

## Effective Date 7/15/2025

<b>Name of Rotation:</b>	Ultrasound
<b>PGY Level:</b>	2, 3, 4, 5
<b>Supervising Attending(s):</b>	Shamim, Bresler, R. Green, Anderson, Sephadari, Arnett, Nijhawan, Ekechukwu

### Goals: early level rotations

After completion of the early ultrasound rotations (approximately 4-8 weeks), the resident should be able to:

1. Demonstrate learning of the organ-based medical knowledge objectives cited below.
2. Understand the indications for the ultrasound procedure.
3. Describe the indications and contraindications for the ultrasound procedure.
4. Understand basic safety principles for ultrasound.
5. After determining the appropriateness of the examination and collecting the background clinical information, protocol a simple ultrasound (ie. to assess gallstones, biliary ectasia, etc.).
6. Dictate accurate, concise, and timely radiology reports on the ultrasound rotation after the images have been reviewed by the faculty with only minimal assistance or editing by the faculty.
7. Effectively communicate simple instructions to technologists.
8. Effectively communicate findings to the referring physician staff, house staff, and patients when the need arises.
9. Demonstrate professionalism and a responsible work ethic.
10. Participate in Quality Assessment/Quality Improvement (QA/QI) conferences.
11. Present simple cases concerning ultrasound at the End of Rotation Conference.
12. Perform at an appropriate level on national or departmental in-service exams.

### Specific objectives/benchmarks: early rotations

#### A. Patient Care

At the end of the early rotations in ultrasound, the resident will demonstrate that he or she can:

1. Determine at a basic level if ultrasound scan is appropriate to answer the clinical question and if that scan has been ordered appropriately.

2. Protocol straightforward ultrasound cases and direct the technologists to perform appropriate/additional imaging needed. If suboptimal images are obtained, communicate with the technologist to find out if the patient cooperated with the study and if the technologist had tried to repeat the images.
3. Where needed, perform review of the patient's medical history, examination of the patient and obtain informed consent from the patient and/or guardian.
4. Recognize adequate versus inadequate studies resulting from artifacts such as patient body habitus and motion.
5. On a basic level, assist in performance of ultrasound procedures when particular questions arise as to the validity of results.
6. Review the history of the patient for whom an ultrasound has been ordered, and determine the appropriateness of the study requested with assistance of the faculty in most cases.

## **B. Medical Knowledge**

At the end of the early rotations in ultrasound, the resident will demonstrate that he or she has learned:

1. Most of the relevant anatomic structures as denoted in the Appendix - 1.
2. Common emergent abnormalities of the abdomen, and pelvis, including collections and masses.
3. Basic physics of ultrasound acquisition.
4. Basic ultrasound protocol design.
5. Elements of a ultrasound report, including proper descriptive terms for simple abnormalities.
6. Typical ultrasound appearance of common abnormalities, ie.:
  - Gallbladder disease – gallstones, inflammation, infection
  - Biliary disease – dilatation, obstruction, stenosis
  - Female pelvic – uterine fibroids, ovarian cysts
  - Liver disease - cirrhosis, steatosis, masses
  - Thyroid disease – thyroid nodule
  - Transplant
  - Renal disease – medical renal disease, hydronephrosis
7. How to operate the department's ultrasound equipment.
8. Risk factors for usage of ultrasound upon patients, ie. theoretical fetal heart local heating effects.
9. The rationale for the standard views for ultrasound.
10. The appearance of a normal ultrasound.
11. The expected changes associated with aging and body habitus in ultrasound.
12. Perform at an appropriate level on national or departmental in-service exams.

### **C. Practice-based Learning and Improvement**

At the end of the early rotations in ultrasound, the resident will demonstrate that he or she can:

1. Appropriately use the Picture Archiving and Communication System (PACS) to mark studies as dictated documenting the resident's participation in the case.
2. Appropriately use the Picture Archiving and Communication System (PACS) to set viewing protocols for routine studies.
3. Appropriately use the Picture Archiving and Communication System (PACS) to set appropriate window levels for routine studies.
4. Engage the faculty in discussion about the resident's own preliminary interpretation of the case and analyze discordant readings and why they occurred.
5. Document any potential procedural or other complication in the medical record using the appropriate hospital risk-management system after consulting with the faculty (also applies to Professionalism).
6. Show other residents on the rotation interesting cases and be prepared to discuss the findings with a specific focus on why the case was personally challenging.
7. Participate in the department's QA/QI conference.
8. Present a simple case at the end of rotation conference.

