DR Oral Certifying Exam Sample Cases and Discussion

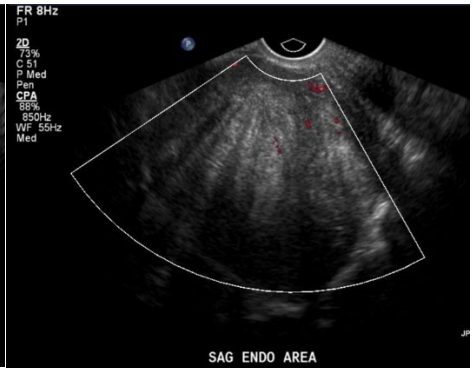
The diagnostic radiology Trustees have created a set of sample cases to give an idea of the types of topics and depth that will be evaluated on the DR Certifying Oral Exam. The sample text describes what a candidate should be able to identify and discuss regarding the images. The focus is on allowing the candidates to demonstrate their skills in observation, synthesis, and management. The exam is still under development, and these are not actual cases that will be used in 2028. The intention is to provide a general idea of the content and format.

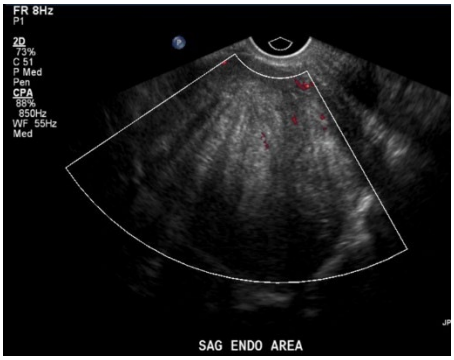
Index of Oral Exam Categories:

ABDOMEN

Diffuse Adenomyosis:

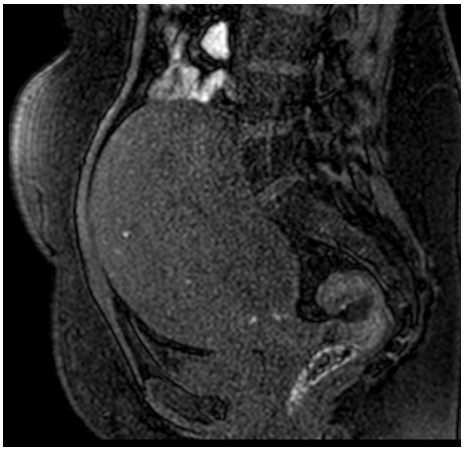
Image Series 1: Transvaginal Ultrasound



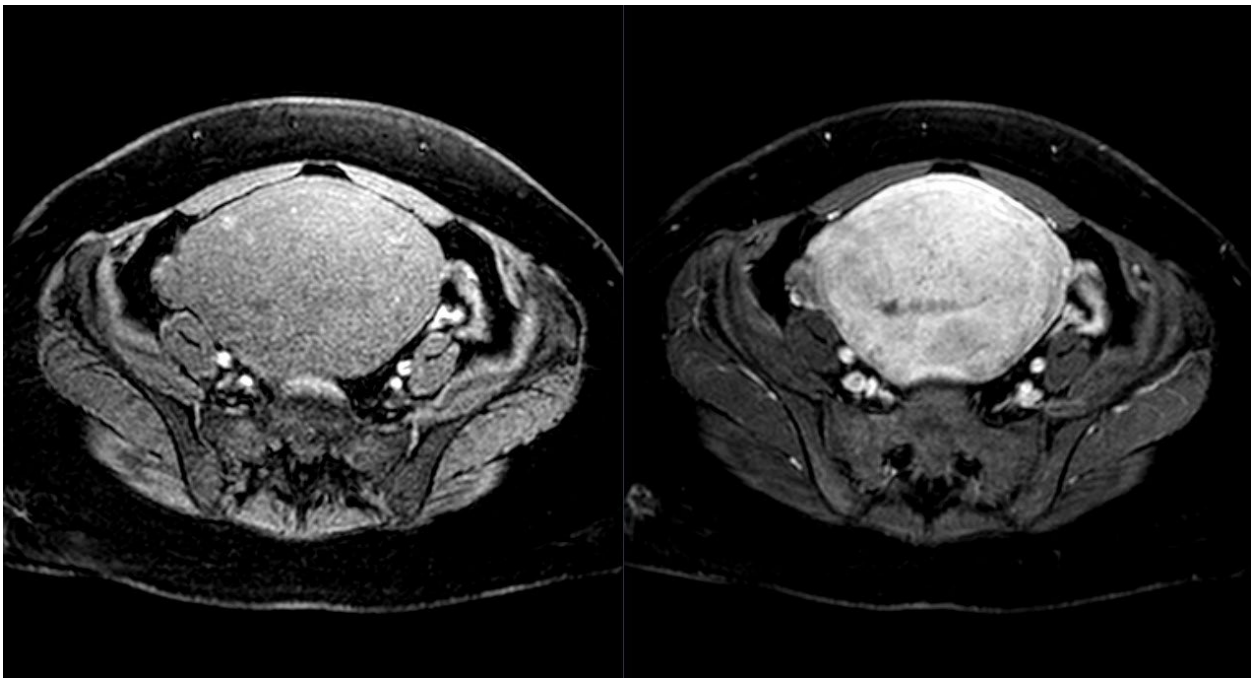


The candidate should identify most or all findings of globular uterine enlargement, myometrial heterogeneity, and linear shadowing obscuring the endometrium. They should also identify pertinent negatives, including the absence of obvious endometrial thickening and focal mass, offer provisional diagnosis, and recommend MRI to further evaluate.

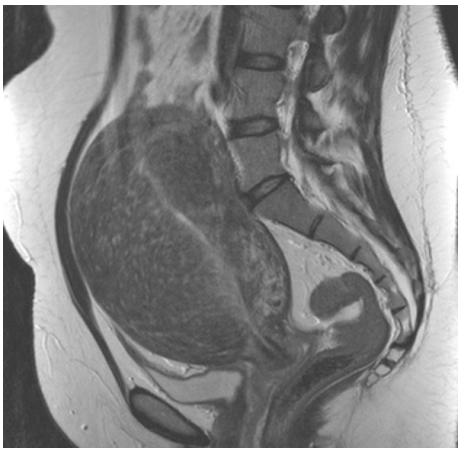
Image Series 2: MRI



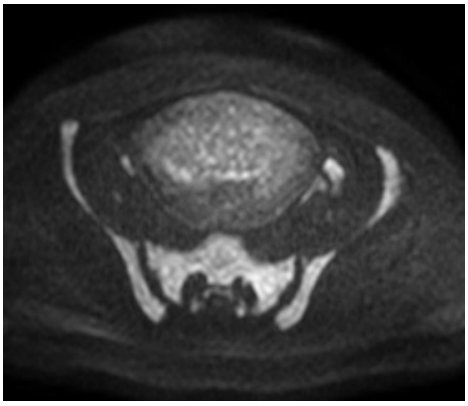
Sag T1WI



Ax T1WI pre and post



Sag T2WI



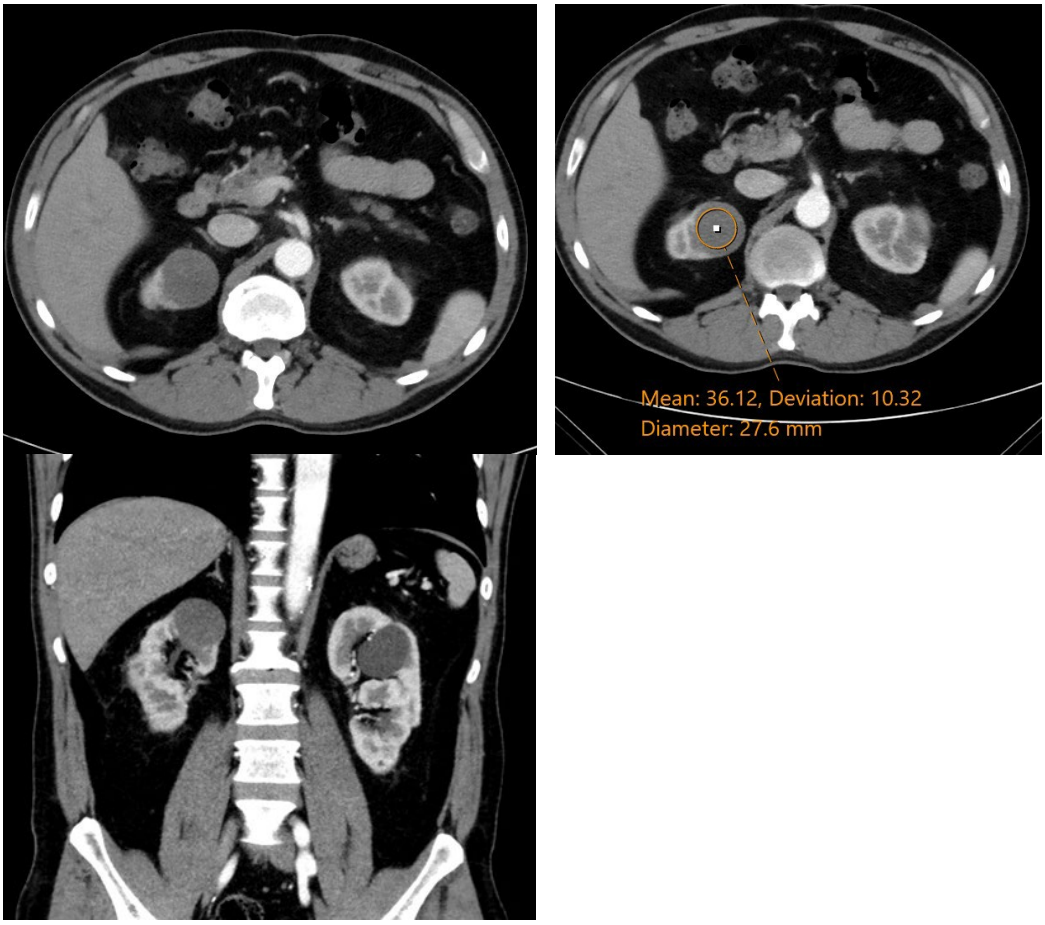
Ax DWI b 1200

The candidate should describe diffuse thickening of the junctional zone and the threshold criteria for diagnosis. They may identify tiny endometriotic inclusions (with hyperintense signal on precontrast T1WI) within the myometrium and note the absence of significant restricted diffusion. They should correctly exclude malignancy and confirm benign adenomyosis.

