INTEGRIS

Baptist Medical Center

DIAGNOSTIC RADIOLOGY

RESIDENCY HANDBOOK

2020-2021

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INTRODUCTION

The Diagnostic Radiology Residency Program has established this Handbook as a reference and guide for residents of the Program.

The Diagnostic Radiology Residency Handbook functions as a supplement to the INTEGRIS Graduate Medical Education Handbook, which is the official policy manual for all Graduate Medical Education programs at INTEGRIS facilities. If inconsistencies are identified between this Diagnostic Radiology Residency Handbook and the INTEGRIS Graduate Medical Education Handbook, the INTEGRIS Graduate Medical Education Handbook will be the overriding document.

The Diagnostic Radiology Residency Handbook will be updated annually. Individual policies may be updated more frequently. It is the responsibility of the resident to determine that he or she is relying on the most current version of any particular policy.

ACADEMIC STANDARDS

The primary goal of this residency program is to produce residents that are capable of performing the duties of a diagnostic radiologist to the highest level possible. The main secondary goal is for every resident to pass the CORE exam. Given that academic and educational achievement is central to the mission of this residency, there are minimum academic standards for less central activities.

- ESIR: Being an ESIR resident in our program is a privileged position. Given that the ESIR program focuses on IR education, it is imperative that interested and involved residents have achieved a solid understanding and performance of diagnostic radiology. ESIR residents not meeting minimum academic standards on evaluations or scoring at or above the 50% on the ACR in service exam will be subject to remediation including an evaluation meeting between the IR representative on the residency committee, program director, and resident.
- Moonlighting: Any resident seeking to initiate or continue moonlighting is required to score at or above the 50% on the ACR in service exam. Those scoring below this benchmark may submit a remediation plan to the residency committee. If completed and approved, the resident may then be allowed to moonlight at the discretion of the program director and committee.
- Academic leave: Those residents scoring below 50% on the ACR in service exam are restricted to one period of leave and funding to present at one academic meeting per year.
- General: Residents scoring below the 30% on the in-service exam are at risk for failing the core exam. Given the centrality of a core pass, any resident scoring below 30% will be required to present a remediation plan to the residency committee and to meet with the program director at least every other week to monitor academic progress.

RADIOLOGY RESIDENTS FOR ACADEMIC YEAR 2020-2021

Raheel Anwar, MD	PGY 2
University of Oklahoma College of Medicine	
Dustin Coleman, DO	PGY 2
Kansas City University of Medicine and Biosciences	
Andrew Giorlando, MD	PGY 2
Louisiana State University School of Medicine	
Matthew Orgel, MD	PGY 2
University of Southern California, The Keck School of Medicine	
Elizabeth Gilbert, MD	PGY 3
University of Oklahoma College of Medicine	
Behrooz Masuodi, MD	PGY 3
Kashan University of Medical Science & Health Treatment Services	
Sandy Nguyen, MD	PGY 3
Texas A&M Health Science Center College of Medicine	
Matthew Weiher, DO	PGY 3
Oklahoma State University College of Osteopathic Medicine	
Benjamin Fortson, MD	PGY 4
University of Washington School of Medicine	
Noelle Reyes, MD	PGY 4
McGovern Medical School at the University of Texas at Houston	
Cindy Shi Weinschenk, DO	PGY 4
University of North Texas Health Science Center, College of Osteopathic Medicine	
Whitney Terrell, MD	PGY 4
University of New Mexico School of Medicine	
Neil Jackson, MD	PGY 5
University of Texas Medical Branch School of Medicine	
Cameron Manchester, MD	PGY 5
University of Texas Medical Branch School of Medicine	
Andrew Moore, MD	PGY 5
Tulane University	
Mertalaine Mulatre, MD	PGY 5
University of Central Florida College of Medicine	
Cole Smith, MD	PGY 5
University of Tennessee HSC College of Medicine	

PROGRAM PERSONNEL AND RESOURCES

1. Program Director: Clint Williamson, MD
2. Designated Institutional Officer (DIO): Chelsey Gilbertson, DO
3. Medical Education Manager: Shannon Thompson
4. Program Coordinator: Natasha Fanson
5. Faculty:
    i. David Bohn MD, Abdominal Imaging and Musculoskeletal radiology, Medical Student Lead
    ii. David Burger MD, Breast radiology and Fluoroscopy*
    iii. Mark Evans MD, Musculoskeletal radiology, Nuclear radiology*
    iv. Vince Farhood MD, Ultrasound and Breast radiology
    v. Vance McCullum MD, VIR, Interventional Neuroradiology
    vi. Rob Gelczer MD, Musculoskeletal radiology*
    vii. Charles Groves MD, Breast radiology
    viii. Robert Jarman, MD, General Radiology
    ix. Kerri Kirchhoff MD, Breast radiology
    x. Stephen Lee MD, VIR
    xi. Allen Molloy MD, VIR
    xii. Michael Morriss, MD, Pediatric radiology (at UT Southwestern)
    xiii. Jimmy Nguyen MD, Abdominal radiology
    xiv. Georgianne Snowden MD, Neuroradiology and Interventional Neuroradiology*
    xv. Ken Stokes MD, VIR
    xvi. Grace Thomas, MD, Breast radiology, Wellness*
    xvii. Chad Thompson, MD, VIR
    xviii. Iwan Tjauw MD, Neuroradiology, Global Health*
    xix. Ryan Trojan, MD, VIR*
    xx. Vikas Vij MD, Neuroradiology*, Cardiothoracic imaging*
    xxi. Clint Williamson MD, Body and Oncologic imaging, Physics*
    xxii. Natalie Williamson MD, Ultrasound* Body and Oncologic imaging
    xxiii. Terry Wolf, MD,
    xxiv. Tim Yates, MD,
    xxv. Sandeep Prabhu, MD, Pediatric radiology* (at OU)

    * denotes faculty member who is responsible for the educational content of that subspecialty area

6. Physics instruction: Karen Brown, MHP

RESIDENT EDUCATIONAL GOALS FOR THE PROGRAM

The purpose of the INTEGRIS Baptist Medical Center Diagnostic Radiology Residency Program is to produce knowledgeable radiologists who will provide excellent patient care and meaningful consultations for referring physicians. Our graduates will be prepared to present lectures, and discuss radiology issues at medical scientific meetings, to participate in training programs in their communities, and to advise the public on radiologic topics such as screening mammography. Our graduates will be familiar with recent scientific literature and be able to analyze articles critically, as part of an overall commitment to lifelong learning.

In the four years of residency training, the maximum period of training in any one of the nine subspecialty areas shall be 16 months. The nine subspecialty areas are neuroradiology, musculoskeletal radiology, vascular and interventional radiology, cardiothoracic radiology, breast radiology, abdominal radiology, pediatric radiology, ultrasonography (including obstetrical and vascular ultrasound) and nuclear radiology (including PET and nuclear cardiology).

Residents entering training on July 1, 2010 or thereafter must be provided appropriate clinical rotations and formal instruction in all subspecialties of diagnostic radiology and in the core subjects pertaining to diagnostic radiology (e.g. medical physics, physiology of contrast media, etc.) before taking the American Board of Radiology (ABR) Core Examination (given after 36 months of diagnostic radiology training at the end of PGY-4).

During the final year of diagnostic radiology training (PGY-5), these residents should be allowed, within program resources, to select and participate in rotations, including "general radiology," that will reflect their desired areas of concentration as they enter practice.

The following educational goals are to be distributed to radiology residents and faculty annually. Our residents will be instructed in the ACGME identified competencies, with the expectation that residents will demonstrate progressive performance improvement appropriate to his or her education level.

1. Patient Care and Procedural Skills:
    a. Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. The residents should provide patient care through safe, efficient, appropriately utilized, quality-controlled diagnostic and/or interventional radiology techniques. The resident must communicate effectively and in a timely manner the results of procedures, studies, and examinations to the referring physician and/or other appropriate individuals.
    b. Practice performance measurement:
        i. Global faculty evaluation (to include evaluation of knowledge about safety issues such as radiation doses, MRI safety, correct patient-exam site verification)
        ii. Case/procedure logs

RESIDENT EDUCATIONAL GOALS FOR THE PROGRAM (CONTINUED)

iii. Direct observation of selected procedures and other critical processes (such as obtaining informed consent)
iv. 270 or 360 degree evaluations

2. Medical Knowledge
    a. Residents must demonstrate knowledge of established and evolving biomedical, clinical, and epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. Residents must demonstrate competence in their knowledge of the subspecialty clinical didactic content and general didactic content.
    b. Practice performance measurement:
        i. Global faculty evaluation (which includes the six competencies)
        ii. Yearly objective testing (mock boards, ABR in-service examination, ABR core examination, RadExam)
        iii. Journal club participation with emphasis on skills accessing, interpreting and applying best evidence in the radiology literature to patient care.

3. Practice-Based Learning and Improvement
    a. Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.
    b. Practice performance measurement:
        i. Global faculty evaluation
        ii. Documentation of participation in quality assurance and regulatory activities

4. Interpersonal and Communication Skills
    a. Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents are expected to communicate effectively with patients, colleagues, referring physicians and other members of the health care team concerning imaging appropriateness, informed consent, safety issues and results of imaging tests or procedures.
    b. Practice performance measurements:
        i. Global faculty evaluation
        ii. 270-360 degree evaluations
        iii. Evaluation of quality of radiology reports
        iv. Direct observation of communication issues (e.g., informed consent, speaking with patients about adverse events or outcomes of imaging tests, consultations with referring clinicians, interactions with non-physician members of the health care team.)

RESIDENT AND EDUCATIONAL GOALS FOR THE PROGRAM (CONTINUED)

5. Professionalism
    a. Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles, and sensitivity to a diverse patient population. Residents are expected to commit to high standards of professional conduct, demonstrating altruism, compassion, honesty and integrity. Residents must follow principles of ethics and confidentiality and consider religious, ethnic, gender, educational and other differences in interacting with patients and other members of the health care team.
    b. Practice performance measurements
        i. Global faculty evaluation
        ii. 270-360 degree evaluations
        iii. Verify status of medical license
        iv. Documentation of compliance with institutional and departmental policies (e.g., conference attendance, HIPPA, TJC, dress code)

6. Systems-Based Practice
    a. Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents will understand how the components of the local and national healthcare system function interdependently and how changes to improve the system involve group and individual efforts. Residents will optimize coordination of patient care both within one's own practice and within the healthcare system. Residents will consult with other healthcare professionals, and educated healthcare consumers, regarding the most appropriate utilization of imaging resources.
    b. Residents must participate in program specific and institutional quality improvement and patient safety activities. Participation will include bimonthly Patient Safety/Process Quality Improvement committee meetings, and participation in other committees, such as radiation safety committee, medical staff committees and review of complications and deaths.
    c. Practice performance measurements:
        i. Global faculty evaluation
        ii. Documentation of resident participation in analysis of systems-based problem
        iii. Documentation of active participation in multi-disciplinary conferences.

How to Train to be a Radiologist

- To develop expertise, you must train like those who have developed expertise. Experience alone will not develop expertise.

- Radiology is the skill of transforming images into a clinically useful report while managing the workflow of the reading room and dealing with calls and clinical consultations. It is this skill that must be practiced and developed at work. In order to do this, you must practice the skill at the edge of your ability.

- Simply performing the skill repeatedly will not lead to expertise. You must deliberately practice. This means remaining 100% focused during interpretation, purposely working your checklist for each exam, and receiving feedback about points of failure.

- If you aren't making mistakes you're not training hard enough. It is through the process of error correction that progress is made.

- The resident's role is to interpret exams to the point errors are made. Staff's role is to detect the errors and evaluate why the errors were made.

- The skill of radiology is developed through the refinement of mental models of normal and abnormal patterns on the exams. Error correction involves figuring out which portion of the mental model lead to an erroneous outcome. That portion of the model is corrected and improved, leading to a higher level of skill.

- The aim of checkouts is the refinement of skill, not the dissemination of background knowledge.

- Solid background knowledge is necessary to train effectively. This knowledge must be gained when not developing the skill.

- Background knowledge must be learned outside of the hospital. Taking time to read about a finding or disease process at work takes time away from skill training.

- Similar focus should occur during knowledge acquisition. Aim for study efficiency rather than volume.

- Do at least 3 focused 20-minute sessions per night in which you focus on what you're learning and think about how it fits with your framework of knowledge. Aim to finish a foundational book (Core Radiology or Brant and Helms) by February of your first year.

- Review notes of problem areas before bed as sleep is the time when the brain transfers items from short term to long term memory.

- The first time you rotate through an area (CT, NM, US) focus on reading as many of those exams as possible during the day. At night focus on learning the details of that chapter in the book you're reading. Use the radexam at the end of the month to evaluate your performance. Aim to at least match the national mean.

- By the time you take buddy call you should be able to do 5 CT reports per hour minimum.

- Ask for feedback regarding your workflow, efficiency, dictations, and mental model of radiology.

- After the completion of a foundational book, focus on specialty books in each area: requisites have many good books.

Common mistakes made by first year residents

- Do your last check out of the morning or afternoon at least 30 minutes before lecture.
- Proofread your reports
- Don't forget to list comparisons.
- Look up the history in the chart
- Create an atmosphere of mutual respect with the techs
- Call report or check out stat cross-sectional exams in less than 30 minutes.
- Log your studies monthly
- Take care of QI and scholarly activity early
- Form your own checklists and memorize them.
- When comparing lesions across exams state the current and prior size. Include series and image number on the current exam.
- Make sure to document calling critical or significant unexpected findings with whom they spoke to and date/time.

DAILY WORK SCHEDULE

7 am Teaching file review (most often computer based) – recommended

Interventional service

Conferences:

Breast conference – Covered by the Mamms resident(s)

Radiology Pathology conference – coverage assigned by the Coordinator

Liver Transplant conference – Covered by residents who have completed at least 1 rotation at ICIO

GI conference – Covered by ICIO resident

GU conference – Covered by ICIO resident

Lung conference – Covered by ICIO resident

Stroke conference

8 am - 5 pm Most days

Call: Call resident will begin their day at 8 am (or at 7 am if required by a conference or rotation requirement) and work until 8 pm.

Night shift: Night shift resident will begin their shift at 8 pm and work until after checkout the following morning (approximately 8:30 – 9:30 am)

Beginning in September first year residents who have had a fluoroscopic rotation will begin rotating Saturday and Sunday morning coverage 8 am-12 pm. This includes performing any fluoroscopic exams, reading plain film and ER inpatient CT/US.

Weekend and holiday: One resident will work 8 am-8 pm and a second resident will work 8 pm-8 am (approximately, following checkout).