### **D. Interpersonal and Communications Skills**

At the end of the early rotations in ultrasound, the resident will demonstrate that he or she can:

1. Communicate with the technologist about any special or additional views that should be obtained to demonstrate possible pathology.
2. Generate a coherent, logical report reflecting the review session and discussion with the radiology faculty for most cases with minimal assistance. In cases in which there are complex findings, it is expected that the early rotation resident will need some assistance with choosing proper wording of the report.
3. Communicate to the referring physician on the day of the exam any significant or unexpected abnormalities identified on the examination AND document in the report who was called at what date and time.
4. Comply with hospital and departmental policy for reporting critical test results.
5. Discuss the findings and relevant literature for relatively simple cases at the departmental case conference(s).

### **E. Professionalism**

At the end of the early rotations in ultrasound, the resident will demonstrate that he or she can:

1. Arrive on time and fulfill the clinical and educational tasks necessary as part of the daily routine. This includes looking up relevant articles, completing background reading and

attending all intradepartmental conferences and those interdepartmental conferences relevant to the ultrasound services.

2. When consulting with referring physicians or house staff, recognize his or her own limitations and seek input from radiology faculty.
3. Comply with the provisions of the Health Insurance Portability and Accountability Act (HIPAA) and all state confidentiality rules.
4. Comply with all Institutional Review Board (IRB) rules (if the resident has become involved in research during their early rotation).
5. With guidance from the faculty, record cases for both their own and the section's teaching file.

### **F. Systems-based Practice**

At the end of the early rotations in ultrasound, the resident will demonstrate that he or she can:

1. Join at least one of our professional organizations, including: American College of Radiology (ACR), American Roentgen Ray Society (ARRS), Association of University Radiologists (AUR), or Radiological Society of North America (RSNA).
2. Attend the teaching sessions and quiz of the local radiology society (CRS).
3. Identify systems-based operational challenges within the department and engage the faculty in discussions on how to affect changes that would be beneficial in ultrasound or the department as a whole.
4. Observe and learn how to participate in the Departmental Quality Improvement Process.



### **Goals: mid-level rotations**

After completion of the mid ultrasound rotations (approximately 11-20 weeks), and in addition to those goals listed for the early level rotations, the resident should show increasing sophistication and be able to:

1. Demonstrate learning of the organ-based medical knowledge objectives cited below.
2. After determining the appropriateness of the examination and collecting the background clinical information, protocol the vast majority of all ultrasound studies.
3. Understand more advanced usage and limitations involved with ultrasound as an imaging modality.
4. Dictate accurate, concise, and timely radiology reports on all cases after reviewing the findings with the faculty.
7. Participate in QA/QI conferences and regularly bring increasingly advanced ultrasound cases to the end of rotation conference.
8. Perform and track an appropriate number of invasive procedures done under the supervision of the interventional faculty.

9. Show improvement in performance on national or departmental in-service exams.

## **Specific objectives/benchmarks: mid-level rotations**

### **A. Patient Care**

At the end of the mid-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. For most cases, determine if ultrasound is appropriate to answer the clinical question and if that scan has been ordered appropriately. Discuss with clinical teams alternative imaging techniques that may be needed.
2. Protocol all but the most complex ultrasound procedures and direct the technologists to perform appropriate additional views as needed.
3. Overall improved recognition of all of the listed entities within the appendix.
4. Review the history of the patient for whom an ultrasound procedure has been ordered and determine the appropriateness of the study requested with rare assistance from the faculty.
5. Interpret ultrasound examinations using the PACS or independent workstations.

