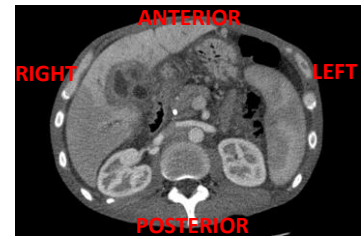


Background

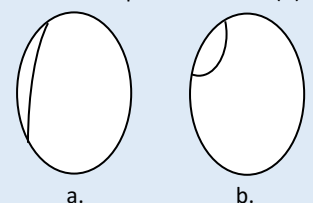
- Orientation: horizontal slices of the patient are shown as if you are looking towards the patients head from the foot of the bed while they are lying supine (i.e. their left is on your right and vice versa)
- Remember free air will rise (appear anteriorly) and free fluid will descend (appear posteriorly) due to the effect of gravity on the supine patient
- Contrast vs non-contrast
 - Types of contrast:
 - Iodine-based IV contrast: used for opacification of vascular structures and solid abdominal and pelvic organs
 - Barium- or iodine-based oral or rectal contrast: used for bowel opacification for abdominal/pelvic CT scans
 - Contrast is **not** required if looking for: head trauma (acute blood is bright), stroke, bone trauma, parenchymal lung disease (HRCT used), kidney stones (radio-opaque)
- CT scans use X-rays and therefore, like a standard radiograph, there are 4 densities:
 - Bone
 - Soft tissue
 - Fat
 - Air
- Abnormal material
 - Hyperdense = bright (e.g. acute haemorrhage, calcification)
 - Hypodense = dark (e.g. oedema, infarction)
- Types of CT chest
 - Spiral CT chest
 - Standard type of CT chest
 - Compresses thick slices (7-10mm) of lungs into images so no lung tissue is missed
 - High-resolution CT (HRCT) chest
 - Thin slices of lungs (1mm) scanned at wide intervals (1cm)
 - This gives a detailed image of the lung parenchyma but can miss lung lesions in between the thin slices
 - Used to look for parenchymal lung disease
 - CT pulmonary angiogram (CTPA)
 - Images taken when contrast reaches the pulmonary artery
 - Used to look for pulmonary emboli (seen as a filling defects)



Common pathology

- Brain
 - Bleeds
 - Subdural: crescent-shaped, spreads diffusely across affected hemisphere (hyperdense if acute, hypodense if chronic)
 - Extradural: lens-shaped, does not cross suture lines (hyperdense)
 - Subarachnoid: hyperdense material in subarachnoid space (can fill sulci, fissures, basal cisterns and ventricles)
 - Stroke
 - Ischaemic: hyperdense clot in vessel, loss of grey-white matter differentiation, cortical hypodensity
 - Haemorrhagic (intracerebral haemorrhage): hyperdense material in brain parenchyma, surrounding hypodense oedema
 - Lesions
 - Glioblastoma: irregular thick margins, hypodense necrotic centre, surrounding oedema
 - Cerebral lymphoma: hyperdense lesion, may be multiple
 - Toxoplasmosis: ring-enhancing lesion
 - Cerebral metastasis: may be hyperdense, isodense or hypodense

Crescent-shaped subdural (a) vs lens-shaped extradural (b)



Look for midline shift and herniation!

- Chest
 - Pulmonary fibrosis: 'honeycombing appearance' due to lots of very small cystic air spaces
 - Bronchiectasis: dilated bronchioles (>1.5x adjacent pulmonary artery branch – normally the same size), lack of tapering, bronchi within 1cm of pleural surface
 - COPD: bronchial wall thickening, alveolar septal destruction, airspace enlargement, bullae
 - PE: filling defect on CTPA (i.e. black area in the enhanced pulmonary artery)



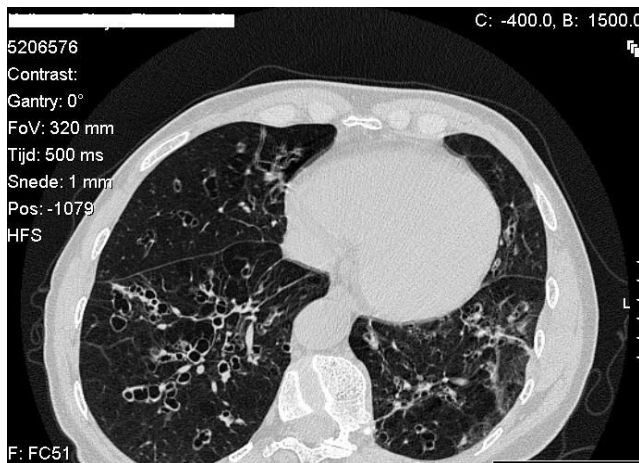
Subarachnoid haemorrhage:
blood in basal cisterns and
fissures



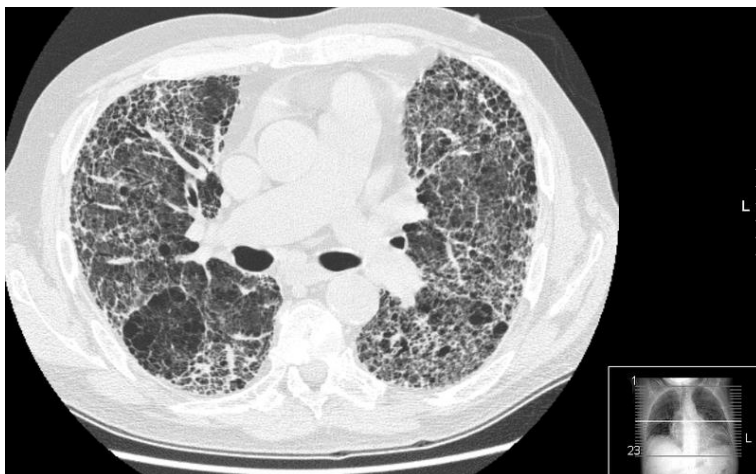
Right MCA infarct:
hyperdense MCA clot with
cortical hypodensity



Haemorrhagic stroke:
hyperdense blood with
surrounding oedema



Bronchiectasis: dilated bronchioles



Pulmonary fibrosis: honeycombing appearance