BODY IMAGING: GI/GU tract

Knowledge Based Objectives: The resident should be able to:
Anatomy

1. Discuss the basic principles of CT scanning and the basic protocols of CT scanning
2. Describe how a CT scan is acquired (planes, slice thickness, timing)
   Describe the phases of imaging
   Describe the normal enhancement patterns of the abdominal organs
3. Describe Hounsfield units, window and level settings, lung and bone algorithm.
4. Identify all normal anatomy of the chest, abdominal, and pelvis
5. Learn hepatic lobar anatomy and landmarks-left lobe, caudate lobe, quadrate lobe, right lobe, ligamentum venosum, ligamentum teres
6. Learn the location of lymph node chains-celiac, porta hepatic, porta caval, retroperitoneal, pelvic, inguinal, etc.
7. Know the different body compartments-peritoneal cavity, retroperitoneal spaces, extraperitoneum, and how they contribute to spread of disease in the abdomen.
8. Demonstrate the segments of the liver and be able to correctly describe the location of a lesion
9. Know the different body compartments-peritoneal cavity, the subdivisions of the retroperitoneum, and how they contribute to spread of disease in the abdomen.
10. Define the omentum, mesentery, mesenteric root
11. Compare and contrast the strengths and limitation of MRI and CT in the evaluation of masses in the solid abdominal organs.
12. Identify common pathology on CT scans of the chest, abdomen, pelvis. Inflammation: diverticulitis, appendicitis, pancreatitis. Bowel obstruction; Lung masses; Lymphadenopathy-size criteria by location; Renal calculi & hydronephrosis; Intraperitoneal & retroperitoneal hemorrhage
13. Describe the CT manifestations of common pathologies: Organ, visceral and mesenteric inflammation; Neoplasia of the solid organs; Patterns of obstruction
14. Describe the CT manifestations of common disease entities & their complications: Pancreatitis, appendicitis, diverticulitis; Organ and luminal ischemia; Traumatic injury to solid and visceral organs, skeleton, aorta and major branch vessels; Vascular dissection, aneurysm, intramural hematoma, rupture; Cysts and solid masses in the solid organs.
15. How to risk stratify cystic lesions in the kidneys, possible HCCs in the liver, characterize adrenal masses.
16. Lymphadenopathy- locations, definitions, differential diagnosis.
17. Abcsess, fluid collections, hemorrhage
18. Learn to recognize closed loop obstruction, types of hernias, and bowel ischemia
19. Describe how to manage incidental findings in the solid abdominal organs and what resources guide these decisions
20. Be able to quickly recognizes emergent and pertinent findings

21. Describe how to analyze and diagnose focal liver lesions on CT including: hemangioma, adenoma, focal nodular hyperplasia hepatocellular carcinoma, fibrolamellar hepatocellular carcinoma hypervascular and hypovascular metastatic disease
22. Describe how to analyze and diagnose diffusel liver disease on CT including: Fatty infiltration, hepatitis, hemochromatosis, cirrhosis
23. Describe how to analyze and diagnose focal pancreatic lesions on CT including: pancreatic adenocarcinoma; cystic pancreatic neoplasms; islet cell tumor.
24. Describe the analysis, differentiation of and diagnosis of adrenal lesions, including: adrenal adenomas, myeolipomas; pheochromocytoma; adrenocorticocarcinoma and metastatic disease
25. Describe common conditions affecting the spleen, and their diagnosis.
26. Characterize cystic renal lesions using the Bosniak classification
27. Describe and accurately report the findings pertinent to a vascular surgeon for each of the following: AAA- pre treatment; CT angiography of the abdomen and pelvis; AAA – post endograft therapy
28. Define hypovascular and hypervascular tumors, list types, describe how this impacts diagnosis.
29. List the indications and uses of intravenous iodinated contrast material
30. Prescribe the correct steroid pre-medication protocol for IV contrast
31. Discuss contrast reactions
32. Describe what occurs in a contrast reaction
33. Describe specific measures indicated in the treatment of contrast reactions
34. Describe how and when to use the oral pre-medication protocol for IV contrast, and how to handle emergent IV contrast enhanced CTs in the patient with an allergy history
35. Describe the screening process used for identifying patients with high risk of renal insufficiency, to determine who needs a pre-CT/MRI creatinine/GFR checked
36. Prescribe the correct oral and intravenous steroid prep in the management of a history of contrast reactions
37. Recognize common image artifacts
38. Know how to check any scans that require monitoring or additional views.
39. Describe the indications for obtaining delayed images.
    Explain when and why multiphase protocols are used in the solid abdominal organs
40. Discuss the basic principles of CT angiography and the basic protocols of 3D reformatting
41. Describe how a CTA scan is acquired (planes, slice thickness, timing
42. Describe how a CTA is interpreted: what slice thickness, which series to look for aneurysm, stenosis
43. Describe the methods used to create 3D reformats
44. Define centerline reformat, curved planar reformats and when each is used

45. Describe how a virtual colonoscopy is performed, including patient prep, CT technique, methods of interpretation. Be able to discuss the role of CT colonography with referring clinicians.

Technical Skills: The resident should be able to:

1. List/discuss the indications for CT-guided chest, abdomen, and pelvic drains/aspirations
2. List/discuss the indications for CT-guided chest, abdomen, and pelvic biopsies
3. Describe the medications and labs which are pertinent to know about, and check or stop prior to a CT guided intervention
4. Accurately work up a request for a CT guided intervention
5. Approve the case, in conjunction with the attending
6. Write the pre-procedure note
7. Perform the consent and examine the patient
8. Perform percutaneous biopsies and drainages under the supervision of the attending radiologist.

Decision-Making and Value Judgment Skills: The resident should be able to:

1. Make decisions about when to alert house staff to the immediacy of a condition that is apparent on the imaging study.
2. Determine when to request that a repeat examination is needed because of technical inadequacy.
3. Determine which cases require the immediate assistance of attending radiologist.
4. Demonstrate a high degree of accuracy in interpreting and dictating cases, identifying consistently those cases with which assistance is needed.
   Consult, with confidence, with primary care physicians and surgeons in regard to most chest imaging procedures.