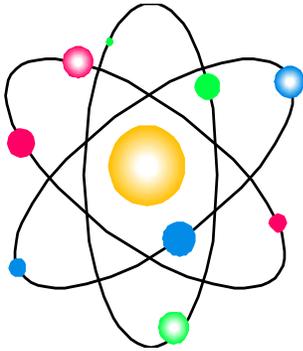


**University of Alabama at Birmingham
DIVISION OF NUCLEAR MEDICINE
Department of Radiology**

**Resident Manual
2012-2013**



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Email: padma@uab.edu

Shilpa Surasi

Email: dsurasi@uabmc.edu

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Jon A. Baldwin, D.O.	7704
Eva V. Dubovsky, M.D., Ph.D.	6905
Pradeep Bhambhani, M.D.	8544
Samuel Almodovar, M.D.	5669
Michael V. Yester, Ph.D.	3450
Sharon White, Ph.D.	6943
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VAMC Nuclear Medicine

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Residents: Pager/Telephone Numbers

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Padma Manapragada, M.D.	3007
Shilpa Surasi, M.D.	3682

Technologist: On-Call Pager/Telephone Numbers

Daniel Yoder (Tech. Supervisor)	6818
Restituto (Rusty) Caranto	6822
Jennifer Hill	6822
David Kynard	6822
Shawn Roberts	6822
Cynthia Robinson	6822
Jeff Black	6822
Jeanette Bythwood	6822

PET-CT Facility

Tommy Mahone (Chief Tech.)	7369	
PET control room:		801-8643 or 801-7714
Front Office (Linda Williams):		801-7561 or 801-7563
Fax		801-7562

Chest Pain Beeper	7022	ED. Phone	934-5100
		E.D. Fax	934-6538

Residency Policies and Procedures

A. Resident Selection

Eligible applicants for a Nuclear Medicine Residency position must complete (at a minimum) a PGY-1 clinical year in an ACGME (or AOA, RCPSC, or PCPQ) accredited residency. On a very limited basis, we will accept a waiver by the American Board of Nuclear Medicine (ABNM) for the equivalent of a PGY-1 year (our program requires that a foreign medical graduate will first secure a waiver from the ABNM for Equivalency of Clinical Training—see www.abnm.org for more information). The resident must demonstrate a valid ECFMG certification (if applicable) and USMLE (or COMLEX) steps I, II and III. Foreign citizens must be able to obtain a valid VISA, which UAB does sponsor, by the beginning of the residency contract.

Resident applications are selected for interview by the Resident Education Committee (REC) based on a combination of transcript reports, post-graduate experiences (including advanced degrees, research experience, certification by a subspecialty board), USMLE and/or COMLEX board scores, written communication skills (for example, the applicant's personal statement), and a minimum of three letters of recommendation. Following the interview, the REC makes a recommendation to the nuclear medicine faculty for consensus.

UAB Nuclear Medicine accepts resident and fellows outside of the national match. Once an offer is made and accepted, the resident will receive a letter of intent. Contracts from the University will be sent as soon as they are available, usually in late spring, but is required to be at the UAB General Medical Education (GME) Office by July 1 or the first day of work. Residency positions are set for an academic year running July 1- June 30 of the following calendar year. We will accept off-cycle residents on a case-by-case basis, and as position availability and funding will allow.

B. University Residency Policies and Requirements

Residents must meet UAB Institutional Requirements in order to remain in good standing, avoid Administrative Probation, and advance to the next academic level as outlined on the UAB GME website:

<https://www.uab.edu/medicine/home/education/residents-fellows-post-grad/gme>

USMLE Step III:

UAB requires documentation of successful completion of USMLE (or COMLEX) Step III by the end of the 6th month of the PGY-2 year. This applies to US medical school graduates; see above paragraph A for policy regarding foreign medical graduates.

Medical License:

UAB requires residents obtain an unrestricted Alabama license to practice medicine or osteopathy no later than 7 months after becoming eligible. A physical Certificate from the USMLE Step III is required for submission with the license application. Graduates of U.S. and Canadian medical schools (L.C.M.E. accredited) are eligible at the end of their first post-graduate year of training. Graduates of medical schools not L.C.M.E. accredited are eligible for an unrestricted Alabama medical license only after they have completed 3 years of residency training in the U.S. These residents must obtain a limited Alabama medical license at the start of their PGY-2 year. Once they have obtained an Alabama medical license, residents must keep that license valid.

All License Certificates must be physically in the GME office by the deadline. The GME Department is required to report any resident failing to comply with the institution's licensure requirements to the Dean's Council on Graduate Medical Education. The Dean's Council reviews all information presented and takes appropriate action which can include administrative probation, suspension without pay and/or termination.

Other Requirements:

Federal DEA numbers are no longer required for Nuclear Medicine Residents for the performance of residency work. Residents are responsible for obtaining their own Federal and State DEA numbers for any outside moonlighting.

Residents must attend such conferences and training sessions that the University deems necessary. This includes HIPPA training as well as IRB/research training.

C. Resident Resources

UAB residents have access to resources through the GME office and the Dean's Council for GME. In addition, the House Staff Council, described on the GME website, serves to protect and advance the interests of all residents. One resident from our program is required to represent Nuclear Medicine on this council.

The Nuclear Medicine residents are part of the Department of Radiology under the direction of the Chairperson, Cheri Canon, M.D. UAB Department of Radiology and Nuclear Medicine Residency policies and procedures are listed at www.rad.uab.edu.

Basic national residency requirements for all residencies can be found on the Accreditation Council for Graduate Medical Education (ACGME) website: www.acgme.org

ACGME Nuclear Medicine-specific program requirements can be found on the Nuclear Medicine Resident Review Committee (RRC) webpage:
http://www.acgme.org/acWebsite/navPages/nav_200.asp

Eligibility requirements for specialty Boards in Nuclear Medicine are described on the American Board of Nuclear Medicine (ABNM) website:
<http://www.abnm.org/index.cfm?PageID=5044&RPID=4999>

Eligibility requirements to become an authorized user of radioactive materials for diagnosis and therapy can be found at the following websites:

<http://www.nrc.gov/reading-rm/doc-collections/cfr/part035/part035-0190.html>

<http://www.nrc.gov/reading-rm/doc-collections/cfr/part035/part035-0290.html>

<http://www.nrc.gov/reading-rm/doc-collections/cfr/part035/part035-0390.html>

<http://www.nrc.gov/reading-rm/doc-collections/cfr/part035/part035-0392.html>

<http://www.nrc.gov/reading-rm/doc-collections/cfr/part035/part035-0394.html>

D. Grievances and Disciplinary Actions

Resident Grievances:

Residents are encouraged to approach the Chief Resident or the Residency Director with any grievance. These will be taken through the appropriate channels: House Staff Council, Dean's Council for General Medical Education or Chairman of Radiology as indicated and if further action is needed. Most resident grievances will be directed to the Resident Education Committee (REC) or a

Nuclear Medicine Faculty Meeting. If the Chief Resident is the complainant, the Chief Radiology Resident could be formally invited to attend the Nuclear Medicine Faculty Meeting.

Residents can directly approach the House Staff Council, the GME office, or the Dean's Council for Graduate Medical Education. UAB institutional grievance policy is outlined on the GME website (GME Policy and Procedure Manual Section XI--
http://services.medicine.uab.edu/publicdocuments/GME/GME_Policy_Manual_July_2011.pdf).

Disciplinary Action:

When a complaint is lodged against a resident, the Residency Director will investigate the complaint and meet with the resident. If the complaint is of a serious nature, a formal written notification will be provided to the resident outlining the complaint, any potential consequences such as probation (Academic or Administrative) or suspension, and steps needed for corrective action. The resident will be scheduled for periodic follow-up sessions with the Director and progress will be monitored through extra written faculty/staff evaluations. The Residency Director will also notify the REC.

If a resident fails to comply or meet standards (set by the University, Department of Radiology, or Division of Nuclear Medicine), the matter will be brought to the attention of faculty at the Nuclear Medicine faculty Meeting. The Chairman of Radiology and the Dean's Council for GME will be notified immediately of any situation that might result in resident suspension, a failure to renew a resident's contract, or dismissal. This includes situations that would lead to Academic or Administrative Probation, impending suspension, or leave of absence that might lead to a delay in residency completion or repeating years of training. Any intention to not renew a resident's contract will be reported to the Dean's Council on GME and the Chairman of Radiology.

The resident will be notified in writing and directed to means for adjudication and hearings. Every attempt will be made to avoid dismissal, and such action will only be considered after the Dean's Council has exhausted any legal or grievance committee process University policy mandates.

Disciplinary procedures are outlined on the GME website under the UAB GME Policy and Procedure Manual Section X.

E. Dress Code

No blue jeans, sweat pants, or warm up suits are permitted. Men should wear shirt (tie optional), dress pants, and dress shoes. Corresponding attire should be worn for women. Scrub attire is acceptable, but the pervious mentioned dress is preferred.

White lab coats, Hospital identification badges, and radiation badges **must** be worn in the department at all times. Radiation badges must be exchanged promptly.

F. Duty Hours

Resident duty hours may vary by service. Generally, residents must be in the reading room by 7:45 AM and remain until the work for the day is completed, usually between 5- 6 PM. Some occasions may call for residents to be present earlier. The General Reading Room must have a physician present during normal business hours, including lunch and conference time. Coverage must be set up with the attending faculty, and the chief technologist must be notified of how to locate the covering physician while residents attend required conferences.

ACGME Duty Hour Restrictions:

Resident duty hours are defined as all clinical and academic activities related to the residency program, i.e., patient care (both inpatient and outpatient), administrative duties related to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled academic activities such as conferences. Duty hours do not include reading and preparation time spent away from the duty site (see GME Policies and Procedures Manual).

1. The UAB Division of Nuclear Medicine adheres to the ACGME institutional requirements with duty hours limited to <80 hours per week, averaged over a four-week period, inclusive of all in-house call activities. The required 10-hour time period between all daily duty periods and continuous on-site duty does not exceed 24 hours.
2. No in-house call is scheduled. Call is taken from home by pager call on weekends and holidays. Time spent in the hospital responding to call procedures does count towards the 80 hour limit. This time should be counted when the resident reports hours worked to the program coordinator. In addition, the resident will be guaranteed one day free from all educational and clinical responsibilities (including at-home call) each week, averaged over a four week period.
3. Moonlighting, if pursued by a resident or fellow, should not be scheduled so that it will interfere with meeting duty hour limitations (see moonlighting policy below).
4. Fatigue symptoms should be reported to the supervising faculty.

G. Division of Nuclear Medicine On-Call Policy

Radiology residents provide in-house call coverage Monday through Thursday. Prior to taking Nuclear Medicine weekend/holiday call, the resident or fellow will have a minimum of one month's training to become sufficiently familiar with nuclear medicine procedures and interpretation (an exception can be made for those fellows that have successfully completed an ACGME residency in Diagnostic Radiology). The resident will complete the "On Call Checklist" prior to taking call (see Appendix D). Nuclear medicine residents take call from home Friday (usually beginning at 5 PM) through Monday morning. Holiday coverage is also provided by the Nuclear Medicine resident. The resident on-call must be available at all times, either by telephone or by pager. Failure to respond promptly to pages will result in disciplinary action by the program director. All resident call is done under faculty supervision 24 hours a day, 7 days a week.

The ordering clinician will contact the resident directly, via a page from the page operator or from the radiology/paging website. Information regarding the patient and study should be obtained as in the appendix E supplement entitled "On Call Suggestions".

On-call technologists must respond within 5-10 minutes of a page. Difficulties in reaching technologists or radiopharmacy staff should be reported to the chief technologist and attending physician immediately. The resident and technologists will coordinate their timing so that they arrive in the department within one hour (ideally) of the resident contacting the technologist. **THE NUCLEAR MEDICINE RESIDENT MUST BE ON-PREMISES WHILE THERE IS A PATIENT IS IN THE DEPARTMENT.** Findings will be reviewed by the attending on-call, especially early in the resident's career, before a preliminary report is released. As the resident progresses and attendings are more confident in the resident's interpretative skills, studies can be reviewed when the resident has a particular question or after several studies have accumulated, rather than with each study. All studies require preliminary reports be phoned to the referring physician/house staff officer. Written documentation of the preliminary report must be included in the final report indicating the date, time and name of the physician given results.

On-Call Schedule Changes:

Any On-Call Schedule changes must be noted on the master schedule posted on the radiology schedule website by reporting the change to either Ms. Shirley Levins or Ms. Gwendolyn Streeter. The resident originally on-call is responsible for notifying the hospital page operator of any change, and the resident then taking the call must personally confirm with the operator that the correct resident is listed on-call. The on-call attending physician must also be informed of the change. Page operators should have up to date home phone numbers for residents, attending staff and the head technologist in case of pager failure. Call changes must be reported to the Program Director as well, to ensure that the “one-in-seven” day off rule is not violated (see ACGME Duty Hour Restrictions #2 above).

H. Division of Nuclear Medicine Moonlighting Policy

No moonlighting is allowed Monday through Friday during normal work hours while a resident is on service. No moonlighting should be scheduled during early evening hours on a normal work day, as the work day may run into the early evening. No moonlighting is permitted on weekends when the resident is taking pager call from home. Moonlighting is permitted on weekends or holidays when a resident is not on call or during pre-approved vacation time. This vacation time must not extend beyond normal allotted number of vacation days. Use of sick days for moonlighting is not allowed. Since it is an ACGME policy that moonlighting hours count towards the 80 hour limit, **Moonlighting must not interfere with duty hours; if moonlighting places the resident or fellow over ACGME duty hour limitations, it is the moonlighting hours that must be sacrificed. Residency training comes first!**

The resident must notify the Nuclear Medicine Program Director if he/she decides to pursue or accept a moonlighting opportunity. Also, it should be noted that all insurance coverage and DEA certification needed for any such venture is completely the resident’s responsibility. If a resident decides to take the opportunity to moonlight, he or she must provide the Director of Nuclear Medicine with contact information including a reference name at the institution or practice at which he/she will be moonlighting. The resident must also provide the Director with documentation of malpractice coverage for this moonlighting opportunity (see Appendix I, Acknowledgment of Moonlighting Policy).

I. LEAVE POLICIES AND ATTENDANCE

Sick Leave

What to do if you are ill

- Call or page the chief resident, preferably before 7 AM. Leaving a message is not sufficient; you must directly speak with the chief (or acting chief if chief is away).
- Make sure the chief (or acting chief) will arrange coverage for you as needed. You or the chief must contact the attending on service as soon as you are aware you will be absent.
- If you are ill more than 2 days, or the absences fall within the last 2 weeks of June, a doctor’s excuse is needed.
- Sick time cannot be used as extra vacation time.
- Sick leave allowance is 15 days per year, does not carry over to the next year.
- Completed sick forms signed by the chief resident and the attending must be submitted to the residency coordinator (Shirley Levins) as soon as the resident returns to work.

- Rules for vacation and sick leave depend on University policies that are subject to change. Consult the appropriate administrative officials for current regulations.

Vacation and Academic Meeting Leave

- The vacation allowance is 15 days per year. Vacation leave **may not** be carried over from one academic year to the next, except in cases of Maternity Leave.
- All Residents Must Complete Leave Requests for Vacation or Academic Meetings. All absences for vacation must be approved first by the Chief Resident to verify vacations do not conflict with necessary clinical coverage. The attending on service must then approve the request and sign the form.
- The Program Director must sign off the completed requests. Leave is granted on a first-come basis. The form is kept on file by the Residency Coordinator.
- Residents should be aware that June is a special problem because of the Society of Nuclear Medicine annual meeting and departure of graduating residents. A maximum of five (5) days per resident will be allowed in the month of June. Some June vacation requests may be denied if clinical coverage cannot be met. Departing residents should plan at the beginning of the year vacation time if they need to leave the residency before June 30th.

Maternity Leave / Paternity Leave

Updated leave policies are available on the UAB GME website, and duty time requirements for the American Board of Nuclear Medicine can be found by contacting the ABNM through their website.