First year weekend call expectations include: reading as many cross-sectional imaging exams as possible during their time at work - to be checked by staff. Be mindful of "STAT" exams or those with life threatening positive findings (i.e. P.E., dissection, etc) and have staff check those out immediately. If you are caught up, grab plain films (CXR, Abd., MSK) to hone your skills. You may also be required to performed flouro exams on occasion. If Lakeside US calls you to read exam, make sure you call results after checking out with staff.

Vascular/interventional rotation may have later finishing times. The residents are expected to stay to complete work in progress. Residents are expected to check in with VIR staff about the day's work list and responsibilities. All fluoroscopic procedures completed prior to 4 pm conference must be checked out with staff and dictated prior to the performing resident leaving for the day.

If a fluoroscopic study will extend into the evening/night hours, the resident who started the exam must discuss the case with the resident on call and leave a detailed note detailing pertinent findings seen so far, indications for exam, altered anatomy due to surgery, etc.

RESIDENCY ROTATIONS

Overview:

Residents are assigned to one specific rotation per month but may occasionally be asked to assist with other services. If two procedures are scheduled on a service simultaneously, a resident may ask one of the other residents to help. Please ask the other resident directly.

While residents have a specific rotation assignment each month, it is expected that a spirit of teamwork and a desire for learning by doing will lead each resident to interpret studies outside his or her specific rotation in response to shifting examination volumes.

The sections that follow describe the expectations for residents during each rotation.

PLAIN FILM ROTATION

The goal of this rotation is to increase a resident's competency and efficiency in the interpretation and reporting of plain film examinations.

- The shift starts at 6 am. From that time until 8 am, the resident is to read as many plain film exams as possible.
- Chest X-rays are anticipated to compose the majority of exam type read. The resident is to make sure and read lesser common exams such as abdominal X-rays and paranasal sinus films in order to increase the scope of exams interpreted.
- At 8 am, the resident is to split their drafts among all staff in the Baptist reading room for check outs.
- After the initial plain film check out, the resident is to function as a general reading room resident with a focus on stat and inpatient cross sectional exams.
- The shift ends at 3 pm. If the resident leaves the hospital, he or she is then required to remotely attend the 4 pm lecture via Zoom.

FLUOROSCOPY

These residents must be in the department and ready to perform studies at 8 am. These residents will:

1. Perform all barium swallows, dysphagiagrams, upper GIs, small bowel studies, barium enemas (or the same studies when gastrografin or Omnipaque is used).
2. Interpret accompanying abdomen or acute abdomen series when a patient comes for a fluoroscopic study.
3. Interpret intraoperative studies, including cholangiograms, retrograde pyelograms, cystograms, etc.
4. Perform all intravenous urograms, sialograms, cystograms, arthrograms, myelograms, retrograde urethrograms performed in the Radiology Department.
5. Perform or assist in all hysterosalpingograms.
6. **Read as many ER studies as possible, with emphasis on chest, abdominal and musculoskeletal imaging.**
7. Be familiar with the fluoroscopy manual.

It is expected that residents will work together in a cooperative manner to ensure each resident has a fair share of the workload and an adequate exposure to many kinds of fluoroscopic studies. **When the fluoroscopic schedule is caught up, it is expected that the residents on the fluoroscopy rotation will interpret examinations from other modalities such as CT, US or plain film.** It is expected that residents will not leave the hospital for the day until the fluoroscopy studies they performed have been checked out by staff and dictated. If a study (such as a small bowel exam) goes beyond 4 pm, the resident who began the study must discuss the case with the on call resident and leave a detailed note prior to leaving the hospital for the day.

Fluoroscopic examinations on pediatric patients MUST be reviewed with staff prior to releasing the patient from the department, particularly if the resident performing the examination has yet to do a pediatric radiology rotation.

Please try to get NICU patients back to the floor as soon as possible, preferably staying in the department for less than an hour.

The staff members of the residency committee have decided that in order to increase patient safety by decreasing the risk of aspiration, if there is a large amount of gastrografin residual in the stomach following a fluoroscopic study, the resident performing the examination should place an NG tube and remove as much gastrografin as possible.

ULTRASOUND

1. Interpret ultrasound exams at BMC, Yukon, and ICIO.

2. Learn to operate ultrasound equipment. Specifically, to understand the use of variable transducers as they relate to types of exams.

3. Perform routine examinations with a senior technologist present.

4. Attend all ultrasound department conferences.

5. Prepare interesting cases for presentation. Resident must prepare at least four interesting cases to present to other residents during their resident conferences.

6. As with all rotations, if US volume is low, the resident is expected to read studies from other services.

7. First year residents are expected to scan patients and check out those cases with staff. Other year residents are strongly encouraged to scan patients as well. You should spend at least 1 week a year performing exams as the schedule allows. This can be arranged through ICIO technologist, Brooke Salpino, at 733-9599.

IBMC CT and US Biopsy Service (revised May 2018)

The biopsy service can be difficult to manage. The cases can be difficult and the staff approving the biopsy may not be the attending physician that is performing or staffing the biopsy. Unfortunately, not every diagnostic radiologist or interventional physician will agree about approach, technique, feasibility, and sometimes the necessity of the biopsy. Clinical acumen develops when you are most uncomfortable. Hopefully, the following guidelines/approach/rules of engagement to every biopsy will help.

1. Respect the referring physician. They chose us to do perform a biopsy on their patient. They did not have to send their patient to us. I think it is excellent practice to call the referring physician post biopsy. It's a simple way to show we care and that we are the best choice for their patient. If we are not approving or cancelling a biopsy it is our job (resident/staff) to call and explain why. Do not ever leave the decision to say no in the hands of our coordinators.

2. Review prior imaging. Do not just look at the recent CT/PET/MRI. Make sure you agree with the read. Prove to yourself that each and every lesion you biopsy needs to be biopsied. This should be done long before the patient arrives. Whoever staffs the biopsy should not be reinventing the wheel when the patient arrives to the department. You are team with your staff attending. The resident needs to be the team leader. Sometimes you will find what was ordered may be difficult to biopsy but a thorough review of the imaging reveals a ''chip shot" elsewhere.

3. **Review the order.** The order and any special stains/cultures/requests should be readily available. A printed copy of the order should be behind the consent.

4. Prior cancer history. Check the patient's record. If the previous path was done elsewhere ask the patient where. They may or may not know. It helps pathology know where to start if they need to compare slides. Again, should be done before the patient arrives.

5. Infection. Not everything is cancer. If you get pus, send it for culture. If you don't get cancer then be thinking infection. Sometimes there are both in the same lesion.

6. Rounding. If we have a complication, we will handle the complication. If we need to admit, then we admit. If we need a hospitalist to help then we will assure them we will handle the IR aspect. You MUST see the patient daily before the day starts.

7. Staff. Ideally, you will know how many biopsies are going to occur on any given day. The earliest will start at 0830. An effort should be made the day before to review the cases for any given day. This should be feasible when Trojan, Molloy, or Thompson is in the reading room. I recommend having the imaging pulled up to review the "next's day cases 30" before afternoon conference and to approve new biopsies too. The planning will lead to less anxiety about a biopsy one of us did not approve or disagree with etc.

8. Patients. The patients are generally in IR for the first step in devastating news. Confidently state risks and limitations of the biopsy. It is important to remain confident even when there are risks that make you nervous. You are no longer an intern. Welcome to your life as a future attending.

9. Families. Update family members constantly.

10. Cores. IBMC is unique in that we have cytopathologists for our biopsies. You will not likely have this luxury in your future job. The trend has been for more cores. Learn how to use core needles.

11. Consent. Your patients MUST be consented 25 to 30 minutes before their start time. Help out the nurses how you can. Is CT ready? Is US ready? Do not start your day late. Do not delay the day of the IR nurses. The day is staffed based on number and type of cases. If we start cases late, then extra nurses get called in, overtime gets paid, administrators ask questions, etc.

12. Medications/labs. You better review if the patient is on blood thinners. You better know the relevant labs. SIR guidelines are printed in the department.

With this change, the rotation responsibilities would be as follows:

Fluoroscopy	Biopsy
All fluoroscopic examinations (except lumbar punctures and myelograms) including: • GI exams • GU exams • Sniff test • Portogram • Joint injection • Arthrogram	• All image-guided biopsies • Lumbar puncture • Myelogram

We also suggest that, in order to ensure that new first-year residents receive some lumbar puncture training prior to starting weekend morning call in September, one first-year resident from the fluoro rotation will participate in lumbar punctures alongside the biopsy resident. This will only be necessary on the first-year resident's fluoroscopy training month at the beginning of the academic year, where there are two first-years and one second-year assigned to the fluoroscopy rotation.

NUCLEAR MEDICINE
INTEGRIS CANCER INSTITUTE of OKLAHOMA

1. The resident will sit at ICIO and read all nuclear studies from ICIO, BMC, Edmond, and Yukon. If all nuclear studies are caught up, read CT's from ICIO.

2. Visit the OU nuclear pharmacy in third year before core prep and complete the checklist for Authorized User certification.

3. Check general nuclear medicine exams with ICIO techs to determine the need for SPECT-CT.

4. Attend and maintain a record of **all** thyroid therapy cases. Do not stop after achieving the 6 NRC required therapies.
   You must perform 3 low dose and 3 high dose I-131 therapies (NRC regulations). You must maintain accurate logs regarding these therapies.

5. Residents will be assigned over the year to shifts in the hot lab at BMC. During this time residents will participate both in general and nuclear cardiology.

6. Rotations in the general nuclear medicine hot lab will start at 7 am and include:
- Learn to perform quality control procedures in nuclear medicine.
- Learn how the nuclear medicine instruments work.
- Participate in the performance of the day's scheduled exams.

7. Rotations in nuclear cardiology will include:
- Quality control
- Instrumentation and protocol
- Participating in the performance of stress tests
- Participating in the interpretation of stress tests

8. As in all rotations, if work volume on Nuclear Medicine is slow, the resident is expected to read studies from other services, such as CT, US, fluoroscopy, or plain film.

9. Present at all ICIO multidisciplinary conferences that occur during the month.

Nuclear Regulatory Compliance

ABR training in nuclear medicine - compliance with NRC regulations

The U.S. Nuclear Regulatory Commission (NRC) has established guidelines for physicians who wish to achieve the status of Authorized User (AU) of radioisotopes. The ABR is committed to compliance by:

1. Providing information about the required components of training and experience
2. Requiring from program directors a written attestation that the proper training has been given, and a case log of I-131 therapy work experience supervised and attested to by appropriate AU-preceptor(s); and
3. Testing knowledge of the required subjects

The ABR requires a resident training program to fulfill the NRC requirements for training and experience of radiology residents as does the Diagnostic Radiology Residency Review Committee (see reference to these requirements below). The ABR endeavors to meet those requirements within the context of an overall balanced radiological curriculum and with a set of didactic, laboratory and clinical experiences in nuclear medicine that ensure safe and effective use of radionuclides by board-certified radiologists. The ABR believes that these items are important components of a responsible education for radiologists and that they contribute to the safety of medical practice in ways that are broadly supported by organized medicine, regulators, and the public.

NRC training and experience requirements

Candidates seeking certification for diagnostic radiology must meet the specific training and experience requirements described in 10 CFR 35.290 (c)(1)(i) and (c)(1)(ii); 10 CFR 35.392 (c)(1) and (c)(2); and 10 CFR 35.394 (c)(1), (c)(2), and (c)(3). Radiation safety, radionuclide handling and quality control, and related topics specified in 10 CFR 35.290, 10 CFR 35.392, and 10 CFR 35.394 must be covered.

Detailed information regarding 10 CFR 35.290, 35.392, and 35.394 may be found via the NRC Electronic Reading Room, which provides access to the NRC Regulations, Frequently Asked Questions and other pertinent references.

Specifically, each candidate for AU status through the ABR pathway must have completed a minimum of 700 hours of training and experience in imaging and localization studies, which must include 80 hours of classroom and laboratory training in basic radionuclide handling techniques applicable to both the medical use of unsealed byproduct material for imaging and localization studies and the medical use of sodium iodide I-131 for procedures requiring a written directive. In addition, each candidate must also meet the training and experience requirements specified in §35.392 and §35.294 for medical uses of radioiodine I-131 (≤33 mCi and >33 mCi, respectively) requiring a written directive. The training and experience must include, at a minimum, the following:

1. Classroom and laboratory training (minimum of 80 hours) under the direction of an Authorized User in the following areas:
   a. radiation physics and instrumentation
   b. radiation protection
   c. mathematics pertaining to the use and measurement of radioactivity
   d. chemistry of by-product material for medical use
   e. radiation biology

Nuclear Regulatory Compliance (continued)

2. Work experience for imaging and localization studies (§35.290) under the supervision of a preceptor AU who meets the requirements in §35.57, §35.290, or §35.290(c)(1)(ii)(G), or equivalent Agreement State requirements, involving the following:

    a. ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys
    b. performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters
    c. calculating, measuring, and safely preparing patient or human research subject dosages
    d. using administrative controls to prevent a medical event involving the use of unsealed by-product materials
    e. using procedures to safely contain spilled radioactive material and using proper decontamination procedures
    f. administering dosages of radioactive drugs to patients or human research subjects
    g. eluting generator systems appropriate for preparation of radioactive drugs for imaging and localization studies, measuring and testing the eluate for radionuclidic purity, and processing the eluate with reagent kits to prepare labeled radioactive drugs
    h. Residents **must demonstrate hands-on work experience** when they perform the supervised work experience requirements. **Observation alone is not sufficient.**

3. Work experience for the oral administration of sodium iodide I-131 (§35.392 and §35.394), requiring a written directive:

    A. Experience under §35.392 must be obtained under the supervision of an AU who meets the requirements in §35.390, 35.392, 35.394, or equivalent Agreement State requirements. A supervising AU who meets the requirements in §35.390 (b) must also have experience in the oral administration of sodium iodide I-131, for which a written directive is required.

    This work experience must involve the following:

    a. ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys
    b. performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters
    c. calculating, measuring, and safely preparing patient or human research subject dosages
    d. using administrative controls to prevent a medical event involving the use of unsealed byproduct materials
    e. using procedures to safely contain spilled radioactive material and using proper decontamination procedures
    f. administering doses to patients or human research subjects that include at least three cases involving the oral administration of ≤33mCi of sodium iodide I-131 and three cases involving the administration of >33mCi of sodium iodide I-131.