Overall: *The candidate should make the correct diagnosis and distinguish it from other uterine pathologies — such as leiomyomas and endometrial and cervical masses — and demonstrate awareness of management significance*.

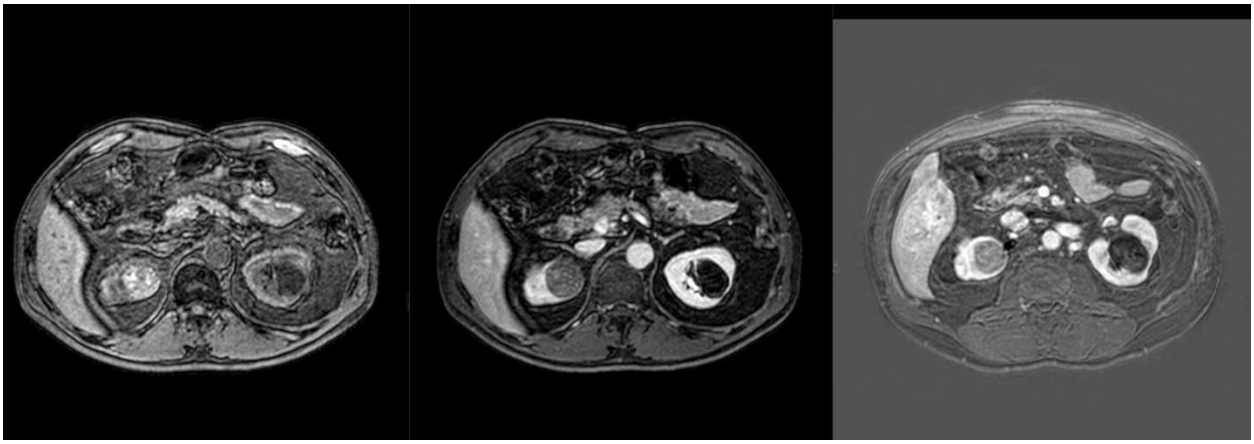
Papillary RCC:

Image Series 1: CT

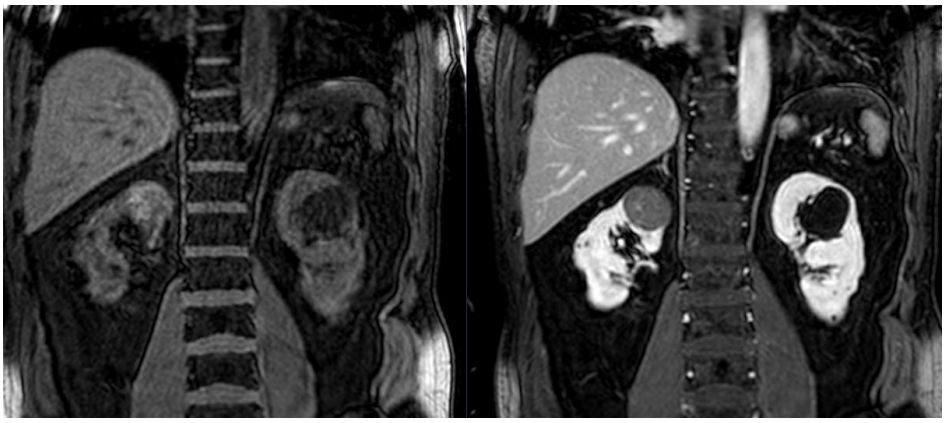


The candidate should describe the low-density right upper pole renal lesion and request ROI to assess internal attenuation. They should recognize that the value of 36 HU is higher than simple fluid and note limitation due to the lack of precontrast acquisition to assess enhancement. The candidate should give a differential diagnosis of a cyst containing hemorrhagic or proteinaceous fluid vs. a hypoenhancing renal mass. They should suggest surveillance or imaging characterization with MRI.

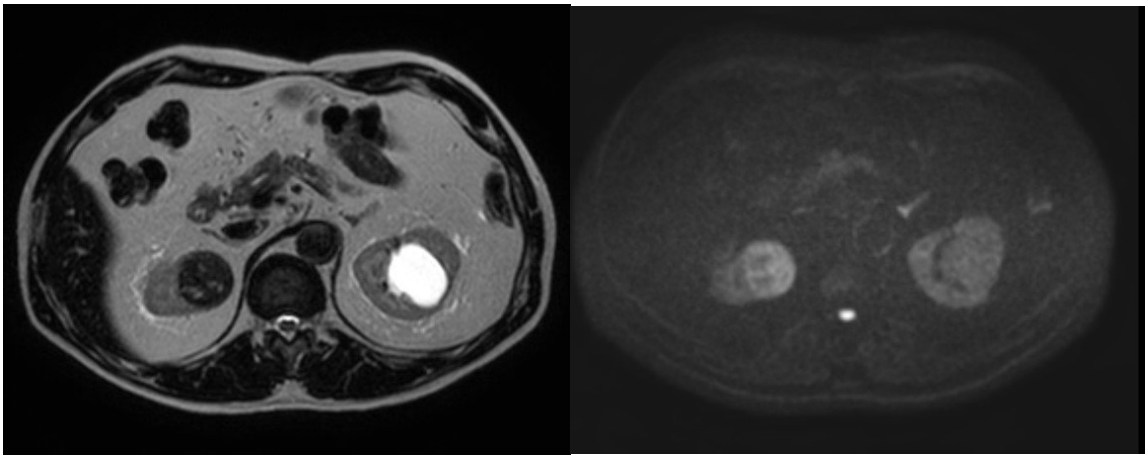
Image Series 2: MRI



Ax T1WI pre-post-subtraction



Cor T1WI pre and post



Ax T2WI **Ax DWI b 800**

The candidate should correctly describe morphologic and signal intensity characteristics: well marginated; hypointense on T2WI, hyperintense on precontrast T1WI due to blood products; low level enhancement (in contrast to the

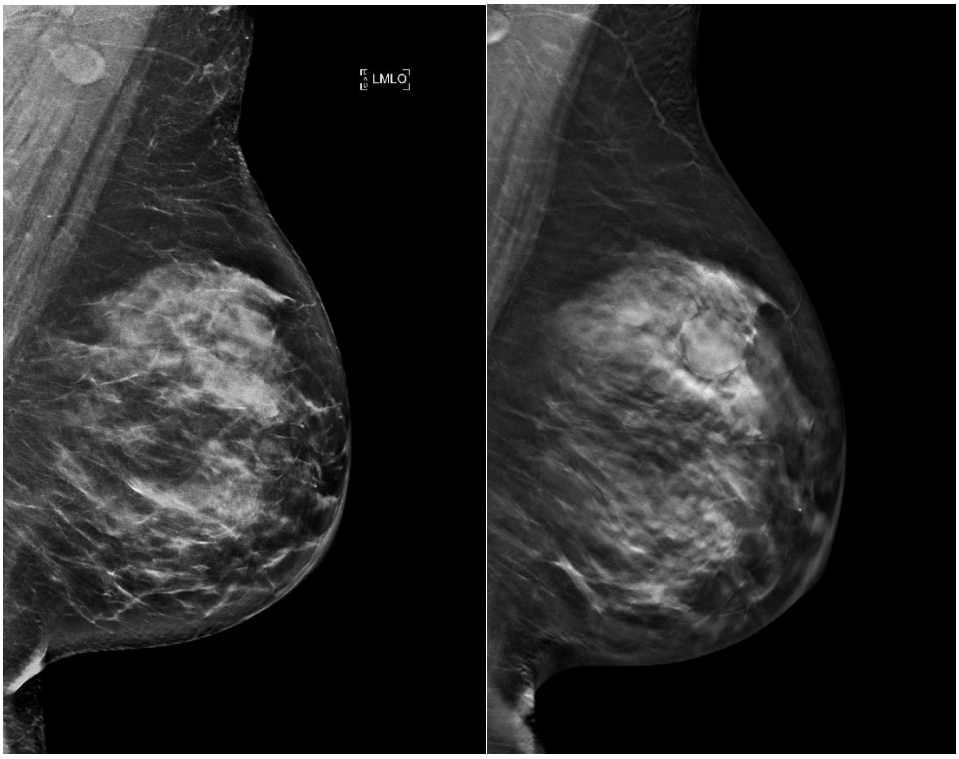
cyst in the left kidney). They may discuss the importance of subtraction series to assess enhancement. They should exclude additional smaller renal lesions, vascular involvement, and lymph node enlargement.

Overall: *The candidate should propose the most likely histologic subtype and explain why that distinction might be important. They should evaluate for absence of metastasis and provide an overview of relevant staging features*.