- Residents are granted three weeks (15 business days) annual illness leave for each academic year without carrying over from one year to the next.
- Residents are granted three weeks (15 business days) vacation leave per academic year without carrying over except for maternity leave as noted below.
- Salary continuation by University Hospital during maternity leave is comprised of the annual 3 weeks illness leave plus the annual 3 weeks vacation less any sick leave or vacation already expended during the academic year in question.
- Residents anticipating the need for maternity leave during their residency training may elect to leave some of their vacation time unused and save this time for maternity leave in a subsequent year. Radiology Department policy permits female residents to augment paid maternity leave by the number of days of outstanding unused vacation, even if that unused vacation time was carried over from a previous academic year. For example, a first year resident might elect to take only 2 weeks of vacation in the first year of residency and save the third week to be taken as paid maternity leave in a subsequent year. Residents may not carry over vacation for purposes other than maternity leave.
- With regard to night and weekend call missed during maternity/paternity leave, a resident will make up all call days missed during paid maternity leave, and the resident is responsible for arranging call trades. Call trades must not interfere with the “1 in 7 rule” (see section G, on-call policy above). Call days missed during periods of unpaid maternity leave need not be made up.
- Requests for leave of absence for childcare by women or men beyond the time of pregnancy-related medical disability are considered as requests for personal leave. Such requests should be directed to the program director.
- Residents are allowed family and medical leave in accordance with university policies. These and additional paternity leave policies can be found on the UAB GME webpage. It is the responsibility of the resident to notify the program director so that plans to complete the

residency training requirements can be made. The resident can also contact the American Board of Nuclear Medicine through their website (www.abnm.org).

J. Compensation and Other Benefits

“Book and Travel” Allowance: A distinction is made regarding whether the individual is a resident or fellow. The description in #1 and #2 below regards a 2-year or 3-year nuclear medicine resident. #3 below describes the situation for a 1 year fellow.

1. Each Nuclear Medicine resident receives a yearly expense allowance of \$500 per year for professional expenses, including textbooks and travel. This allowance may be spent at any time during the residency.
2. Reimbursement for Scientific Meetings
The department reimburses each resident for one or two trips to scientific meetings according to the guidelines listed below. **To be eligible for reimbursement for travel expenses, be sure you obtain written approval from the Divisional Director before you make your reservations.** This financial support is intended to assist residents in attending meetings such as the RSNA, the ASNM, SNM, AMI and some of the better courses sponsored by subspecialty societies. Board review courses and meetings outside the continental U.S. will not be approved for reimbursement. The program coordinator requires 1) your expected travel dates, 2) name of the meeting you plan to attend, and 3) what type of presentation (if you are presenting) that you will give at the meeting so that an approval letter can be processed and forwarded to Ms. Teresa Swinsick prior to your departure.

During the total period of residency, each Nuclear Medicine resident is entitled to reimbursement for one trip to attend an approved professional meeting at which the resident presents a scientific paper or has a poster exhibit. Receipts for hotel accommodations, meeting registration, coach class air fare and ground transportation to and from the airport (e.g., taxi) will be reimbursed. In addition, there will be a flat per diem allowance of \$45.00 per day which is intended to cover expenses for food, local transportation, etc. Receipts for per diem expenses need not be presented for reimbursement but may be needed for tax purposes.

In addition, each Nuclear Medicine resident is entitled to reimbursement for one trip to attend an approved professional meeting or course at which the resident need not present a paper. Reimbursement will be on the same basis as described above.

3. A one year fellow is given an allowance of \$2700 for professional expenses, including textbooks and travel. These funds are all inclusive for the fellow's needs. For example, if a resident is fortunate enough to present at more than one meeting, he/she will not be given additional funds beyond the \$2700 (as opposed to the resident situation in # 2 above). This allowance may be spent at any time during the residency.

As the Society of Nuclear Medicine Annual Meeting is most popular and near the end of the year when residents are departing, it must be noted that requests are granted on a first come basis; of course, as much as possible, a one-year fellow would be given priority over a resident that will have another opportunity to go the following year. As VA and Hospital coverage must be maintained, requests may not be granted if residents have not arranged service coverage.

K. Resident Compensation

The following are the resident salaries for academic year 2011-2012.

PGY Level	Annual	Monthly
1	\$46,806.00	\$3,900.50
2	\$47,402.00	\$3,950.17
3	\$48,616.00	\$4,051.33
4	\$50,642.00	\$4,220.17
5	\$52,208.00	\$4,350.67
6	\$55,005.00	\$4,583.75
7	\$56,562.00	\$4,713.50

Salary updates and full information concerning other benefits (parking, medical insurance, malpractice insurance, etc.) are listed on the UAB GME website (<https://www.uab.edu/medicine/home/education/residents-fellows-post-grad/gme/res-phys-salary>).

L. Nuclear Medicine Library

Although a tremendous amount of information regarding radiology and nuclear medicine is available via the internet (e.g., www.snm.org, www.auntminnie.com, etc.), a number of pertinent videos, CDs, journals and textbooks are available in the nuclear medicine library. When borrowing an item from the Division library—even if only to take it to the Reading Room—the item must be properly signed out. Material may be checked out for up to 3 weeks but may be returned for re-issue if needed.

When returning material, give it directly to the person from whom you checked it out (the residency coordinator). Be sure the check-out card is dated to reflect when you returned it. You will be held financially responsible for replacement of material that cannot be located, if the records still show the material to be in your possession.

M. Resident Progress Evaluation

Residents are evaluated based on policies set by the ACGME. Examples of the evaluation forms are in the appendix. Evaluations are done in “360 degrees”, which means residents will be evaluated by faculty, staff, peers, and by patients regarding the six competencies:

Patient care

Medical Knowledge

Practice Based Learning and Improvement

Interpersonal and Communication Skills

Professionalism

Systems Based Practice

Residents will be evaluated by faculty each rotation (including electives). These monthly evaluations will be reviewed by the residency Director and kept on file. They will be made available at any time for resident review. Evaluations will be formally reviewed at the bi-annual meeting between the Director and the Resident. Resident rotations and resident progress will also be discussed at quarterly REC meetings.

Any unsatisfactory evaluations will be reviewed immediately with the resident and appropriate action taken. In general, all problems will be dealt with by the Residency Director, but if no resolution is found, problems can be addressed through the formal grievance process.

Faculty Evaluations:

Residents will evaluate the nuclear medicine faculty members and rotations monthly. The resident will complete each questionnaire independently. These evaluations are strictly anonymous. Because of the small number of nuclear medicine residents/fellows, faculty reviews will be held in conjunction with the radiology residents. To further protect the anonymity of the residents, results from several years will be summarized by the program coordinator and then presented to the program director.

Peer Evaluations:

Residents will periodically review their fellow residents. Because of the small number of nuclear medicine residents/fellows, peer reviews will be held in conjunction with the radiology residents.

Examinations:

Residents are required to take the annual national in-service exam held in early February. Case conference will provide oral examination of knowledge and skills. A series of modules will be completed (RSNA and in house) and kept as part of the learning portfolio. The physics staff will schedule additional tests, quiz material and homework.

N. Supervision of Residents

Only licensed physicians who are credentialed to perform nuclear medicine procedures may have primary responsibility for the nuclear medicine aspects of patient care. Since the program is required by the ACGME to demonstrate that the appropriate level of supervision is in place for all residents who care for patients to ensure oversight of resident supervision and graded authority and responsibility, the following levels of supervision are generally followed: It is expected that in the initial few months of training, direct supervision (the supervising physician is physically present with the resident and patient) is available for key patient interactions and study interpretations. This is particularly true for thyroid therapies (see individual rotation-specific requirements). As the trainee becomes more competent in their training, graduation to indirect supervision with direct supervision available (the supervising physician is not physically present within the hospital or other site of patient care, but is immediately available by means of telephonic and/or electronic modalities, and is available to provide direct supervision). The transition from direct to indirect supervision is initially within the purview of supervising physician of the service that the trainee is covering; but this will be formalized no later than the first semi-annual review. It is expected that the supervising physician will notify the trainee of their expectations for attending supervision at the beginning of the rotation. In addition, in specific regard to nuclear medicine studies and therapies, it is understood that the resident acts as the authorized user's agent, but all actions must ultimately be approved by the authorized user when radiopharmaceuticals are used.

Residency Training, Duties and Expectations for Promotion/Graduation

A. Organization

The residency program is divided into three-year, two-year, and one-year tracks. The one year path has been used by residents who have completed diagnostic radiology residencies but is open to residents who have completed a radiology program at an international (non-ACGME) institution (i.e. the “Alternate Pathway” for ABR board certification). The two-year path is for residents after their specialty training in Internal Medicine. The three year path is for residents that have completed a PGY-1 year and are interested in pursuing a career in Nuclear Medicine. These pathways are organized around clinical rotations:

The Standard Three-year Curriculum:

University Hospital General Nuclear Medicine & PET: 12 months
VA Hospital: 12 months
CT: 4 months (Additional CT is done as part of VA rotations)
Children’s Hospital: 3 months
Elective/Research: 3 months
Radiation Oncology/Endocrine: 1 month
University Hospital nuclear cardiology/technology: 1 month

The Standard Two-year Curriculum:

University Hospital General Nuclear Medicine & PET: 8 months
VA Hospital: 8 months
Children’s Hospital: 2 months
CT: 3 months (Additional CT is done as part of VA rotations)
Elective/Research: 2 months
Radiation Oncology/Endocrine: 1 month
University Hospital nuclear cardiology/technology: 1 month

The Standard One-year Curriculum:

University Hospital General Nuclear Medicine & PET: 4 months
VA Hospital: 4 months
Children’s Hospital: 1 month
University Hospital Nuclear Cardiology/technology: 1 month
Radiation Oncology/Endocrine: 1 month
Elective/Research: 1 month

Residents are required to rotate through University Hospital, the VA Medical Center, and Children’s Hospital to gain a wide breadth of clinical experience. During clinical rotations, residents will accumulate data, interview the patients, determine appropriateness of the exam, interpret the images and submit a preliminary dictation. A faculty member is present and supervises each case, providing and approving each report of each case. As residents mature, they gain more independence to supervise the clinic, but all images and reports must be reviewed by the supervising attending.

Residents are expected to master basic skills before being eligible to take call or participate in therapy sessions. Preparation for these areas occurs during the first month in physics/radiation safety orientation lectures, therapy training sessions, therapy role playing sessions, and clinical lectures.

B. Goals and Objectives for Residency Training

The Nuclear Medicine training program at the UAB provides comprehensive, patient-centered, and learner-centered training in Nuclear Medicine. We have designed an experience that allows for a graded amount of responsibility as you progress through training. Each rotation in this training program has specific goals and objectives that related to the six competencies:

- Professionalism
- Patient Care Skills
- Interpersonal and Communication Skills
- Problem or Practice Based Learning and Improvement
- Systems based Practice
- Medical Knowledge

The overall Goals and Expectations based on the six competencies are outlined here by year of training. Then the specific goals for each rotation are outlined separately, to allow you to better understand what you will be expected to know and do at each stage. Each resident must fulfill all of the goals for each competency to be promoted to the next level of training and eventually successfully graduate from the UAB Nuclear Medicine Training program.

Intermediate residents/fellows will be expected to fulfill junior and intermediate requirements before being promoted to their senior year. Senior fellows (i.e. diagnostic radiology residency graduates) typically enter the program at a level where they have met the goal and objectives set for the first two years; however, it is required that they meet *all* expectations for the three years before they are allowed to graduate from the nuclear medicine residency.

1. Junior resident (“NM-1”)

A. Professionalism

From the first day of your training you are expected to dress and behave in a manner consistent with the medical profession. Professionalism should be manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. All residents must:

- 1) Respect those under your care at all times. You will care for patients to the best of your abilities independent of their gender, ethnicity, socio-economic status, religious background, sexual orientation, psychiatric problems, or use of illicit substances. It is necessary to demonstrate integrity, honesty, compassion and commitment to meet the patient’s needs.
- 2) Respect patient’s privacy, dignity, and autonomy.
- 3) Demonstrate consistent, highly honest and ethical behavior towards co-workers.
- 4) Be accountable to patients, society, and the profession of medicine.

Professional behavior will be learned and perfected in the following settings:

- 1) Interaction with inpatients and outpatients in the various nuclear medicine clinics: by having contact with a large spectrum of patients of different backgrounds.
- 2) Role Models: by witnessing the interactions of your peers, supervising fellows, and faculty.
- 3) Allied health care professionals: by interacting with nurses, social workers, physical therapist, and clinical care coordinators.
- 4) Personal responsibility, by documentation of compliance with institutional and departmental policies, as well as maintenance of medical license.

B. Patient Care: Clinical & Management Skills

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. Junior residents must learn to incorporate history and physical examination skills learned in internship into the decision making process involved in imaging and therapy. The data from the radiographic exams must be assimilated with the whole clinical picture in order to provide the best patient care possible and render a useful exam report. Junior residents will participate in the management of patients receiving thyroid therapy, by assuring patient compliance with pre-therapy instructions regarding medications and diet. Residents will carefully discuss all therapy cases and plans with the attending who will order the dose. The resident will also follow the patient after therapy is administered, both short term in the hospital (with high dose therapies) and long term to see the effects of the therapy. Residents at the VA are expected to be familiar with exercise and pharmacologic stress protocols, as well as management of potential complications of different stress test modalities. While the residents are closely supervised in the management of these patients, we expect them to be an integral part of the day-to-day management of these patients. With all exams, residents will learn appropriate follow-up recommendations.

At the end of the first year, residents will:

- 1) Interview and triage patients as needed, review the referring physicians order, obtain basic clinical information on the patient, and examine correlative imaging studies (CT, x-ray, MRI) to select the best imaging study with the appropriate views. Cardiac stress test evaluation will include selecting the proper stress modality and counseling the patient for consent. For the thyroid therapy patients, proper counseling of patients for consent, procedures for a “written directive”, proper patient preparation, care of adverse reactions, and potential radiation safety issues must be learned.
- 2) After careful discussion with the attending, you will provide clear written and verbal directions to the technologist and staff concerning the procedure.
- 3) Evaluate images independently and then review images with the attending prior to signing any written report.
- 4) Communicate results promptly and clearly to the referring physician or other appropriate health care worker. Critical results will be communicated verbally and documented in the written report (time, date, name of physician contacted). The dictated written report briefly describes pertinent findings and summarizes their significance. A final impression is given, which includes any necessary follow-up or imaging correlation needed. You should refine your interpretative skills in standard diagnostic exams.
- 5) Demonstrate competency in the selection of appropriate nuclear medicine procedures in bone, thyroid, hepatobiliary, and cardiac imaging.
- 6) Demonstrate competency in the supervision of the performance of bone, thyroid, hepatobiliary, and cardiac imaging, as well as demonstrating competency in the preliminary review and interpretation of those studies
- 7) Demonstrate competency in the therapeutic administration of radioiodine for benign thyroid disease, including: patient selection, evaluating risks and benefits, determining the administered dose, patient identity verification, obtaining informed consent, documenting pregnancy status, using administrative controls to prevent a medical event, complying with federal and state regulations regarding medical use of radiopharmaceuticals, counseling patients and their families about radiation safety issues, and scheduling and performing post-therapy follow-up.

Acquisition of clinical skills is expected to occur in the following settings:

- 1) Interviewing and examining patients, as well as performing or interpreting their studies in the UAB, VA, and Children’s Hospital nuclear medicine outpatient and inpatient settings Clinical conferences

- a. UAB Nuclear Medicine Lectures
 - b. Nuclear Cardiology Conference
 - c. Radiology Noon Conference
 - d. Interdisciplinary Conferences
- 2) Interaction with supervising attendings, fellows, consultants, and referring physicians

C. Interpersonal and Communication Skills

The practice of medicine demands superior communication skills to effectively exchange information and collaborate for the care of the patient. Communication skills will be observed during daily clinic interactions and through daily review of dictated reports.