Nuclear Regulatory Compliance (continued)

I-131 case experience documentation

1. Regarding §35.392, the ABR requires that candidates must have completed a minimum of three cases that involve administration of ≤33mCi of I-131 for therapy under an preceptor AU who meets the requirements in §35.390, 35.392, 35.394 or equivalent Agreement State requirements. A supervising AU who meets the requirements in §35.390 (b) must also have experience in the oral administration of sodium iodide I-131 for which a written directive is required. A logbook of these therapies must be kept by the resident and submitted to the ABR in the format given below.
2. Regarding §35.394, the ABR requires that candidates must have completed a minimum of three cases that involve the administration of >33mCi of I-131 for therapy under a preceptor AU who meets the requirements in §§35.57, 35.390, 35.394, or equivalent Agreement State requirements. A supervising AU, who meets the requirements in §35.390(b), must also have experience in administering dosages as specified in §35.390(b)(1)(ii)(G)(2). A logbook of these therapies must be kept by the resident and submitted to the ABR in the format given below.

Forms to be submitted to the ABR

Two forms are available to document compliance with and completion of the required NRC training and experience. Both completed forms must be submitted on behalf of each candidate in order for the candidate to be eligible for an ABR Diagnostic Radiology Certificate with the *AU-Eligible* designation.

1. ABR Form A (Program Director Attestation)
2. ABR Form B (Candidate I-131 Case Log)

ABR Form A - Program Director Attestation

This form is intended to assure the ABR (and, thus, the NRC) that each individual candidate has completed the required training. The program director must submit an attestation form. There should not be blanket approval of a resident class, because the training and experience in NRC-related aspects of nuclear medicine may vary within the group. The decision to provide attestations should be individualized and linked to completion of the NRC curriculum by individual residents.

Under no circumstances should program directors designate as NRC-compliant a candidate who has not completed the full course of study mandated in the NRC curriculum for authorized users. False attestation of completion of training for NRC-noncompliant residents would jeopardize the reputation and integrity of the residency program, the ABR, and the Residency Review Committee (RRC) and would threaten the relationship among these organizations and the NRC.

The ABR reserves the right to audit the manner in which the residents completed the curricular requirements. Whether or not a resident completes the full NRC-mandated curriculum, **the resident must have completed 16 or more clinical weeks of nuclear medicine during the four years of training as required by the Diagnostic Radiology RRC and will be responsible to answer NRC-related questions on all ABR examinations. Time away (e.g., vacations, AFIP, etc.) cannot be counted toward the 16-week requirement in nuclear medicine.**

Nuclear Regulatory Compliance (continued)

Form B - Candidate I-131 Case Log

Because of HIPAA concerns, no data that might identify a patient are to be included on Form B.

Please note that participation in three I-131 administrations in each of the two categories is required. Because patients requiring I-131 therapy in amounts ≤33 mCi and >33 mCi present in very different clinical settings, and to assure clinical experience with both levels of I-131 administration, each set of three cases must be discrete and listed in the proper category. Thus, administered amounts of I-131 in each category, ≤33 mCi and >33 mCi, must actually be within the appropriate category in the case log. Administered activity >33 mCi of I-131 cannot be used in the category designated for ≤33 mCi of I-131 or vice versa.

Both Form A and Form B are to be submitted by the program director prior to a resident's graduation.

ABR examinations and the NRC curriculum

The NRC accepts ABR certification as evidence that a practitioner is properly trained to safely and effectively use radioactive materials in nuclear medicine. Content addressing safety and the handling of radioisotopes as specified by the NRC-required curriculum is embedded in the ABR examinations leading to initial certification in diagnostic radiology, including the Core and Certifying examinations.

A candidate's performances on the NRC-related portions of the Core and Certifying examinations jointly comprise the Radioisotope Safety Exam (RISE). The results of the RISE will be determined after a candidate successfully completes and passes the Certifying Examination.

The ABR recommends that all residency programs ensure that their training in nuclear medicine is compliant with all the elements listed by the NRC and on the ABR website. In this way, all residents will be well prepared and qualified to take the NCR-related portions of the ABR exams, and also will be well prepared to provide nuclear medicine services safely and effectively.

The ABR *AU-eligible* certificate in diagnostic radiology

The preceding ABR forms do not have to be completed for a resident to take the ABR exams. Timely submission of the ABR forms, however, documents completion of the required NRC training and allows candidates who fulfill all the requirements listed above on Forms A and B and who pass all their ABR exams, including the RISE content, to receive an ABR certificate that contains the additional designation of *AU-eligible*. This designation will appear near the left lower corner of the certificate.

If Forms A and B are not completed and submitted to ABR for a candidate, *AU-eligible* certificate designation will not be possible, even though the NRC-required training and experience may have been completed, and the examinations passed by the candidate.

Nuclear Regulatory Compliance (continued)

An *AU-eligible* certificate indicates that the diplomat has fulfilled all the training and experience requirements of the NRC and has passed all the ABR examinations. It means that the person is eligible through the ABR board certification pathway to be approved by the NRC as an Authorized User (AU) of medical radionuclides for imaging and localization studies, and for oral administration of sodium iodide I-131 in amounts ≤33 mCi and >33 mCi requiring a written directive. Such a person can apply to the NRC for Authorized User status, which allows the diplomat to be listed on the institutional or practice site license and to oversee the safe and effective medical uses of radionuclides.

Authorized User status is obtained upon written application to the NRC/Agreement State and also requires submission of an NRC preceptor form that has been completed and signed by the preceptor, who must be an AU. The forms are available on the NRC website.

ABR diplomates who do not have the designation *AU-eligible* on their certificates also may apply to the NRC for status as an AU via the alternate pathway, but they will be required to provide detailed information to the NRC about their relevant training and experience.

Reference:
NRC-relevant diagnostic radiology RRC program requirements

There must be at least 80 hours of didactic (classroom and laboratory) training under the direction of an authorized user (AU). This training must include the following subjects as they relate to nuclear medicine:

a. diagnostic medical physics, instrumentation, and radiation biology;
b. patient and medical personnel safety (i.e., radiation protection);
c. the chemistry of byproduct material for medical use;
d. biologic and pharmacologic actions of materials administered in diagnostic and therapeutic procedures; and
e. topics in safe handling, administration, and quality control of radionuclide doses used in clinical medicine.

The didactic instruction and work experience must include ordering, receiving, and unpacking radioactive material safely, and performing the related radiation surveys; the safe elution and quality control (QC) of radionuclide generator systems; calculating, measuring, and safely preparing patient dosages; calibration and QC of survey meters and dose calibrators; safe handling and administration of therapeutic doses of unsealed radionuclide sources (i.e., I-131); written directives; response to radiation spills and accidents (containment and decontamination procedures); radiation signage and related materials; and using administrative controls to prevent medical events involving the use of unsealed byproduct material.

Residents must demonstrate hands-on work experience when they perform the supervised work experience requirements. Observation alone is not sufficient.

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Quality Control Procedures Worksheet

Name _____

§ 35.290 Training for imaging and localization studies

Please complete the following activities and have them attested by the nuclear medicine technologist in the laboratory and fax to 703-995-4433.

(B) Performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters;

(1) Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;

Date Completed _____ Attestation Signature_____

(2) Calibrating instruments and performing quality control procedures used to determine the activity of dosages and performing checks for proper operation of survey meters;

Date Completed _____ Attestation Signature_____

(3) Calculating, measuring, and safely preparing patient or human research subject dosages;

Date Completed _____ Attestation Signature_____

(4) Using administrative controls to prevent a medical event involving the use of unsealed byproduct material;

Date Completed _____ Attestation Signature_____

(5) Using procedures to safely contain spilled radioactive material and using proper decontamination procedures;

Date Completed _____ Attestation Signature_____

(6) Administering dosages of radioactive drugs to patients or human research subjects;

Date Completed _____ Attestation Signature_____

Attester: (must be certified nuclear medicine technologist, authorized user, Radiation Safety Officer, or certified medical physicist)

Name: _____

Title: _____

Telephone Number: _____

PHYSICS, RADIATION BIOLOGY, AND RADIATION PROTECTION

Physics instruction is required throughout all four years of residency. In the first three years, the instruction is achieved through a combination of didactic lectures given by Karen Brown, MHP, Dr. Evans, and Dr. Williamson and through participation in RSNA physics teaching modules. Prior to sitting for the CORE exam, residents Karen will come in for a 3-day physics review course. In the final year of residency, physics instruction will continue in a clinically based approach.

Residents will have additional hot lab education regarding radiation biology and protection during time assigned as a part of the nuclear medicine rotation.

RSNA physics teaching modules may be accessed at:

www.rsna.org/Physics-Modules.

Residents can become members to access this site for free by completing a questionnaire on the web site.

Residents must complete all modules and include the printed certificates in their learning portfolios. This should happen during a third year NM rotation.

The required textbook is The Essential Physics of Medical Imaging, 2nd edition, Bushberg, Seibert, Leidholdt, and Boone

Lippincott, Williams & Wilkins, 2002

Additional instruction regarding radiation biology and radiation protection is provided on http://www.radquiz.com/physics/html

INTERVENTIONAL RADIOLOGY

The spectrum of Interventional Radiology consists of Neuro-interventional, Vascular and Interventional Radiology. The following guidelines and expectations are relevant for all areas of Interventional Radiology for all residents. For those following the ESIR path additional expectations are defined.

Faculty:

Neuro-interventional Radiology:

- Dr. Georgianne Snowden

Interventional Radiology:

- Dr. Kenneth Stokes
- Dr. Alan Molloy
- Dr. Chad Thompson
- Dr. Ryan Trojan
- Dr. Vance McCollum

Neuroradiology:

- Dr. Georgianne Snowden
- Dr. Vikas Vij
- Dr. Iwan Tjauw
- Dr. Timothy Yates

Daily Rotation Guidelines, Expectations & Responsibilities:

Pre-Rotation Reading:
When beginning the rotation, the resident is expected to have a basic working knowledge of cervical, cerebral and spinal vascular arterial and venous anatomy. Resources for study are listed below in "*Recommended Reading*".

Procedural participation:
The resident on service should participate in every IR case during working hours as able per ACGME work-hour restriction guidelines. The resident is expected to review any relevant history, imaging, laboratory values, and indications for procedures the day before and be prepared to discuss these with the attending first thing in the morning each day. The resident should meet and evaluate the patient in the preoperative area prior to any procedure. Any preoperative or postoperative notes and orders should be entered by the resident under the direction of the appropriate faculty. Outpatient should be re-evaluated post-procedurally at an appropriate interval prior to discharge. Inpatients who are postoperative day #0 should be rounded on and re-evaluated in the evening prior to leaving the hospital.

Rounding:
The resident is expected to round on all IR service patients each morning before scheduled cases (Monday-Friday) as schedule allows. This should be discussed with the attending beforehand to clarify their preference. The resident should perform a focused physical exam, discuss any significant overnight events with support staff, review relevant follow-up laboratory values and imaging studies, and develop a daily assessment and plan for the patient. The resident should be prepared to discuss these patients with faculty prior to follow-up rounding as a team. The resident should enter any relevant orders, consults and/or notes at the faculty's instruction.

Clinic:
The resident should coordinate with faculty to have as much exposure to the clinic experience as possible during the rotation. This may come in the form of preoperative consultations, postoperative follow-up visits and/or routine follow-up evaluations for monitoring previously treated patients. The resident is expected to review any relevant imaging and history, evaluate the patient in consultation, develop an assessment and plan, and discuss and execute a plan with faculty. Any clinical documentation in the electronic medical record should be performed at the discretion of the supervising attending.

Hospital Consults:
The resident is expected to coordinate with relevant staff to be involved in the evaluation and workup of any consults to the IR service from the Emergency Department or Inpatient services. The urgency of seeing a patient in a timely fashion should be considered and discussed with staff. The resident is expected to review any relevant imaging and history, evaluate the patient in consultation, develop an assessment and plan, and discuss and execute a plan with faculty. Any clinical documentation in the electronic medical record should be performed at the discretion of the supervising attending.

PPL/Vacation:
As per previously established GME guidelines. Please make faculty aware of any expected absences at the beginning of the rotation.

ESIR Specific Requirements:
Call:

The ESIR resident should arrange with faculty to have some exposure during the rotation to the IR call experience. This could consist of overnight and/or weekend call. The resident should expect to participate in at least two weekend or overnight emergent call cases, most often endovascular stroke therapy, emergent treatment of ruptured cerebral aneurysms, emergent endovascular treatment for vasospasm, and emergent endovascular epistaxis treatment.

Capstone Project:
The ESIR resident is expected to utilize one of the interesting cases they participated in during the rotation to write up a Case Report. In coordination with a faculty of their choice, the resident should perform an appropriate literature review to support their learning and understanding of the given pathology and treatment modality. This data should be used to author a Case Report for submission either to an academic journal or as a poster for an academic conference.

VASCULAR AND INTERVENTIONAL RADIOLOGY

1. Work up angiography and interventional patients prior to the scheduled procedure. Inpatients should be evaluated the evening prior to the procedure.

2. Perform some CT and US guided drainages.

3. Round on and enter progress notes on all inpatients on the interventional service. Check the schedule with the interventional radiology secretary Candi (945-4232) at the end of each day.

4. Complete dictations daily after reviewing films with staff.

5. Be available via cellphone during the day.

6. **Obtain approval for vacation, in advance, from the Vascular/Interventional staff in addition to other regularly required approval.** You may take no more than 1 week vacation while on the interventional service.

7. Maintain a log of all procedures you perform. The log will include all:

    a. Vascular and interventional procedures
    b. Imaging guided biopsies
    c. Imaging guided drainages
    d. Non coronary angioplasties
    e. Embolization and infusion procedures
    f. Percutaneous introduction techniques
    g. Arthrography and joint aspirations

    Logbooks should be maintained on the ACGME web site for procedure tracking. Procedures not tracked on the ACGME web site should be recorded in New Innovations. Complications must be recorded in the log. The Accreditation Council for Graduate Medical Education requires the logs; you may need these logs to be credentialed to do certain procedures after residency. The Program Director will review the log every 6 months.

VASCULAR AND INTERVENTIONAL RADIOLOGY (CONTINUED)

8. The resident on the Vascular/Interventional service must report for duty daily at 8am. **If a 7am case is scheduled, the resident should come in early to participate in that case.**

9. The Vascular/Interventional resident should make an effort to go to the residents' conferences. However, there will be times that the resident will be involved in a case during conference times and will therefore miss conference.

10. You are required to prepare and present one Vascular/Interventional conference during the course of your rotation. This will usually be scheduled toward the end of the month. This lecture can then be given to the program coordinator as a teaching file case.