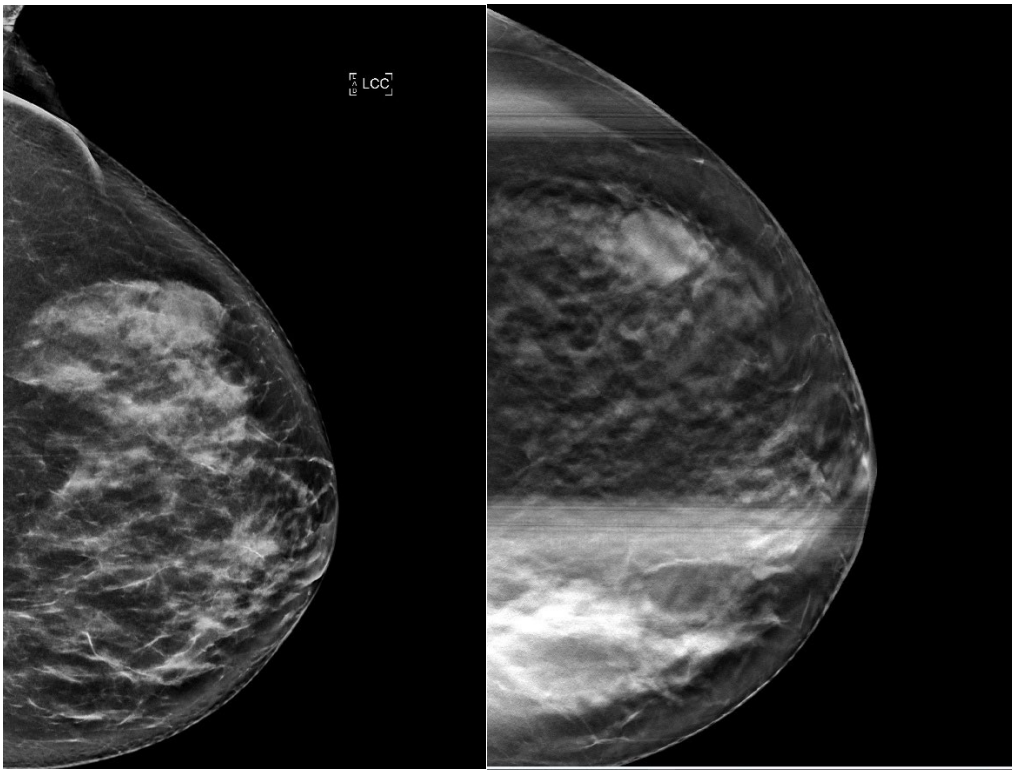
BREAST

Breast cyst:

Image Series 1: Left mammogram (CC and MLO views)



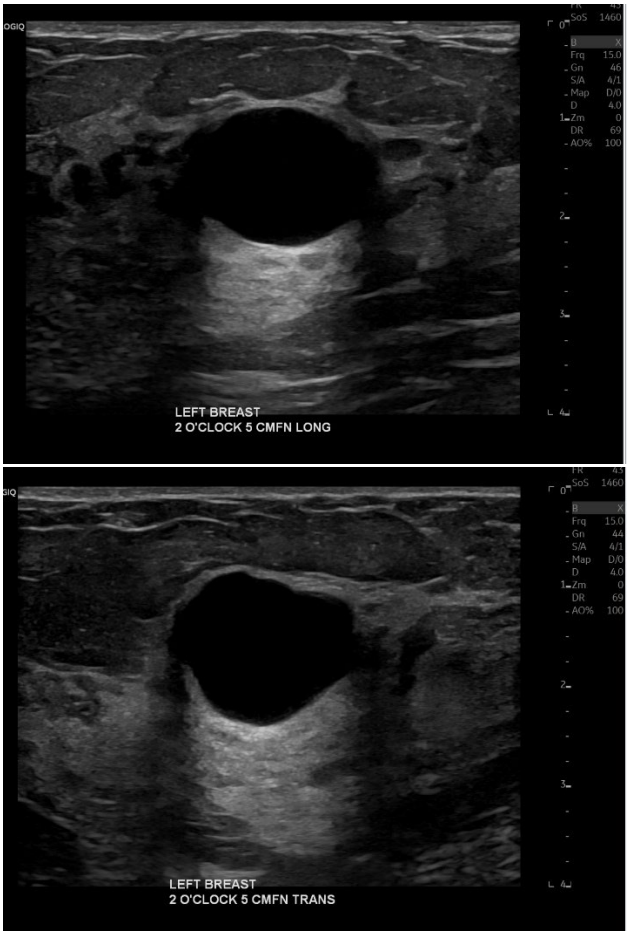
Left MLO **Left MLO DBT slice**



Left CC **Left CC spot**

The candidate should identify and describe the left breast oval circumscribed mass using BI-RADS terminology. They should include benign etiologies among the most likely diagnoses but note the possibility of a malignant cause. They should outline pertinent negatives (e.g., no associated calcifications or apparent adenopathy) and recommend ultrasound for further characterization.

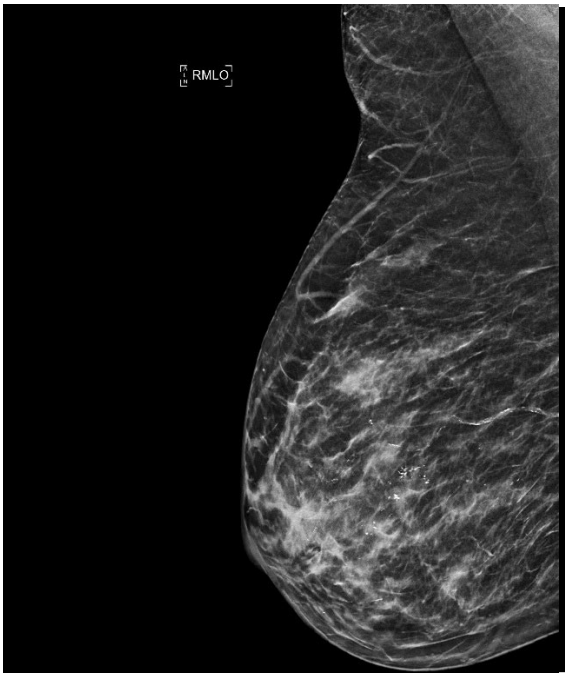
Image Series 2: Ultrasound

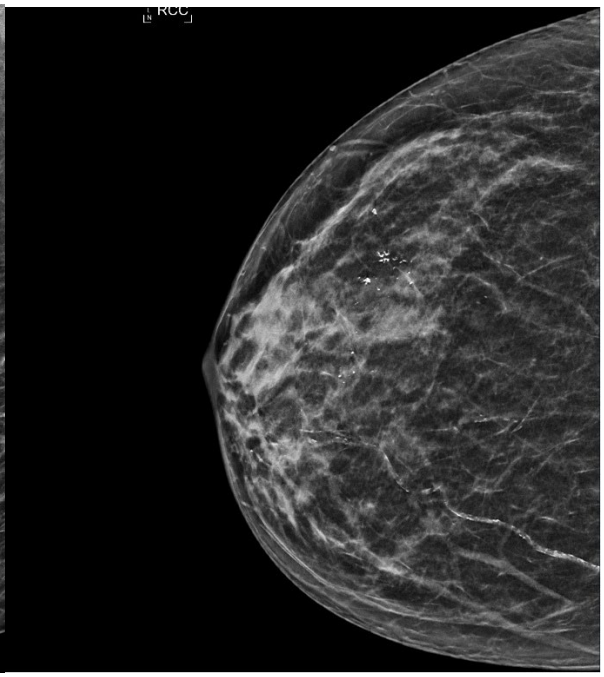


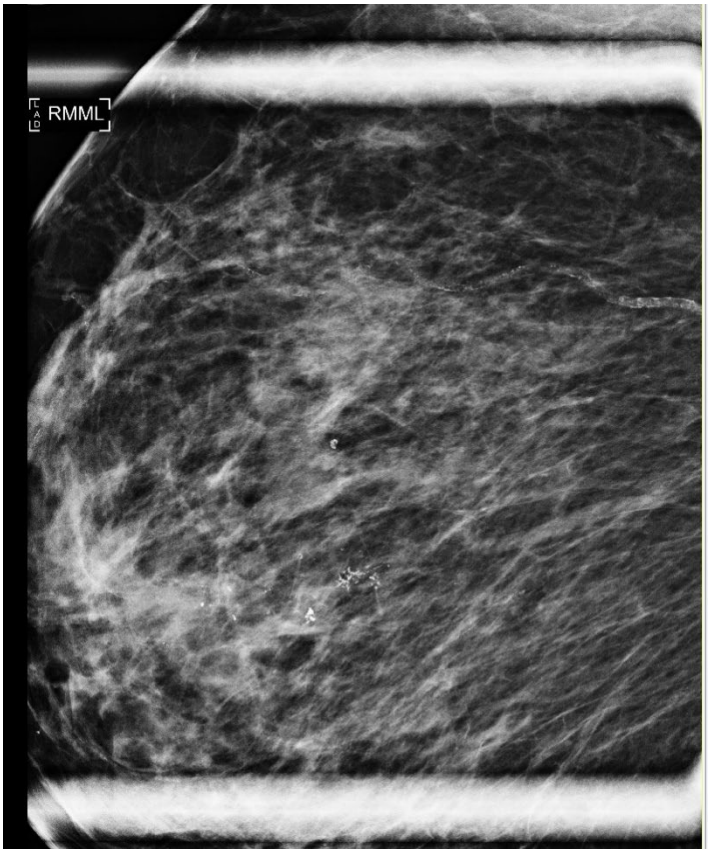
The candidate should identify that the finding shown on the ultrasound correlates in size and location to the mammogram finding. They should recognize it as a simple cyst and assign the correct BI-RADS assessment category (Category 2, benign) and proper management (return to screening).

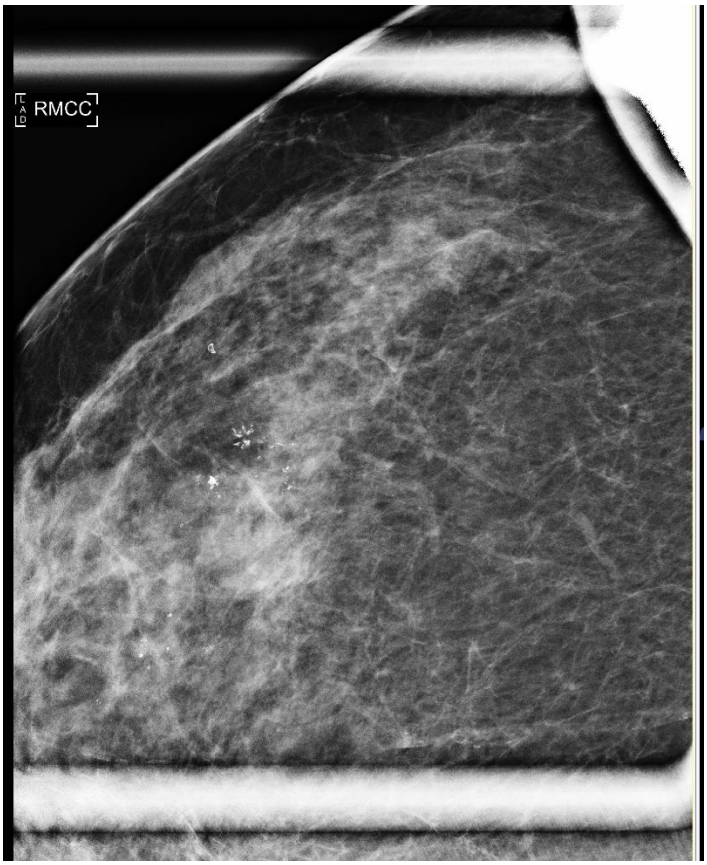
DCIS:

Image Series 1: Standard and mag views of the right breast



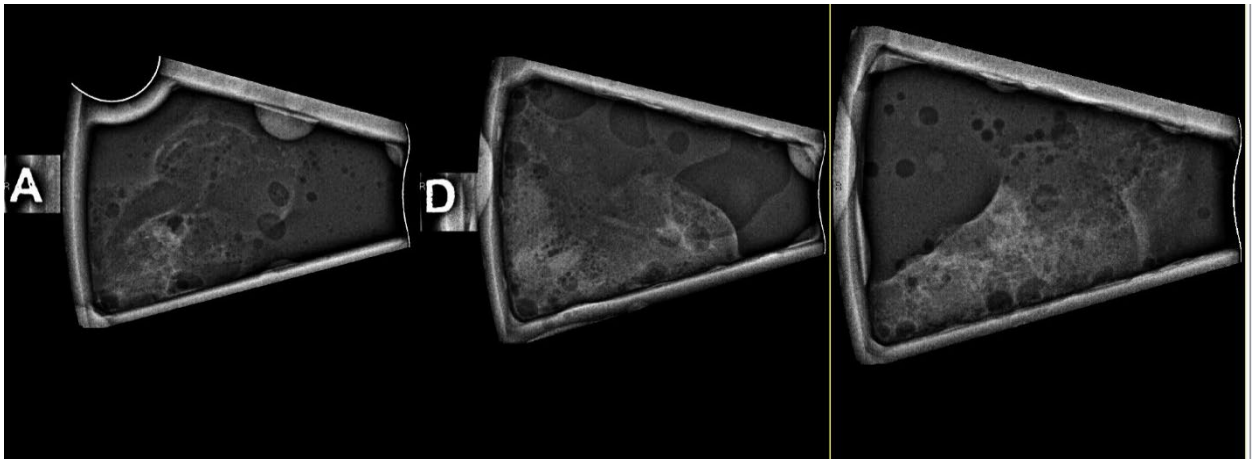






The candidate should recognize an area of suspicious calcifications in the right breast and describe the location, morphology, and distribution using BI-RADS terminology. They should convey a degree of suspicion based on appearance and probable diagnosis (DCIS) and recognize that there is no associated soft tissue component or adenopathy. The candidate should recommend mammographic-guided biopsy.

Image Series 2: Specimen radiograph obtained during biopsy



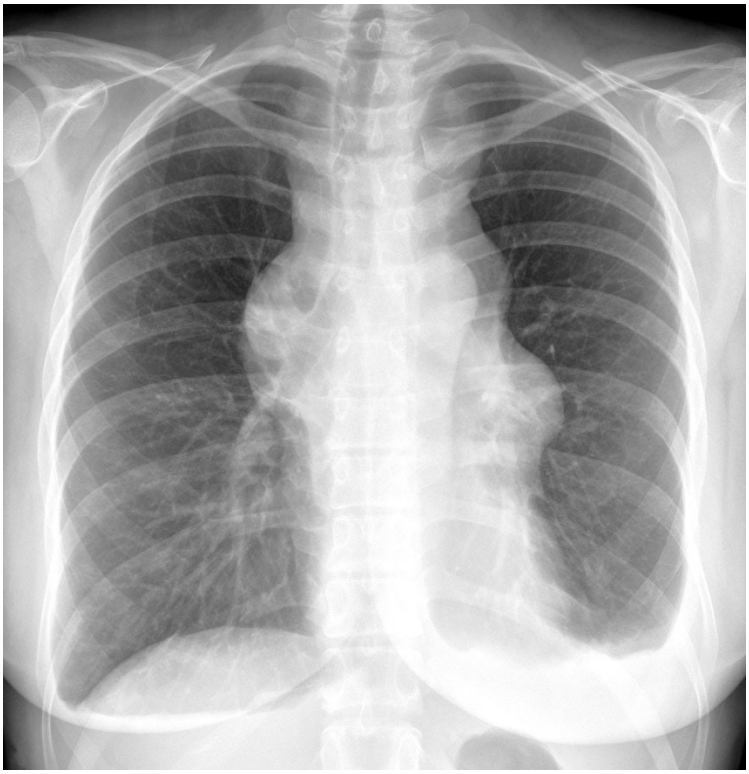
The candidate should recognize that no calcifications have been retrieved during the procedure and recommend additional sampling prior to biopsy marker placement. The examiner will note that the patient is feeling nauseated and light-headed after the procedure. The candidate should recognize that the patient may be having a vasovagal episode and outline proper diagnosis and treatment of this condition.

The candidate will be told that the biopsy results after repeat biopsy (with some calcifications retrieved) are returned as “atypical lobular hyperplasia with scant calcifications.” The candidate should note that this is a discordant biopsy result and recommend re-biopsy as the next management option.

CHEST

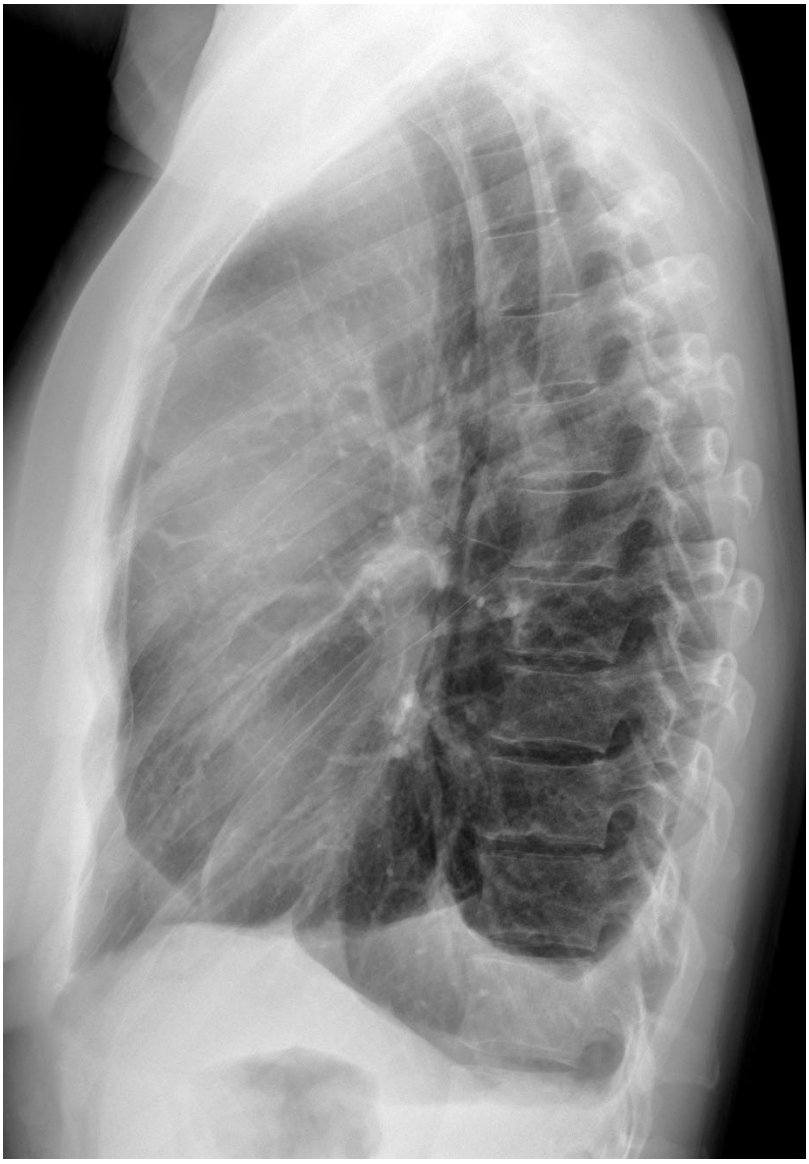
Hodgkin Lymphoma:

Image Series 1: PA Radiograph



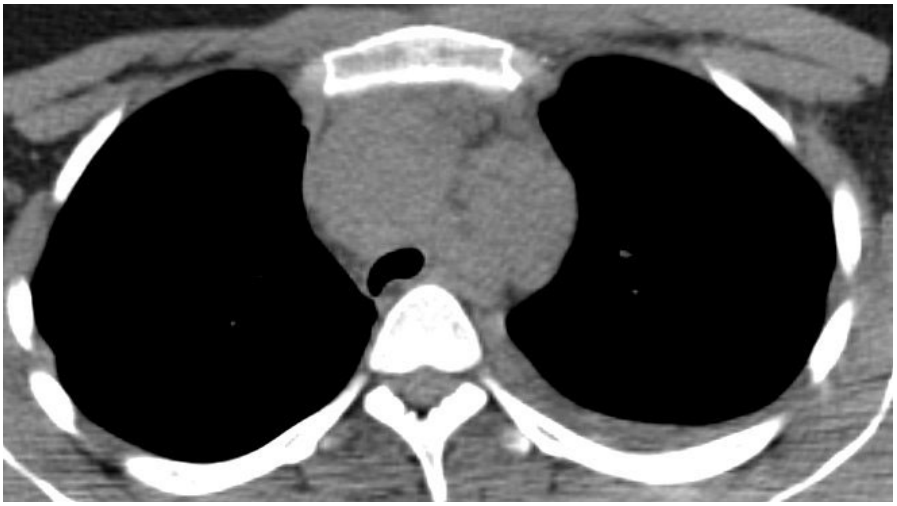
The candidate should adequately describe a large lobulated mediastinal mass that fails to silhouette the hilar structures or the aortic arch, indicating either an anterior (prevascular) or posterior (paravertebral) compartment location. The candidate should ask for a lateral view to assist in finding localization.

Image Series 2: Lateral Radiograph



The candidate should recognize increased density in the retrosternal space and confirm the anterior mediastinal location. The candidate should provide an anterior mediastinal mass differential diagnosis including lymphoma and thymoma and recommend a CT chest examination.