### **B. Medical Knowledge**

At the end of the mid-level rotations in ultrasound, the resident will demonstrate that he or she has mastered all knowledge of an early-level resident in addition to:

1. At least two thirds of the medical knowledge topics identified as Appendix - 2.
2. Show further understanding of various diseases processes, anatomy, and aging changes.
3. More advanced physics of ultrasound, including doppler shift principle, doppler angle, and various useful artifacts, ie. shadowing, posterior enhancement, and ring down.
4. Elements of an advanced ultrasound reports, including proper descriptive terms for more complex abnormalities than would be used by an early rotation resident.
5. Expanded recognition of variations in the ultrasound appearance of common abnormalities such as:
  - Hepatic cirrhosis
  - Primary abdominal and pelvic neoplasia
  - Transplant organ viability
  - Simple and complex cystic lesions and collections
  - Gallbladder diseases
  - Thyroid nodule and nodal survey assessment
  - Spectral and Color doppler analysis of various vascular structures
  - Obstetrical and Gynecological ultrasound, with greater understanding of normal and abnormal presentations

6. Improved performance on national or departmental in-service exams.

### **C. Practice-based Learning and Improvement**

At the end of the mid-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Engage the faculty in more advanced discussion about the resident's own preliminary interpretation of the case and, conjointly with the faculty attending, involve other attending physicians for second opinions.
2. Document with increasing sophistication any potential procedural or other complication in the medical record using the appropriate hospital risk management system with minimal/occasional need for assistance from the faculty (applies to Professionalism also).
3. Bring cases to show other residents as unknowns for the departmental case conference(s). Be prepared to discuss the findings with a specific focus on "why the case is challenging to most of us" and play an active role in instructing the more junior residents.
4. Participate in the department's QA/QI conference by actively suggesting and discussing cases with a moderate degree of sophistication.
5. Maintain a procedure log detailing all invasive procedures performed by the resident including his or her role, complications, preceptor name, and date. This will be primarily be performed under the supervision of the IR radiology staff, and occasionally US staff.

### **D. Interpersonal and Communications Skills**

At the end of the mid-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Communicate with the technologist about any special or additional views that should be obtained to demonstrate the pathology identified with little assistance from the faculty.
2. Generate a coherent, logical report reflecting the review session and discussion with the radiology faculty for most cases without assistance.
3. Maintain his or her commitment to communicate to the referring physician on the day of the exam any significant or unexpected abnormalities identified on the examination AND document in the report who was called on what date and time.
4. Discuss the findings and literature for complex cases at the departmental case conference(s), and teach the more junior residents.
5. Explain all procedures to patients and their families and obtain informed consent with minimal assistance from the faculty for all but the most complex invasive procedures (if this is consistent with specific departmental policy for that procedure).
6. Confidently determine if the clinical situation/scenario for specific patients warrants the study requested, and offer alternatives after discussion with the faculty.

7. Accurately, logically, and concisely present findings at Tumor Board or other multidisciplinary interdepartmental conferences, and answer questions with some assistance from the radiology faculty in attendance.

**E. Professionalism**

At the end of the mid-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Arrive on time and fulfill the clinical and educational tasks necessary as part of the daily routine. This includes looking up relevant articles, completing background reading, attending all intradepartmental conferences and representing the department at those interdepartmental conferences relevant to the ultrasound services.
2. When consulting with referring physicians or house staff, recognize his or her own limitations and seek input from radiology faculty.
3. Obtain informed consent for an invasive procedure with greater independence than an early rotation resident (if this is consistent with specific departmental policy for that procedure) including doing so compassionately and without ethnic, religious, or sexual bias, explaining the procedure's risks, benefits, alternatives, and addressing all of the patient's concerns.
4. Comply with HIPAA and all state confidentiality rules.
5. Comply with all IRB rules (if the resident has become involved in research by their mid-level rotation).
6. Proactively collect information for all multidisciplinary conferences such as the institutional Tumor Board and the Armed Forces Institute of Pathology.
7. Proactively contribute cases to the teaching file.

**F. Systems-based Practice**

At the end of the mid-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Begin using the resources of our professional organizations, such as: ACR, ARRS, or RSNA.
2. Attend the teaching sessions (and win the junior resident quiz if applicable) of the local radiology society (CRS).
3. Identify systems-based operational challenges within the department and engage the faculty in discussions on how to affect changes that would be beneficial in ultrasound or the department as a whole. Work on a specific project that will benefit operations in the department or operations within the hospital.