Junior residents must be able to communicate successfully with the following groups of individuals:

- 1) Patients and their families, using HIPPA compliant methods
- 2) Colleagues such as consulting physicians, physicists, and other physicians in radiology and nuclear medicine
- 3) Nuclear medicine technologists
- 4) Allied health personnel (nurses, physician extenders, technologists, radiation safety personnel, and radiopharmacists)
- 5) Communicate successfully with referring physicians from other specialties by written report as well as through verbal exchange.

Junior residents must demonstrate competence by the completion of their first year in:

- 1) Preparing a preliminary basic nuclear medicine procedure report
- 2) Communicating the final procedure results promptly and clearly to the referring physician

D. Practice or Problem Based Learning and Improvement

All residents are expected to investigate and evaluate patients, critically evaluate and assimilate scientific evidence and literature, and seek methods to improve their patient care. Residents must develop and continuously skills in obtaining medical knowledge using resources available at UAB and new techniques as they develop in information technology. This includes:

- 1) Search for relevant information using the internet and computer data bases such as Pubmed and IPV to search for patient information, disease, and technique information. Residents should also be familiar with viewing and manipulating images with the computer, such as PET, SPECT, and routine images on nuclear medicine viewing stations as well as through the radiology PACS system.
- 2) Access electronic texts and protocol information such as “Aunt Minnie” and the Society of Nuclear Medicine websites.
- 3) Improve understanding of diseases and patient care by attending inter-specialty conferences, correlative conferences, mortality and morbidity conferences, and utilization conferences.
- 4) Utilize standard textbooks of nuclear medicine and journals such as *Clinical Nuclear Medicine* and *The Journal of Nuclear Medicine*.
- 5) Reflection on your own practice and patient follow up at Rad/Path Follow-up Case Conference, thyroid therapy and journal log follow-up, and at interdisciplinary conferences. This should include evaluation of correlative images, complications, biopsy results, and patient outcomes.
- 6) Begin analyzing articles in a critical manner so as to understand the strengths and weaknesses of the study. Acquisition and refinement of these skills will occur during:
 - a) Journal Club (Nuclear Medicine Journal Club and Radiology Journal Club)
 - b) Literature searches for clinical daily work

E. System Based Practice

Understanding the intricacies of the current health care delivery system is important to optimize the health of our patients. Systems-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. This involves learning to work in a variety of health care settings and understanding the inter-relationship with other health care professionals. Specifically, residents should be aware of:

- 1) Be aware of work conditions in hospitals, out-patient clinics, diagnostic centers, and private practice settings including hours restrictions for house officers.
- 2) Utilize resource allocation and methods directed towards controlling health care costs such as Diagnostic Related Groups (DRGs), APC, and pre-certification by medical insurers. Notably the concepts of charging methods for nuclear medicine procedures will be emphasized. Residents will use resources available from scheduling and billing personnel to help approve and protocol exams such as PET-CT which require complex knowledge of Medicare and private insurance policies.
- 3) Triage patients and determine which indications have scheduling priority to best allocate resources in the VA hospital setting.
- 4) Exercise the concept of providing optimal patient care by selecting the most cost-effective procedures and using or recommending other diagnostic tests that might complement the nuclear medicine procedures. This will be achieved by learning the efficacy of our tests and ACR appropriateness criteria.
- 5) Develop basic financial and business skills to function effectively in current health care delivery systems. This includes an understanding and knowledge of coding, procedure charges, billing practices, and reimbursement mechanisms. This will be covered in Protocol Review sessions.
- 6) Gain understanding of the regulatory bodies involved in the human use of radioactive materials including the NRC, State of Alabama, and the UAB Radiation Safety Committee. Residents will gain this knowledge during the physics lecture series and labs, I131 therapy training sessions, and clinical use of therapeutic ¹³¹I.

F. Medical Knowledge

Rotation on the general UAB, PET, VA, CT, and pediatric rotations provides an ideal environment to be exposed and familiarized with both common and uncommon disorders and the types imaging studies useful in various clinical situations. Residents should develop a sound foundation of knowledge concerning nuclear medicine techniques. They must closely follow scientific progress in nuclear medicine and learn to incorporate it effectively for modifying and improving diagnostic and therapeutic procedures.

Residents completing the NM-1 year should demonstrate basic knowledge of:

- 1) Radiation effects, safety and protection
- 2) Instrumentation basics of gamma cameras and counting devices, including quality control
- 3) Study/patient selection, performance, and interpretation of imaging studies
- 4) Pathophysiology/differential diagnosis of common clinical disorders seen in the nuclear medicine clinic
- 5) Nuclear medicine procedures, especially bone scans, thyroid uptake and scans, hepatobiliary scans, myocardial perfusion, and gated ventriculography
- 6) Radioiodine therapy for hypothyroidism

Acquisition of knowledge is expected to occur in the following settings:

- 1) Readout sessions with attending physicians and interaction with consultants and referring doctors
- 2) Clinical conferences
 - a. Mandatory Nuclear Medicine lectures
 - b. Radiology Noon Conference
 - c. Nuclear Cardiology Conference
 - d. Interdisciplinary conferences
- 3) Reading the major textbooks in nuclear medicine. Residents should complete the reading list topics for the year in detail.
- 4) Participate in required journal club activities
- 5) Use computer technology, including internet web sites (such as the required RSNA physics modules)

2. Intermediate resident (“NM-2”)

A. Professionalism

Residents and fellows are expected to dress and behave in a manner consistent with the medical profession. Professionalism should be manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. All residents must adhere to the goals listed above under professionalism for the Junior resident (“NM-1”), striving to further perfect these goals and objectives as their year progresses.

B. Patient Care: Clinical & Management Skills

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. Intermediate residents must learn to further refine the history and physical examination skills learned in their previous residency or NM-1 year into the decision making process involved in imaging and therapy. The data from the radiographic exams must be assimilated with the whole clinical picture in order to provide the best patient care possible and render a useful exam report. Intermediate residents will participate in the management of patients receiving thyroid therapy for benign and malignant indications, by assuring patient compliance with pre-therapy instructions regarding medications and diet. Residents will carefully discuss all therapy cases and plans with the attending who will order the dose. The resident will also follow the patient after therapy is administered, both short term in the hospital (with high dose therapies) and long term to see the effects of the therapy. Residents at the VA are expected to be familiar with exercise and pharmacologic stress protocols, as well as management of potential complications of different stress test modalities. While the residents are closely supervised in the management of these patients, we expect them to be an integral part of the day-to-day management of these patients. With all exams, residents will learn appropriate follow-up recommendations.

At the end of the intermediate year, residents will:

- 1) Interview and triage patients as needed, review the referring physicians order, obtain basic clinical information on the patient, and examine correlative imaging studies (CT, x-ray, MRI) to select the best imaging study with the appropriate views. Cardiac stress test evaluation will include selecting the proper stress modality and counseling the patient for consent. For the thyroid therapy patients, proper counseling of patients for consent, procedures for a “written directive”, proper patient preparation, care of adverse reactions, and potential radiation safety issues must be learned.
- 2) After careful discussion with the attending, you will provide clear written and verbal directions to the technologist and staff concerning the procedure.
- 3) Evaluate images independently and then review images with the attending prior to signing any written report.

- 4) Communicate results promptly and clearly to the referring physician or other appropriate health care worker. Critical results will be communicated verbally and documented in the written report (time, date, name of physician contacted). The dictated written report briefly describes pertinent findings and summarizes their significance. A final impression is given, which includes any necessary follow-up or imaging correlation needed. You should refine your interpretative skills in standard diagnostic exams.
- 5) Demonstrate competency in the selection of appropriate nuclear medicine procedures in parathyroid, gastrointestinal, infection, pulmonary, urinary tract procedures, and PET studies.
- 6) Demonstrate competency in the supervision of the performance of parathyroid, gastrointestinal, infection, pulmonary, urinary tract procedures, and PET studies, as well as demonstrating competency in the proper data analysis, preliminary review and interpretation of those studies.
- 7) Demonstrate competency in the interpretation of PET studies performed for oncologic indications.
- 8) Demonstrate competency in the preparation of radiopharmaceuticals, including preparing patient doses and performing quality control measures.
- 9) Demonstrate competency in the therapeutic administration of radioiodine for thyroid malignancy, including: patient selection, evaluating risks and benefits, determining the administered dose, patient identity verification, obtaining informed consent, documenting pregnancy status, using administrative controls to prevent a medical event, complying with federal and state regulations regarding medical use of radiopharmaceuticals, counseling patients and their families about radiation safety issues, and scheduling and performing post-therapy follow-up.

Acquisition of clinical and management skills are expected to occur in the following settings:

- 1) Interviewing and examining patients, as well as performing or interpreting their studies in the UAB, VA, and Children's Hospital nuclear medicine outpatient and inpatient settings
- 2) Clinical conferences
 - a. UAB Nuclear Medicine Lectures
 - b. Nuclear Cardiology Conference
 - c. Radiology Noon Conference
 - d. Interdisciplinary Conferences
- 3) Interaction with supervising attendings, fellows, consultants, and referring physicians

C. Interpersonal and Communication Skills

The practice of medicine demands superior communication skills to effectively exchange information and collaborate for the care of the patient. Communication skills will be observed during daily clinic interactions and through daily review of dictated reports.

Intermediate residents must be able to communicate successfully with the following groups of individuals:

- 1) Patients and their families, using HIPPA compliant methods
- 2) Colleagues such as consulting physicians, physicists, and other physicians in radiology and nuclear medicine
- 3) Nuclear medicine technologists
- 4) Allied health personnel (nurses, physician extenders, technologists, radiation safety personnel, and radiopharmacists)

- 5) Communicate successfully with referring physicians from other specialties by written report as well as through verbal exchange.

Intermediate residents must demonstrate competence by the completion of their NM-2 year in:

- 1) Preparing a preliminary basic nuclear medicine procedure report
- 2) Providing effective contributions to the interdisciplinary and clinical didactic conferences
- 3) Educating patients and their families in diagnostic and therapeutic nuclear medicine procedures

D. Practice or Problem Based Learning and Improvement

All residents are expected to investigate and evaluate patients, critically evaluate and assimilate scientific evidence and literature, and seek methods to improve their patient care. Residents must develop and continuously skills in obtaining medical knowledge using resources available at UAB and new techniques as they develop in information technology. This includes:

- 1) Search for relevant information using the internet and computer data bases such as Pubmed and IPV to search for patient information, disease, and technique information. Residents should also be familiar with viewing and manipulating images with the computer, such as PET, SPECT, and routine images on nuclear medicine viewing stations as well as through the radiology PACS system.
- 2) Access electronic texts and protocol information such as “Aunt Minnie” and the Society of Nuclear Medicine websites.
- 3) Improve understanding of diseases and patient care by attending inter-specialty conferences, correlative conferences, mortality and morbidity conferences, and utilization conferences.
- 4) Utilize standard textbooks of nuclear medicine and journals such as *Clinical Nuclear Medicine* and *The Journal of Nuclear Medicine*.
- 5) Reflection on your own practice and patient follow up at Rad/Path Follow-up Case Conference, thyroid therapy and journal log follow-up, and at interdisciplinary conferences. This should include evaluation of correlative images, complications, biopsy results, and patient outcomes.
- 6) Begin analyzing articles in a critical manner so as to understand the strengths and weaknesses of the study. Acquisition and refinement of these skills will occur during:
 - a) Journal Club (Nuclear Medicine Journal Club and Radiology Journal Club)
 - b) Literature searches for clinical daily work

E. System Based Practice

Understanding the intricacies of the current health care delivery system is important to optimize the health of our patients. Systems-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. This involves learning to work in a variety of health care settings and understanding the inter-relationship with other health care professionals. Specifically, residents should be aware of:

- 1) Be aware of work conditions in hospitals, out-patient clinics, diagnostic centers, and private practice settings including hours restrictions for house officers.
- 2) Utilize resource allocation and methods directed towards controlling health care costs such as Diagnostic Related Groups (DRGs), APC, and pre-certification by medical insurers. Notably the concepts of charging methods for nuclear medicine procedures will be emphasized. Residents will use resources available from scheduling and billing personnel to help approve

and protocol exams such as PET-CT which require complex knowledge of Medicare and private insurance policies.

- 3) Triage patients and determine which indications have scheduling priority to best allocate resources in the VA hospital setting.
- 4) Exercise the concept of providing optimal patient care by selecting the most cost-effective procedures and using or recommending other diagnostic tests that might complement the nuclear medicine procedures. This will be achieved by learning the efficacy of our tests and ACR appropriateness criteria.
- 5) Develop basic financial and business skills to function effectively in current health care delivery systems. This includes an understanding and knowledge of coding, procedure charges, billing practices, and reimbursement mechanisms. This will be covered in Protocol Review sessions.
- 6) Gain understanding of the regulatory bodies involved in the human use of radioactive materials including the NRC, State of Alabama, and the UAB Radiation Safety Committee. Residents will gain this knowledge during the physics lecture series and labs, ^{131}I therapy training sessions, and clinical use of therapeutic ^{131}I .

F. Medical Knowledge

Rotation on the general UAB, PET, VA, CT, and pediatric rotations provides an ideal environment to be exposed and familiarized with both common and uncommon disorders and the types imaging studies useful in various clinical situations. Residents should develop a sound foundation of knowledge concerning nuclear medicine techniques. They must closely follow scientific progress in nuclear medicine and learn to incorporate it effectively for modifying and improving diagnostic and therapeutic procedures. Residents completing the NM2 year should demonstrate basic knowledge in radiopharmacy; nuclear medicine procedures, including parathyroid, gastrointestinal, infection, pulmonary and urinary tract; radioiodine therapy for thyroid malignancy; positron emission tomography for oncologic indications; and

Residents completing the NM-1 year should demonstrate basic knowledge of:

- 1) Radiopharmacy, radiation effects, safety and protection
- 2) Instrumentation basics of gamma cameras and counting devices, including quality control
- 3) Pathophysiology/differential diagnosis of common clinical disorders seen in the nuclear medicine clinic
- 4) Nuclear medicine procedures, especially studies related to the parathyroid, gastrointestinal, infection, pulmonary and urinary tract
- 5) Cross-sectional imaging of the thorax, abdomen, and pelvis with CT in the context of SPECT/CT and PET/CT
- 6) Radioiodine therapy for hypothyroidism and malignant conditions

Acquisition of knowledge is expected to occur in the following settings:

- 1) Readout sessions with attending physicians and interaction with consultants and referring doctors
- 2) Clinical conferences
 - a. Mandatory Nuclear Medicine lectures
 - b. Radiology Noon Conference
 - c. Nuclear Cardiology Conference
 - d. Interdisciplinary conferences

- 3) Reading the major textbooks in nuclear medicine. Residents should complete the reading list topics for the year in detail as well complete the textbook: *Nuclear medicine: the Requisites* by the end of the NM-2 year.
- 4) Participate in required journal club activities.
- 5) Use computer technology, including internet web sites (such as the required RSNA physics modules).

3. Senior Resident and Radiology Fellows (“NM-3”)

Senior residents and fellows are expected to enter their last year of training at a level where they have met the goal and objectives set for the junior and intermediate resident. They will be expected to demonstrate adequate knowledge and skill to operate more independently.

This document provides the Goals and Expectations of the six competencies by year of training, as well as a section regarding other training requirements that must be completed by the end of the NM-3 year. Each resident must fulfill these requirements and all of the goals for each competency listed in the NM-1 through the NM-3 year to successfully graduate from the UAB Nuclear Medicine Training program.

A. Professionalism

The standards of professionalism are set from the first day of your training and are described in the junior and intermediate resident goals and objectives. All residents must:

- 1) Respect those under your care at all times; you will care for patients to the best of your abilities independent of their gender, ethnicity, socio-economic status, religious background, sexual orientation, psychiatric problems, or use of illicit substances. It is necessary to demonstrate integrity, honesty, compassion and commitment to meet the patient’s needs.
- 2) Respect patient’s privacy, dignity, and autonomy.
- 3) Demonstrate consistent, highly honest and ethical behavior towards co-workers.