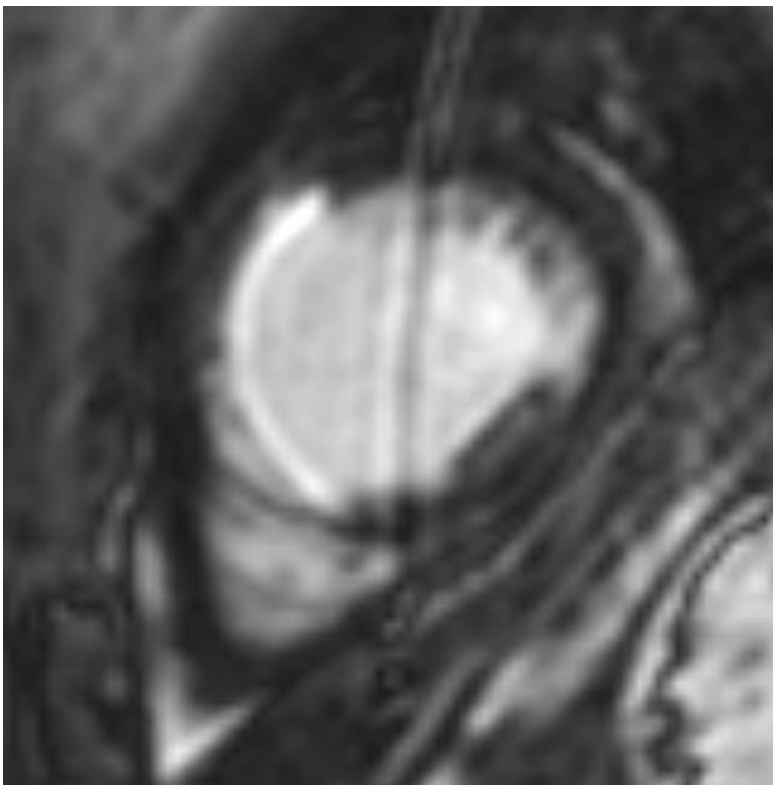
Image Series 2: Chest CT

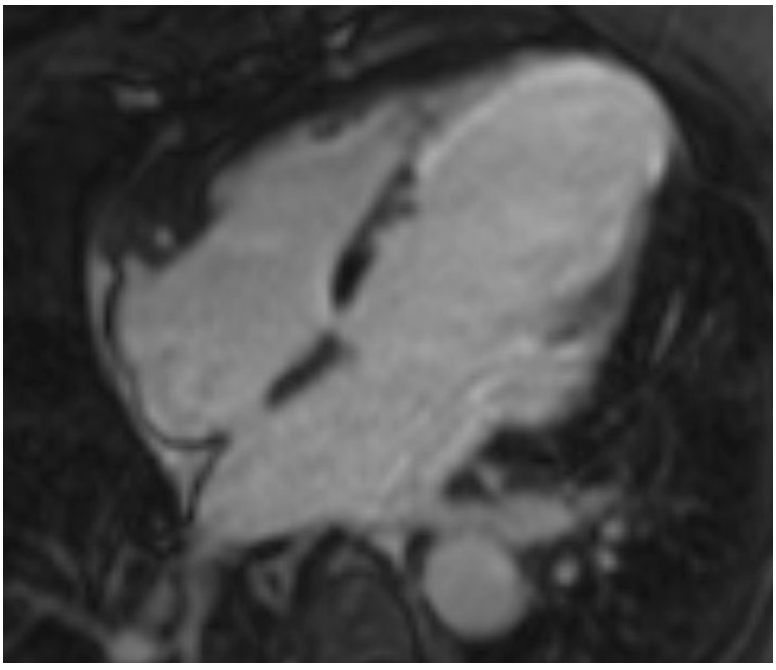


The candidate should describe multiple lobulated masses in the anterior mediastinum and refine the differential diagnosis to favor lymphoma. They should recommend biopsy and describe an image-guided approach.

Myocardial Infarction:

Image Series 1: Short Axis and 4 Chamber long axis late gadolinium enhanced MR images





The candidate should describe transmural enhancement of the midventricular to apical septal segments extending to include the left ventricular apex. The candidate should correctly identify the finding to represent a left anterior descending territory myocardial infarction and categorize the infarct as nonviable, indicating conservative management.

MUSCULOSKELETAL

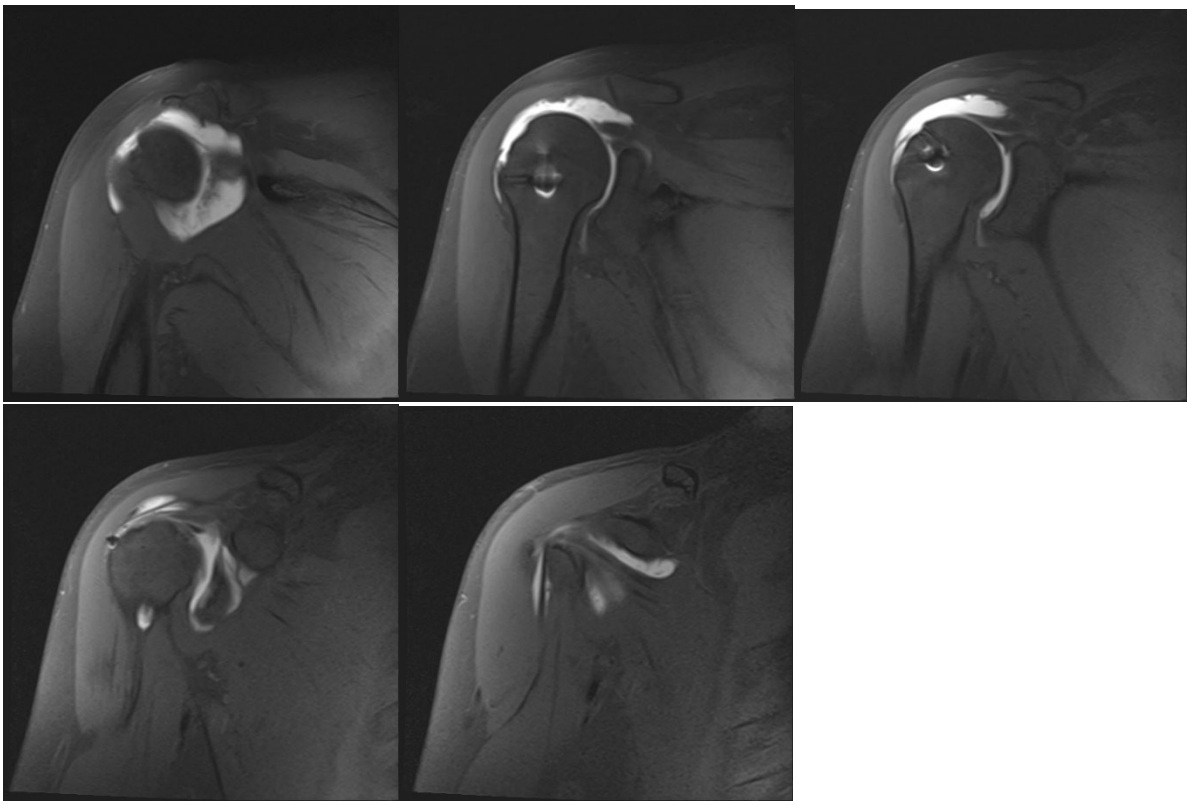
Erosive Osteoarthritis - Clinical information: Finger pain in 80-year-old female

Image series: Radiograph of bilateral fingers

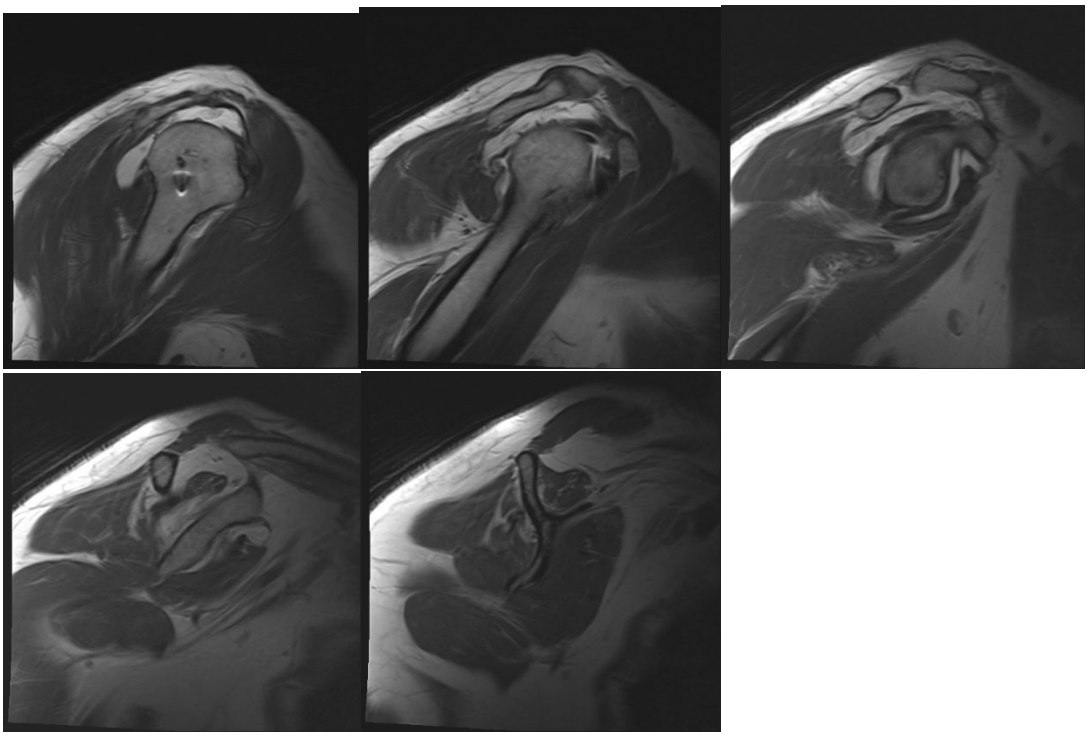
The candidate should describe an arthropathy affecting nearly all the DIP joints of both hands and, to a lesser degree, the PIP joints, with both productive (osteophytes) and erosive features. The erosions are central and without periostitis (aka "seagull" pattern). The candidate should give the correct diagnosis of erosive osteoarthritis. The candidate may include a differential of psoriatic arthritis and standard (nonerosive) osteoarthritis but should realize that the demographics and appearance of central erosions with productive changes favor erosive osteoarthritis over the others. The examiner may ask about some typical features that differentiate psoriatic arthritis from erosive osteoarthritis (marginal erosions, bone proliferation, asymmetric involvement, demographics, pencil-in-cup deformity, sausage digit).

