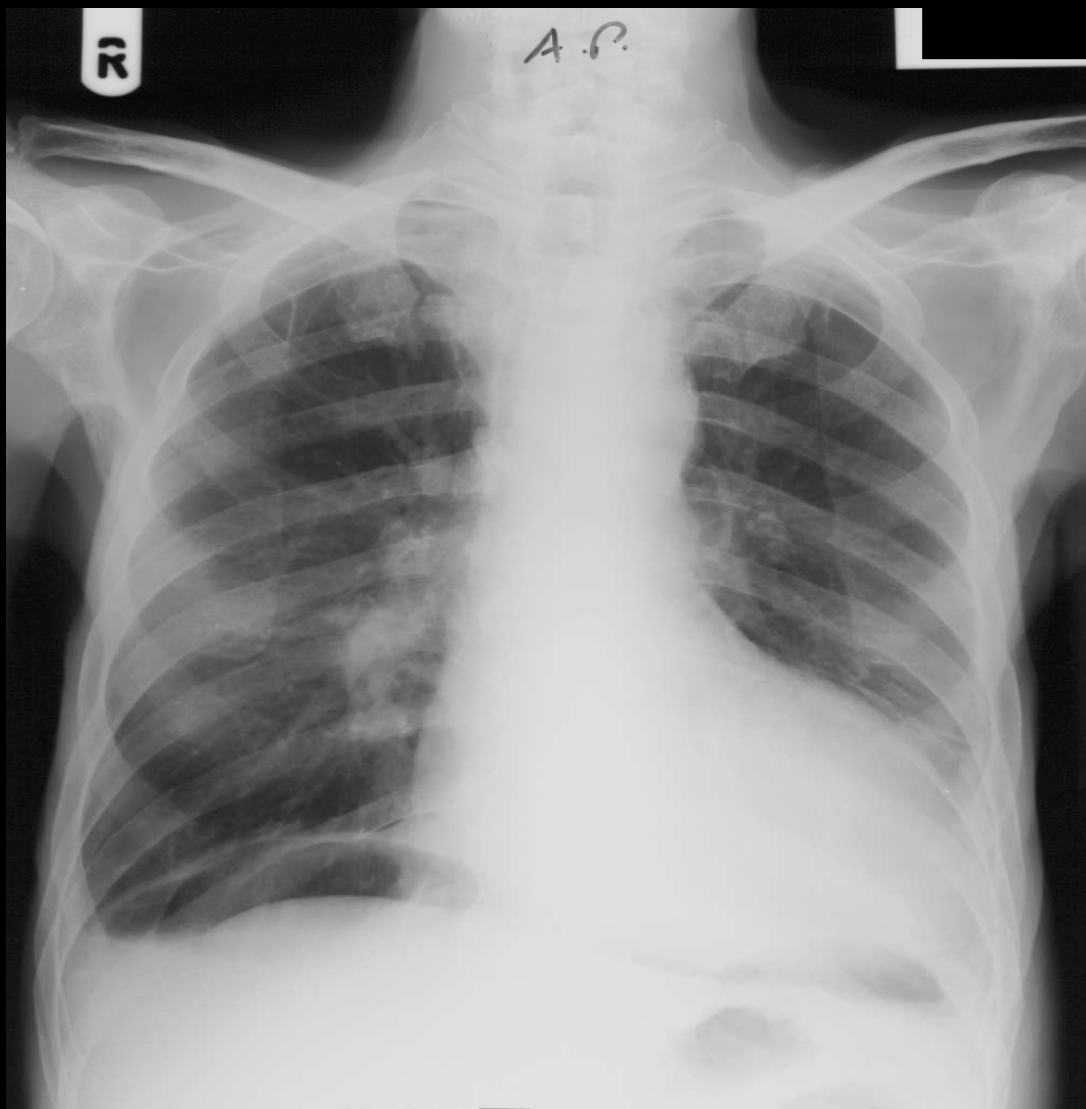
LVF



MITRAL STENOSIS



PERF GU

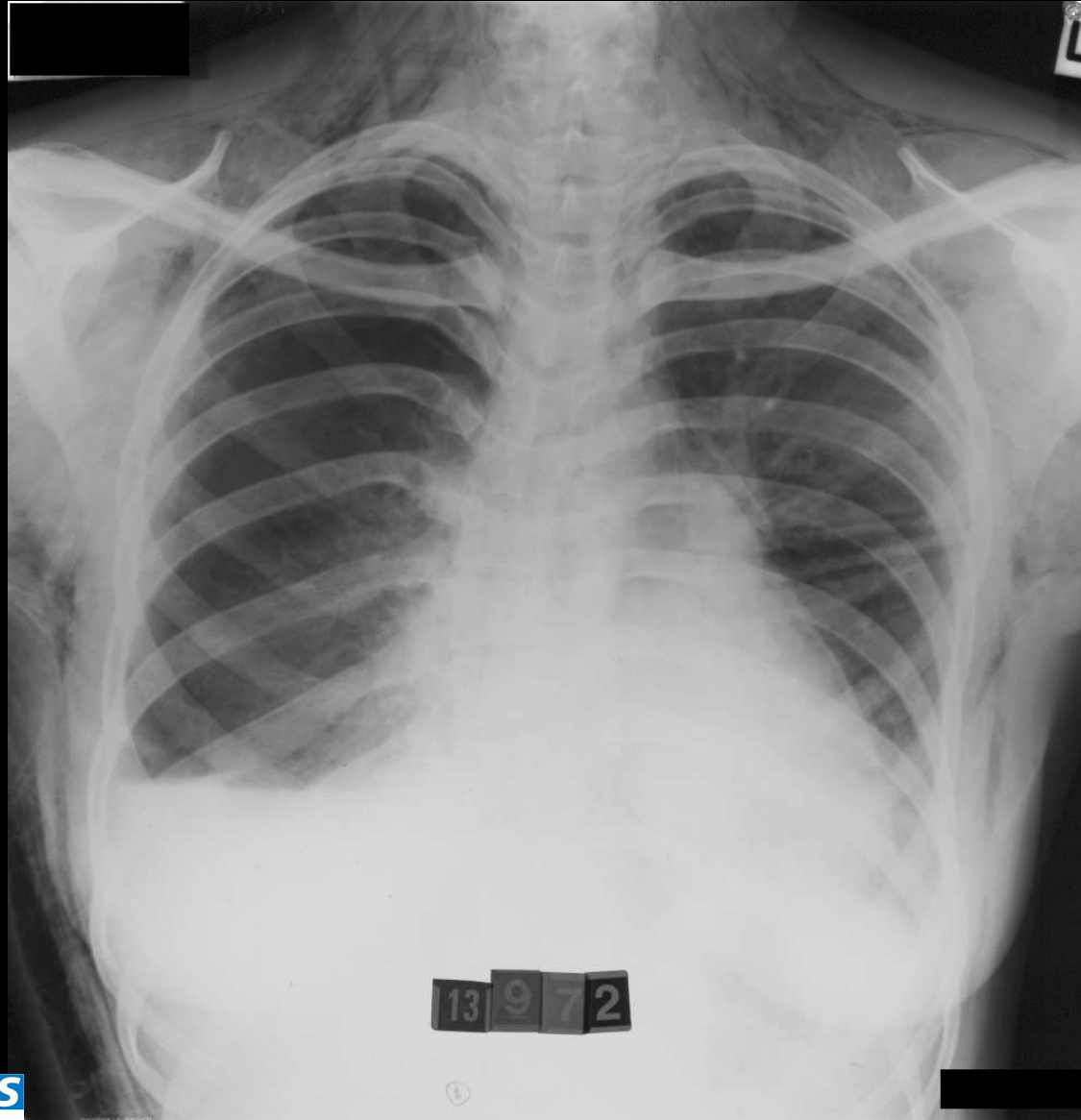


VIEWING ROUTINE



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SURGICAL EMPHYSEMA



TEST: VIEWING ROUTINE