B. Patient Care: Clinical and Management Skills

Senior residents are in the phase of being information managers. While continued excellence interviewing patients and gathering data to determine the most appropriate test is expected, the resident must integrate these skills in deciding which studies, imaging protocols, and follow-up procedures are best for the patient in a more independent manner. While an attending will be available at all times for consultation and will personally review all studies prior to signing them off, senior residents develop a plan and perform preliminary interpretations in most diagnostic cases. In addition, as a senior resident, you will be expected to take a more active role in teaching more junior nuclear medicine and radiology residents.

Senior residents should:

- 1) Obtain detailed information about the patient related to the requested test or therapy using patient interview, chart and computer data base review, and physical examination when needed. They must integrate this information into a cohesive summary of the indications for the study, image findings, differential diagnosis, and best course for additional testing. The resident determines how the imaging results are best integrated into patient care while consulting with attending as needed.
- 2) Independently select appropriate procedures or therapy based on the physician's request and the patient's history after careful discussion with the patient and technical staff before study is begun. This involves review of image quality, defining the need for additional images and

correlation with other imaging studies such as x-rays, CT, MRI, or ultrasound. The decisions about extra views and methods of analysis will be reviewed with the attending physician and staff after the study is provisionally completed (in most instances). After this, the attending and trainee will determine if additional views, manipulations will be needed. If questions exist, such as for infrequently performed procedures, the attending will be available.

- 3) Communicate results promptly and clearly to the referring physician or other appropriate health care workers. This communication should include clear and succinct dictation of the results. Preliminary results can be communicated before the case is discussed with attending staff, however all cases will be promptly reviewed by an attending.
- 4) Demonstrate competency in interpreting PET studies performed for non-oncologic indications
- 5) Demonstrate competency in therapeutic administration of radiopharmaceuticals, including patient selection, evaluating risks and benefits, determining the administered dose, patient identity verification, obtaining informed consent, documenting pregnancy status, using administrative controls to prevent a medical event, complying with federal and state regulations regarding the medical use of radiopharmaceuticals, counseling patients and their families about radiation safety issues, and scheduling and performing post-therapy follow-up
- 6) Be competent in interpreting the following:
 - a. Musculoskeletal studies for benign and malignant disease
 - b. Myocardial perfusion imaging with treadmill and pharmacologic stress, including patient monitoring, with special emphasis on electrocardiographic interpretation
 - c. ECG-gated ventriculography for evaluation of ventricular performance
 - d. Endocrinologic studies, including thyroid and parathyroid
 - i. Thyroid studies must include measurement of iodine uptake and dosimetry calculations for radioiodine therapy
 - e. Gastrointestinal studies, including transit studies, liver and hepatobiliary, bleeding, and Meckel's diverticulum
 - f. Infection studies, including gallium, labeled leukocytes, and bone marrow imaging
 - g. Oncology studies, including sentinel node localization, fluorodeoxyglucose (FDG), adrenal, somatostatin-receptor imaging and other agents as they become available
 - h. Neurologic studies, including cerebral perfusion, cerebral metabolism and cerebrospinal fluid. This should include studies of dementia, epilepsy, and brain death
 - i. Pulmonary studies, including perfusion and ventilation for pulmonary embolus, right-to-left shunts, and quantitative assessment of perfusion and ventilation
 - j. Urinary tract studies, including renal perfusion, function and cortical imaging, renal scintigraphy with pharmacologic interventions, and renal transplant evaluation
 - k. Cross-sectional imaging of the brain, head and neck, thorax, abdomen, and pelvis with CT in the context of SPECT/CT and PET/CT

C. Interpersonal and Communication Skills

A senior level resident should be particularly aware of his/her role as a role model for the technologists, junior residents, radiology residents, and medical students working under his/her leadership.

You must be able to communicate successfully with the following groups of individuals:

- 1) Patients and their families, using HIPPA compliant methods
- 2) Colleagues such as consulting physicians, physicists, and physicians in radiology and nuclear medicine
- 3) Nuclear medicine technologists
- 4) Allied health personnel (nurses, physician extenders, technologists, radiation safety personnel, and radiopharmacists)

By the completion of the NM-3 year, trainees should be competent in

- 1) Communicating the final procedure interpretation, an appropriate differential diagnosis, and any clinical, diagnostic or therapeutic recommendations.
- 2) Supervising and teaching junior residents, residents from other services, and students on rotations in nuclear medicine.

D. Practice or Problem Based Learning and Improvement

All residents are expected to investigate and evaluate their own patient care, be able to critically evaluate and assimilate scientific evidence and literature, and seek methods to improve their patient care. Residents must develop and continuously skills in obtaining medical knowledge using resources available at UAB and new techniques as they develop in information technology. As well as continuing to refine goals from the prior year, this includes:

- 1) Evaluating methods to improve practice and patient care by completing a QC project.
- 2) Perform continued routine QC and patient follow-up on thyroid therapy patients and for Rad/Path Follow-up Case Conference
- 3) Complete at least one research project. The goal is for publication in a peer reviewed journal but presentations and posters are acceptable.
- 4) Attend and if possible present at a scientific meeting (National, State, or Regional)

E. System Based Practice

Understanding intricacies of the current health care delivery system is important to optimize the health of our patients. Systems-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. This involves learning to work in a variety of health care settings and understanding the inter-relationship with other health care professionals. Specifically, senior residents should:

- 1) Attend a Radiation Safety Committee Meeting
- 2) Present PET-CT and other cases at interdisciplinary conferences
- 3) Develop familiarity with "Medicare Approved" and private insurer policies for various indications using PET.
- 4) Attend radiopharmacy and commercial cyclotron facility.

F. Medical Knowledge

Residents should develop a sound foundation of knowledge concerning nuclear medicine techniques. They must closely follow scientific progress in nuclear medicine and learn to incorporate it effectively for modifying and improving diagnostic and therapeutic procedures. Residents are expected to complete goals for the NM1 and NM2 year and:

- 1) Participate in presenting PET-CT cases at interdisciplinary conferences
- 2) Demonstrate competence in their knowledge of all topics included in the didactic curriculum

- 3) Use feedback from In-Training Examination to plan Board study outlines
- 4) Develop at least one conference including a Radiology Noon Conference

G. The Learning Portfolio

Until such time as an electronic format through eValue is up and running, the trainee will accumulate data in a paper copy of a learning portfolio. The Resident Learning Portfolio must be maintained by each resident, must be reviewed with the program director as part of the semiannual evaluation, and must include the following:

- 1) Documentation of participation in the following required nuclear medicine procedures (kept in a HIPAA-compliant manner):
 - a) A minimum of 10 cases of oral administration of less than or equal to 1.22 gigabecquerels (33 millicuries) of sodium iodide I-131, for which a written directive is required
 - b) A minimum of five cases of oral administration greater than 1.22 gigabecquerels (33 millicuries) of sodium iodide I-131, for which a written directive is required
 - c) A minimum of three cases of parenteral administration of any beta emitter, or a photon-emitting radionuclide with a photon energy less than 150 keV, for which a written directive is required and/or parenteral administration of any other radionuclide, for which a written directive is required
 - (1) Documentation of participation in therapeutic procedures should include the date, diagnosis, and dose of each therapy. Follow-up of the patients (appendix G) should also be included.
 - d) A minimum of 50 cardiovascular pharmacologic and/or exercise stress studies
 - (1) Documentation of participation in stress myocardial studies should include date, radiopharmaceutical, and type of stress (exercise or pharmacologic)
 - e) A minimum of 25 pediatric nuclear medicine procedures per year
 - f) Documentation of all CT cases they interpret
- 2) Documentation of basic cardiac life support (BCLS) and advanced cardiac life support (ACLS) certification
- 3) Documentation of conference presentations, external courses and meetings attended, and self-assessment modules completed
- 4) Documentation of compliance with regulatory-based training requirements (“NRC Checklist”, appendix H)
- 5) Documentation of performance on the annual in-training examination
- 6) Initial and semi-annual resident self-assessment and learning plan
- 7) Formal faculty evaluation of report quality
- 8) Documentation of compliance with institutional and departmental policies
- 9) Status of medical license

- 10) Documentation of participation in identifying and implementing potential systems solutions (“QC Project”. This QC project is meant for the resident/fellow to assess his or her learning and practice environment, and come up with ideas on how to improve the quality of patient care, image interpretation, etc. Examples of previous QC projects performed include upgrading the Nuclear Medicine library, creating wall charts that allow for the rapid identification of lymph node stations and spaces of the head and neck, and a book for the General reading room meant to acquaint/reacquaint residents and fellows rotation through with daily reading room procedures)
- 11) Documentation of scholarly activity. Generally speaking, this would involve either performing basic or clinical research, with the goal of publication of a paper, abstract or a poster presentation at a scientific meeting, or presentation of topics at local, state, regional, or national meetings. A resident or fellow is required to present at least one topic at the radiology noon conference over the course of his or her training. Forms of documentation can include actual publications, an announcement of presentation(s), or like materials
- 12) Any additional materials requested by the program director, such as RSNA module completion certificates, EKG module results, and the like.

ROTATION SPECIFIC KNOWLEDGE GOALS AND OBJECTIVES

Competency-Based Rotation Goals and Objectives Nuclear Medicine Residency Program University of Alabama Medical Center

VA Hospital (Three Year Residency, NM-1—First Month)

This rotation involves interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. Patient interviewing and consenting skills are developed, as well as EKG interpretation skills.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify basic nuclear radiology equipment and describe pertinent quality control measures,
- (2) Understand the indications, risks, benefits and contraindications for myocardial perfusion imaging so as to effectively communicate this to patients,
- (3) State appropriate indications for commonly ordered nuclear medicine studies, and
- (4) Describe basic concepts of nuclear cardiology.

Skill Objectives:

- (1) Be facile with Xeleris and PACs viewing stations and utilize available information technology (CPRS, TalkTech, etc.) to manage patient information,
- (2) Understand the fundamentals of the following types of nuclear radiology studies: myocardial perfusion studies, myocardial viability studies (with Tl-201), and MUGA scans,
- (3) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (4) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on the UAB nuclear medicine rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation
- (3) Consenting patients for and performing nuclear medicine stress tests.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Introduction to clinical electrocardiography interpretation,

- (2) State organ localization and clinical uses of common radiopharmaceuticals, especially those related to myocardial perfusion imaging, and
- (3) Recognize the normal and abnormal biodistribution of radiopharmaceuticals as related to coronary vascular territories in myocardial MPI imaging.

Skill Objectives:

- (1) Participate in radiation safety processes as outlined by the Nuclear Regulatory Commission (NRC) requirements (talk given by VA RSO), and
- (2) Complete reading list topics: ASNC Imaging Guidelines—Stress Protocols and Tracers (<http://www.asnc.org/imageuploads/ImagingGuidelinesStressProtocols021109.pdf>) and nuclear cardiac chapter of either Mettler or Requisites).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and

- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate risks, benefits, and radiation safety issues to patients receiving myocardial perfusion studies, to be accomplished by first observing the informed consent process with an attending nuclear medicine physician, then by consenting a patient while being observed by an attending nuclear medicine physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-1—Second Month)

This rotation involves continued interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. EKG interpretation skills are improved. SPECT myocardial perfusion imaging (MPI) appropriateness criteria are introduced.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of myocardial SPECT imaging, including quality control, image acquisition and study interpretation, and
- (2) Describe pharmacologic interventions in nuclear cardiology including Adenosine, Regadenosine, Dipyrimadole, and Dobutamine.

Skill Objectives:

- (1) Accurately interpret radionuclide scans related to myocardial studies,
- (2) Continued practice of EKG interpretation,
- (3) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (4) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care, and
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical characteristics and state organ localization of commonly used radionuclides for cardiac imaging,
- (2) Describe the appropriate indications for stress MPI imaging, and
- (3) Begin to understand the implications of normal and abnormal stress MPI imaging as it applies to specific populations/risk factors.

Skill Objectives:

- (1) Understand the dynamics of myocardial perfusion imaging,
- (2) Complete reading list topics: ASNC Appropriate Use Criteria for Cardiac Radionuclide

Imaging (<http://www.asnc.org/imageuploads/AUCCardiacRadionuclideImaging2009.pdf>) and ASNC Imaging Guidelines—Single Photon Emission Computed Technology (<http://www.asnc.org/imageuploads/ImagingGuidelineSPECTJune2010.pdf>).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under observation of a nuclear medicine attending, with the goal of independent informed consent by the end of the rotation. The resident/fellow will continue to perfect the stress myocardial perfusion study informed consent process

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-1—Third Month)

This rotation involves continued interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. EKG interpretation skills are improved

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Continue to refine knowledge of myocardial SPECT imaging, including quality control, image acquisition and study interpretation,
- (2) Describe indications and contraindications for pharmacologic interventions in nuclear cardiology including Adenosine, Regadenosine, Dipyrimadole, and Dobutamine, as well as management of complications, and
- (3) Describe the appropriate indications for stress MPI imaging.

Skill Objectives:

- (1) Accurately interpret radionuclide scans related to myocardial studies,
- (2) Continued practice of EKG interpretation,
- (3) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (4) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care, and
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical characteristics and state organ localization of commonly used radionuclides for cardiac imaging,
- (2) Describe the appropriate indications for planar stress MPI imaging, and
- (3) Further refine the understanding of the implications of normal and abnormal stress MPI imaging as it applies to specific populations/risk factors.

Skill Objectives:

- (1) Participate in patient set-up process for stress testing, both exercise and pharmacologic,

- and
- (2) Complete reading list topics: Review ASNC Imaging Guidelines—Stress Protocols and Tracers (<http://www.asnc.org/imageuploads/ImagingGuidelinesStressProtocols021109.pdf>) and ASNC Imaging Guidelines—Myocardial Perfusion Planar Imaging (<http://www.asnc.org/imageuploads/ImagingGuidelinesPlanar021109.pdf>).

Behavior and Attitude Objectives:

Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients and myocardial perfusion imaging patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-1—Fourth Month)

This rotation involves continued interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. EKG interpretation skills are improved. Information regarding PET myocardial imaging is introduced.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Continue to refine knowledge of myocardial SPECT imaging, including quality control, image acquisition and study interpretation,
- (2) Review the appropriate indications for stress MPI imaging, including indications for PET MPI imaging,

Skill Objectives:

- (1) Accurately interpret SPECT/CT studies related to cardiology and other indications,
- (2) Continued practice of exercise and pharmacologic stress testing,
- (3) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (4) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State organ localization and clinical uses of ^{18}F -FDG and ^{82}Rb PET, and
- (2) Perfect knowledge of exercise and pharmacologic stress testing,

Skill Objectives:

- (1) Participate in patient set-up process for stress testing, both exercise and pharmacologic, and
- (2) Complete reading list topics: Review ASNC Imaging Guidelines—PET Myocardial Perfusion and Metabolism Clinical Imaging (<http://www.asnc.org/imageuploads/ImagingGuidelinesPETJuly2009.pdf>) and ASNC

Imaging Guidelines—Standardized Reporting of Radionuclide Myocardial Perfusion and Function (<http://www.asnc.org/imageuploads/ImagingGuidelinesReportingJuly2009.pdf>)

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-2—Fifth Month)

This rotation introduces VA PET/CT and CT study interpretation. Indications for and interpretation of Dual Energy X-ray Absorption (DEXA) studies are also introduced. There is continued interpretation of planar and SPECT myocardial studies.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of CT, PET, and PET/CT imaging, including quality control, image acquisition and study interpretation,
- (2) Summarize concepts of DEXA imaging, including quality control, image acquisition and study interpretation

Skill Objectives:

- (1) Accurately interpret CT and PET/CT scans related to oncology indications,
- (2) Accurately interpret DEXA scans,
- (3) Continued practice of nuclear medicine MPI interpretation,
- (4) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on the UAB NM rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State organ localization and clinical uses of 18F-FDG PET,
- (2) Discuss quality control of DEXA,
- (3) Discuss clinical uses of DEXA, and relevance of T and Z scores.