Full-thickness rotator cuff tear - Clinical information: Shoulder pain in 60-year-old patient

Image series: MRI of right shoulder



T1FS Oblique coronal images



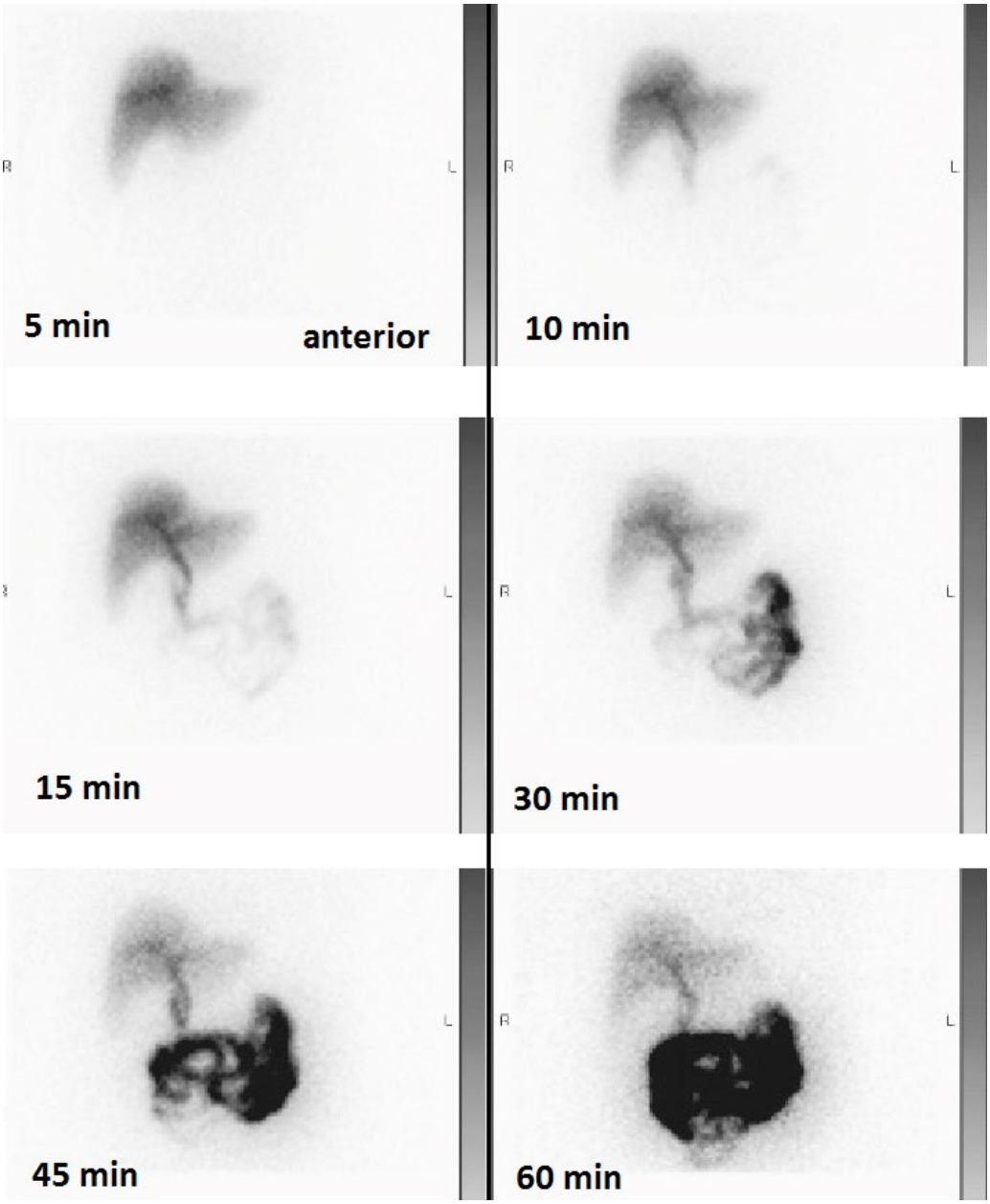
PD oblique sagittal images of the shoulder

The candidate should recognize the images as an MR shoulder arthrogram, given the intra-articular T1 bright fluid. (The candidate will be prompted if this is not volunteered.) The candidate should diagnose a recurrent full-thickness rotator cuff tear in a patient with prior rotator cuff repair. The candidate will be asked which tendon(s) is/are torn (infraspinatus and supraspinatus), if not volunteered already. The candidate will be asked to name the four rotator cuff muscles on a more medial sagittal image, and also to state which ones are atrophied. There will then be a discussion regarding MR arthrography. The candidate should describe the preparation of the gadolinium concoction, what gauge/length (approximate) needle they would use, the approach, and how much fluid they would typically inject.

NUCLEAR RADIOLOGY

Chronic Cholecystitis

Image Series 1: Hepatobiliary scintigraphy, pre-morphine sulfate intervention

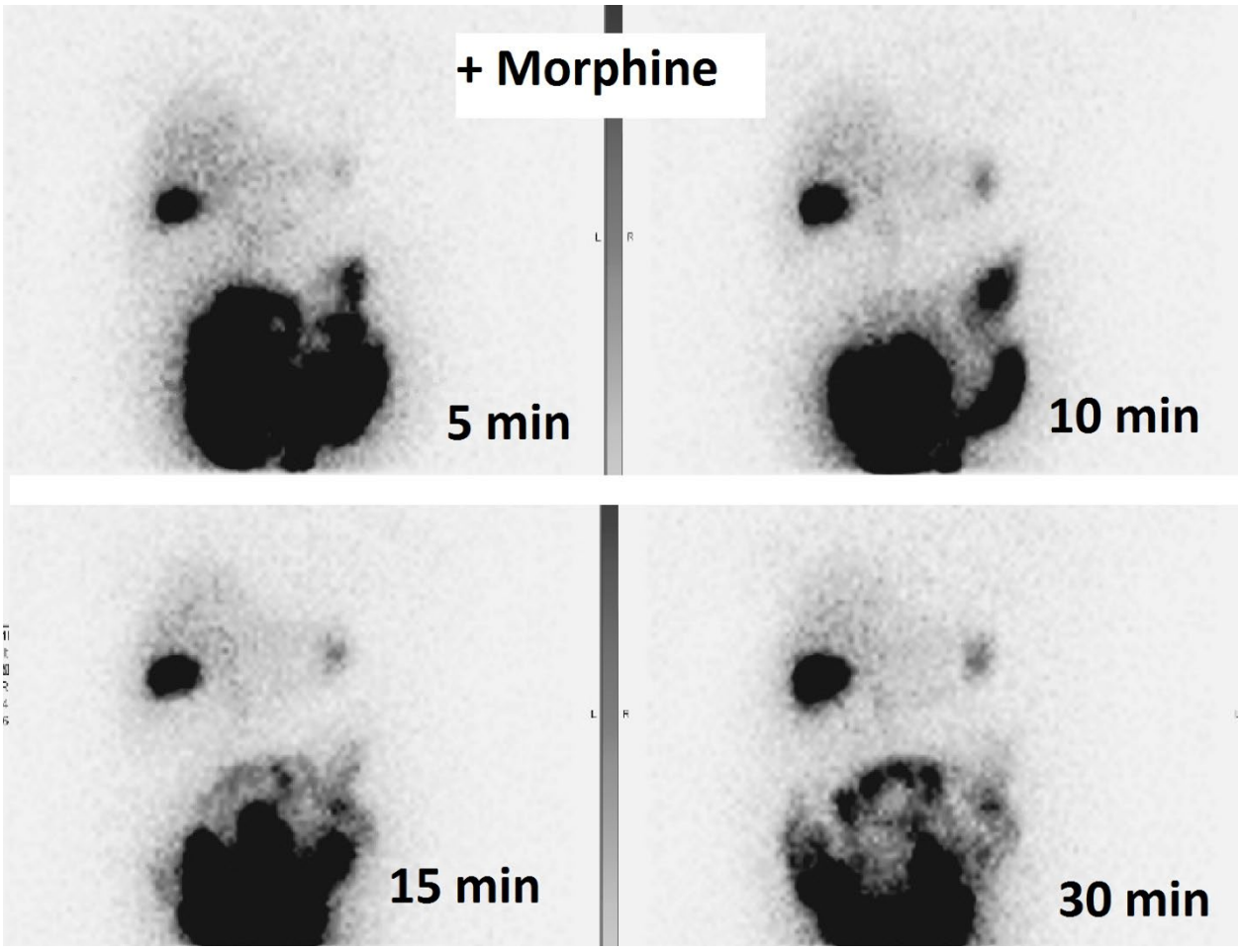


Hepatobiliary scintigraphy

The candidate should describe the findings of normal hepatocellular function and normal visualization of the small intestine, but nonvisualization of the gallbladder.

They should state that the differential diagnosis includes acute vs chronic cholecystitis and recommend intervention with IV morphine sulfate, with further imaging up to 30 minutes to look for gallbladder visualization.