11. It is best if you read up on procedures that are scheduled the night before the procedure is to be done.

12. You will be expected to learn about:

    a. Informed consent
    b. Conscious sedation (including actions and side effects of commonly used medications and means of reversal if indicated)
    c. Sterile technique
    d. Indications, risks, benefits, contraindications and alternatives to interventional and angiographic procedures.
    e. Pre-procedure workup of patients
    f. Post procedure care
    g. Performance of angiographic and interventional procedures
    h. Procedural and post procedural pain management

13. Residents will generally observe and assist early in the rotation and will be gradually given more responsibility, up to and including performing as primary operator under the immediate supervision of one of the attending staff.

NEURO-INTERVENTIONAL ROTATION

Last Update: April 2020, Dr. Georgianne Snowden and Andrew Moore

Definition:

Neuro-interventional radiology (NIR) is an exciting, complex and evolving field utilizing expertise in neurological imaging, minimally-invasive techniques, and periprocedural care to diagnose and treat numerous pathologies of the central nervous system and adjacent structures.

Most Common Procedures:

- Diagnostic angiography
- Stroke intervention with mechanical thrombectomy
- Catheter-directed cerebral vasospasm treatment
- Arterial stenting for dissection and aneurysm treatment
- Coil embolization for aneurysm and arteriovenous malformation treatment
- Endovascular aneurysm treatment using coils, stents, liquid embolics or flow diverters
- Liquid or particulate embolic, coil or other endovascular embolization of spinal, cerebral, facial, and head and neck vascular malformations
- Emergent endovascular treatment for recurrent or refractory epistaxis
- Preoperative arterial embolization
- Carotid stenting
- Lumbar puncture, diagnostic and therapeutic
- Nerve blocks
- Kyphoplasty/vertebroplasty

Reading Room/Dictation:
At faculty discretion and direction, the resident should interpret relevant diagnostic imaging for all of the patients on the NIR service. This includes but is not limited to:

- Work-ups for stroke, arteriovenous malformation, subarachnoid hemorrhage, intracranial aneurysms and spine interventions
- Any relevant follow-up imaging both from the inpatient and outpatient settings

Recommended Reading:

The ESIR resident is expected to supplement their Textbooks:

- *Stroke Made Simple*, Dr. Nasser Razack

Online:

- *Procedure Guides*, SIR RFS Website

CLINICAL NEURORADIOLOGY ROTATION
IMAGING CENTER

General Objectives:

Diagnosis:

a. Understand relevant anatomy by CT, MR and angiography
b. Be able to describe findings in a clear and concise manner
c. Formulate logical and complete differential diagnoses
d. Recognize and diagnose common neurologic findings such as CVA, hemorrhage, tumor, herniated disc, changes related to trauma, etc.
e. Understand the indications and limitations of neuroimaging for neurological disease
f. Know how to interpret stroke imaging including ASPECT, CT perfusion, basic CT and stroke MRI
g. Know how to age hemorrhage on MRI

General Knowledge:

a. Appropriate fund of knowledge to understand clinical questions
b. Ability to protocol CT, MR exams to answer the clinical questions
c. Be able to provide "wet reading" when supervision not immediately available
d. Comprehend the role of CT and MRI in the diagnosis of CNS disease
e. Comprehend the role of various MRI sequences in the diagnosis of CNS disease
f. Generate an appropriate differential diagnosis, and when relevant provide appropriate follow-up recommendations, based on the imaging findings
g. It is strongly recommended that you review the ABR CORE study guide for topics you may feel weak in. Use this rotation to master specific areas of weakness in neuroradiology.

Practice-based Learning and Improvement:

a. Research topics for presentation at resident conferences based on cases reviewed during the neuroradiology rotation
b. Review and understand scientific evidence, participate in self-evaluation during the different stages of residency, and engage in life-long learning
c. Attendance at all reading sessions that do not conflict with conferences
d. Conduct work in an ethical, professional manner

Patient Safety:

a. Be familiar with MRI safety. Be knowledgeable on knowing resources for MR compatible medical devices.
b. Know the four MRI safety zones.
c. Know the basics of MRI safety in imaging of patients and for personnel.

CLINICAL NEURORADIOLOGY ROTATION (CONTINUED)
IMAGING CENTER

Consultation:

a. Be able to act as an effective consultant with other clinical services
b. Present cases in appropriate clinical conferences
c. Understand the specific needs of referring clinical services and anticipate these needs when protocoling exams and reporting them (for example; sinus CT's for ENT, or indications for contrast administration)
d. Be able to act as a consultant regarding imaging of "Code Stroke" patients to the involved neurologist and ER physicians.
e. Be able to accurately assign ASPECT score, interpret CTA and MRA, CT perfusion and "Code Stroke" CT heads.
f. The resident must demonstrate communication and interpersonal skills that allows for exchange of information, and collaboration with patients and clinicians

Procedural: neuro-angio and myelography, special ENT biopsies

a. Understand indications, contraindications and risks of these procedures
b. Be able to consent patient and speak with families in an informative, compassionate manner
c. Be able to perform lumbar punctures and myelography. Know contraindications. Observe and participate in fluoroscopically-guided lumbar punctures, myelograms, and chemotherapy injections
d. Perform basic cerebral angiograms with supervision of staff.
e. Learn basic catheters, wires, fluoro –radiation safety specific to these procedures
f. Interpret angiograms and myelograms and be able to recognize major arteries, veins and common pathology.
g. Round with attending on interventional patients when appropriate
h. Be able to perform femoral arteriotomy safely, knowing landmarks to use and possible complications and their treatment. Actively learn how to obtain hemostasis with manual pressure port procedure.
i. Know the indications and contraindications for Intra-arterial stroke intervention, risks, and currently used devices.
j. Know indications and risks, basic techniques of spinal angiography.
k. Know angiographic manifestations of common spinal vascular pathologies.

Workflow:

1. The resident will sit in the neuro reading slot opposite the neuroradiologist in the imaging center.
2. Exams to be read by the resident: neonatal head ultrasound, CT temporal bone/MR IAC, CT sinuses, Pituitary MRI, and pediatric MRI, all neuro from ICIO. If that is caught up, read neuro MRI from the system.

Lumbar Puncture Policy:

3. 1 LP is included in core privileges for Neurologists and other clinicians at Baptist Medical Center.
4. For Inpatients and Outpatients, an attempt at the bedside is expected by all clinicians before requesting fluoroscopic guidance as imaging guidance adds ionizing radiation and cost. Radiology will not routinely perform an LP without prior attempt at the bedside. Any physician may call a Radiologist, on a case by case basis, with any exceptions expected to have a difficult LP.[1]
5. Radiology is available to perform LP with fluoro after an unsuccessful attempt. This will be scheduled ASAP depending on the acuity of the patient and Radiology staffing.

[1] Revised June 6, 2018

CARDIOVASCULAR EDUCATION

During cardiovascular education, the assigned resident is responsible for:

1. checking the Nuclear Cardiology scheduled cases for the week and attending nuclear cardiac stress tests.
2. rotating with Heart Hospital CT scan techs to watch the Cardiac CTA technique.
3. spending time with Chasity Clark (CT technologist lead) in the mornings during cardiac CTAs. Chasity can be contacted at 405-552-0185.

Dr. Alastair Moore provides cardiac educational lectures via teleconference on a monthly basis.

Texts which are useful during the rotation are:

Pocket Radiologists Cardiac

Cardiovascular chapter in Purple Primer

CV section in Mettler

Case Review Series Cardiac

The cardiac section in the Gold Mine series is a good board review. The Thoracic Radiology website (www.thoracicrad.org) has several powerpoint lectures of approximately 20-30 minutes in length. Also, www.scmr.org has a case of the week series.

Cardiac resident will interpret **15 cardiovascular or thoracic imaging studies per day**.

Goals and Objectives:

1. Observe and perform interpretation of cardiac MR studies.
2. Observe and perform interpretation of CT coronary studies.
3. Observe and perform interpretation of nuclear cardiac studies.
4. Understand cardiac and coronary artery anatomy.
5. Increase competence in interpretation of thoracic radiograph.
6. Spend time with technologists to see how cardiac examinations are performed.

THORACIC RADIOLOGY EDUCATION

Resident Goals and Objectives

Year 1

After year 1, the resident will be able to:

1. Concisely dictate a chest radiograph report.
2. Use accurate nomenclature on reports and during consultation with referring physicians.
3. Communicate significant or unexpected findings to referring physicians, and document who was called and the date and time of the call.
4. Understand indications for PA, AP, lateral, decubitus, and lordotic chest radiographs.
5. Interpret line placement radiographs and assess for nonstandard line positions and complications.
6. Assist referring clinicians with patient management.
7. Learn the clinical indications for when a CT or MR may be necessary.
8. Protocol and interpret CT chest exams, including standard, pulmonary embolism, dissection, and high-resolution protocol exams.
9. Know when and when not to give intravenous contrast for CT scans.
10. Know when to obtain help from faculty radiologists.
11. Demonstrate a responsible work ethic.
12. Review recommended study materials, arrive on time, and display a professional demeanor.
13. Successfully perform thoracic biopsies with faculty supervision, and accurately document the procedure in a report.
14. Obtain informed consent for procedures while adhering to safety, confidentiality, and ethical protocols.
15. Demonstrate initiation of learning of the knowledge-based objectives (see addendum from *Collins et al, Academic Radiology, Vol 12, No 2, February 2005*).

Year 2

After year 2, in addition to year 1 goals, the resident will be able to:

1. Build on chest radiograph and CT interpretation.
2. Further develop skills in protocoling CT exams.
3. Monitor CT exams, and determine if additional imaging is necessary when asked by the technologist.
4. Present thoracic radiology cases to other residents and faculty in conferences.
5. Present cases independently, with staff supervision, during multidisciplinary conferences.
6. Participate in quality improvement/quality assurance, and other operational activities.
7. Manage an intravenous contrast extravasation and contrast reaction during a CT exam.
8. Know the proper ACR approved protocols for premedicating patients who have an iodine allergy.
9. Demonstrate knowledge of radiation safety and exposure, and understand CT parameters that contribute to patient radiation safety.
10. Supervise and teach junior residents and medical students.
11. Demonstrate further learning of the knowledge-based objectives (see addendum from *Collins et al, Academic Radiology, Vol 12, No 2, February 2005*).

Years 3 and 4

After years 3 and 4, in addition to years 1 and 2 goals, the resident will be able to:

1. Dictate an accurate report with no major interpretive errors.
2. Have a comprehensive understanding of various CT protocols tailored for specific indications.
3. Become a more autonomous consultant.
4. Correlate clinical information and pathologic data with thoracic imaging.
5. Work independently and be able to mentor junior residents and students in thoracic radiology.
6. Prepare and present materials for radiology and multidisciplinary conferences, and if applicable for scholarly activities.
7. Demonstrate learning of the knowledge-based objectives (see addendum from *Collins et al, Academic Radiology, Vol 12, No 2, February 2005*).

Addendum from Collins et al, Academic Radiology, Vol 12, No 2, February 2005

Knowledge-Based Objectives

Normal Anatomy.—

1. Name and define the three zones of the airways.
2. Define a secondary pulmonary lobule.
3. Define an acinus.
4. Name the lobar and segmental bronchi of both lungs.
5. Identify the following structures on the posteroanterior (PA) chest radiograph:

- Lungs—right, left, right upper, middle and lower lobes, left upper (including lingula) and lower lobes
- Fissures—minor, superior accessory, inferior accessory, azygos
- Airway—trachea, carina, main bronchi
- Heart—right atrium, left atrial appendage, left ventricle, location of the four cardiac valves
- Pulmonary arteries—main, right, left, interlobar, truncus anterior
- Aorta—ascending, arch, descending
- Veins—superior vena cava, azygos, left superior intercostal ("aortic nipple")
- Bones—spine, ribs, clavicles, scapulae, humeri
- Right paratracheal stripe
- Junction lines—anterior, posterior
- Aortopulmonary window
- Azygoesophageal recess
- Paraspinal lines
- Left subclavian artery

1. Identify the following structures on the lateral chest radiograph:

- Lungs—right, left, right upper, middle and lower lobes, left upper (including lingula) and lower lobes
- Fissures—major, minor, superior accessory
- Airway—trachea, upper lobe bronchi, posterior wall of bronchus intermedius
- Heart—right ventricle, right ventricular outflow tract, left atrium, left ventricle, the location of the four cardiac valves
- Pulmonary arteries—right, left
- Aorta—ascending, arch, descending
- Veins—superior vena cava, inferior vena cava, left brachiocephalic (innominate), pulmonary vein confluence
- Bones—spine, ribs, scapulae, humeri, sternum
- Retrosternal line
- Posterior tracheal stripe
- Right and left hemidiaphragms
- Raider's triangle
- Brachiocephalic (innominate) artery

Signs in Thoracic Radiology.—

2. Define, identify and state the significance of the following on a radiograph:

- air bronchogram—indicates a parenchymal process, including nonobstructive atelectasis, as distinguished from pleural or mediastinal processes
- air crescent sign—indicates a lung cavity, often resulting from fungal infection or saprophytic colonization
- deep sulcus sign on a supine radiograph—indicates pneumothorax
- continuous diaphragm sign—indicates pneumomediastinum
- ring around the artery sign (air around pulmonary artery, particularly on lateral chest radiograph)— indicates pneumomediastinum
- fallen lung sign—indicates a fractured bronchus

- flat waist sign—indicates left lower lobe collapse
- gloved finger sign—indicates bronchial impaction, which can be seen in allergic bronchopulmonary aspergillosis
- Golden S sign—indicates lobar collapse caused by a central mass, suggesting an obstructing bronchogenic carcinoma in an adult
- luftsichel sign—indicates upper lobe collapse, suggesting an obstructing bronchogenic carcinoma in an adult
- Hampton's hump—pleural-based, wedge-shaped opacity indicating a pulmonary infarct
- silhouette sign—loss of the contour of the heart, aorta or diaphragm allowing localization of a parenchymal process (eg, a process involving the medial segment of the right middle lobe obscures the right heart border, a lingular process obscures the left heart border, a basilar segmental lower lobe process obscures the diaphragm)
- cervicothoracic sign—a mediastinal opacity that projects above the clavicles is retrotracheal and posteriorly situated, whereas an opacity effaced along its superior aspect and projecting at or below the clavicles is situated anteriorly
- tapered margins sign—a lesion in the chest wall, mediastinum or pleura may have smooth tapered borders and obtuse angles with the chest wall or mediastinum while parenchymal lesions usually form acute angles
- figure 3 sign—abnormal contour of the descending aorta, indicating coarctation of the aorta

fat pad sign or sandwich sign—indicates pericardial effusion

MAMMOGRAPHY

All mammography at INTEGRIS Baptist Medical Center, stereotactic biopsies, ultrasound-guided biopsies, and breast ultrasounds are performed at the Comprehensive Breast Center. The resident will:

3. Participate in breast localization procedures.

4. Review all prior studies for breast localization with staff. Staff will check you, at least one, preferably two days before the procedure. Review the approach you will use with the staff. Some surgeons prefer the anterior approach unless there are complications.

    b. Show the needle localization to the staff. Draw a circle around the lesion. Label the orientation of the study.