Skill Objectives:

- (1) Participate in quality control processes in regards to DEXA scanner, and
- (2) Complete reading list topic: ACR Practice Guidelines for the Performance of Dual Energy X-ray Absorptiometry
(http://www.acr.org/SecondaryMainMenuCategories/quality_safety/guidelines/dx/musc/dxa).

[aspx](#))

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine and CT images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-2—Sixth Month)

This rotation involves continued VA PET/CT study interpretation, with some CT interpretation as well. There is some continued interpretation of planar and SPECT myocardial studies.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of CT, PET, and PET/CT imaging, including quality control, image acquisition and study interpretation,
- (2) Summarize steps taken to mitigate iodine contrast reactions.

Skill Objectives:

- (1) Accurately interpret CT and PET/CT scans,
- (2) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (3) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Recognize normal and abnormal appearance of ^{18}F -FDG and ^{18}F -NaF PET,
- (2) Recognize normal and abnormal appearance of CT cross sectional anatomy.

Skill Objectives:

- (1) Observe quality control processes in regards to PET/CT scanner, and
- (2) Review ACR Manual on Contrast Media:
http://www.acr.org/secondarymainmenucategories/quality_safety/contrast_manual.aspx

Behavior and Attitude Objectives:

- (2) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine and CT images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the

day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent from patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-2—Seventh Month)

This rotation involves continued VA PET/CT study interpretation, with some CT interpretation as well. There is some continued interpretation of planar and SPECT myocardial studies as needed.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of CT, PET, and PET/CT imaging, including quality control, image acquisition and study interpretation,
- (2) Summarize steps taken to mitigate iodine contrast reactions.

Skill Objectives:

- (1) Accurately interpret CT and PET/CT scans,
- (2) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (3) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State normal and abnormal appearance of ^{18}F -FDG and ^{18}F -NaF PET, and
- (2) State normal and abnormal appearance of CT cross sectional anatomy.

Skill Objectives:

- (1) Participate in quality control processes in regards to PET/CT scanner, and
- (2) Review ACR Manual on Contrast Media:
http://www.acr.org/secondarymainmenucategories/quality_safety/contrast_manual.aspx

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine and CT images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the

day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent from patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-2—Eighth Month)

This rotation involves continued VA PET/CT and CT study interpretation, now with more of an emphasis on CT. There is minimal continued interpretation of planar and SPECT myocardial studies.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of CT, PET, and PET/CT imaging, including quality control, image acquisition and study interpretation,
- (2) Summarize steps taken to mitigate iodine contrast reactions.

Skill Objectives:

- (1) Accurately interpret CT and PET/CT scans,
- (2) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (3) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care, and
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Recognize the typical appearance of common malignancies when imaging with ^{18}F -FDG and ^{18}F -NaF PET, and
- (2) Recognize the typical appearance of common disease processes when imaging with CT cross sectional anatomy.

Skill Objectives:

- (1) Review PET chapters in Wahl (see reading list).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine and CT images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after

conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent from patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Three Year Residency, NM-3—Months 9-12)

These rotations involve continued VA PET/CT and CT study interpretation, now with an emphasis on CT. Nuclear Cardiology studies are performed only in rare cases of attending coverage shortages.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of CT, PET, and PET/CT imaging, including quality control, image acquisition and study interpretation,
- (2) Summarize steps taken to mitigate iodine contrast reactions.

Skill Objectives:

- (1) Accurately interpret CT and PET/CT scans,
- (2) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (3) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care, and
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State normal and abnormal appearance of ^{18}F -FDG and ^{18}F -NaF PET,
- (2) State normal and abnormal appearance of CT cross sectional anatomy.

Skill Objectives:

- (1) Review CT reading selections in reading list.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine and CT images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off,

meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

VA Hospital (Nuclear Medicine One Year Fellowship, NM-3—First Month)

This rotation involves interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. Patient interviewing and consenting skills are developed, as well as EKG interpretation skills.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (5) Identify basic nuclear radiology equipment and describe pertinent quality control measures,
- (6) Understand the indications, risks, benefits and contraindications for myocardial perfusion imaging so as to effectively communicate this to patients,
- (7) State appropriate indications for commonly ordered nuclear medicine studies, and
- (8) Describe basic concepts of nuclear cardiology.

Skill Objectives:

- (5) Be facile with Xeleris and PACs viewing stations and utilize available information technology (CPRS, TalkTech, etc.) to manage patient information,
- (6) Understand the fundamentals of the following types of nuclear radiology studies: myocardial perfusion studies, myocardial viability studies (with Tl-201), MUGA, bone, and V/Q, scans,
- (7) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (8) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on the UAB nuclear medicine rotation).

Behavior and Attitude Objectives:

- (4) Work with the health care team in a professional manner to provide patient-centered care.
- (5) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation
- (6) Consenting patients for and performing nuclear medicine stress tests.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (4) Introduction to clinical electrocardiography interpretation, and
- (5) State organ localization and clinical uses of common radiopharmaceuticals, especially

those related to myocardial perfusion imaging.

Skill Objectives:

- (3) Participate in radiation safety processes as outlined by the Nuclear Regulatory Commission (NRC) requirements (talk given by VA RSO), and
- (4) Complete reading list topics: ASNC Imaging Guidelines—Stress Protocols and Tracers (<http://www.asnc.org/imageuploads/ImagingGuidelinesStressProtocols021109.pdf>) and nuclear cardiac chapter of either Mettler or Requisites).

Behavior and Attitude Objectives:

- (2) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (2) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (3) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (4) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (3) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (4) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (2) Understand how their image interpretation affects patient care.

Skill Objectives:

- (4) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (5) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (6) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (2) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (3) Understanding of the need for respect for patient privacy and autonomy, and
- (4) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (2) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (2) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (2) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (4) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (5) Communicate effectively with physicians, other health professionals, and
- (6) Effectively communicate risks, benefits, and radiation safety issues to patients receiving myocardial perfusion studies, to be accomplished by first observing the informed consent process with an attending nuclear medicine physician, then by consenting a patient while being observed by an attending nuclear medicine physician.

Behavior and Attitude Objectives:

- (2) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Nuclear Medicine One Year Fellowship, NM-3—Second Month)

This rotation involves continued interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. EKG interpretation skills are improved. SPECT myocardial perfusion imaging (MPI) appropriateness criteria are introduced.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (3) Summarize concepts of myocardial SPECT imaging, including quality control, image acquisition and study interpretation, and
- (4) Describe pharmacologic interventions in nuclear cardiology including Adenosine, Regadenosine, Dipyrimadole, and Dobutamine.

Skill Objectives:

- (5) Accurately interpret radionuclide scans related to myocardial studies,
- (6) Continued practice of EKG interpretation,
- (7) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (8) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (3) Work with the health care team in a professional manner to provide patient-centered care, and
- (4) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (4) Describe physical characteristics and state organ localization of commonly used radionuclides for cardiac imaging,
- (5) Describe the appropriate indications for stress MPI imaging, and
- (6) Begin to understand the implications of normal and abnormal stress MPI imaging as it applies to specific populations/risk factors.

Skill Objectives:

- (3) Understand the dynamics of myocardial perfusion imaging,
- (4) Complete reading list topics: ASNC Appropriate Use Criteria for Cardiac Radionuclide

Imaging (<http://www.asnc.org/imageuploads/AUCCardiacRadionuclideImaging2009.pdf>) and ASNC Imaging Guidelines—Single Photon Emission Computed Technology (<http://www.asnc.org/imageuploads/ImagingGuidelineSPECTJune2010.pdf>).

Behavior and Attitude Objectives:

- (2) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (2) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (3) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (4) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (3) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (4) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (2) Understand how their image interpretation affects patient care.

Skill Objectives:

- (4) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (5) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (6) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (2) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (3) Understanding of the need for respect for patient privacy and autonomy, and
- (4) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (2) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (2) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (2) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (4) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (5) Communicate effectively with physicians, other health professionals, and
- (6) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under observation of a nuclear medicine attending, with the goal of independent informed consent by the end of the rotation. The resident/fellow will continue to perfect the stress myocardial perfusion study informed consent process

Behavior and Attitude Objectives:

- (2) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Nuclear Medicine One Year Fellowship, NM-3—Third Month)

This rotation involves continued interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. EKG interpretation skills are improved. NM Fellows will begin to participate in VA PET/CT and CT study interpretation as time allows.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (4) Continue to refine knowledge of myocardial SPECT imaging, including quality control, image acquisition and study interpretation,
- (5) Describe indications and contraindications for pharmacologic interventions in nuclear cardiology including Adenosine, Regadenosine, Dipyrimadole, and Dobutamine, as well as management of complications, and
- (6) Describe the appropriate indications for stress MPI imaging.

Skill Objectives:

- (5) Accurately interpret radionuclide scans related to myocardial studies,
- (6) Continued practice of EKG interpretation,
- (7) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (8) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (3) Work with the health care team in a professional manner to provide patient-centered care, and
- (4) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (4) Describe physical characteristics and state organ localization of commonly used radionuclides for cardiac imaging,
- (5) Describe the appropriate indications for planar stress MPI imaging, and
- (6) Further refine the understanding of the implications of normal and abnormal stress MPI imaging as it applies to specific populations/risk factors.

Skill Objectives:

- (3) Participate in patient set-up process for stress testing, both exercise and pharmacologic, and
- (4) Complete reading list topics: Review ASNC Imaging Guidelines—Stress Protocols and Tracers (<http://www.asnc.org/imageuploads/ImagingGuidelinesStressProtocols021109.pdf>) and ASNC Imaging Guidelines—Myocardial Perfusion Planar Imaging (<http://www.asnc.org/imageuploads/ImagingGuidelinesPlanar021109.pdf>).

Behavior and Attitude Objectives:

Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (2) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (3) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (4) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (3) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (4) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (2) Understand how their image interpretation affects patient care.

Skill Objectives:

- (4) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (5) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (6) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (2) Advocate for quality patient care in a professional manner, particularly concerning

imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (3) Understanding of the need for respect for patient privacy and autonomy, and
- (4) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (2) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (2) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (2) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (4) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (5) Communicate effectively with physicians, other health professionals, and
- (6) Obtain informed consent for therapy patients and myocardial perfusion imaging patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (2) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

VA Hospital (Nuclear Medicine One Year Fellowship, NM-3—Fourth Month)

This rotation involves continued interpretation of planar and SPECT myocardial studies, as well as a wide range of other radionuclide imaging studies. EKG interpretation skills are improved. Information regarding PET myocardial imaging is introduced. NM Fellows will review indications for and participate in interpretation of Dual Energy X-ray Absorption (DEXA) studies. PET/CT studies will also be interpreted as time allows.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Continue to refine knowledge of myocardial SPECT imaging, including quality control, image acquisition and study interpretation,
- (2) Review the appropriate indications for stress MPI imaging, including indications for PET MPI imaging,
- (3) Fellows will summarize concepts of CT, PET, and PET/CT imaging, including quality control, image acquisition and study interpretation, and
- (4) Fellows will summarize concepts of DEXA imaging, including quality control, image acquisition and study interpretation,

Skill Objectives:

- (1) Accurately interpret SPECT/CT studies related to cardiology and other indications,
- (2) Continued practice of exercise and pharmacologic stress testing,
- (3) Fellows will accurately interpret DEXA and PET/CT scans,
- (4) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Submit cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State organ localization and clinical uses of ^{18}F -FDG and ^{82}Rb PET,
- (2) Fellows will summarize concepts of DEXA imaging, including quality control, image acquisition and study interpretation, and

- (3) Fellows will discuss clinical uses of DEXA, and relevance of T and Z scores.

Skill Objectives:

- (1) Participate in patient set-up process for stress testing, both exercise and pharmacologic, and
- (2) Complete reading list topics: Review ASNC Imaging Guidelines—PET Myocardial Perfusion and Metabolism Clinical Imaging (<http://www.asnc.org/imageuploads/ImagingGuidelinesPETJuly2009.pdf>) and ASNC Imaging Guidelines—Standardized Reporting of Radionuclide Myocardial Perfusion and Function (<http://www.asnc.org/imageuploads/ImagingGuidelinesReportingJuly2009.pdf>)
- (3) Fellows will review the ACR Practice Guidelines for the Performance of Dual Energy X-ray Absorptiometry (http://www.acr.org/SecondaryMainMenuCategories/quality_safety/guidelines/dx/musc/dxa.aspx)

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and

- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for patients with the utmost professionalism.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Nuclear Radiology Fellowship
UAB General & PET (First Month)

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify basic nuclear radiology equipment and describe pertinent quality control measures,
- (2) State appropriate indications for commonly ordered nuclear medicine studies,
- (3) Describe basic concepts of radionuclide therapy for thyroid carcinoma and hyperthyroidism including radiation safety issues.
- (4) Review commonly ordered call studies (V/Q scans, GI Bleed, HIDA, MAG3 Renal Scans, Radionuclide Cerebral Angiography) to facilitate proper patient care when the fellow begins taking call.

Skill Objectives:

- (1) Be facile with Jet Stream and PACs viewing stations and utilize available information technology (Horizon, CDA, TalkTech, etc.) to manage patient information,
- (2) Observe and perform Sentinel Lymph Node Scintigraphy studies,
- (3) Correlate findings with radiographs and other imaging studies and prescribe additional studies when appropriate,
- (4) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Actively interact with patients and ordering physicians, along with self-directed review of clinical notes to accurately assess any effects of radioactive iodine administration on the patient. Specifically, residents will document (as possible) results of iodine therapy in patients that they have treated on previous rotations. This documentation will be kept as part of the resident's learning portfolio, and
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care,
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical,

epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical properties of commonly used radionuclides,
- (2) State organ localization and clinical uses of common radiopharmaceuticals, and
- (3) Discuss common pathologic appearances for common call studies (listed above).

Skill Objectives:

- (1) Participate in quality control processes as outlined by the Nuclear Regulatory Commission (NRC) requirements (see Appendix H), to be facilitated by the physicist staff,
- (2) Complete the following RSNA physics modules (<http://www.rsna.org/RSNA/AAPM Online Physics Modules .aspx>): “Gamma Cameras/Image Quality”, and “Nuclear Medicine: Radioisotopes and Radiopharmaceuticals.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****, and
- (3) Complete reading in chapters on topics correlating to commonly ordered nuclear medicine studies, with an emphasis in “on-call” studies (preferred texts include “The Requisites” or “Essentials of Nuclear Medicine Imaging”; see reading list).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate radiation safety issues to patients receiving radioactive iodine therapy, to be accomplished by first “role playing” the informed consent process with an attending nuclear medicine physician, then by consenting a patient while being observed by an attending nuclear medicine physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

**Nuclear Radiology Fellowship
UAB General & PET (Second Month)**

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease and lymphoma.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of SPECT imaging, including quality control, image acquisition and study interpretation,
- (2) Describe pharmacologic interventions in nuclear radiology including morphine/cholecystikinin hepatobiliary imaging, ACE inhibitor (Captopril) renography, Diamox brain imaging, Lasix renography, and Reglan gastric emptying, and
- (3) Describe the indications for PET imaging and tumor for which PET is of more limited use, proper patient preparation, and technical factors associated with PET acquisition.

Skill Objectives:

- (1) Accurately interpret radionuclide scans related to infection and tumor such as FDG PET, Octreoscan, leukocyte scan, Gallium scan, MIBG scan, Thallium brain scan and hemangioma studies, and HMPAO brain scans,
- (2) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (3) Actively interact with patients and ordering physicians, along with self-directed review of clinical notes to accurately assess any effects of radioactive iodine administration on the patient. Specifically, residents will document (as possible) results of iodine therapy in patients that they have treated on previous rotations. This documentation (see appendix G) will be kept as part of the resident's learning portfolio, and
- (4) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical characteristics of commonly used radionuclides,
- (2) State organ localization and clinical uses of common radiopharmaceuticals,
- (3) Begin to review current guidelines for the use of ^{131}I in benign and malignant thyroid conditions, as well as the use of thyroid-specific medications and their effects, and
- (4) Continue to perfect knowledge relating to the pathophysiologic distribution of specific radiotracers in common disease processes.