## **Goals: advanced level rotations**

After completion of the advanced ultrasound rotations (approximately 20-30 weeks), and in addition to those goals listed for the early and mid-level rotations, the resident should show further progression with the need for little supervision, and be able to:

1. Demonstrate learning of the medical knowledge objectives cited below.
2. After determining the appropriateness of the examination and collecting the background clinical information, protocol all but the most complicated ultrasound studies without faculty assistance.
3. Understand more advanced safety principles in ultrasound, and the appropriateness of use.
4. Pre-dictate accurate, concise, and timely radiology reports on all but the most complex studies.
5. Participate in QA/QI conferences and regularly bring increasingly advanced ultrasound cases to the departmental case conference(s) and play an active role in instructing the more junior residents.
6. Perform at an average or better level on national in-service exams or the clinical/written exam administered by the American Board of Radiology.

## **Specific objectives/benchmarks advanced-level rotations**

### **A. Patient Care**

At the end of the advanced-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Even for the most complex cases, determine if an ultrasound scan is appropriate to answer the clinical question and if that scan has been ordered appropriately. Discuss with clinical teams alternative imaging techniques that may be needed and work with colleagues within radiology to optimize those studies.
2. Protocol all but the most complex ultrasound cases and direct the technologists to perform appropriate/additional views as needed.
3. Comfortably answer the technologist's questions regarding problematic ultrasound exams with only rare need of input from the attending radiologist.
5. Recognize subtle artifacts or physiological variations and the implications of those artifacts on diagnostic scan quality, and take steps to correct these deficiencies.
6. Recognize all of the entities in Appendix -1 of Medical Knowledge with a high degree of accuracy including their variations.
7. Perform ultrasound procedures with supervision, but with minimal direction by the faculty.
8. Review history of the patient for whom an ultrasound procedure has been ordered and determine the appropriateness of the study requested with no assistance from the faculty.

9. Screen patients and identify those at risk for poor visualization of structures. Make further recommendations for alternative exams or modifications of the exam protocol with no assistance from the radiology faculty.
11. Comfortably correlate ultrasound images with CT & MR images, xray, PET & SPECT in almost all instances.

## **B. Medical Knowledge**

At the end of the advanced-level rotations in ultrasound, the resident will demonstrate that he or she has mastered all knowledge of a mid-level resident in addition to:

1. All of the medical knowledge topics identified in Appendix – 2.
2. Further understanding of anatomy and the anatomic spaces compared to a mid-level resident.
3. More advanced physics of ultrasound image acquisition than a mid-level resident.
4. Expanded knowledge of principles for ultrasound studies and protocol design allowing customization of exams in all circumstances the resident may encounter.
5. Elements of an advanced ultrasound report, including proper descriptive terms for simple and complex abnormalities.
7. Expanded recognition of variations and the multimodality appearance of all ultrasound abnormalities described for the early- and mid-level rotations in addition to:
  - Multisystem diseases that affect the abdominal structures, including Tuberous sclerosis, von Hippel-Lindau, Sarcoid, malignancy, and infection.
  - Solid organ tumors of the abdomen, including hepatic, renal, pancreatic, splenic and peritoneal neoplasia.
  - Tumors and infections of the pelvis
  - Staging of various carcinoma, such as renal cell carcinoma.
  - Advanced imaging of tumors and similar entities such as complex cysts or abscess.
  - Differential diagnosis of hepatic masses
  - Tumors and inflammation of the Kidneys
  - Recognize congenital variations appropriately, ie. column of Bertin.
8. Perform at the average or better on national in-service exams or the clinical/written exam administered by the American Board of Radiology.

## **C. Practice-based Learning and Improvement**

At the end of the advanced-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Further engage the faculty in more advanced discussion about the resident's own preliminary interpretation of the case and conjointly with the faculty, involve other ultrasound faculty members for second opinions.
2. Document with increasing sophistication any potential procedural or other complication in the medical record using the appropriate hospital risk-management system.
3. Bring cases to show other residents as unknowns for the Case of the month, and be prepared to discuss the findings with a specific focus on "why the case is challenging to most of us" so as to stimulate discussion at the level of the advanced residents and faculty.
4. Participate in the department's QA/QI conference by actively suggesting and discussing cases with a high level of sophistication.
5. Continue to maintain a procedure log detailing all invasive procedures performed by the resident including his or her role, complications, preceptor name, and date, showing an increasing number or complexity as compared to a mid-level resident. This will be primarily performed under the supervision of the IR radiology staff, and occasionally US staff.