5. Review any complications or problems immediately.

6. Review breast localization images to ensure the lesion is removed. Note the adequacy of the surgical margins.

7. Review and participate in reporting of screening studies.

8. Attend all problem solving mammography cases.

9. Participate in stereotactic biopsies.

10. Participate in breast ultrasound and ultrasound guided breast interventional procedures. Practice ultrasound guided biopsy with a phantom.

11. Participate in review and reporting of breast MR studies.

12. Practice US guided biopsies on chicken breast phantom. You may use money from your book fund to purchase the chicken.

MQSA Breast Imaging Experience Requirements

The RRC for Diagnostic Radiology requires 3 months of breast imaging. The latest RRC regulations state "There must be a minimum of 12 weeks of clinical rotations in breast imaging. Each resident should have documentation of the interpretation of at least 240 mammograms within a 6-month period within the last 2 years of the residency program."

MAMMOGRAPHY (CONTINUED)

Residents completing radiology residency must fulfill the following requirements as *initial qualifications* for interpreting mammograms:

A. Be licensed to practice medicine in at least one state.
B. Have a minimum of 60 hours of documented medical education in mammography, which shall include:
    i. Instruction in the interpretation of mammograms and education in basic breast anatomy, pathology, and physiology;
    ii. technical aspects of mammography; and
    iii. quality assurance and quality control in mammography. Hours spent in residency specifically devoted to mammography will be accepted if documented in writing by the appropriate representative of the training institution.
C. Be board certified in Diagnostic Radiology.
    i. If the radiologist has become appropriately board certified *at the first allowable time*, they must have interpreted or multi-read at least 240 mammographic examinations under the direct supervision of an interpreting physician *in any 6-month period during the last 2 years of a diagnostic radiology residency.*
    ii. If they are not board certified at the first allowable time, he or she must have interpreted or multi-read at least 240 mammographic examinations *within the 6-month period immediately before the date that he or she qualifies as an interpreting physician.* This interpretation or multi-reading shall be under the direct supervision of an interpreting physician.

PEDIATRIC ROTATIONS

13. Children's Hospital of Oklahoma: Two months General Pediatric Radiology
    The supervising attending at Children's Hospital will assign rotation duties and activities.

14. Children's Medical Center of Dallas: One month

    The supervising attending will determine rotation specifics. The rotation should include pediatric:

    - CT
    - MRI
    - Ultrasound
    - Nuclear Medicine
    - GI
    - GU
    - Radiographs
    - Cardiac ultrasound

3. **No vacation or personal time can be taken on these away rotations unless approved in advance by the IBMC Radiology Residency Program Director and the hosting site Program Director.**

4. The resident on the Dallas rotation will take four nights of call, which will not occur on a Friday, Saturday, or Sunday.

5. The other 3 weeks of the Dallas rotation will consist of a normal pediatric radiology schedule including fluoro, body CT/MR/US, MSK and neuro.

EMERGENCY RADIOLOGY

There are at least two residents on this service every month. One resident will work the night shift; the other resident will be off. Night shift begins at 8 pm and ends following checkout the next morning (approximately 9:30 am). Generally, the night shift resident will work 3 or 4 nights in a row, and the other resident will be off. Subsequently, the first resident will be off and the second resident will work. Residents can work no more than 6 nights of consecutive night float duty, as per the new ACGME common program requirements.

Call: Call resident begins in the morning at 7 or 8 am, depending upon lectures and clinical responsibilities. The call resident attends all the scheduled lectures for that day, and then works until 8 pm.

Weekend call: July and August: Call resident arrives at 8 am on Saturday or Sunday and works until 8 pm (Night shift starts at 8pm). During the rest of the year a first year will work 8 am – 12 pm and a 2-4th year will work 12 pm – 8 pm.

Workflow: Residents on call between 5-8 on weekdays and 8 am – 8 pm weekends will read in the following order: ER CT and MRI, inpatient CT and MRI, outpatient CT and MRI, ultrasound, plain film.

Call initiation: The first two months of second year will be divided such that a resident will alternate between ER buddy shifts, teaching fluoro, and CT. A standard month-long rotation will include two weeks of buddy shifts, one week of fluoro, and one week in the reading room focused on code stroke/trauma, neuro/msk MRI for infection, ER CT/MR, and MRCP. Residents will complete the call readiness Radexam at the end of August and members of the second-year class will become eligible for night float in September after clearance from the residency committee. Residents are expected to be able to read 5-6 general ER CT/MRI per hour before call initiation.

Body – MSK
INTEGRIS CANCER INSTITUTE OF OKLAHOMA

1. Sit in the body/MSK reading station across from the body-MSK staff.
2. Read all MSK MRI from BMC, ICIO, Yukon, and Edmond.
3. Read all body MRI from ICIO
4. If those are caught up, read triphase CT's from BMC, MSK CT, and MRCP from across the system.

ELECTIVE ROTATIONS

When you reach your senior year of residency you will have options for elective months. In addition to adding regular rotations to your year you can also choose among other areas of interest. You can choose among rotations previous residents have created or create your own with the Program Director's approval. If you would like to create a rotation or work with an outside physician please contact Natasha on requirements the rotation needs to cover.

Unique Past Elective Rotations:

Additional Pediatric Rotation at OU

Administrative Rotation with Tommy Ibrahim, MD, EVP and Chief Physician Executive

Global Health International Rotation in Guyana

Informatics Rotation

EARLY SPECIALIZATION IN INTERVENTIONAL RADIOLOGY (ESIR)

In the Fall of 2016 the INTEGRIS Health Diagnostic Radiology Residency Program received ESIR designation from the ACGME. The purpose of the ESIR designation is to standardize the IR training of Diagnostic Radiology residents who identify early a desire to specialize in IR. Diagnostic Radiology residents who complete approved ESIR training and satisfy the IR procedural requirements will be eligible to start in an advanced (2^{nd}) year position in the independent IR program to which they match.

1. The Program will accept no more than 2 applicants for the ESIR positions from any one existing radiology resident class
2. No more than 4 ESIR residents total can be active for any given residency year
3. ESIR residents will be selected by the Residency Committee (and a representative from Interventional Radiology if none are current members of the committee). In the case of a tie, the Program Director and Section Head for general IR will make the final decision.
4. Criteria - applicant must be a member of the residency in good standing. No resident may apply if on probation for any reason. Several factors will be taken into consideration in making the decision including, academic achievements, professionalism, case logs, ability to work as part of the team, attention to detail, work ethic. Completion of scholarly activities and/ or QI projects will be considered in a positive light.
5. Applications will be considered for those in the 2nd half of the PGY3 (2nd year Radiology) year.

Being an ESIR resident in our program is a privileged position. Given that the ESIR program focuses on IR education, it is imperative that interested and involved residents have achieved a solid understanding and performance of diagnostic radiology. ESIR residents not meeting minimum academic standards on evaluations or scoring at or above the 50% on the ACR in service exam will be subject to remediation including an evaluation meeting between the IR representative on the residency committee, program director, and resident.

POLICIES AND PROCEDURES

MISCELLANEOUS

1. Before checking a case with a staff radiologist:
    a. Obtain a history
    b. Compare study to prior relevant studies
    c. Review prior reports
    d. Review the case carefully and complete assessment
    e. Develop reasonable diagnosis and/or differential diagnosis
    f. Determine which, if any, additional studies may be helpful for problem solving
2. Call reports of significant findings directly to referring physicians. Examples: free intraperitoneal air in a patient who has not had abdominal surgery, pneumothorax, and intracranial bleed.
3. Please be aware that when you dictate CT or US guided Bx you must include in the report verbiage "inadequate FNA tissue, pathologist requested a core sample" when the charge sheet is marked for both a core and FNA BX. the word "core biopsy" must be used in the dictation to bill for that.
4. Assist referring physicians with study interpretation at night.
5. Do not leave valuables unattended.
6. Submit all receipts for out-of-town travel to the Graduate Medical Education office. The hospital maintains strict requirements for certain travel activities and documentation of all travel to obtain reimbursement. (See Travel Policy).
7. You may read your residency file at any time. The file must stay in the Graduate Medical Education Office.
8. Check and dictate any studies you have completed before you leave for the day. If you have a study, such as a SBFT, which is still in process at the close of the day, you must discuss the case with the on call and/or swing resident and leave a detailed note before you leave.
9. Residents who have to retake the CORE Exam or even condition a section will **not** be allowed study time. Residents will be allowed to switch rotations with their fellow residents' permission.
10. You are required to maintain BLS certification, ACLS certification is recommended.
11. Program specific requirements are available at www.acgme.org
12. Please remember that your handwritten notes about cases, saved images, computer-generated lists, and work logs may contain identifiable patient information. This patient health information MUST be kept confidential.
13. Use secure SPOK mobile service for transmitting any patient information to another clinician.

CLINICAL AND EDUCATIONAL WORK HOURS
(formerly DUTY HOURS)

Please refer to the Graduate Medical Education Handbook for information on Clinical and Educational Work Hours.

SUPERVISION AND RESIDENT RESPONSIBILITIES

1. The faculty is responsible for the quality of resident teaching and the quality of patient care. The Program Director is responsible for oversight of the faculty. Faculty members on call at night will be immediately available by pager, cell phone or home phone number. These numbers will be readily available to the residents on after hour's duty. The faculty call schedule will be available to the residents.

2. Residents check outs with faculty will occur at the faculty work station.

3. No resident is to perform any procedure without staff supervision until he/she has demonstrated competence in doing that procedure under staff supervision.

4. Major vascular/interventional procedures (including, but not limited to, arteriograms, biliary drainage procedures, CT or ultrasound guided biopsies, abscess drainages and nephrostomies) will be performed only under the direct supervision of the staff. Progressively increasing responsibility will be given to the resident. Prior to performing an arteriogram, the resident will review the patient's medical record and discuss the objectives with the staff radiologist. The staff radiologist and resident will both attend the arteriogram. The resident will dictate the case following discussion with the staff.

5. Myelograms, arthrograms, and other invasive procedures will also be performed under the direct supervision of the staff.

6. No other procedure including but not limited to UGI, BE, IVU, will be performed by a resident without supervision until the resident has observed the procedure multiple times, fully understands the procedure, and has performed the procedure competently while supervised. Progressively graded responsibility will be given to the resident. Initially, all residents observe fluoroscopy; after becoming familiar with the positions and routines, the resident will perform fluoroscopy with another physician in the room. Subsequently the resident will perform the procedure independently then review it with staff.

7. Each resident will have a minimum of twelve (12) full months in the program before being assigned to night independent duty. However, no one will take night call if the Program Director feels he/she is not ready. Each resident will take an exam before taking call. Before taking call each resident will spend several early evenings in the hospital to learn routines and observe the call resident at work.

SUPERVISION AND RESIDENT RESPONSIBILITIES (CONTINUED)

8. There are three staff radiologists on call, one on general radiology one on vascular/interventional radiology, and one on interventional stroke call. Each will be immediately available by pager, cell phone or home phone number. The vascular/interventional staff radiologist will come in for all vascular/interventional procedures. The general staff radiologist will come in when requested and will have a teleradiology setup at home. The resident is responsible to call the attending for any question, which requires clarification before morning for appropriate patient care. A referring physician may request that an attending review any case at their discretion.

9. At night and during certain other times, a resident may render a preliminary report when the resident is confident about the diagnosis, and the case is appropriate to his/her level of training and experience. However, **all** studies will be checked as soon as is practical by the staff and never later than the morning after the night on call. The resident is responsible to call the staff radiologist for any question, which should be answered prior to morning to ensure safe patient care.

10. If the attending report is different from the resident preliminary report, the resident must call the amended report to the patient's physician, and document this change with the physician and time notified in the report.

11. No final report will be issued until the staff radiologist has reviewed the images.

12. The staff in charge of a subject area will develop guidelines for performing procedures; the guidelines may include written curricula, manuals, handouts, conferences, and other training materials.

13. Senior residents are expected to act in a supervisory and teaching capacity toward the junior residents and medical students.

14. Residents will have faculty assess their performance on common and anticipated procedures. These assessments will be documented on forms created for this purpose. These forms are available in the GI closet and online on New Innovations. Once these forms have been completed, the resident must place them in his or her learning portfolio under "Patient Care" and these forms are also to be given to Shannon Thompson for inclusion in the resident's file.

    Following documented competence, direct supervision is **not** required for the following:

    Performance of diagnostic LP

    Performance of thoracentesis

    Performance of paracentesis

    Placement of PICC line

SUPERVISION AND RESIDENT RESPONSIBILITIES (CONTINUED)

15. Residents' abilities will be evaluated based on specific criteria. When available, national standards-based criteria will be used. It is anticipated that as "Milestones" criteria are developed by the Review Committee for Diagnostic Radiology and ABR, that those criteria will form the basis of evaluation.

Guidelines for circumstances and events in which residents MUST communicate with appropriate supervising faculty members, as related to patient care/ procedural skills

Residents must communicate in a timely fashion with appropriate supervising radiology faculty members when:

1. The resident is performing a diagnostic lumbar puncture, paracentesis, thoracentesis, or placement of PICC line. Other interventions would be performed only under direct supervision of a supervising faculty member
2. The resident is aware of a complication or possible complication of a radiology diagnostic or interventional procedure
3. The resident is aware that a patient is having or may be having a contrast reaction
4. The resident is aware that a patient has fallen or may have fallen or had a similar source of potential injury in the department
5. A non-radiology faculty member requests faculty radiology involvement, despite the best efforts of the resident to meet the physician's expectations
6. The resident has a question which will or could directly impact patient care and the resident is unable to resolve the issue in a timely fashion without faculty assistance
7. The resident should not hesitate to contact appropriate supervising faculty if patient safety is at issue

MOONLIGHTING

First-year residents are not permitted to moonlight during the first six months of residency.

