Body Imaging Ultrasound Rotations

Our goal is to make residents become progressively more knowledgeable of normal ultrasound anatomy, technique, clinical presentations and the correlation to the radiological appearances of diseases. The challenge to you as a resident is to acquire skills in both interpretation as well as performing ultrasound exams. The sonographers will assist you in acquiring the technical skills needed to perform high quality ultrasound. There is no substitute for plunging in and taking hold of the transducer. Ultrasound is both a science and an art; therefore, hands-on experience is key.

Keys to Success

- Read as many ultrasound studies as possible. Expose your eyes to variations.
- Challenging case: unknown finding, try to find the answer by using online resources (Statdx, radiographics, google) while you wait for the attending.
- Review prior studies and EPIC notes.
- Review attending changes to final reports.

Daily workflow

- 8-8:30 AM: Participate in procedure huddle
- 8:30- 12 PM: Read Cases, Dictate Reports, Review cases with attending
- 12:30-1 PM: Resident Conference
- 1-5 PM: Read Cases, Dictate Reports, Review cases with attending
- Every Monday 7-8 am- Hands on Ultrasound with sonographer starting 2nd week August

  We have arranged for residents assigned to ultrasound service for their first rotation to work with our skilled sonographer to learn how to operate ultrasound machines, hands-on scanning skills, ergonomics, and to identify technical errors that can gives false positive or negative results.

  You are expected to scan a volunteer, learn knobology on US machine and technique.
- Every Tuesday (R1) and Thursday (R2-R4): 8:30-10 AM Hands-on Ultrasound with sonographer on in-patients.

  Save the accession number of the studies you scan. This will be part of ACGME requirement to document hands-on skill along with your other ultrasound experiences (Breast, MSK and Peds). *You are required to document 75 hands-on cases during your residency.*

Reading List for All Years

1. Ultrasound: The Requisites, 2nd Edition. William D. Middleton and Alfred B. Kurtz.
2. The Core Curriculum, 1st Edition. William E. Brant.
3. Diagnostic Ultrasound: 2-volume Set. 3rd Edition. Carol Rumak, Stephanie Wilson, J. William Charboneau, and Jo-Ann Johnson.
4. Stat Dx
5. Radiographic

A. First Year resident (4 week rotation) expectation

1st week on US

- Understand the anatomy, scan planes and focus on DVT, Right upper quadrant, Complete Abdomen US, Gallbladder US, fluid survey (abdomen and chest), Scrotal Ultrasound

2nd Week on US

- Continue with what you learnt during the first week and focus more on Pelvic US, OB US, Transplants (Liver, Renal and Pancreas) and Thyroid US
- Participate in performing Contrast enhance Ultrasound and read the studies
- Read Ultrasound Elastography and understand the principle

3rd and 4th Week on US

- Read all types of US studies

B. Subsequent US rotations (Usually 2 week rotation)

- Read all types of US studies
- Improve on your interpretation skills (focus on, if the study is technically optimal or not)
- Participate in procedure huddle and US guided procedures

C. The following condition organ based is expected for any trainee to comfortably make the diagnosis

1. Gallbladder and biliary ultrasound: Cholelithiasis, cholecystitis, adenomyomatosis, and biliary obstruction.

2. Liver: segmental liver anatomy and normal ultrasound appearance, diffuse liver diseases (fatty liver, cirrhosis), liver lesion identification and characterization.

3. Pancreas: Identify acute and chronic inflammatory processes of the pancreas, identification of pancreatic cysts and tumors.

4. Renal ultrasound: Normal anatomy and ultrasound appearance, hydronephrosis, medical renal disease, renal cyst/mass identification and characterization, renal calculi, pyelonephritis

5. Abdominal Doppler: Be familiar with the normal Doppler waveform for all of the major abdominal vessels (hepatic veins, hepatic artery, portal veins, splenic vein,

superior mesenteric vein, renal artery, renal vein, iliac artery, iliac vein, IVC). Know the diagnostic criteria for hemodynamically significant stenosis (TIPS, renal artery). Understand the spectrum of vascular complications in transplants (liver, pancreas, and kidney).

6. Abdominal wall- Differentiated fluid collections (hematoma, abscess, seroma), inguinal and femoral hernias

7. Pelvic ultrasound: Normal anatomy; changes in the appearance of the endometrium and the ovaries during the menstrual cycle, normal vs. abnormal endometrial stripe thickness for pre vs. post-menopausal women; fibroids; benign ovarian masses (hemorrhagic cysts, endometrioma, dermoids); ovarian cancer, adnexal masses and the appropriate differential diagnosis depending on age and clinical presentation, O-RADS. Be familiar with appropriate recommendations for follow-up ultrasound versus other imaging (CT vs. MRI) or surgery.

8. First trimester obstetrics ultrasound: Normal development; ectopic pregnancy; early pregnancy failure. Anomalies related to maternal and placental imaging including placenta previa and abruption, cervical os incompetency, placenta accreta.

9. Second and third trimester OB ultrasound: Normal anatomy, basic congenital anomalies diagnosed during second and third trimester scanning to include and not limited to diaphragmatic hernia, omphalocele and gastrochisis, renal hypoplasia, intracardiac defects, biliary atresia. Be familiar with the ultrasound findings in Turners syndrome and most frequently encountered trisomies including trisomy 21 (Down's syndrome), trisomy 15 and 18. This later component is part of the OB rotation with maternal-fetal medicine.

10. Testicle: Normal anatomy; testicular pathology including torsion, trauma, epidydimitis/orchitis, neoplasia.

11. Thyroid/parathyroid: Normal anatomy; multinodular goiter, thyroiditis; thyroid nodule characterization; TI-RADS, follow up of thyroid cancer resection, and parathyroid adenoma.

12. Venous Doppler imaging: Upper and lower venous anatomy; criteria for diagnosis of deep venous thrombosis, venous insufficiency, AV fistula, pseudoaneurysm.

13. Abdominal Doppler: Be familiar with the normal Doppler waveform for all of the major abdominal vessels (hepatic veins, hepatic artery, portal veins, splenic vein, superior mesenteric vein, renal artery, renal vein, iliac artery, iliac vein, IVC). Know the diagnostic criteria for hemodynamically significant stenosis (TIPS, renal artery). Understand the spectrum of vascular complications in transplants (liver, pancreas, and kidney).

14. Contrast Enhanced Ultrasound (CEUS): Understand the role of CEUS, types of ultrasound contrast agents, indications and contraindications, principle, technique, and differentiation of benign versus malignant lesions, application of CEUS LI-RADS

15. Ultrasound Elastography: Familiarize with the technique, principle, identify technical appropriateness, and learn how to interpret the study per SRU consensus.
16.