Skill Objectives:

- (1) Participate in quality control processes as outlined by Nuclear Regulatory Commission (NRC) requirements (if not already completed; see Appendix H),
- (2) Complete the RSNA physics modules (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules.aspx): “SPECT, SPECT/CT Image Quality” and “PET/ PET/CT Image Quality.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****, and
- (3) Complete reading in chapters on topics correlating to the studies included in the “Patient Care Objectives” listed above (preferred texts include “The Requisites” or “Essentials of Nuclear Medicine Imaging”; see reading list).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under indirect supervision of a nuclear medicine attending.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

**Nuclear Radiology Fellowship
UAB General & PET (Third Month)**

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease and lymphoma.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize the NRC and Alabama rules concerning radionuclide imaging and therapy, completing a radiation safety review in the department with a nuclear medicine physicist, and
- (2) Distinguish among the different nuclear medicine antibody studies and therapies, including Zevalin, Bexxar, Prostascint and CEA scan. With this, the resident should begin to appreciate of the importance of the field of Molecular Imaging to targeted patient care.

Skill Objectives:

- (1) Accurately interpret most general nuclear medicine and PET examinations,
- (2) Actively interact with patients and ordering physicians, along with self-directed review of clinical notes to accurately assess any effects of radioactive iodine administration on the patient. Specifically, residents will document (as possible) results of iodine therapy in patients that they have treated on previous rotations. This documentation (see appendix G) will be kept as part of the resident's learning portfolio,
- (3) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone, and
- (4) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify the different systems used for PET acquisition – coincidence detectors, dedicated PET systems, and PET/CT systems,

- (2) Describe the indications and use of PET agents in nuclear cardiology including F-18 FDG, Rubidium, and ammonia,
- (3) Continue to perfect knowledge relating to ^{131}I therapy of benign and malignant thyroid conditions, and
- (4) Identify PET radiopharmaceuticals that are soon to be in clinical use, and describe their characteristics.

Skill Objectives:

- (1) Complete reading in chapters on topics correlating to the studies listed in the “Patient Care Objectives” listed above (preferred texts include “The Requisites” or “Essentials of Nuclear Medicine Imaging”; see reading list),
- (2) Complete recommended PET reading list in Wahl,
- (3) Complete the RSNA physics module (<http://www.rsna.org/RSNA/AAPM Online Physics Modules .aspx>): “Image Processing and Reconstruction”. *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****,
- (4) Begin reading from more “advanced” nuclear medicine textbooks (e.g. Henkin and Gottschalk), the Molecular Imaging reading list (appendix A) as well as recommendations provided by the Molecular Imaging Center of Excellence Education Task Force (http://www.molecularimagingcenter.org/docs/Compendium_Final_5_30_08.pdf and/or <http://www.molecularimagingcenter.org/index.cfm?PageID=8063&RPID=6328>), and
- (5) Engage in teaching nuclear medicine and radiology residents on the rotation.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of radiology residents, medical students, and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective

exchange of information and teaming with patients, their families, and professional associates.
Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent with the utmost professionalism under the indirect supervision of a nuclear medicine attending.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

**Nuclear Radiology Fellowship
UAB General & PET (Fourth Month)**

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease and lymphoma. As a junior attending, the senior fellow should be responsible for the service he is overseeing. Molecular imaging topics will continue to be covered.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Perfect ability to interpret general nuclear medicine and FDG studies,
- (2) Further advance in knowledge of indications and use of radiolabeled antibody imaging (CEA scan, NeutroSpec, ProstaScint) and therapy (Zevalin, Bexxar), as well as radionuclide therapy for controlling bone pain,
- (3) Further advance in knowledge in concepts of Molecular Imaging

Skill Objectives:

- (1) Accurately interpret most general nuclear medicine and PET studies,
- (2) Perform and log the required number of radionuclide treatments for hyperthyroidism thyroid cancer, and antibody therapies (appendix G),
- (3) Describe and perfect use of staging systems for lung cancer and head and neck cancer using PET to identify lymph node stations,
- (4) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected finding, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Perfect knowledge of normal and abnormal biodistributions of radiopharmaceuticals used in nuclear medicine imaging and therapy,
- (2) Further solidify knowledge of PET radiopharmaceuticals about to enter clinical practice

(e.g. ^{18}F -NaF, ^{18}F FLT, ^{18}F -FMISO, ^{18}F -FDOPA, etc),.

- (3) Continue to perfect knowledge relating to ^{131}I therapy of benign and malignant thyroid conditions. At this level of training, the fellow should be able to familiar enough with therapy guidelines to describe dosing strategies, use of pharmacologic interventions, and what pertinent lab values should be followed, and
- (4) Investigate and understand ways Molecular Imaging will impact clinical practice.

Skill Objectives:

- (1) Complete the RSNA physics modules (<http://www.rsna.org/RSNA/AAPM Online Physics Modules .aspx>): “Radiation Detection Instrumentation in Nuclear Medicine Practice” and “Radionuclide Dosimetry and Nuclear Regulations.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation***,**
- (2) Continue reading from more “advanced” nuclear medicine textbooks (e.g. Henkin and Gottschalk), the Molecular Imaging reading list (appendix A), as well as recommendations provided by the Molecular Imaging Center of Excellence Education Task Force (http://www.molecularimagingcenter.org/docs/Compendium_Final_5_30_08.pdf and/or <http://www.molecularimagingcenter.org/index.cfm?PageID=8063&RPID=6328>), **and complete pre- and post- test (Post test will be scanned in and placed in fellow’s learning portfolio),** and
- (3) Engage in teaching nuclear medicine and radiology residents on the rotation.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self studying using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Engage in teaching of radiology residents rotating through the nuclear medicine department.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, board review, etc.), this *must* be arranged in advance with the appropriate faculty and/or fellow.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent with the utmost professionalism under the indirect supervision of a nuclear medicine physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Nuclear Medicine Residency
UAB General & PET (First Month)

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify basic nuclear radiology equipment and describe pertinent quality control measures,
- (2) State appropriate indications for commonly ordered nuclear medicine studies, and
- (3) Describe basic concepts of radionuclide therapy for thyroid carcinoma and hyperthyroidism including radiation safety issues.

Skill Objectives:

- (1) Be facile with Jet Stream and PACs viewing stations and utilize available information technology (Horizon, CDA, TalkTech, etc.) to manage patient information,
- (2) Review commonly ordered on-call studies (V/Q scans, GI Bleed, HIDA, MAG3 Renal Scans, Radionuclide Cerebral Angiography) to facilitate proper patient care when the resident/fellow begins taking call
- (3) Correlate findings with radiographs and other imaging studies and prescribe additional studies when appropriate,
- (4) Learn to coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical properties of commonly used radionuclides,
- (2) State organ localization and clinical uses of common radiopharmaceuticals, and
- (3) Discuss common pathologic appearances for common call studies (listed above).

Skill Objectives:

- (1) Participate in quality control processes as outlined by the Nuclear Regulatory Commission (NRC) requirements (see Appendix H), to be facilitated by the physicist staff. This requirement can be completed during Technology rotation),
- (2) Complete the following RSNA physics modules (<http://www.rsna.org/RSNA/AAPM Online Physics Modules .aspx>): “Gamma Cameras/Image Quality”, and “Nuclear Medicine: Radioisotopes and Radiopharmaceuticals.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****, and
- (3) Complete reading list topics correlating to commonly ordered nuclear medicine studies, emphasizing on-call studies (see reading list).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency

- department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
 - (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
 - (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
 - (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate radiation safety issues to patients receiving radioactive iodine therapy, to be accomplished by first "role playing" the informed consent process with an

attending nuclear medicine physician, then by consenting a patient while being observed by an attending nuclear medicine physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Nuclear Medicine Residency
UAB General & PET (Second Month)

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify basic nuclear radiology equipment and describe pertinent quality control measures,
- (2) State appropriate indications for commonly ordered nuclear medicine studies, and
- (3) Describe basic concepts of radionuclide therapy for thyroid carcinoma and hyperthyroidism including radiation safety issues, particularly as it relates to the patient's safety.

Skill Objectives:

- (1) Be facile with Jet Stream and PACs viewing stations and utilize available information technology (Horizon, CDA, TalkTech, etc.) to manage patient information,
- (2) Work to perfect interpretation the following types of nuclear radiology studies: bone, V/Q, hepatobiliary, GI bleeding, thyroid, parathyroid and basic renal scans,
- (3) Correlate findings with radiographs and other imaging studies and prescribe additional studies when appropriate,
- (4) Continue to learn to coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Actively interact with patients and ordering physicians, along with self-directed review of clinical notes to accurately assess any effects of radioactive iodine administration on the patient. Specifically, residents will document (as possible) results of iodine therapy in patients that they have treated on previous rotations. This documentation (see appendix G) will be kept as part of the resident's learning portfolio, and
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical,

epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe the radiotracers used for different nuclear medicine studies,
- (2) Work to perfect knowledge of organ localization and clinical uses of common radiopharmaceuticals,
- (3) Begin to review current guidelines for the use of ¹³¹I in benign and malignant thyroid conditions, as well as the use of thyroid-specific medications and their effects, and
- (4) Understand the typical appearance of the disease processes investigated by the studies described above (Patient care skill objective 2).

Skill Objectives:

- (1) Participate in quality control processes as outlined by the Nuclear Regulatory Commission (NRC) requirements (see checklist, appendix H),
- (2) Complete the RSNA physics module (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules.aspx): “SPECT, SPECT/CT Image Quality.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****, and
- (3) Continue to perfect interpretation of studies, working to become independent on call (concentrating on common on-call cases such as renal, GI bleeds, V/Q, and hepatobiliary).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersedes self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism.
Iodine therapy informed consents will be performed under direct supervision of a nuclear medicine attending, with the goal of indirect supervision informed consent by the end of the rotation at the attendings' discretion.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Nuclear Medicine Residency
UAB General & PET (Third Month)

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, and radiotherapy of thyroid disease.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize concepts of SPECT imaging, including quality control, image acquisition and study interpretation, and
- (2) Understand pharmacologic interventions in nuclear radiology including morphine/cholecystikinin hepatobiliary imaging, ACE inhibitor (Captopril) renography, Diamox brain imaging, Lasix renography, and Reglan gastric emptying.

Skill Objectives:

- (1) Understand the physiologic and pathophysiologic distribution of the following radiotracers/studies: Octreoscan, leukocyte scan, Gallium scan, MIBG scan, Thallium brain scan and hemangioma studies, and HMPAO brain scans, with the goal of beginning to accurately interpret these radionuclide scans,
- (2) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (3) Actively interact with patients and ordering physicians, along with self-directed review of clinical notes to accurately assess any effects of radioactive iodine administration on the patient. Specifically, residents will document (as possible) results of iodine therapy in patients that they have treated on previous rotations. This documentation (see appendix G) will be kept as part of the resident's learning portfolio, and
- (4) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical characteristics of commonly used radionuclides,

- (2) State organ localization and clinical uses of common radiopharmaceuticals,
- (3) Discuss underlying disease processes for commonly ordered nuclear medicine studies,
- (4) Continue to perfect knowledge relating to ^{131}I therapy of benign and malignant thyroid conditions. Specifically, the resident should become familiar with therapy guidelines relating to dosing strategies, the use of pharmacologic interventions, and what pertinent lab values should be followed, and
- (5) Describe how different drugs can be used as adjuncts for or potentially interact with the radiopharmaceuticals describe above (Patient Care Knowledge Objectives #2, Skill Objectives #1)

Skill Objectives:

- (1) Participate in quality control processes as outlined by Nuclear Regulatory Commission (NRC) requirements if not already completed (see appendix H),
- (2) Complete the RSNA physics module (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules_.aspx): “PET/ PET/CT Image Quality.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****and
- (3) Begin reading list topics regarding the topic listed in the knowledge and skill objectives listed above.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice- Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up of interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under the indirect supervision of a nuclear medicine attending.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Nuclear Medicine Residency
UAB General & PET (Fourth Month)

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, and radiotherapy of thyroid disease and lymphoma. PET/CT imaging is introduced.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Summarize the NRC and Alabama rules concerning radionuclide imaging and therapy, completing a radiation safety review in the department with a nuclear medicine physicist,
- (2) Understand indications for FDG PET imaging, and
- (3) Distinguish among the different nuclear medicine antibody studies and therapies, including Zevalin, Bexxar, Proscint and CEA scan. With this, the resident should begin to appreciate the importance of the field of Molecular Imaging to targeted patient care.

Skill Objectives:

- (1) Accurately interpret most general nuclear medicine and PET examinations,
- (2) Assist in the interpretation of antibody studies when available,
- (3) Perform and log the required number of radionuclide treatments for hyperthyroidism thyroid cancer, and, when available, radiopharmaceutical therapies for lymphoma and painful bone metastases,
- (4) Actively interact with patients and ordering physicians, along with self-directed review of clinical notes to accurately assess any effects of radioactive iodine administration on the patient. Specifically, residents will document (as possible) results of iodine therapy in patients that they have treated on previous rotations. This documentation will be kept as part of the resident's learning portfolio.
- (5) Coordinate activities in the reading room, including providing direction for the Technologists, consultation for other clinicians, and answering the phone, and
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe the physiologic and common pathophysiologic distributions of the radiolabeled antibody studies,
- (2) Understand the underlying disease processes that the radiolabeled antibody studies are targeting,
- (3) Describe the physiologic and pathophysiologic distribution of FDG PET, as well as normal variants such as brown fat uptake, etc,
- (4) Continue to perfect knowledge relating to ¹³¹I therapy of benign and malignant thyroid conditions. At this level of training, the resident should be able to familiar enough with therapy guidelines to describe dosing strategies, use of pharmacologic interventions, and what pertinent lab values should be followed, and
- (5) Continue to perfect understanding of commonly ordered nuclear medicine studies.

Skill Objectives:

- (1) Complete the RSNA physics modules (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules.aspx): “Radiation Detection Instrumentation in Nuclear Medicine Practice” and “Radionuclide Dosimetry and Nuclear Regulations.” *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****, and
- (2) Complete recommended PET reading list in Wahl, and relevant chapters to antibody imaging in Mettler and/or Requisites.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess nuclear medicine images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of radiology residents, medical students, and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective

exchange of information and teaming with patients, their families, and professional associates.
Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under the indirect supervision of a nuclear medicine attending.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

**Nuclear Medicine Residency
UAB General & PET (Fifth Month)**

This rotation involves interpretation of a wide range of radionuclide imaging studies, functional radionuclide studies, SPECT, PET, and radiotherapy of thyroid disease and lymphoma.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Further ability to interpret general nuclear medicine and FDG studies,
- (2) Further advance in knowledge of indications and use of radiolabeled antibody imaging (CEA scan, NeutroSpec, ProstaScint) and therapy (Zevalin, Bexxar), as well as radionuclide therapy for controlling bone pain,
- (3) Further advance in knowledge in concepts of Molecular Imaging

Skill Objectives:

- (1) Accurately interpret most general nuclear medicine and PET studies,
- (2) Perform and log the required number of radionuclide treatments for hyperthyroidism, thyroid cancer, and antibody therapies,
- (3) Describe and perfect use of staging systems for lung cancer and head and neck cancer using PET to identify lymph node stations,
- (4) Continue to document follow-up of patients to which radioiodine therapy was administered by the resident (see appendix G),
- (5) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected finding, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify the different systems used for PET acquisition – coincidence detectors, dedicated PET systems, and PET/CT systems,

- (2) Complete the RSNA physics module (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules_.aspx): “CT Image Quality and Protocols” (*****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****),
- (3) Continue to perfect knowledge relating to ^{131}I therapy of benign and malignant thyroid conditions. At this level of training, the fellow should be able to familiar enough with therapy guidelines to describe dosing strategies, use of pharmacologic interventions, and what pertinent lab values should be followed,
- (4) Describe the indications and use of PET agents in nuclear cardiology including ^{18}F -FDG, Rubidium, and ammonia, and
- (5) Begin to understand the biodistributions of PET agents that are close to widespread clinical use (e.g. ^{18}F -NaF, ^{18}F FLT, ^{18}F -FMISO, ^{18}F -FDOPA, etc).