Requests to moonlight will be reviewed on an individual basis. As a general guideline, the resident will be expected to be progressing as appropriate for his/her level of training. Progress will be evaluated monthly through the Radexam and every six months with the ACR in-service exam. Any resident seeking to initiate or continue moonlighting is required to score at or above the 50% on the ACR in service exam. Those scoring below this benchmark may submit a remediation plan to the residency committee. If completed and approved, the resident may then be allowed to moonlight at the discretion of the program director and committee.
Evidence of lack of progress will trigger a review of any new or continued requests for moonlighting. Fourth-year residents who fail the CORE exam are not allowed to moonlight until they have retaken the exam and shown passing results.

All moonlighting must be approved in advance in writing by the Program Director. The moonlighting request form can be found on New Innovations or requested from the Program Coordinator.

Hours spent moonlighting must be documented on New Innovations and are included in the Duty Hour restrictions and are counted towards the 80 hour maximum weekly hour limit.

Moonlighting is a privilege. The residency committee may withhold or suspend moonlighting privileges should patient safety or resident education be compromised. The residency committee has the right to withhold permission to moonlight.

See INTEGRIS Graduate Medical Education Handbook for additional information.

USE OF RESIDENCY LIBRARY MATERIALS

The Radiology Residency Library includes a large number of texts, journals, slide sets, CDs, and DVDs. Materials available in the library should be used in the library. Certain educational resources (particularly CDs and DVDs) and computer equipment are maintained in the Graduate Medical Education office and must be checked out through the Residency Coordinator. Borrowed CDs, DVDs, or computer equipment must be returned to the Graduate Medical Education office.

SCHOLARLY ACTIVITY REQUIREMENT

The Accreditation Council for Graduate Medical Education requires that all residents participate in scholarly activity during the residency program.

Residents will receive training in critical thinking skills and research design through lectures and journal club.

All residents MUST complete a scholarly project with a faculty mentor. Scholarly activity may take the form of a publication (book chapter, publications in peer-reviewed journals, and online publications, such as "ACR Case in Point") or presentation at a local or national meeting. The activity may focus on laboratory research, clinical research, the analysis of disease processes, imaging techniques or practice management issues.

The results MUST be published or presented at institutional, local, regional or national meetings.

The program does provide support such as access to the medical library, librarian assistance, physicist assistance and/or statistical assistance as needed.

The results of the scholarly activity must be included in the resident's learning portfolio for evaluation.

A routine part of the residency includes case presentations at various conferences: Radiology/Pathology, for example. Presentations should be concise thorough summaries of the patient or issue under discussion

Occasionally residents may be required to give longer lectures on various radiology topics. Upper level resident training and supervision of lower level residents and medical students is a requirement for all residents.

JOURNAL CLUB

Journal club will be on the 3rd Tuesday of every month, unless otherwise noted. Two articles will be chosen every month by the assigned resident. One should be a research article that will be reviewed with Dr. Stacia Shipman and the other can be of the resident's choosing to review with an assigned staff member. Come prepared to discuss.

The resident assigned to journal club will consult with the assigned staff radiologist to select an appropriate article to be presented. After the journal article has been agreed upon, the article is to be distributed to the other residents as soon as possible, but no later than seven days prior to the conference. It is expected that all residents will have carefully read the articles prior to the conference.

Goals of journal club:

- Acquire, disseminate, and apply new medical information
- Teach and assess critical appraisal skills for reading and writing a scientific paper
- Promote lifelong learning skills in evidence-based medicine
- Improve reading habits
- Provide an interactive and social opportunity for peer-to-peer learning
- Improve small group participation, presentation and communications skills
- Emphasis on original research articles, but good review articles also accepted
- Discussion of statistics and principles of evidence-based medicine
- Active participation with interactive discussion format

Standardized Checklist of Review Criteria

1. What type of study is this article? (consult the definitions in glossary of study design at http://www.ajo.com)
    a. Randomized or non-randomized clinical trial
    b. Interventional case series or case report
    c. Cohort study or case-controlled study
    d. Cross-sectional study
    e. Observational case series or case report
    f. Experimental study
    g. Meta-analysis of literature
2. Review the manuscript sections
    a. Title: Is the title accurate, concise, and complete?
    b. Introduction: Are the purposes of the study, the research rationale, and the hypothesis described? Is the pertinent literature reviewed and cited accurately?

JOURNAL CLUB (CONTINUED)

3. Design
    a. Methods: Is the description of the study methodology accurate, complete and appropriate? Does the method section inadvertently contain results or discussion? Do the methods adequately describe:
        i. Setting (multi-center, institutional, referral, academic, or clinical practice)
        ii. Patients or study population including patient numbers, one or both sides of the body, selection procedures, inclusion/exclusion criteria, randomization, allocation and masking
        iii. Intervention or observation procedure(s): (treatments and controls)
        iv. Main outcome measures (primary, secondary, other).
    b. Human Subject Participation in Experimental Investigations: Does the manuscript describe the approval from the appropriate Institutional Review Board (IRB) or equivalent monitoring agency? Was appropriate informed consent obtained from the patients or subjects?
    c. Use of Animals in Biomedical Research: Does the manuscript describe the animal care protocol, name the institution that sponsored the study, and identify relevant IRB approval? Does the research conform to the generally accepted principles of animal maintenance and care?
    d. Statistics: Was the statistical analysis valid? When P values are used, is the actual P value (for example P=.032) provided or is an inequality used (for example, P<.05)? In the reporting of the basic summary statistics, are the mean and standard error, as well as the confidence limits, provided to help the reader understand the conclusions of the study? Are the statistical models used (analysis of variance, covariance, multiple regressions) specified?
    e. Results: Are the outcomes and measurements provided in an objective sequence? Are the data provided in a clear and concise manner? Do the tables and figures accurately summarize the data or add to the information presented in the text? Does the data report confidence intervals (usually at the 95% interval) and exact P values or other indications of statistical significance?
    f. Discussion: Does the discussion accurately describe the results? Does it identify any statistically or clinically significant limitations or qualifications of the study? Do the authors accurately state the conclusions of the study? Are there overgeneralizations or undue speculations in the discussion? Is equal emphasis given to positive and negative findings?

Some material adapted from ACGME Bulletin

LEARNING PORTFOLIO

Each resident is required to maintain their individual learning portfolio in the binders provided by the program. Each resident must keep the portfolio up to date and bring it for review by the program director at each six-month evaluation with the program director.

The learning portfolio must document, at a minimum:

1. Patient Care and Procedural Skills
    a. Case/procedure logs
    b. ACGME log print outs
    c. I-131 log
    d. Mammography logs
    e. Procedure competency sign off forms
2. Medical Knowledge
    a. Documentation of conferences attended, courses/meetings attended, self-assessment modules completed, etc
    b. Documentation of compliance with regulatory-based training requirements in nuclear medicine and breast imaging
    c. Documentation of performance on yearly in-service examination & RadExams
3. Practice-Based Learning and Improvement
    a. Annual resident self-assessment and learning plan
4. Interpersonal and Communication Skills
    a. Formal evaluation of quality of dictated reports
5. Professionalism
    a. Documentation of compliance with institutional and departmental policies (e.g. HIPAA, JCAHO, patient safety, infection control, dress code, etc.)
    b. Status of medical license
6. Systems-Based Practice
    a. Documentation of a learning activity that involves deriving a solution to a system problem at the departmental, institutional, local or national level
7. Scholarly Activities
    a. Documentation of scholarly activity, such as publications, announcement of presentations, etc.
8. Other
    a. Any materials pertinent to the educational experience of residency training.

CONFERENCES

1. Attendance at conferences is required except when post-call, on vacation, on interventional/angiography or PEDS, at Children's Hospital, ICIO or AIRP rotation. Attendance at conferences is considered in your evaluation. The Chief Residents will prepare a list of conferences each month. Conferences are designed to enhance the clinical education of the residency.

2. Residents are required to present cases at interdisciplinary conferences.

3. Resident attendance in conferences will be documented.

ACADEMIC LEAVE

Academic leave: Those residents scoring below 50% on the ACR in service exam are restricted to one period of leave and funding to present at one academic meeting per year.

Resident Academic Leave Policy:

Residents will be allowed up to 5 days of official academic leave per monthly rotation, in addition to the 5 total days that are allotted for any given monthly rotation. Academic leave is possible provided the following criteria are all met:

- Resident has met one of the following criteria for an approved academic leave activity:
  - Accepted to give formal plenary session presentation at an academic conference
  - Poster accepted for presentation at an academic conference
  - Scholarship recipient to attend an academic conference, meeting and/or regional or national event
  - Attendance to an academic conference while serving in a regional or national leadership position (ie, Chair of the Resident Section of RSNA, etc.)
  - Attendance to an academic continuing education conference (ie, ACR boot camps, etc.)
  - Chief Conference if elected as chief resident
  - Or, any other academic pursuit, at the discretion of the Program Director

- Resident has requested and acquired written approval from the Program Director that the resident's participation does in fact qualify as appropriate for academic leave.

- Resident has confirmed with residency chiefs that all coverage needs have been met for the given rotation that the resident will be on at the time of academic leave. The chiefs will be responsible for communicating these specific days to GME/Residency Program Coordinator

Conference Travel Guidelines

Travel funds can cover:

- Registration (if necessary)
- Flight (or mileage depending on conference location)
- Hotel for approved nights only
- Transportation to and from the airport (transportation to and from hotel and conference center)
- Airport parking
- Baggage fees (one checked bag each way)
- Meals up to $55 a day on approved days only ($25 if conference provides lunch)
    - Itemized receipt must be provided without alcohol and include your meals only.
        - Receipts provided with alcohol or meals for others will only receive reimbursement for subtotal of your food and non-alcoholic drinks (no tip or tax)

Travel funds do not cover:

- Flight upgrades or early boarding fees
- Alcoholic beverages
- Valet
- Snacks
- Personal items

If you have dietary restrictions (allergies or intolerances), please contact your program coordinator prior to travel.

If you are uncertain of reimbursement eligibility, please contact your program coordinator.

If you plan to request travel funds for a conference presentation, you must get approval for your travel funds before submitting your research to the conference. If you apply and have not received approval beforehand, funding may not be granted.

This funding is meant to cover expenses related to your presentation, NOT conference attendance.

Travel funds will only cover the days you are required to be at the conference.

- If you only need to provide your presentation 3 of the 5 days of the conference, only those 3 days will be covered.

- If you are giving a talk and only need to be there on the day of your talk we are only covering that day.
- If you do not need to attend the conference to give your presentation, we will not cover registration for the rest of the conference.
- If you receive special funding from the conference to attend, make sure your coordinator is aware and knows the requirements of the funding. (If you are required to attend certain sessions due to these funds, this will be considered part of your required presentation attendance).

Travel receipts must be submitted to the program coordinator within 30 days of return from travel or by the fiscal year reimbursement deadline, whichever comes first.

APPROVED FUNDING MAY NOT COVER EXPENSES IN FULL

Additional Note: *Supplemental non-guaranteed funds may be available at the end of the academic year at the discretion of the GME Department. This varies based on departmental usage of conference funding and can be divided among those with remaining, qualifying reimbursements from conferences during the prior academic year.*

NEW INNOVATIONS PROCEDURE LOGS

Types of studies and procedures to be logged

Vascular/Interventional procedures, including biopsies and drainages

ACGME RESIDENT CASE LOGS

Your ACGME case log MUST be kept updated. Your case logs will be compared to others in your class and other residents of your level from previous years. Your case log numbers are expected to be similar or greater in number than your peers.

Also, please be advised that the program director will do random checks of work production by searching the PACS system. Residents should attach their names to studies they dictate on the PACS system.

Residents who are not on vacation, at conference, at AIRP, sick, on post-call days of the emergency rotation, or otherwise legitimately excused MUST participate in patient care EVERY DAY. This is a requirement that is based on Medicare requirements. This work must be documented, whether by attaching your name to studies on PACS or keeping logs of VIR procedures or mammography cases, etc. This requirement is related to the core competencies of patient care and professionalism.

The average first year resident has 1356 cases on the ACGME case log.

The average second year resident has 2722 cases on the ACGME case log.

The average third year resident has 2318 cases on the ACGME case log.

The average fourth year resident has 2972 cases on the ACGME case log.

Data from the ACGME indicates that the **average graduate** from a diagnostic radiology residency program will have read **9000 examinations**. It is expected that our residents' work experience will meet or exceed that number.

ACGME RESIDENT CASE LOGS (CONTINUED)

Online ACGME Case Logs:

Examinations:
Chest X-ray (71045-48)
CT Abd/Pel (72192-94, 74150, 74160, 74170, 74176-78)
CTA/MRA (71275, 71555, 72159, 72191, 72198, 73026, 73225, 74174-75, 74185, 70544-49, 70496, 70498, 73725, 73706)
Image Guided Bx/Drainage (20604, 20606, 20611, 32555, 32557, 49083, 49405-07)
Mammography (77061-62; 77065-67)
MRI Body (71550-52, 72195-97, 74181-83)
MRI Brain (70551-53)
MRI Lower Extremity Joints (73721-23)
MRI Spine (72141-42, 72146-49, 72156-58)
PET (78459, 78491-92, 78608-09, 78811-16)
US Abd/Pel (76700,5-6, 76770,5, 76830, 76856-57)

The Resident Case Log System for Operative Log Reporting is an Internet based case log system utilizing CPT codes and ICD9 codes to track resident experiences. The Residency Review Committee (RRC) has indexed these codes into categories for evaluation. All valid CPT and ICD9 codes have been added to the ACGME Resident Case Log System. RRC identifies the codes that pertain to the specific specialty and chooses the category in which it counts (area and type). Those codes that the RRC is not tracking at this time are placed into an area and type called miscellaneous or unassigned and will display on the reports as “miscellaneous” or “unassigned”.

The resident should enter encounters/procedures and choose codes that accurately reflect the encounter/procedure performed or the code that most closely matches the procedure done. Some entries may fall into the unassigned category. You can generate a full detail report on a weekly or monthly basis to review the unassigned procedures to make sure that they are being reported correctly. When you run the report, choose the appropriate resident and in the area select “unassigned”. The residents also have this capability, so they can run the report as well (see report section for more details).

Any valid code can be entered into the application, but only those codes the RRC has selected will be counted for experience.

While some programs prefer to have administrative personnel enter resident experience, this application was designed to allow residents to enter data on a regular basis at their convenience. Entry can be done on the internet at any time 24 hours a day.

The site is secured by encryption certificates obtained through the Verisign Corporation and is backed up daily.

Case logs, duty hour logs, and New Innovations Faculty Evaluations should be evaluated at least monthly.