#### **D. Interpersonal and Communications Skills**

At the end of the advanced-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Communicate with the technologist about any special or additional views that should be obtained to demonstrate the pathology identified.
2. Pre-dictate a coherent, logical report which agrees with the faculty's findings discussed in the review session for almost all cases without assistance of the supervising faculty.
3. Maintain his or her commitment to communicate to the referring physician on the day of the exam any significant abnormalities identified on the examination AND document in the report who was called and at what date and time.
4. Discuss the findings and literature for complex cases at the departmental case conference(s), and teach all levels of residents and faculty.
5. Explain all procedures to patients and their families and obtain informed consent independently from the faculty for all invasive procedures (if this is consistent with specific departmental policy for that procedure).
6. Confidently determine if the clinical situation/scenario for specific patients warrants the study requested, and if not, logically be able to communicate other alternatives including advanced imaging studies such as CT, MRI, contrast angiography, SPECT, positron emission tomography/CT, single photon emission CT/CT or other advanced imaging studies.
7. Accurately, logically, and concisely present findings at the Tumor Board or other multidisciplinary interdepartmental conferences, and answer questions with no assistance from the radiology faculty in attendance.
8. Continue reporting critical test results.

## **E. Professionalism**

At the end of the advanced rotations in ultrasound, the resident will demonstrate that he or she can:

1. Arrive on time and fulfill the clinical and educational tasks necessary as part of the daily routine. This includes looking up relevant articles, completing background reading, attending all intradepartmental conferences and representing the department at those interdepartmental conferences relevant to the ultrasound service.
2. When consulting with referring physicians or house staff, recognize his or her own limitations and seek input from radiology faculty.
3. When necessary, obtain informed consent for an invasive procedure with greater independence than a mid-level resident (if this is consistent with specific departmental policy for that procedure) including doing so compassionately and without ethnic, religious, or sexual bias, explaining the procedure's risks, benefits, alternatives, and addressing all of the patient's concerns.
4. Comply with HIPAA and all state confidentiality rules.
5. Comply with all IRB rules.
6. Play an expanded role in interdepartmental multidisciplinary conferences and conferences such as for medical and surgical house staff educational sessions.
7. Continue to contribute teaching file cases and teach more junior residents and medical students with the saved cases.
8. Complete all Chief Resident assignments relevant to ultrasound imaging or the department as a whole.

## **F. Systems-based Practice**

At the end of the advanced-level rotations in ultrasound, the resident will demonstrate that he or she can:

1. Comfortably use the resources of our professional organizations, including: ACR, AUR, ARRS, or RSNA.
2. Continue to attend the teaching sessions (and win the senior resident quiz if applicable) of the local radiology society (CRS).
3. Complete a systems-based practice project.
4. Attend a national meeting such as the Association of University Radiologists or ACR where educational, administrative, or economics issues are reviewed.

## APPENDIX - 1

ABDOMEN US
- liver
- gallbladder
- common bile duct
- kidneys
- spleen
- vasculature – portal vein, hepatic vein, artery, splenic artery/vein

PELVIC US
- uterus and endometrial stripe
- ovaries
- adenexa

- Obstetrical (at Mercy Hospital)
-----------------------------------

SCROTAL US
------------

- testes
----------

- epididymis
--------------

- color and spectral doppler of testes
----------------------------------------

PERIPHERAL VASCULAR
---------------------

- dvt
-------

- color and spectral doppler
------------------------------

- upper and lower extremity
-----------------------------

RENAL
-------

- kidneys
-----------

- bladder
-----------

- color and spectral doppler of renal artery and vein
-------------------------------------------------------

NEONATAL
----------

- head
--------

- abdomen
-----------

- extremity
-------------

- chest
---------

TRANSPLANT
------------

- kidney
----------

- liver
---------

- pancreas
------------

Aorta and bifurcation vessels – color and spectral doppler
------------------------------------------------------------

IVC and bifurcation vessels – color and spectral doppler
----------------------------------------------------------

## APPENDIX – 2

### Abdomen Ultrasound

1. Normal Ultrasound Anatomy
2. Intra and retroperitoneal tumors, collections
3. Liver Pathology: steatosis, hepatitis, cirrhosis, tumors/carcinoma
4. Biliary and Gallbladder Pathology: choledocho- & cholelithiasis, cholecystitis/cholangitis, neoplasm, adenomyomatosis
5. Spleen Pathology: hemangioma, cysts, tumors, trauma, infarct.
6. Pancreas Pathology: pancreatitis, neoplasia, congenital variants
7. Adrenal Pathology: hyperplasia, tumors, hemorrhage
8. Renal Pathology: parenchymal disease, obstructive nephropathy, calculi, solid and cystic neoplasia, pyelonephritis

## Transplant Ultrasound

Normal Presentation; Rejection, Vascular, & Lymphatic complications. Other complications – Hematoma, Neoplasm, organ specific complications.