Skill Objectives:

- (1) Complete reading from the PET readings in Wahl, Mettler, and Requisites
- (2) Engage in teaching of radiology residents rotating through the nuclear medicine department

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self studying using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Engage in teaching of radiology residents rotating through the nuclear medicine department.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism**Goal**

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, board review, etc.), this *must* be arranged in advance with the appropriate faculty and/or fellow.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under the indirect supervision of a nuclear medicine attending.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Nuclear Medicine Residency
UAB General & PET (Months 6-12)

At this point in the resident's career, he or she should be able to function as a junior nuclear medicine attending. Whether the resident is in the general reading room or PET/CT reading room, they will take responsibility for the service that they are covering.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Perfect ability to interpret general nuclear medicine, PET, and CT studies, and
- (2) Further advance in knowledge in concepts of Molecular Imaging,

Skill Objectives:

- (1) Accurately interpret most general nuclear medicine and PET studies,
- (2) Perform and log the required number of radionuclide treatments for hyperthyroidism thyroid cancer, and antibody therapies,
- (3) Perfect abilities to communicate information to clinicians regarding their patient's care
- (4) Continue to document follow-up of patients to which radioiodine therapy was administered by the resident (see appendix G),
- (5) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected finding, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify the different systems used for Molecular Imaging—SPECT, SPECT/CT, dedicated PET systems, PET/CT systems, optical imaging, etc,
- (2) Describe the indications and use of PET agents in clinical nuclear medicine,
- (3) Perfect understanding of the physiologic and pathophysiologic distributions of PET agents that are close to widespread clinical use (e.g. $^{18}\text{F-NaF}$, $^{18}\text{F FLT}$, $^{18}\text{F-FMISO}$, $^{18}\text{F-}$

- FDOPA, etc),
- (4) Identify common non-Nuclear Medicine Molecular Imaging agents pertinent to clinical practice, and
 - (5) Continue to perfect CT and other cross-section imaging interpretation skills.

Skill Objectives:

- (1) Continue reading from more “advanced” nuclear medicine textbooks (e.g. Henkin and Gottschalk), the Molecular Imaging reading list (appendix A), as well as recommendations provided by the Molecular Imaging Center of Excellence Education Task Force
(http://www.molecularimagingcenter.org/docs/Compendium_Final_5_30_08.pdf and/or <http://www.molecularimagingcenter.org/index.cfm?PageID=8063&RPID=6328>),
- (2) Complete the RSNA physics modules
(http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules_.aspx) according to the following schedule:
 - a. Month 6—“Basic Radiation Biology” and “Basic Concepts in Radiography”
 - b. Month 7—“CT Systems” and “Radiation Dose in CT”
 - c. Month 8—“Basic Principles of Nuclear Magnetic Resonance”
 - d. *****Post tests must be completed, and the completion certificates submitted to the Program Coordinator at the end of the individual rotation*****,
- (3) Review Molecular Imaging disc provided by SNM (available for check-out from the Program Coordinator) and,
- (4) Engage in teaching of radiology residents rotating through the nuclear medicine department.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self studying using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Engage in teaching of radiology residents rotating through the nuclear medicine department.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information

with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, and
- (2) Assess appropriateness criteria for various nuclear medicine studies for different disease processes.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted,
- (3) Verify that studies ordered by clinicians are appropriate for the clinical indication,
- (4) Provide technologists with written guidance as to which special views/projections will be necessary for a particular study if different from normal procedures (3 & 4 are typically performed under the attending physician's guidance on the written directives provided the day before the study is performed), and
- (5) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, board review, etc.), this *must* be arranged in advance with the appropriate faculty and/or fellow.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Residents are expected to:

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Obtain informed consent for therapy patients with the utmost professionalism. Iodine therapy informed consents will be performed under the indirect supervision of a nuclear medicine attending.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

CT Elective—UAB

This rotation involves interpretation of a wide range of CT imaging studies. The experience will vary depending on the service the resident participates on: Abdominal, Chest, or Neuro.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify basic CT equipment and describe pertinent quality control measures,
- (2) Understand the signs and symptoms of contrast reactions, and the pharmacologic interventions available to prevent or manage reactions,
- (3) Recognize the findings of life threatening conditions and respond urgently, and
- (4) State appropriate indications for commonly ordered CT studies.

Skill Objectives:

- (1) Be facile with PACs viewing stations and utilize available information technology (Horizon, CDA, TalkTech, etc.) to manage patient information,
- (2) Interpret CT studies with and without contrast,
- (3) Correlate CT findings with radiographs and other imaging studies and recommend additional studies when appropriate,
- (4) Learn to coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation). These cases may be interesting cases encountered on the resident's rotation or on-call studies.

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe how different CT parameters affect image quality and patient dose, and
- (2) Describe normal and abnormal appearance of cross sectional neurologic anatomy.

Skill Objectives:

- (1) Summarize steps taken to mitigate iodine contrast reactions,

(2) Complete the RSNA physics module

(http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules_.aspx): “CT Image Quality and Protocols” (*****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation. Does not have to be repeated if done on prior CT elective*****), and

(3) Complete CT related reading list topics (see reading list).

Behavior and Attitude Objectives:

(1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

(1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

(1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
(2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

(1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
(2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

(1) Understand how their image interpretation affects patient care.

Skill Objectives:

(1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay, and
(2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted;
(3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

(1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service, and
- (2) Communicate effectively with physicians and other health professionals.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

VA Hospital CT

This rotation involves interpretation of a wide range of CT imaging studies.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (5) Identify basic CT equipment and describe pertinent quality control measures,
- (6) Understand the signs and symptoms of contrast reactions, and the pharmacologic interventions available to prevent or manage reactions,
- (7) Recognize the findings of life threatening conditions and respond urgently, and
- (8) State appropriate indications for commonly ordered CT studies.

Skill Objectives:

- (1) Be facile with PACs viewing stations and utilize available information technology (Horizon, CDA, TalkTech, etc.) to manage patient information,
- (2) Interpret CT studies with and without contrast,
- (3) Correlate CT findings with radiographs and other imaging studies and recommend additional studies when appropriate,
- (4) Learn to coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation). These cases may be interesting cases encountered on the resident's rotation or on-call studies.

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe how different CT parameters affect image quality and patient dose,
- (2) If not already completed, complete the RSNA physics module (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules.aspx): **“CT Image Quality and Protocols” (***)Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation. Does not have to be repeated if done on prior CT elective (***)**, and

- (3) Describe normal and abnormal appearance of cross sectional anatomy.

Skill Objectives:

- (1) Summarize steps taken to mitigate iodine contrast reactions and
- (2) Continue CT reading list topics (see reading list).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills**Goal**

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service, and
- (2) Communicate effectively with physicians, other health professionals.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives

Nuclear Medicine Residency Program University of Alabama Medical Center

Radiation Oncology & Endocrinology

This rotation involves observation in a wide range of radiation oncology and endocrinology situations, focusing on how nuclear medicine and other diagnostic studies influence patient treatment. Residents/fellows will rotate through the endocrine clinic, with emphasis on the management of hyperthyroid and thyroid cancer patients. Experience with antibody therapy and radionuclide therapy for bone metastases will also be attained when available.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify basic theory behind radiation therapy for different cancers,
- (2) Identify how diagnostic imaging (PET/CT, CT, bone scan, etc.) influences therapy patients will receive,
- (3) Identify key concepts in the diagnosis and management of hyperthyroid and thyroid cancer patients, and
- (4) Describe basic concepts of radionuclide therapy for lymphoma and bone metastases, including radiation safety issues.

Skill Objectives:

- (1) Become familiar with the different forms of therapy available to the radiation oncologist (i.e. x-rays, electrons, brachytherapy, radionuclides),
- (2) Observe the use of CT in modern radiation therapy planning,
- (3) Participate in tumor boards and therapy planning,
- (4) Observe and participate in the endocrinology clinic, with the emphasis on diagnosis and treatment of hyperthyroid conditions and thyroid cancer,
- (5) Observe radiolabeling of imaging or therapy compounds (when available), and
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on rotation); these may be interesting cases of patients under treatment in endocrinology, radiation oncology or on-call studies.

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe physical properties of commonly used radiation therapies,
- (2) State organ localization and clinical uses of Zevalin, Bexxar, Sr-82, and Sm-153, and
- (3) Discuss quality control of and radiations safety requirements for radiopharmaceuticals used for therapy.

Skill Objectives:

- (1) Participate/observe radiation oncology treatment planning and endocrinology clinic,
- (2) Complete the RSNA physics modules (http://www.rsna.org/RSNA/AAPM/Online_Physics_Modules.aspx): "Radiation Effects" and "Interaction of Radiation and Tissue" (*****Post tests must be completed, and the completion certificates submitted to the Program Coordinator at the end of the rotation*****), and
- (3) Participate in endocrinology and radiation oncology conferences.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Observe radiation oncology practitioners as they perform CT therapy planning for their patients, and how other imaging modalities (especially PET) can impact patient management, and
- (2) Discuss current management guidelines for thyroid conditions.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of radiation oncology residents and other health care professionals in the area of nuclear medicine.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care, specifically as it applies to the realm of endocrinology and radiation oncology.

Skill Objectives:

- (1) How providing accurate and timely interpretations to decrease length of hospital and emergency department stay,

- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Appropriately interact with patients in the endocrinology clinic,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate radiation safety issues to patients receiving radiopharmaceutical therapy, to be accomplished by observing the informed consent process with an attending radiation oncology physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Children's Hospital/Pediatric Nuclear Medicine (First Month)

This rotation involves interpretation of pediatric nuclear medicine studies, as well as an initial exposure to DEXA studies.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) State appropriate indications for commonly ordered pediatric nuclear medicine studies, and
- (2) Describe basic similarities and differences of pediatric as opposed to adult nuclear medicine imaging, including interaction with the pediatric patient and their families.

Skill Objectives:

- (1) Be facile with viewing stations and utilize available information technology to manage patient information,
- (2) Interpret the following types of nuclear medicine studies: VCUG, DMSA renal scans, bone scans, HIDA, and coincidence PET studies,
- (3) Correlate findings with radiographs and other imaging studies and prescribe additional studies when appropriate,
- (4) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (5) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on the UAB nuclear medicine rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation
- (3) Consenting patients for and performing nuclear medicine stress tests.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State organ localization and clinical uses of common radiopharmaceuticals, especially those related to pediatric nuclear medicine imaging.

Skill Objectives:

- (1) Participate in image acquisition,
- (2) Complete the RSNA physics module

(http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules_.aspx): “Imaging Gently: CT Imaging and Radiation Protection of Pediatric Patients” (*****Post tests must be completed, and the completion certificates submitted to the Program Coordinator at the end of the rotation*****) and

- (2) Complete reading list topics (pertinent pediatric sections in either Mettler or Requisites).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay, and
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted;
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate risks, benefits, and radiation safety issues to parents of patients receiving nuclear medicine studies, as instructed by the attending nuclear medicine physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center

Children's Hospital/Pediatric Nuclear Medicine (Second and Third Months)

This rotation involves continued interpretation of pediatric nuclear medicine studies. The resident is also assist technologists in the performance of the studies. The resident will participate in CT readouts/dictations as time permits.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) State appropriate indications for commonly ordered pediatric nuclear medicine studies, and
- (2) Describe basic similarities and differences of pediatric as opposed to adult nuclear medicine and CT imaging, including interaction with the pediatric patient and their families.

Skill Objectives:

- (1) Be able to assist the nuclear medicine technologist in the performance of common nuclear medicine studies,
- (2) Interpret the following types of nuclear medicine studies: VCUG, DMSA renal scans, bone scans, HIDA, and coincidence PET studies,
- (3) Correlate findings with radiographs and other imaging studies and prescribe additional studies when appropriate
- (4) Participate in diagnostic CT readouts and dictation as time permits,
- (5) Coordinate activities in the reading room, including providing direction for the technologists, consultation for other clinicians, and answering the phone,
- (6) Contribute cases to the monthly rad-path conference (attended by all nuclear medicine residents and those radiology residents on the UAB nuclear medicine rotation).

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.
- (2) Notify referring clinician for urgent, emergent, or unexpected findings, and document in dictation
- (3) Consenting patients for and performing nuclear medicine stress tests.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) State organ localization and clinical uses of common radiopharmaceuticals, especially those related to pediatric nuclear medicine imaging,
- (2) State normal and abnormal appearance of pediatric cross-sectional imaging.

Skill Objectives:

- (1) Participate in image acquisition, and
- (2) Complete reading list topics (pertinent pediatric sections in either Mettler or Requisites).

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement**Goal**

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Assess images for quality, identify sources of artifact, and suggest methods of improvement.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet, and
- (2) Facilitate the learning of students and other health care professionals.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice**Goal**

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 are expected to:*

Knowledge Objectives:

- (1) Understand how their image interpretation affects patient care.

Skill Objectives:

- (1) Provide accurate and timely interpretations to decrease length of hospital and emergency department stay,
- (2) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted, and
- (3) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate risks, benefits, and radiation safety issues to parents of patients receiving nuclear medicine studies, as instructed by the attending nuclear medicine physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

**Competency-Based Rotation Goals and Objectives
Nuclear Medicine Residency Program
University of Alabama Medical Center**

UAB Technology/Cardiac Nuclear Medicine

This rotation involves observation participation in a wide range of nuclear medicine QA/QC situations, as well as allowing for hands-on experience with imaging processing. The resident will also observe “Wet Lab” studies, spend time with the radiation safety staff, and visit the local radiopharmacies.

Patient Care

Goal

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. *Residents are expected to:*

Knowledge Objectives:

- (1) Identify and observe which QA/QC procedures are performed daily in a Nuclear Medicine facility,
- (2) Identify how nuclear medicine QA/QC impacts image quality, which can alter what therapy patients will receive,
- (3) Further refine understanding of nuclear cardiology interpretation through interaction with Cardiology faculty/staff, and
- (4) Attend daily readouts in nuclear cardiology and correlate initial clinical impression with image interpretation.

Skill Objectives:

- (1) Become familiar with the different filters available in SPECT processing, and how they affect the processed image, and ability to correctly interpret the study,
- (2) Observe the use of attenuation correction in nuclear cardiology imaging,
- (3) Perform image acquisition of a patient utilizing planar techniques, and
- (4) Observe routine radiation safety procedures as performed by the radiation safety staff.

Behavior and Attitude Objectives:

- (1) Work with the health care team in a professional manner to provide patient-centered care.

Medical Knowledge

Goal

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. *Residents are expected to:*

Knowledge Objectives:

- (1) Describe common indications of myocardial perfusion imaging based on Cardiology criteria,
- (2) State organ localization and clinical uses of various cardiac imaging agents,
- (3) Complete the RSNA physics module (<http://www.rsna.org/RSNA/AAPM Online Physics Modules .aspx>): “Image Processing and Reconstruction”. *****Post test must be completed, and the completion certificate submitted to the Program Coordinator at the end of the rotation*****, and

- (4) Discuss quality control of and radiations safety requirements for radiopharmaceuticals used in daily practice.

Skill Objectives:

- (1) Participate in quality control processes as above,
- (2) Process nuclear medicine data (planar and SPECT) into a interpretable image,
- (3) Finish NRC requirements checklist (if not already completed; residents are encouraged to repeat experiences for review. See appendix H), and
- (4) Observe radiolabeling of imaging or therapy compounds at the local radiopharmacies.

Behavior and Attitude Objectives:

- (1) Recognize limitations of personal competency and ask for guidance when appropriate.

Practice-Based Learning and Improvement

Goal

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 lifelong learning. *Residents are expected to develop skills and habits to be able to:*

Knowledge Objectives:

- (1) Realize the implications of their myocardial perfusion interpretations by observing and interacting with the cardiology practitioners as they discuss patient management.