Image Series 2: Hepatobiliary scintigraphy, post-morphine sulfate intervention



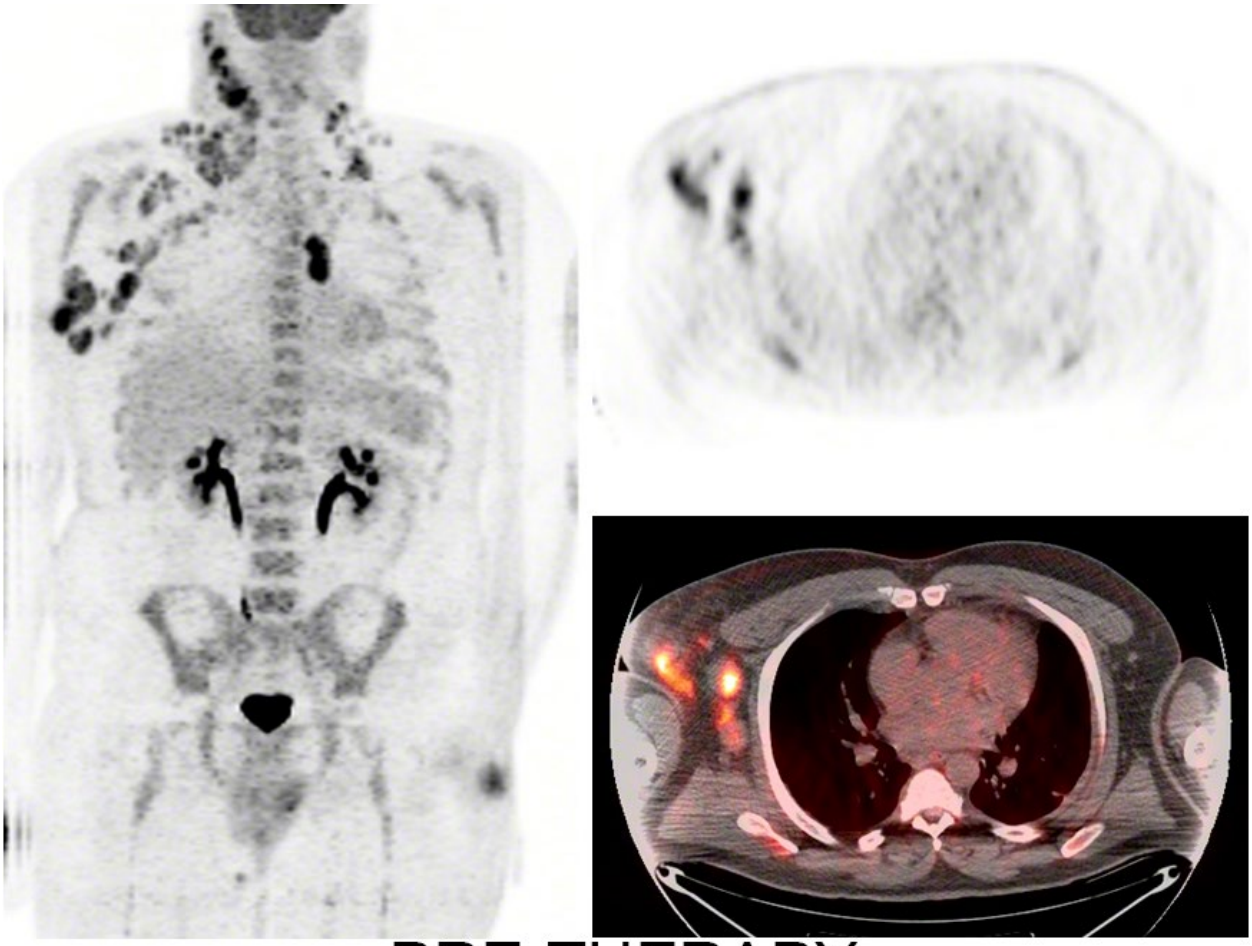
Post-morphine sulfate intervention

The candidate should describe visualization of the gallbladder, indicating patency of the cystic duct, precluding the diagnosis of acute cholecystitis, and supporting the diagnosis of chronic cholecystitis.

They should also explain the patient preparation (fasting for four to 24 hours) and the mechanism of action of morphine sulfate in this examination.

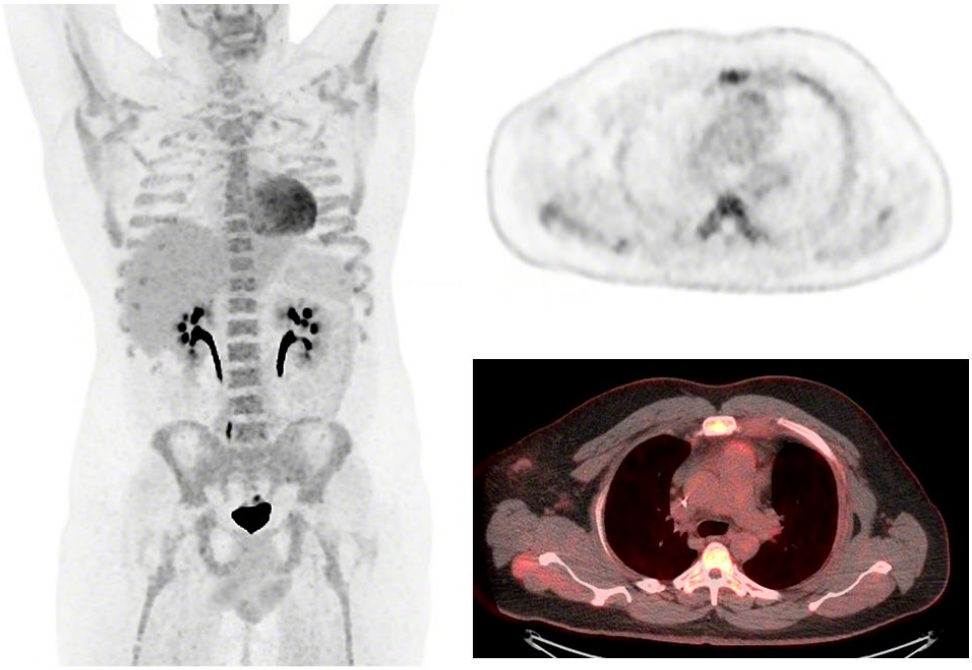
Lymphoma

Image Series 1: F-18 FDG PET/CT scan, baseline



The candidate should recognize the multifocal localization of FDG in the lymph nodes above and below the diaphragm and suggest a differential diagnosis that includes lymphoma, metastatic cancer, or sarcoidosis/TB.

Image Series 2: F-18 FDG whole-body PET/CT scan, follow-up



POST-THERAPY PET/CT

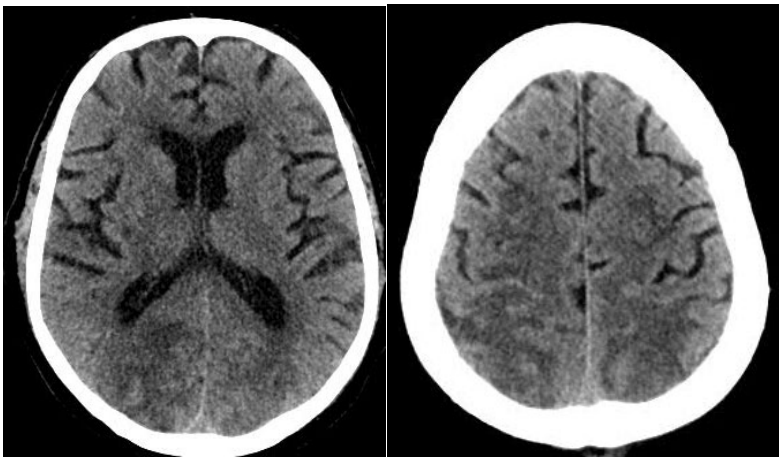
The candidate should describe the changes from the baseline scan and conclude that the disease has responded well to chemotherapy. They should explain staging and the response evaluation systems.

Neuroradiology

Posterior Reversible Encephalopathy (PRES)

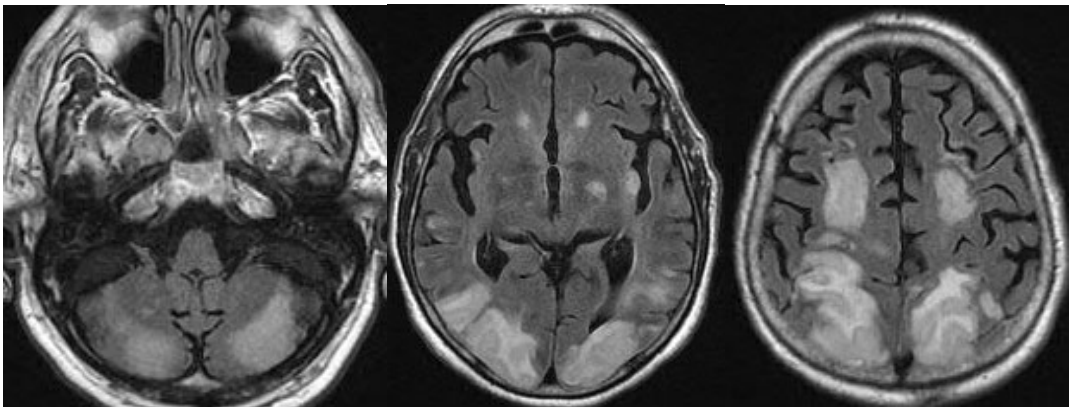
Image Series 1: Noncontrast Head CT Exam

Axial CT images

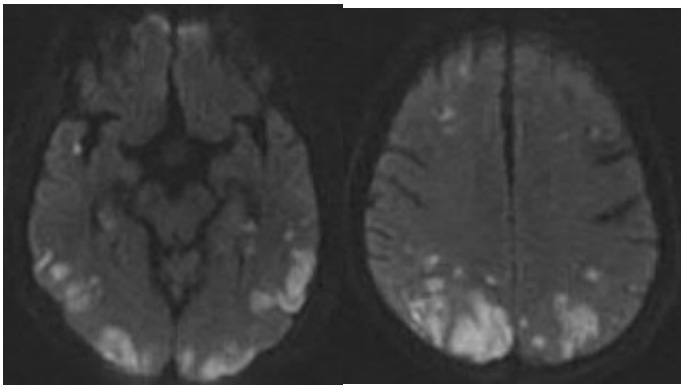


The candidate should note the low-density changes in the cortex and white matter in both cerebral hemispheres, with sulcal effacement especially posteriorly without any hemorrhage. They should discuss a differential diagnosis for diffuse low-density changes. A superior candidate will recognize that the pattern is symmetric with a posterior predilection and favor PRES. The candidate should ask for an MRI to clarify and narrow their differential diagnosis.