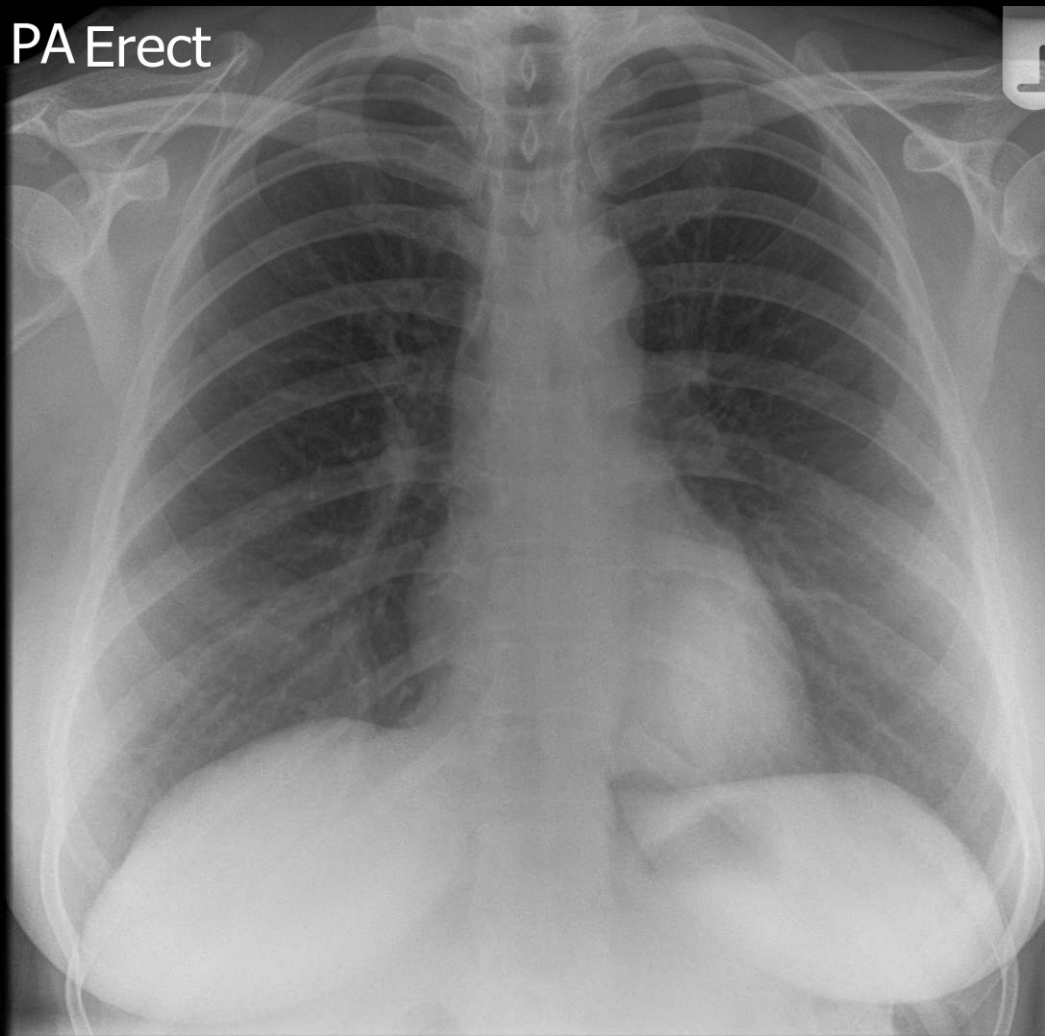


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BILATERAL BREAST IMPLANTS!

TEACHINGFILE-CR-2305
ACCEPTEDCR-2305
TEACHINGFILE-CR-2305
06/12/1970
0437
F

PA Erect



85kvp / 3.2mas



TIP!

LOOK AT THE IMAGES BEFORE YOU CALL THE
RADIOLOGIST!

SMILE, AND ENJOY RADIOLOGY!

It's really not as bad as you think!



Remember: Practice makes perfect!

THANK YOU!

MARTINA PAETZEL, CONSULTANT RADIOLOGIST

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