1. Transplant Liver
2. Transplant Kidney
3. Transplant Pancreas

## Genital Tract and Bladder Ultrasound

1. Normal Anatomy
2. Uterine Pathology: congenital anomalies, uterine and endometrial neoplasia, fibroids, adenomyosis
3. Ovarian Pathology: cystic and solid neoplasia, torsion, infection
4. Testes, Epididymis, and Scrotum: torsion, epididymo-orchitis, intra and extratesticular masses, trauma, infarction, collections/hydrocele, varicoceles
5. Prostate: hyperplasia, neoplasia, prostatitis
6. Urinary Bladder: congenital diverticula, neoplasia, calculi, cystitis

## Obstetric Ultrasound

1. Normal Gestation
2. First Trimester: Implantation, ectopia, abortion, fetal demise, hemorrhage, gestational trophoblastic disease
3. Fetal Measurements: IUGR, Umbilical Cord Doppler, macrosomia
4. Uterus and Adnexa: leiomyomas, cysts, placenta previa, accreta, abruption
5. Amniotic Fluid: oligo-, & polyhydramnios
6. Multiple Gestation
7. Fetal Anomalies: risk factors, trisomy 18, 21, neurological, thoracic, abdominal, extremities

## Thyroid, Parathyroid, Nodal Survey

1. Normal Anatomy
2. Nodules: Benign and Malignant characteristics, management.
3. Diffuse Disease: thyroiditis, goiter
4. Post Cancer Nodal Survey

## Neonatal Brain Ultrasound

1. Normal Anatomy
2. Congenital Anomalies
3. Infection: TORCH, meningitis
4. Ischemic Injury: Hemorrhage, periventricular leukomalacia, cerebral edema
5. Collections: Skull, extra-axial-epidural & subdural

## Vascular Ultrasound

1. Normal Color & Spectral doppler waveforms
2. Liver/Portahepatic Evaluation: portal vein, hepatic veins, hepatic artery, TIPS stent
3. Spleen: artery and vein
4. Renal: arterial stenosis, thrombosis
5. Transplant Doppler Evaluation: including arterial, venous supply and Resistive Index calculation
6. Peripheral: venous thrombosis: DVT evaluation, av fistulas, pseudoaneurysm, 7.  
Abdominal Aorta & IVC: aneurysm, thrombosis

### **I. Regularly scheduled didactic educational experiences:**

**a. See Appendix A**

**II. Radiology resident training encompasses 5 total years of training. Trainees start in the PGY2 year, having successfully completed a prelim clinical year in a medicine or surgical specialty typically. The new residents are paired with senior residents and/or attending faculty at all times. This is true for daily PACS side read out sessions and procedural skills in the interventional radiology Cath lab. As the residents progress in knowledge and skills, they are evaluated with both written and practical skills by the faculty. If deemed proficient, they are advanced to more senior levels of residency, with indirect supervision from**

**faculty. A CCC committee meeting twice a year meets and formally evaluates and decides on advancement of every resident candidate based on faculty monthly rotational evaluations and feedback. Residents do not take independent call in the first radiology year. Instead they are under the direct supervision of a senior resident and/or attending for “buddy” mini-calls in the latter part of the academic year. There are two tests given for independent ER proficiency, and once passed, the resident is allowed to take call in the PGY3 year. However, there is always an attending/fellow/senior backup for cases that need extra attention. Residents at all levels of training are responsible with a team approach to maintain the highest degree of patient care, ranging from direct interaction during procedures to indirect interaction after diagnostic testing (ie. CT/MR/Xray/US read out sessions). As residents become more proficient and senior, the supervision gradually shifts from more direct to indirect. Once the resident reaches the PGY5 year, there is a formal CCC evaluation as to competency for independent practice based on all faculty feedback.**