

Resident Core Curriculum

Obstetric Ultrasound

General Goals: The specific goals include objectives required for every level of training with graduate levels of supervision and responsibility. All aspects of obstetric ultrasound imaging are incorporated into the residency. During every training rotation, the resident will read the required literature and study the teaching file in obstetric ultrasound radiology. Over time, the resident will be progressively more proficient in performing and interpreting obstetrical ultrasounds on routine and high risk women. While gynecological and first trimester obstetrical ultrasound is also incorporated into the general adult ultrasound rotation, this rotation will provide the fourth year resident with exposure to ultrasound studies done during all three trimesters of pregnancy.

Resident Daily Work Responsibilities (OVERALL BENCHMARKS/OBJECTIVES for Self-Evaluation)

1. Residents assigned to obstetric ultrasound imaging will be available for consultations by technologists, clinicians, and other health care providers, except during conference times, when the attending faculty will cover.
2. Resident questions will be referred to the supervising faculty covering obstetric ultrasound.
3. Resident review of cases with the supervising faculty will be conducted as many times in the day as necessary to keep an efficient workflow.
4. All resident examinations will be dictated by the end of every working day.
5. Residents will check and sign his/her reports prior to final verification by supervising faculty.
6. Residents must be familiar with the operation of all ultrasound equipment.
7. Residents must acquire knowledge of radiation protection and ways to reduce radiation exposure to both patients and hospital personnel. The resident will be supervised to assure that safe practices are followed.
8. Residents will learn the fluoroscopic techniques for performing high quality, state-of-the art diagnostic examinations. Examinations will be checked before the patient leaves the department if requested to do so by the supervising faculty.
9. Residents must become proficient at detecting abnormalities demonstrated by ultrasounds and be able to generate meaningful differential diagnosis.
10. Residents will acquire an understanding of the proper preparation of patients for examinations and appropriate follow-up afterward. At the start of every working day, the resident will be familiar with the patient schedule and anticipate need for any procedures. The resident will check requisitions for the next working day to evaluate for appropriateness of the requested procedure or if additional exams/protocols need to be performed. Absent clinical indication or seemingly inappropriate requests will be clarified and discussed with the referring physician.
11. Residents will do in-depth reading and study, along with a review of teaching file cases, to become knowledgeable about the normal development and appearance of the fetus in the first, second, and third trimester.
12. Residents will serve as a secondary consultant to referring physicians regarding obstetric ultrasound imaging. This will strengthen the confidence of the resident in the very important role every radiologist must perform throughout his/her career as a consultant to clinicians.
13. Residents will become prepared to pass the certifying examination of the American Board of Radiology.
14. Residents will teach and share knowledge to medical students, radiologic technologist students, and junior residents.

15. Residents will participate in the preparation and presentation of imaging studies at the monthly Interesting Case Conference.

Supervising Faculty Responsibilities:

1. Supervising faculty will be available at all times for any questions or consultations needed by the resident.
2. Supervising faculty will review all cases with the residents before the end of the day.
3. Supervising faculty will provide the resident with constructive feedback in any problem areas encountered during the rotation.
4. Supervising faculty will verify resident-generated reports in a timely manner and inform the resident of any major changes made.

Educational Goals and Objectives (Fourth Year Residents):

Patient Care:

- Adequately explain each examination to the patient in order to ensure that the patient feels comfortable, provide patient care that is compassionate, appropriate, and effective, and answer all questions the patient may have
 - Familiarity with the operation of ultrasound equipment
 - Aware of the basic principles of radiation protection in order to reduce as much as possible the radiation dose to the patient and reduce exposure to healthcare providers
 - Develop a knowledge of the preparation and aftercare required for common and more complex examinations
 - Demonstrate the ability to recommend additional imaging studies as appropriate to better assess findings on imaging studies
 - Perform first trimester ultrasound exams, both transabdominal and endovaginal
 - Perform second and third trimester ultrasounds meeting the requirements for CPT code 76805
 - Complete an amniotic fluid index and biophysical profile
 - Continue to improve skills for performing obstetric ultrasound examinations, and tailor examinations to answer all questions being asked by the clinician; anticipate those questions that should have been asked but were not
 - Demonstrate knowledge of indications for the examinations requested (when the reason for the examination is not clear, the resident will effectively communicate with the patient and referring physician until clarified)
 - Familiarity with available medical records and how to access them for the purposes of patient care
 - Protocol cases, in consultation with the attending, to assure that the examination is appropriate and of sufficient quality to address the clinical concerns of the patient and referring physician
 - Review all studies with the supervisor faculty attending
 - Provide preliminary reports to all referring clinicians if needed before the final review of cases (when there is a significant discrepancy between the preliminary reading and final reading, the resident will notify the referring clinician immediately)
- Obtain an appropriate family history from an obstetrical patient to determine her risk for fetal anomalies