LEAVE TIME

Please see the INTEGRIS Graduate Medical Education Handbook regarding information about leave. In addition, note the following:

1. The timing of leave is at the discretion of the Program Director.
2. Residents will be allowed 5 days of vacation during each rotation with allowance for special circumstances.
3. Emails must be completed and approved by the Chief Residents. Request leave by emailing the Chief Residents. The Chief Residents will reply to the email with approval and copy the residency coordinator and system director.
4. Residents taking leave are responsible for notifying appropriate staff members of their absence.
5. Leave is generally not allowed during the rotation at Children's Medical Center of Dallas.
6. Any leave taken during the Children's Hospital of Oklahoma rotation must be arranged in advance with the Facility Program Director and with the Chief Residents at INTEGRIS Baptist Medical Center.
7. Leave is limited in July.
8. Resident coverage is required for ICIO. Two residents are assigned to ICIO each month. There must be at least one to cover if vacation is requested. Both residents may not be gone at the same time unless other coverage is arranged with a resident who has already done a rotation at ICIO.
9. The IC does not require coverage
10. Biopsy and fluoro will be covered from the reading room.
11. Leave is not allowed during the ACR – In Training Examination. In addition, leave is limited when residents are taking any exams. See "Examinations" for exam dates.
12. Fourth-year residents are allowed to take two weeks of vacation at the end of June. Leave without pay will not be allowed.
13. Requests for leave time must be received by the GME office no later than the Friday prior to the week for which the vacation is requested. No requests will be approved retroactively. Violations will be referred to the Program Director. **Compliance with this policy reflects the core competency of professionalism.**

ON-CALL ROTATION

There will be in-house resident coverage 24 hours a day 7 days a week.

On the weekday following a night shift, the resident may leave after cases are checked and dictated and any other responsibilities are completed.

The resident may not leave the hospital grounds while on call unless directed to do so by the staff radiologist on call. While on call, the resident must be immediately available by phone. Residents are not to send other residents home before their shifts are over without staff permission.

ON-CALL ROTATION (CONTINUED)

Night Call:

Be professional. Treat patients, support staff, technicians, colleagues, attendings, and referring physicians with respect. The role of the physician is to provide care for the patient. When working at night, offer to help the physician interpret radiographs even before they ask.

Preliminary reports on call:

It is recommended that preliminary reports of on call studies be dictated by the on-call resident in as soon as reasonably possible after the report is called. Please be sure to include in this preliminary report to whom the report was called and when. After this preliminary dictation is completed, please click the "Approve" button. This will allow access to your preliminary report to other interested parties (and hopefully will decrease the number of phone calls made to you about the exams you have seen).

In the check-out session with your staff, show the staff member your preliminary dictation as you go over the images. If minor corrections to your report (such as minor changes in wording, correction of typographical errors, etc) are advised by your staff member, it is acceptable for these corrections to be made in the preliminary report before the staff member signs the report on his or her queue.

On the other hand, in those uncommon situations in which there IS a significant difference in the interpretation of the preliminary report and the final report, follow this procedure: The preliminary report is NOT to be substantially altered. Instead, the resident will call the patient's attending physician and discuss with them the new interpretation. AT THE BOTTOM OF THE PRELIMINARY REPORT ALREADY DICTATED, dictate the new interpretation and document to whom this revised report was called and when.

The rationale behind this process is to ensure an accurate reflection of the content of preliminary reports and also to provide an accurate timeline of what was said to whom and when.

Additional comments:

1) Residents MAY NOT pay other residents to take call.

2) All meals are free for residents at INTEGRIS Baptist Medical Center when on call.

Staff log for significant on call report discrepancies:

A simple log sheet will be placed at the read-out stations for the purpose of monitoring the incidence of "significant differences" between staff and resident on call dictations. You are responsible for telling staff the total number of on call cases. Staff will fill in the rest.

RESIDENT WELL-BEING

Residents and faculty will receive ongoing training in fatigue and its effects, mitigation and management. Primary teaching tools will be the LIFE and SAFER curricula.

Residents who are scheduled to be on call may elect to use the hour from 4 to 5 pm to take a nap, if they feel fatigued.

Should a resident become unable to perform his or her duties due to impairment from fatigue or illness, he or she is immediately excused from duty. Should this occur during the night float rotation, the resident on short call that night will come in as backup. Should this occur during short call, the night float resident will come in early.

The hospital will provide taxi service to residents who are too fatigued to drive home safely. It is the resident's responsibility to make that determination. If necessary, this can be coordinated through the GME office.

WELLNESS RESIDENT

(Elizabeth Gilbert, MD)

The Wellness Resident is a peer selected upper level resident (distinct from the Chief Resident) to serve as a point of contact for peer support and wellness concerns. The Wellness Resident is a confidential resource to discuss stressful clinical events and support team debriefings. Regular "check-ins" are important to facilitating the wellness program and establishing a wellness curriculum. The Wellness Resident receives specific training and is supported administratively.

Characteristics

Respect and trust of peers
Ability to maintain confidentiality
Effective communications skills
Emotional maturity
Empathetic/caring
Non-judgmental
Culturally sensitive
Available for team activities
Ability to work within established framework
Support self-care, work-life balance

CHIEF RESIDENTS

Co-Chief Residents from April 1, 2020 to March 31, 2021:
Noelle Lafitte, MD and Cindy Weinschenk, DP

DUTIES OF CHIEF RESIDENT

1. Write call schedule. All call schedules must be written in accordance with Program and Institutional policy and submitted to the Residency Coordinator by the 10th of the month prior to call schedule month.
2. Assign short evenings with the on-call resident toward the end of the first year.
3. Write monthly lecture schedule. All lecture schedules must be submitted to the Residency Coordinator by the 10th of the month prior to the schedule month.
4. Serve as a role model and mentor for junior residents.
5. Assist in New Resident Orientation.
6. Assist in management of resident activities (e.g. maintenance of logs).
7. Facilitate communication between residents and staff physicians.
8. Assist the Program Director in the communication of new policies and procedures to all residents.
9. Facilitate communication between and resolve minor disagreements between residents.
10. Promote an academic environment.
11. Chief resident or his/her designated alternate must attend the GMEC meeting. The GMEC meeting is held in the Bennett Room at 7 am the second Thursday of the month except July.
12. Complete a Chief Resident improvement project during your tenure.

PROCESS TO DEAL CONFIDENTIALLY WITH RESIDENT PROBLEMS OR CONCERNS

Please feel free to discuss any residency related issue with your program director. Alternately, residents may approach any staff member of the residency committee, any faculty member, Shannon Thompson, Natasha Fanson, or Dr. Chelsey Gilbertson through the GME office. These channels will almost always allow for dealing with issues that may arise. Residents who feel their concerns have not or cannot be addressed through these channels may contact Dara Wanzer in the Legal Department.

Please consult the Graduate Medical Education Handbook for other resources as well.

EVALUATIONS AND RESIDENT ADVANCEMENT

RESIDENTS:

Residents will be evaluated using objective tools in each ACGME-identified competency. Multiple evaluators will be used.

Each resident will receive a competency-based evaluation at the end of each rotation.

Each resident will have a documented semi-annual evaluation of performance.

This evaluation will include:

Global faculty evaluation (all competencies)

270 evaluations of interpersonal skills/communication skills and professionalism

Learning portfolio (please see handbook section regarding learning portfolio)

The residents' case logs will also be reviewed.

The residents' files including their evaluation material is available for resident review any time the GME office is open. Rotation evaluations are available for resident review online at any time.

Residents will be advanced to positions of higher responsibility only on the basis of their satisfactory progressive professional growth and scholarship. Residents experiencing performance difficulties or receiving unfavorable reviews will receive more frequent reviews of performance. Please see the INTEGRIS Graduate Medical Education Handbook for details regarding the processes used for residents experiencing performance deficiencies.

At the end of training, the program director must provide a summative evaluation which will become a part of the resident's permanent record. This evaluation will include information regarding the resident's performance during the final period of training and verify that the resident has demonstrated sufficient competence to enter practice without direct supervision.

FACULTY:

At least annually, the program will evaluate faculty performance as it relates to the program. This evaluation will include review of the faculty members' clinical teaching abilities, commitment to the educational program, clinical knowledge, professionalism and scholarly activities. The evaluation will also include annual written confidential evaluations by the residents.

EVALUATIONS AND RESIDENT ADVANCEMENT (CONTINUED)

Faculty specifically will be evaluated on:

- Availability
- Adequate review of and feedback concerning the resident's work
- Response when contacted during resident's on-call period
- Clinical knowledge and skills
- Familiarity with current literature
- Function as a role model
- Ability to stimulate interest and learning
- Frequency of rounds (check-out)
- Directive versus coaching role
- Skill and guidance in procedural areas

The program director must provide each faculty member with an annual evaluation. The evaluation will include an assessment of clinical knowledge, teaching ability, commitment to the program, and scholarly activity. Anonymous, summative information obtained from the residents' evaluation will be included.

PROGRAM EVALUATION AND IMPROVEMENT:

The program will conduct a formal, systematic evaluation of the curriculum annually. Other areas which will be tracked include: resident performance, faculty development, graduate performance, including performance on the ABR examinations, and program quality.

The faculty and residents will have the opportunity to evaluate the program confidentially and in writing at least annually.

The results of the faculty and resident assessments will be used with other program performance indicators to identify areas in need of improvement. If deficiencies are found, a written plan of action to address the performance issues will be developed. This action plan will be reviewed by the faculty and documented in the meeting minutes.

DIAGNOSTIC RADIOLOGY MILESTONE PROJECT

The Milestones are designed only for use in evaluation of resident physicians in the context of their participation in ACGME accredited residency or fellowship programs. The Milestones provide a framework for the assessment of the development of the resident physician in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

MILESTONE REPORTING

The milestones are designed for programs to use in semi-annual review of resident performance and reporting to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME competencies organized in a developmental framework from less to more advanced. They are descriptors and targets for resident performance as a resident moves from entry into diagnostic radiology residency through graduation. In the initial years of implementation, the Review Committee will examine milestone performance data for each program's residents as one element in the Next Accreditation System (NAS) to determine whether residents overall are progressing.

For each reporting period, review and reporting will involve selecting the level of milestones that best describes each resident's current performance level in relation to milestones. Milestones are arranged into numbered levels. Selection of a level implies that the resident substantially demonstrates the milestones in that level, as well as those in lower levels. A general interpretation of levels for diagnostic radiology is below:

Level 1: The resident demonstrates milestones expected of one who has had some education in diagnostic radiology.

Level 2: The resident is advancing and demonstrating additional milestones.

Level 3: The resident continues to advance and demonstrate additional milestones; the resident consistently demonstrates the majority of milestones targeted for residency.

Level 4: The resident has advanced so that he or she now substantially demonstrates the milestones targeted for residency. This level is designed as the graduation target.

Level 5: The resident has advanced beyond performance targets set for residency and is demonstrating "aspirational" goals, which might describe the performance of someone who has been in practice for several years. It is expected that only a few exceptional residents will reach this level.

DIAGNOSTIC RADIOLOGY MILESTONE PROJECT (CONTINUED)

Additional Notes

Level 4 is designed as the graduation *target* but does not represent a graduation *requirement*. Making decisions about readiness for graduation is the purview of the residency program director (see the following NAS FAQ for educational milestones on the ACGME's NAS microsite for further discussion of this issue: "Can a resident graduate if he or she does not reach every milestone?"). Study of milestone performance data will be required before the ACGME and its partners will be able to determine whether Level 4 milestones and milestones in lower levels are in the appropriate level within the developmental framework, and whether milestone data are of sufficient quality to be used for high stakes decisions.

Answers to Frequently Asked Questions about the NAS and milestones are available on the ACGME's NAS microsite: http://www.acgme-nas.org/assets/pdf/NASFAQs.pdf.

VENDOR POLICY FOR RADIOLOGY RESIDENTS

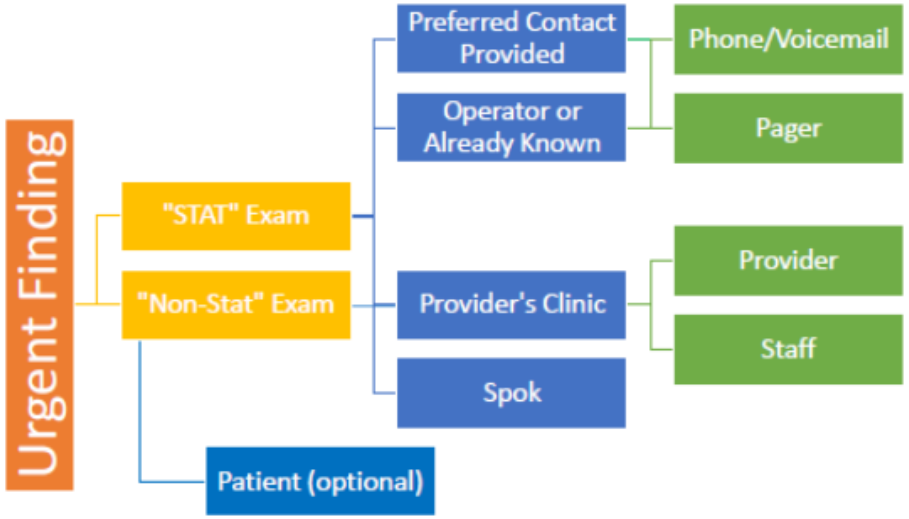
On occasion, vendors may provide educational materials to the residents, provided that:

1. The educational materials provided are of scientific merit and pertain to the practice of radiology
2. They provide information about imaging, contrast agents, or disease process, etc. in a manner with no bias toward a particular vendor's product.
3. Any materials provided will have disclosures regarding financial relationships between the authors of the materials and the vendor's company.
4. All vendor/resident contacts are approved in advance by the program director.

Unsolicited gratuities

Please refer to the INTEGRIS Health Guiding Core Values and Code of Conduct pp 13-15 and the INTEGRIS Metro Policy and Procedure Manual for further details.

Non-Routine Communication of Urgent Findings



Routine Communication – findings conveyed by a preliminary or final report

Non-Routine Communication – findings conveyed in a manner different from the preliminary or final report, e.g. verbal, HIPAA-compliant text message, and pages

Urgent Findings – in this context, an imaging finding with potential to cause patient harm if not acted on before the ordering provider is expected see the preliminary or final report. This is intimately associated with the "STAT" and "Non-Stat" nature of the examination.