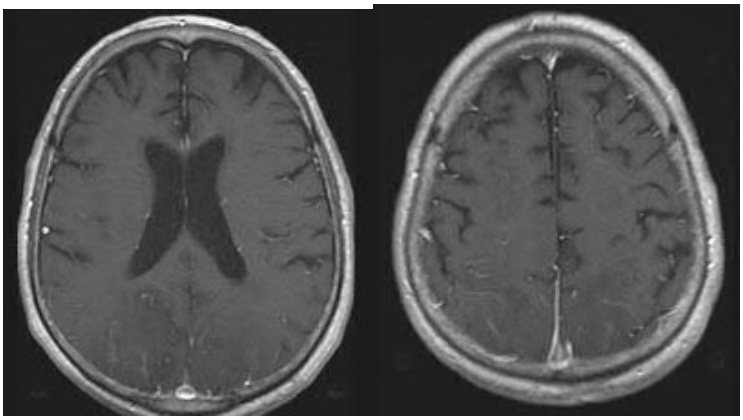
Image series 2: Head MRI Exam



Axial FLAIR images



Axial DWI



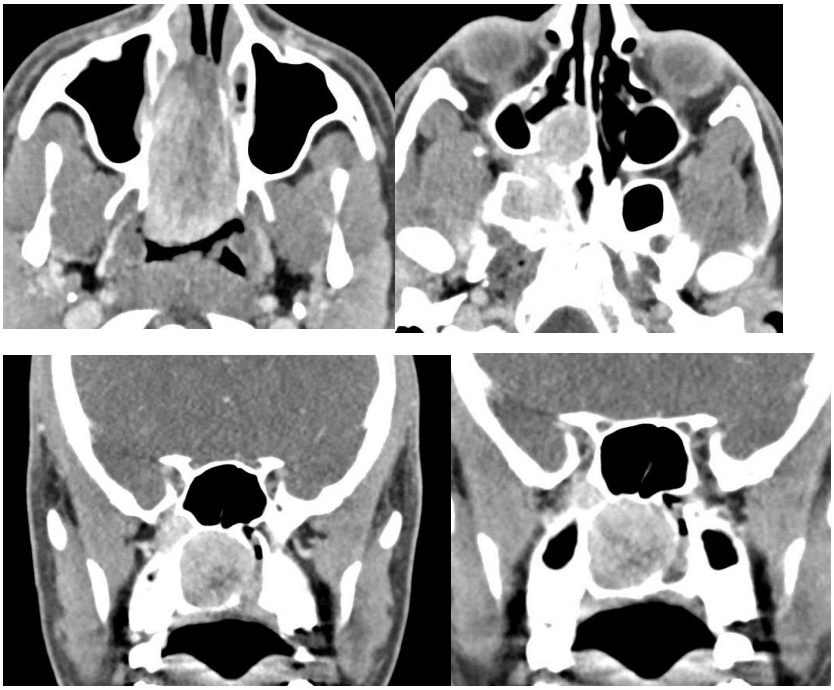
Axial T1 post gadolinium

The candidate should recognize that the pattern is clearly symmetric and involves both cerebellar hemispheres with restricted diffusion and subtle enhancement in the sulci. The candidate should narrow their differential diagnosis and recognize that severe PRES can have restricted diffusion and subtle enhancement in the sulci. The candidate can explain why the other previously noted diagnoses are less likely. The candidate should favor PRES and ask for additional history such as hypertensive crisis, eclampsia, renal disease, or various medications such as cyclosporine or tacrolimus to confirm the diagnosis of PRES.

Juvenile nasopharyngeal angiofibroma (JNA)

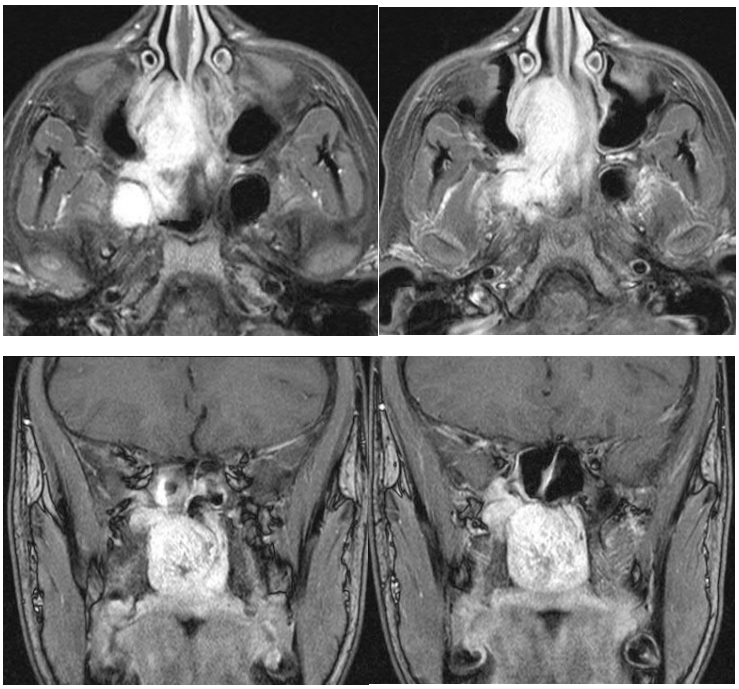
Image series 1: CT Exam

Axial and Coronal Post Contrast CT Images



The candidate should identify a nasal cavity mass that involves the sphenoid sinus with bony remodeling but no clear destruction or erosion. The candidate should recognize that the mass enhances. They should discuss a differential diagnosis for nasal cavity masses, such as a polyp including antrochoanal, an unusual cyst, allergic fungal sinusitis, various types of neoplasms, or an encephalocele. Based on the images, they should note that there is no intracranially extension and therefore an encephalocele or an esthesioneuroblastoma are unlikely. But they should ask for additional images or an MRI to clarify and narrow their differential diagnosis. A superior candidate will note that it also involves the sphenopalatine foramen and raises the possibility of juvenile nasopharyngeal angiofibroma (JNA).

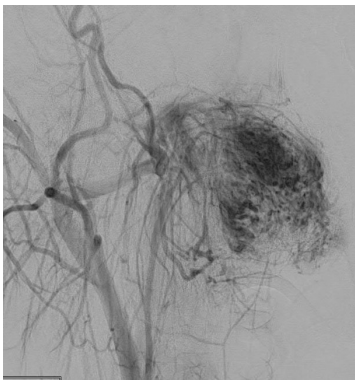
Image series 2: MRI Exam



Axial and Coronal T1 post gadolinium images

The candidate should note that this mass avidly enhances and clearly involves and widens the pterygopalatine fossa. The candidate should narrow their differential diagnosis to some type of neoplasm and based on its location that a juvenile nasopharyngeal angiofibroma is the most likely diagnosis. The candidate should note that juvenile nasopharyngeal angiofibroma are vascular tumors that hemorrhage and should not be biopsied. They should ask for angiography images to confirm the diagnosis. A superior candidate will mention the potential for presurgical embolization.

Images series 3: Catheter cerebral angiogram



AP Image from a Right ECA Injection

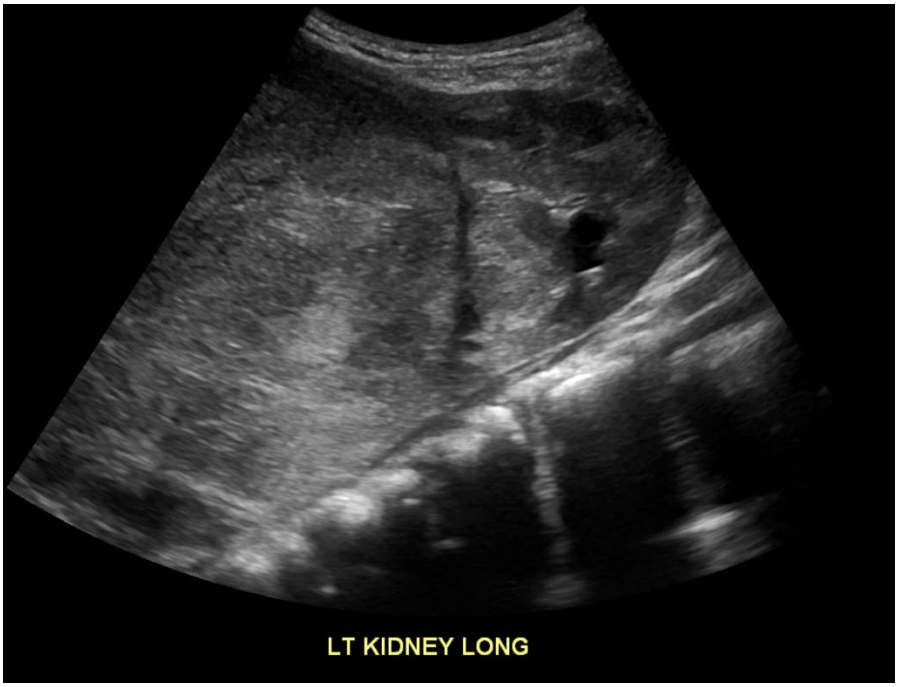
The candidate should arrive at the diagnosis of juvenile nasopharyngeal angiofibroma. (JNA).

PEDIATRICS

Wilms tumor:

Clinical information: 3-year-old with abdominal fullness.

Image Series 1: Ultrasound



The candidate should adequately describe the mass and confirm that it is predominantly solid. They should include renal neoplasm and neuroblastoma among most likely diagnoses. The candidate should recommend CT or MRI to confirm the organ of origin and to look for potential metastases.

Image Series 2: CT

The candidate should identify the organ of origin, offer the most likely diagnosis (Wilms tumor), and know that the most common site of metastasis is the lungs.

The candidate should offer a differential diagnosis of clear cell sarcoma or rhabdoid tumor and explain why the lesion is not mesoblastic nephroma. The candidate should demonstrate knowledge of syndromic associations for Wilms tumor.

Meconium Ileus:

Clinical information: Newborn with abdominal distention.

Image Series 1: Radiograph

The candidate should recognize the diffuse bowel dilation in a newborn infant and discuss the differential diagnosis of distal bowel obstruction including ileal atresia, meconium ileus, Hirschsprung disease, and small left colon syndrome. They should recommend contrast enema as the next imaging study.

Image Series 2: Contrast enema

The candidate should recognize the microcolon and appropriately limit the differential to mainly meconium ileus and ileal atresia. The candidate should be aware of the association between meconium ileus and cystic fibrosis. The therapeutic effect of the enema should also be discussed.