Medical Knowledge:

- Observe and learn the techniques to achieve high-quality ultrasounds
- Distinguish between normal and abnormal development and appearance of fetus in the first, second, and third trimester to level of training when presenting to the attending
- Act as a consultant in obstetric ultrasound to the clinical services
- Understand the basics of heredity/modes of inheritance and be able to estimate the risk of congenital anomaly to a current pregnancy based on family history
- Determine the risk of congenital anomalies in general and specific to populations (e.g. diabetes, specific ethnicities, women on medication)
- Determine the risk of chromosomal abnormalities as it relates to maternal age or serum screening. Understanding advantages (detection rate) and pitfalls (false positives) of maternal serum screening. Understand the selection of screening tests for genetic disorders during pregnancy
- Learn the accepted indications for prenatal ultrasound and the appropriate timing of such studies
- Learn the pathologic findings in the first, second, and third trimester and their significance with an emphasis on: assessment of fetal well-being (amniotic fluid index and biophysical profile); patterns of pathology in chromosomal abnormalities, particularly Down Syndrome; recognize the most common and significant congenital abnormalities
- Understand the risks associated with twin pregnancy

Practice-Based Learning and Improvement:

- Demonstrate appropriate follow up of interesting cases
- Research interesting cases as directed by faculty
- Identify, rectify, and learn from personal errors
- Incorporate feedback into improved performance
- Efficiently use electronic and print sources to access information
- Demonstrate evidence of independent reading and learning through use of printed and electronic resources
- Follow up on abnormal or interesting cases through personal communication with the referring physician or patient medical records
- Competent in using PACS, voice recognition systems, and the patient information systems in the daily accomplishment of the workload and instruct others in their use

Interpersonal and Communication Skills:

- Communicate with the patient at all times during the examination to ensure that patient remains comfortable
- Communicate effectively with all members of the health care team (technologists, medical students, fellows, residents, allied health providers, support staff, and attending physicians/radiologists)
- Communicate effectively the results of studies to referring clinicians whenever needed (for emergent studies, this will be accomplished in a timely manner)
- Interact with clinicians when reviewing cases and show ability to provide preliminary readings, follow up with attending radiologists, formulate a plan of complex cases, and communicate any changes to referring clinicians
- Appropriately obtain informed consent
- Produce concise reports that include all relevant information and be able to effectively convey the findings of examinations through accurate dictation of reports
- Effectively convey the findings of examinations through accurate dictation of reports

- Assist with supervision and teaching of medical and radiology technologist students

Professionalism:

- Demonstrate respect for patients, families, and all members of the healthcare team and be able to discuss significant radiology findings
- Explain the nature of the examination or findings in an examination to patients and their families when needed
- Respect patient confidentiality at all times
- Present oneself as a professional in appearance and communication
- Demonstrate a responsible work ethic with regard to work assignments
- Observe ethical principles when recommending further work-up
- Promptness and availability at work are required of every resident

System-Based Practice:

- Able and willing to participate in clinical conferences in which imaging studies are used to guide patient care/evaluations and be able to demonstrate understanding of how imaging relates to the clinical care of the patient
- Demonstrate knowledge of the ACR practice guidelines and technical standards for obstetric ultrasound
- Demonstrate knowledge of ACR appropriateness criteria and cost effective imaging evaluations
- Show ability to interact with clinicians regarding cost effective and streamlined evaluation for differing clinical entities
- Use appropriate language in communicating to clinicians through reports or consultations so proper management decisions can be made
- Thorough dictations will be made with indications, techniques, findings, and conclusions
- Dictate and correct reports in a timely fashion to avoid delay in patient disposition
- Make suggestions to improve methods and systems utilized in radiology whenever appropriate