Adapted from the ACR's Practice Parameters for Communicating Diagnostic Imaging Findings (http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf)

Written by Vishal Kadakia, MD, Jimmy Nguyen, MD, and Iwan Tjauw, MD

HOW TO DOCUMENT

The following details should be included in the final report regarding non-routine communication.

- Person attempted to contact
- Person message was relayed to IF different from intended recipient
- If direct communication did not occur and number is available, document this number in report
- If page not returned, state that "page was sent"
- If voicemail, state that "voice message was left with a call back phone number"

OTHER GUIDELINES

- Attempt at least two
- When leaving a voicemail, include only patient's initials and study performed.
- If contacting patient, inform that an urgent finding has been made. Further discussion or instruction at the discretion of radiologist

AMERICAN BOARD OF RADIOLOGY (ABR) REQUIREMENTS

Requirements

Five years of approved training

- **One Year in Clinical Training**

The first postgraduate year must be ACGME- or RCPSC- accredited clinical training in internal medicine, pediatrics, surgery or surgical specialties, obstetrics and gynecology, neurology, family practice, emergency medicine, transitional year, or any combination of these. Credit for accredited training in other specialties may be granted on an individual basis after submission of the appropriate documents to the ABR.

If there is an elective in diagnostic radiology, it must be in a department with an ACGME-accredited diagnostic radiology residency program and cannot be longer than two months. No more than a total of three months may be spent in radiation oncology and/or pathology.

- **Four Years in a Diagnostic Radiology Program**

The program must be approved for training in diagnostic radiology by the Residency Review Committee (RRC) for diagnostic radiology of the ACGME, or by the Royal College of Physicians and Surgeons of Canada (RCPSC).

- A minimum of four months of the four-year diagnostic radiology training program must be spent in nuclear medicine.
- A minimum of three months must be spent in mammography/breast imaging.
- No more than 16 months may be spent in any one subspecialty or in research. Those considering careers in research may want to participate in the Holman Research Pathway.

- **Obtain Certification within the Six-Year Board Eligibility Period**

At the completion of training, the ABR officially recognizes candidates as “board eligible” for a period of six full calendar years, through December 31 of the sixth year. Certification must be acquired during this time. Please see the Board Eligibility Policy for further details.

The requirements to attain board certification are:

- Graduate from an ACGME- or RCPSC-accredited diagnostic radiology residency training program.

AMERICAN BOARD OF RADIOLOGY (ABR) REQUIREMENTS (Continued)

- Pass the ABR Core and Certifying examinations. A resident is eligible to take the **Core Examination** in the 36th month of diagnostic radiology training, and must take the examination at the first administration offered. A candidate who has begun training at a date other than July 1 is eligible to take the Core Examination after 36 months of training and must take the examination at the first administration offered after eligibility is attained. Any request for delay requires application for an exception and approval by the ABR. Please contact the ABR office at 520-790-2900 or ic@theabr.org for specific procedures for requesting an exception. In the 15th month after the completion of diagnostic radiology residency training, a candidate is eligible to take the **Certifying Examination**.

Transferring

Residents are expected to remain in the same program for all four years. If a resident wishes to transfer for any reason, that transfer must be approved by the initial program director as well as by the new program director. A list of the satisfactorily completed rotations must be provided to the new program director, who can accept all or some of them. A resident has the right to know how much additional training will be required in the new program. If a program director states that a resident has not successfully completed one or more rotations, that statement must have the signatures of two other faculty members from the same program, supporting the claim of unsatisfactory completion.

Leaves of Absence

Leaves of absence and vacation may be granted to residents at the discretion of the program director in accordance with local rules. Within the required period(s) of graduate medical education, the total such leave and vacation time may not exceed:

6 calendar weeks (30 working days)	for residents in a program for one year
12 calendar weeks (60 working days)	for residents in a program for two years
18 calendar weeks (90 working days)	for residents in a program for three years
24 calendar weeks (120 working days)	for residents in a program for four years

AMERICAN BOARD OF RADIOLOGY (ABR) REQUIREMENTS (Continued)

If a longer leave of absence is granted, the required period of graduate medical education must be extended accordingly.

The ABR leave policy is based on educational requirements and is not affected by other institutional, state, or federal policies.

- **Cardiac Life Support Certification**

All residents must have basic cardiac life support certification. Advanced cardiac life support certification is encouraged.

- **High Moral and Ethical Standards**

The American Board of Radiology expects residents and fellows in training, candidates for initial certification, and its diplomats to uphold fundamental moral and ethical principles.

- **Proof of Valid State Licensure or Canadian Equivalent**

For those in training, a training license is acceptable.

- **Failure to Qualify**

If a program director fails to indicate in writing that a resident will have the required training and will have achieved adequate professional qualifications before the examination, documentation of the reason(s) must be submitted, along with evidence that the resident has been appropriately apprised of these deficiencies. If a program director states that a resident has not successfully completed one or more rotations, that statement must have the signature of two other faculty members from the same program, supporting the claim of unsatisfactory completion.

- **Special Circumstances**

In special instances, these requirements may be modified by a majority vote of the entire Board of Trustees, or by the Executive Committee of the Board acting in its stead.

- **Appealing a Decision**

The applicant must provide the Executive Committee of the Board with a written statement supporting the appeal. The Executive Committee may ask the program director to submit a written response to the applicant's appeal.

AMERICAN BOARD OF RADIOLOGY (ABR) REQUIREMENTS (Continued)

Final Decision

Within a reasonable time frame, the Executive Committee must reach a final decision in determining the candidate's admissibility to the examination. The final decision of the Board is based on the applicant's professional record, training, and accomplishment in the field of diagnostic radiology, as well as on the results of examinations.

Revocation of Certificate

Certificates issued by this Board shall be subject to revocation in the event that:

- the certificate was issued contrary to or in violation of any rule or regulation of the ABR;
- the person to whom the certificate was issued was not eligible to receive it;
- there is substantial misstatement or omission of a material fact to the ABR in an application or in any other information submitted to the ABR;
- any license of the person to practice is not, or ceases to be, a valid and unrestricted license to practice within the meaning set forth in the Rules and Regulations of the ABR (in the event a diplomate's license to practice is suspended, revoked, or restricted in any state in which the diplomate practices, holds a license, or has held a license, the diplomate's board certification may be revoked or suspended);
- there is a violation of rules and regulations relating to the Core, Certifying, or Maintenance of Certification examinations and applications to take the examinations;
- the person is found presenting or distributing, or aiding or assisting another person(s) to present or distribute, a forged document or other written instrument purporting to have been issued by or under the authority of the ABR to evidence that a candidate, diplomate, or any other person(s) is currently or was previously certified by the ABR, when that is not the case, or claims orally or in writing, or assists another person(s) to claim, that a candidate, diplomate, or any other person(s) is currently or was previously certified by the ABR, when that is not the case;
- the person engages in any conduct that materially disrupts any examination or that could reasonably be interpreted as threatening or abusive toward any examinee, proctor, or staff; or
- there is failure to cooperate with the ABR or its Hearing Committee at any point during the investigation of a matter arising under Article X of the ABR Bylaws.

AMERICAN BOARD OF RADIOLOGY (ABR) REQUIREMENTS (Continued)

Before any such certificate shall be revoked, a notice shall be sent by registered or certified mail to the last known address of the holder of such certificate (as it appears on the records of the ABR). The notice will set forth the act, omission, or conduct alleged or complained of and will give the holder of the certificate a reasonable opportunity to answer in writing. The certificate holder shall have at least 30 days in which to reply. The Board of Trustees may at its discretion make such further investigation as it deems necessary and proper.

The Board of Trustees of this Corporation shall have the sole power, jurisdiction, and right to determine and decide whether or not the evidence or information before it is sufficient to constitute one of the grounds for revocation of any certificate issued by the Board. The decision of the Board of Trustees shall be final.

Fees, Dates and Locations

Year	Date	Description
2020	October 5-6	**Diagnostic Radiology Certifying Exam at Chicago Exam Center, Tucson Exam Center**
2020	November 5-6 and 9-10	**Diagnostic Radiology Core Exam at Chicago Exam Center, Tucson Exam Center**
2021	June 3-4 and 7-8	**Diagnostic Radiology Core Exam at Chicago Exam Center, Tucson Exam Center**
2021	September 22-23	**Diagnostic Radiology Certifying Exam at Chicago Exam Center, Tucson Exam Center**
2021	November 4-5	**Diagnostic Radiology Core Exam at Chicago Exam Center, Tucson Exam Center**

Registration and Fees

Please note that fees are subject to change.

If your residency start date is ON OR AFTER July 1, 2010

AMERICAN BOARD OF RADIOLOGY (ABR) REQUIREMENTS (Continued)

Registration Process

After you enter residency, your program director or coordinator will submit your name and email address to the ABR as a new resident in the training program.

When your information is received, the ABR will send you notification and information for logging on to myABR to begin the registration process.

If you have not already registered:

- Registrations are accepted by the ABR July 1 – September 30 (the first annual fee is due at the time of registration).
- Late registrations are accepted by the ABR October 1 – October 31 for a $400 late fee.
- Registrations are reviewed by the ABR in the order they are received.

Annual fees are charged for every year you are in the initial certification process, beginning with your first year of residency. If you do not fully pass the Core or Certifying examination on the first administration, additional exam fees will apply.

You will be sent your annual invoice in January of each year, as long as you are in the certification process. The fee amount is subject to adjustment by the ABR each year. Fees must be paid on myABR. Please note that this fee is not refundable and will be higher if you do not register in PGY2.

Fee	Description	Amount
Annual Fee	Charged every year candidates are in the initial certification process, beginning with first year of residency.	$640
Re-exam fee	If you fail an exam, a re-exam fee may be assessed.	$640

Additional Fees

The following table shows additional fees that may apply.

Category	Diagnostic Radiology Exams	Description	Amount
General	Late Registration Fee	Registration form not filed by September 30.	$400
General	Late Payment Fee	Annual fee not paid by due date.	$100
Core Exam	Cancellation Fee (up to exam date)	Cancelled appointment after registration period has closed.*	$300
Core Exam	Exam No-Show Fee	Did not appear for exam after registering for testing site and scheduling exam.*	$500
Certifying Exam	Cancellation Fee (up to exam date)	Cancelled appointment after registration period has closed.*	$300
Certifying Exam	Exam No-Show Fee	Did not appear for exam after registering for testing site and scheduling exam.*	$500

*Payment is required to continue in the certification process. Any exam fees paid for the cancelled/missed administration will be applied to the next exam attempt; however, a new annual fee may be due in the interim.

Payment may be made by VISA™, MasterCard™, American Express™, or eCheck only (U.S. currency). If your payment is declined for any reason, there will be a $100 processing fee.

ABR CERTIFICATES

The Certificate

As you progress through your residency and after completion of training, you will take examinations to qualify for your initial certification in diagnostic radiology.

If you choose to subspecialize after you receive your diagnostic radiology certificate, you can also take exams to qualify for subspecialty certificates in the following disciplines:

- Hospice and Palliative Medicine
- Neuroradiology
- Nuclear Radiology
- Pediatric Radiology
- Vascular and Interventional Radiology

Your certificate remains valid contingent as long as you are meeting the requirements of Maintenance of Certification (MOC).

Throughout the period for which you hold certification, you are expected to continue learning and improving your skills in a personalized program (see ABR MOC information). Your progress will be tracked annually on a rolling three-year "look-back".

Your initial certification status and MOC status will be publicly reported on our website, as well as on the official public reporting website of the American Board of Medical Specialties (ABMS), www.certificationmatters.org. This shows interested parties that you are keeping up with the latest developments in your field.

The Examinations

The Core Examination is an image-rich, computer-based examination, offered after 36 months of residency training; it covers 18 subspecialty and modality categories. The exam must be passed overall, and in each category, to receive a passing result.

The Certifying Examination, given 15 months after completion of diagnostic residency training, is also computer based and image rich, and it includes five modules. Three modules are clinical practice areas and may be chosen by the examinee to fit his or her interests, experience, and training. The other two modules, Essentials of Diagnostic Radiology and Noninterpretive Skills, will be taken by all examinees.

Content for the Radioisotope Safety Exam (RISE) is integrated into the Core and Certifying Exams. After the Certifying Exam has been passed, the RISE will be scored. The RISE will not affect the pass results for either exam.

ABR CERTIFICATES (Continued)

Time Limitation for Attaining Initial Certification (Board Eligibility)

Candidates have specific time limits for remaining eligible to be initially certified by the ABR and to maintain their status as board eligible. Board eligibility for those currently in training will begin at the completion of diagnostic radiology residency and extend for six years. For international medical graduates (IMGs), seeking initial certification through an alternative IMG pathway, "end of training" is defined as the end of the four-year period outlined in the Sponsoring Department Agreement.

For candidates who have already completed training, the board eligibility period ends according to the following schedule:

End of Training	**Termination of Board Eligibility**
2004 or before	December 31, 2014
2005	December 31, 2015
2006-2010	December 31, 2016
2011 and afterward	Six full calendar years from end of training

After the period of board eligibility ends, candidates failing to successfully complete the initial certification process will no longer be considered by the ABR as board eligible, will no longer be permitted to designate themselves as such for communications or credentialing purposes, and will no longer be reported as such to external agencies in verification letters.

ADVICE TO MAXIMIZE YOUR RESIDENCY EXPERIENCE

1. Every resident needs to study consistently from day one. It is suggested that each resident study two hours per day. Concentrate on studying in the area to which you are assigned that month, but study other areas as well. It is especially helpful to read on diseases or techniques you saw that day or to prepare for cases scheduled for the next day. Once a resident gets behind in his or her studies, it can be very difficult to catch up. Do yourselves a favor and study consistently—this is a habit you will need for the rest of your career.
2. This residency works best when teamwork is stressed. If your assigned duties are caught up, pick up studies in other areas or modalities. Be quick to help out your fellow resident. Be professional and courteous to other members of the radiology team including transcriptionists, technologists, nurses, and others.
3. Be on time with no unexcused absences.
4. Attend and participate in conferences.
5. Do make balance a priority. Everyone needs sufficient rest, relaxation, and fun. Keep your physical health, mental health, spiritual health, and relational health in top shape. Be especially careful not to moonlight so much that your studies or your well-being is compromised. You are expected to work hard and study hard but keep yourself in good physical and emotional condition. Consult the INTEGRIS Graduate Medical Education Handbook for information regarding services available to you, and or talk to your program director or another staff member.
6. To become a proficient radiologist, one must successfully interpret and/or perform many imaging or image guided exams. Remember, the average radiology resident will interpret 9000 exams in 4 years. You benefit most from seeing cases. The more exams you see and interpret, the more experience and interpretive skills you will gain!