Monitoring and Assessment of Resident Performance

The resident's progress will be monitored by the faculty on the service. Toward the end of each rotation, the resident will receive an evaluation of performance from each attending. Deficiencies or substandard performance will be discussed personally and privately with the resident and will be brought to the attention of the Residency Program Director by the attending radiologist. Residents are evaluated monthly by faculty. Resident performance is also evaluated through direct observation, case logs, multi-source professional evaluations, structured case discussion, review of patient outcomes, and other performance evaluation methods as determined.

Reading List for Fourth Year

1. William D. Middleton and Alfred B. Kurtz. *Ultrasound: The Requisites*. Mosby, 2nd Edition, 2003.
2. William E. Brant. *The Core Curriculum: Ultrasound*. Lippincott Williams & Wilkins, 1st Edition, 2001.
3. Carol Rumak, Stephanie Wilson, J. William Charboneau, and Jo-Ann Johnson. *Diagnostic Ultrasound: 2-volume Set*. Mosby, 3rd Edition, 2004.

4. Peter W. Callen. *Ultrasonography in Obstetrics and Gynecology*. Saunders, 5th Edition, 2007.

Other Requirements/Expectations

Schedule

Hours: Monday-Friday

8:30am to 5:00 pm: Prenatal Diagnosis and Treatment Center, 8th floor Hospital. Faculty supervision provided by Dr. Devereux N. Saller, Dr. Chris Chisholm, Dr. Susan Lashley, and Dr. James Ferguson.

12:00 pm to 1:00 pm: Return to Radiology department for lunch/noon lecture.

Core Knowledge Topics

First Trimester Ultrasound

- Normal findings: gestational sac appearance, size, gestational sac growth, yolk sac, embryo, cardiac activity including normal embryonic heart rate, amnion, chorion, normal early fetal anatomy/growth, crown-rump length measurement, correlation with BHCG levels and menstrual dates
- Multiple gestations (chorionicity and amnioicity), failed early pregnancy, spontaneous complete/incomplete abortion, ectopic pregnancy, blighted ovum, embryonic death, subchorionic hematoma, gestational trophoblastic disease, gross embryonic structural abnormalities, anencephaly
- Unusual ectopic pregnancy: interstitial, cervical, ovarian, scar, abdominal, rudimentary horn
- Nuchal translucency
- Chorionic villous sampling

Second and Third Trimester Ultrasound

- Normal findings: normal fetal anatomy/situs/development, placenta, biometry, amniotic fluid volume, and multiple gestations
- Anencephaly
- Oligohydramnios (spontaneous premature rupture of membranes, renal disease, fetal death, intrauterine growth retardation, infection)
- Polyhydramnios, placenta previa
- Cervical appearance and length
- Recognition of fetal abnormalities that require high risk obstetrics referral, including intrauterine growth retardation, hydrops, holoprosencephaly, hydrocephalus, neural tube defects, multicystic dysplastic kidney, hydronephrosis
- Placental abruption, placental masses, two-vessel umbilical cord, cord masses, retained products of conception
- Recognition of fetal abnormalities that require high risk obstetrics referral, including congenital anomalies/chromosomal abnormalities and syndromes such as Down's syndrome and Turner's syndrome, hydrops, congenital infections, chest masses, cardiac malformations and arrhythmias, diaphragmatic hernia, abdominal wall defects, abdominal masses, gastrointestinal tract obstruction/abnormalities, ascities, skeletal dysplasias, cleft lip/palate, complications of twin pregnancy, hydrocephaly

- Borderline findings: nuchal thickening, choroid plexus cyst, echogenic cardiac focus, echogenic bowel, borderline hydrocephalus
- Placental cord insertion site/vasa previa, velamentous cord insertion, cord prolapse, succenturiate placenta, cervical incompetence
- Umbilical cord Doppler, fetal cranial Doppler, biophysical profile
- Guidance for amniocentesis
- Placenta accrete, percreta, increta

Updated 2/1/2010