Skill Objectives:

- (1) Demonstrate independent self-study using various resources including texts, journals, teaching files, and other resources on the internet,
- (2) Perform radiation safety tasks as allowed by radiation safety personnel, and
- (3) Facilitate the learning of cardiology fellows and other health care professionals in the area of nuclear medicine physics.

Behavior and Attitude Objectives:

- (1) Incorporate formative feedback into daily practice, positively responding to constructive criticism, and
- (2) Follow-up interesting or difficult cases without prompting and share this information with appropriate faculty and fellow residents.

Systems Based Practice

Goal

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 are expected to:*

Knowledge Objectives:

- (1) Understand how patient preparation and positioning affects patient care, specifically as it applies to the realm of nuclear medicine/nuclear cardiology, and
- (2) Understand how image quality and radiation safety affects patient care.

Skill Objectives:

- (1) Attend UAB Radiation Safety meeting (can be made up on different UAB rotation month if there is a scheduling conflict),

- (2) Realize how providing accurate and timely interpretations to decrease length of hospital and emergency department stay, and
- (3) Appropriately notify the referring clinician if there are urgent or unexpected findings and document such without being prompted;
- (4) Practice using cost effective use of time and support personnel.

Behavior and Attitude Objectives:

- (1) Advocate for quality patient care in a professional manner, particularly concerning imaging utilization issues.

Professionalism

Goal

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. *Residents are expected to demonstrate:*

Knowledge Objectives:

- (1) Understanding of the need for respect for patient privacy and autonomy, and
- (2) Understanding of their responsibility for the patient and the service, including arriving in the reading room promptly each day, promptly returning to the reading room after conferences, completing the work in a timely fashion, and not leaving at the end of the day until all work is complete. If the resident will be away from a service (for time off, meeting, etc.), this *must* be arranged in advance with the appropriate faculty and chief resident.

Skill Objectives:

- (1) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

Behavior and Attitude Objectives:

- (1) Respect, compassion, integrity, and responsiveness to patient care needs that supersede self-interest.

Interpersonal and Communication Skills

Goal

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. *Residents are expected to:*

Knowledge Objectives:

- (1) Know the importance of accurate, timely, and professional communication.

Skill Objectives:

- (1) Dictate concise and accurate reports on most examinations. It is expected that the trainee will do the majority of the dictations on the service,
- (2) Communicate effectively with physicians, other health professionals, and
- (3) Effectively communicate radiation safety issues to patients receiving radiopharmaceutical therapy, to be accomplished by observing the informed consent process with an attending radiation oncology physician.

Behavior and Attitude Objectives:

- (1) Work effectively as a member of the patient care team.

Appendix A:
Nuclear Medicine Residency Program Reading List: 2012-2013
RSNA Modules and Rotation Tests by Month

Reading List:

Required Nuclear Medicine:

- Ziessman HA, O'Malley JP, Thrall JH, Nuclear Medicine: The Requisites, 3rd Ed, Elsevier, 2006.
- Mettler FA, Guiberteau MJ. Essentials of Nuclear Medicine Imaging, 5th Ed. Saunders Elsevier, 2006.
- Crawford ES, Husain SS. Nuclear Cardiology Imaging, available on Society of Nuclear Medicine web page (snm.org) discounted for members. ISBN 0-932-004-74-1.
- American Society of Nuclear Cardiology Guidelines: http://www.asnc.org/section_73.cfm
- Wahl RL. Principles and Practice of Positron Emission Tomography. Lippincott Williams & Wilkins, 2002. ISBN: 0-7817-2904-1. MINIMUM REQUIRED CHAPTERS: 5.1, 5.2, 5.4, 5.5, 5.6, 5.8, 5.10, 5.13, and 5.14.
- Sandler MP et al. Diagnostic Nuclear Medicine, 4th ed. Lippincott, Williams & Wilkins, 2003.
- Henkin R et al. Nuclear Medicine, 2nd ed. Mosby, 2006.

Recommended:

- Bernier DR, Christian PE, Langan JK. Nuclear Medicine Technology and Techniques, 4th Ed. Mosby, 1997.
- Ziessman HA, Rehm P. Case Review: Nuclear Medicine. Mosby, 2002.
- Klingensmith WC, Eshima D, Goddard J, eds. Nuclear Medicine Procedure Manual. Wick Publishing, Englewood CO. Updated periodically.

CT:

- <http://tech.snmjournals.org/cgi/reprint/35/4/213>
- Slone RM, Fisher AJ. Body CT: A Practical Approach. McGraw Hill, 2000.
- Lee JKT, Sagel SS, Stanley RJ, Heiken JP. Computed Body Tomography with MRI Correlation. Fourth Edition. Lippincott, Williams and Wilkins, Philadelphia, PA, 2005

Nuclear Medicine Physics:

- Cherry SR, Sorenson JA, Phelps ME. Physics in Nuclear Medicine. Saunders, 3rd Ed, 2003. ISBN: 0-7216-8341-X.
- Chandra, Ramesh. Nuclear Medicine Physics: The basics. Lippincott Williams & Wilkins, 5th Ed, 2005.

Molecular Imaging:

- http://jnm.snmjournals.org/content/vol49/Suppl_2/index.dtl#MOLECULAR_IMAGING_OF_CANCER_FROM_MOLECULES_TO_HUMANS
- A Primer on Molecular Biology for Imagers. Li, K editor. Academic Radiology, Volume 11, Supplement 1, November 2004
- http://www.molecularimagingcenter.org/docs/Compendium_Final_5_30_08.pdf
- <http://www.molecularimagingcenter.org/index.cfm?PageID=8063&RPID=6328>

Periodicals:

- Journal of Nuclear Medicine
- Clinical Nuclear Medicine

Appendix A

Summary of RSNA Modules and Rotation Tests by Month

The following months will have RSNA Physics Modules (http://www.rsna.org/RSNA/AAPM_Online_Physics_Modules_.aspx) and/or pre- and post- tests (see Molecular Imaging reading list) that will have to be completed, with the completion form remitted to the Program Coordinator:

- Nuclear Radiology Fellowship, UAB General & PET First Month
 - “Gamma Cameras/Image Quality”
 - “Nuclear Medicine: Radioisotopes and Radiopharmaceuticals”
- Nuclear Radiology Fellowship, UAB General & PET Second Month
 - “SPECT, SPECT/CT Image Quality”
 - “PET, PET/CT Image Quality”
- Nuclear Radiology Fellowship, UAB General & PET Third Month
 - "Image Processing and Reconstruction"
- Nuclear Radiology Fellowship, UAB General & PET Fourth Month
 - "Radiation Detection Instrumentation in Nuclear Medicine Practice"
 - "Radionuclide Dosimetry and Nuclear Regulations"
 - Complete pre- and post rotation Molecular Imaging Test (to be emailed by Program Coordinator)

- Nuclear Medicine Residency, UAB General & PET First Month
 - “Gamma Cameras/Image Quality”
 - “Nuclear Medicine: Radioisotopes and Radiopharmaceuticals”
- Nuclear Medicine Residency, UAB General & PET Second Month
 - “SPECT, SPECT/CT Image Quality”
- Nuclear Medicine Residency, UAB General & PET Third Month
 - “PET, PET/CT Image Quality”
- Nuclear Medicine Residency, UAB General & PET Fourth Month
 - "Radionuclide Dosimetry and Nuclear Regulations"
 - "Radiation Detection Instrumentation in Nuclear Medicine Practice"
- Nuclear Medicine Residency, UAB General & PET Fifth Month
 - “CT Image Quality and Protocols”
- Nuclear Medicine Residency, UAB General & PET Sixth Month
 - “Basic Radiation Biology”
 - “Basic Concepts in Radiography”
- Nuclear Medicine Residency, UAB General & PET Seventh Month
 - “CT Systems”
 - “Radiation Dose in CT”
- Nuclear Medicine Residency, UAB General & PET Eighth Month
 - “Basic Principles of Nuclear Magnetic Resonance”
 - Complete pre- and post rotation Molecular Imaging Test (for those individuals doing a two year residency; otherwise to be done in ninth month for three year nuclear medicine residents; to be emailed by Program Coordinator)

- Nuclear Medicine Residency, CT Elective—UAB or CT Elective—VA Hospital
 - “CT Image Quality and Protocols” (YES, you have to review it again despite having done it in UAB month five)

- Nuclear Medicine Residency/Fellowship, Radiation Oncology/Endocrinology
 - “Radiation Effects”
 - “Interaction of Radiation and Tissue”
- Nuclear Medicine Residency/Fellowship, UAB Technology/Cardiac Nuclear Medicine
 - "Image Processing and Reconstruction"
- Nuclear Medicine Residency/Fellowship, Children's Hospital/Pediatric Nuclear Medicine
 - " Imaging Gently: CT Imaging and Radiation Protection of Pediatric Patients" "

Appendix B: Nuclear Medicine Resident Conference Schedule

1) REQUIRED CONFERENCES

Nuclear Medicine Division Lecture

Chief resident sets the divisional conference schedule as part of their duties. Schedules will be sent by email. Conferences are typically held Wednesdays and Thursdays in the Nuclear Medicine Reading Room or Library. Units are ideally designed to coordinate noon conferences. Topics include Journal Club, Rad/Path Follow-up Case Conference, Protocol Reviews, Radiopharmacy, and clinical conferences. Additional conferences include Tuesday Cardiology conference and monthly Thyroid/Parathyroid conference.

Nuclear Medicine Presentations at Radiology Noon Conferences:

Tishler Conference Room N307 - Radiology, 3rd Floor, Jefferson Tower

(Conferences are usually held every second and fourth Monday of the month from 12:00 to 1:30 PM, but a schedule will be emailed to you).

Nuclear Cardiology Conference

THT 321 Heffner Library

12 PM 1st, 2nd, and 4th Tuesday of the month

Thyroid/Parathyroid Conference

In conjunction with the Division of Endocrinology

BDB 710 Conference Room

12 PM, 3rd Tuesday of the month

Physics and radiation Safety Lecture Series

Time and dates to be announced

2) Elective Conferences

Correlative Imaging Conferences:

Pulmonary: Noon FOB 106; first and third Mondays

Gyne Onc: 4:30 PM Mondays, WIC 5th Floor OB/GYN conference room (#5324)

GI: 4:30 PM Wednesday, 3rd Floor JT (Tishler)

Neuroradiology 8 AM Friday, 4th Floor JT (Neuro)

Pancreatobiliary: 11 AM Friday, 3rd Floor JT (Tishler)

Medical Pathology Conference:

Margaret Spain Auditorium, First Floor

Spain/Wallace Building (East Base)

Every Wednesday, 12:00 noon

Medical Grand Rounds:

Margaret Spain Auditorium, First Floor

Spain/Wallace Building (East Base)

Thursdays 8:00a.m. - 9:00a.m.

Radiology Noon Conferences:

Tishler 12:30-1:30 PM

Considered “elective” for other than required Nuclear Medicine and specific CT presentations. Attendance is taken for CT credit purposes.

Nuclear Medicine Noon Conference Two Year Curriculum—July-December:

Month & Year	Topic
<u>July</u>	<u>Pulmonary</u>
July A, Year I	V/Q for PTE
July B, Year I	PET imaging of Lung Disease
July A, Year II	V/Q for PTE and Non-PTE indications
July B, Year II	PET and Lung Cancer Characterization and Staging
<u>August</u>	<u>General Review</u>
August A, Year I	Nuclear Medicine Physics & Instrumentation
August B, Year I	Common Cases & Indications
August A, Year II	Nuclear Medicine Physics & Instrumentation
August B, Year II	Common Cases & Indications
<u>September</u>	<u>Bone/Infection Imaging</u>
September A, Year I	Bone Scan for Malignancy
September B, Year I	DEXA
September A, Year II	Bone Scan for Metabolic Disease & Non-Malignant Indications
September B, Year II	Infection Imaging (Bone Scan, WBC, Gallium)
<u>October</u>	<u>GU</u>
October A, Year I	Renal Scintigraphy
October B, Year I	VCUG, DSMA, Testicular Imaging
October A, Year II	Transplant Kidney and Renal Failure
October B, Year II	Lasix and Captopril Renogram
<u>November</u>	<u>GI</u>
November A, Year I	Hepatobiliary Imaging
November B, Year I	GI Bleeding, Meckels, & Hemangioma Imaging
November A, Year II	PET Imaging of GI Malignancies
November B, Year II	Cardiac PET
<u>December</u>	<u>Cardiac</u>
December A, Year I	Nuclear Cardiology Overview
December A, Year II	MUGA & Viability Imaging

“A” lectures are given on the second Monday of the month; “B” lectures are given on the fourth Monday of the month. All conferences are subject to change due to holidays, guest lectures, etc. Academic Year 2012-2013 is Year I in this cycle.

Nuclear Medicine Noon Conference Two Year Curriculum—January-June:

Month & Year	Topic
<u>January</u>	<u>Endocrine</u>
January A, Year I	Thyroid Overview: Physiology and Imaging Agents
January B, Year I	Thyroid: Benign Disease & Hyperthyroidism Therapy
January A, Year II	Thyroid Carcinoma: Diagnosis & Treatment
January B, Year II	Hyperparathyroidism and Adrenal Imaging
<u>February</u>	<u>Oncology & PET</u>
February A, Year I	PET Imaging: Physics, Instrumentation, Biodistribution of PET Tracers
February B, Year I	Antibody Imaging & Therapy: Proscint, Zevalin, & Bexxar
February A, Year II	PET Imaging: Clinical Indications & Tumor Overview
February B, Year II	Gallium, OctreoScan, MIBG, NP-59
<u>March</u>	<u>Neurological/Head & Neck Imaging</u>
March A, Year I	Dementias, Seizures, and Tumors: SPECT and PET Appearance
March B, Year I	PET Imaging of Head and Neck Tumors
March A, Year II	Neurological Imaging Agents & Indications
March B, Year II	Brain Vascular Imaging, Cisternography, Shunt Patentency, & Brain Death
<u>April</u>	<u>Molecular Imaging/Therapeutic Agents</u>
April A, Year I	Introduction to Molecular Imaging
April B, Year I	NM Therapeutic Agents—Current and Future
April A, Year II	“Advanced” Molecular Imaging
April B, Year II	NM Therapeutic Agents—Osseous Metastases Palliation
<u>May</u>	<u>Radiology Oral Board Review</u>
May A, Year I	Seldom Seen NM Studies
May B, Year I	Board Review: NRC Requirements
May A, Year II	Seldom Seen NM Studies
May B, Year II	Board Review: NRC Requirements
<u>June</u>	<u>Radiochemistry/Resident Topics</u>
June A, Year I	Radiopharmaceuticals & Radiolabeling— Technetium Agents
June B, Year I	Resident Conference
June A, Year II	Radiopharmaceuticals & Radiolabeling—Non-Technetium Agents
June B, Year II	Resident Conference

“A” lectures are given on the second Monday of the month; “B” lectures are given on the fourth Monday of the month. All conferences are subject to change due to holidays, guest lecturers, etc. Academic Year 2012-2013 is Year I in this cycle.

Sample Nuclear Medicine Conference Schedule

Overview						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		Cardiology Conference 12 Noon	Protocol Review 9 AM	Dr. Dubovsky Review 8 AM (when she is in town)		
	Noon Conference 12 noon Case Conference 1 PM	Cardiology Conference 12 Noon	NM "In-Depth" Lecture 9 AM	Dr. Dubovsky Review 8 AM (when she is in town)		
		Thyroid & Parathyroid Conference 12 noon	Journal Club 10 AM	Dr. Dubovsky Review 8 AM (when she is in town)		
	Noon Conference 12 noon Case Conference 1 PM	Cardiology Conference 12 Noon	"Rad/Path" Follow-Up Conference 10 AM	Dr. Dubovsky Review 8 AM (when she is in town)		

Appendix C: Responsibilities of Residents

1. All residents are expected to report for duty by 7:45 a.m. and to remain until the last study has been reported and signed by the attending. The resident is responsible for seeing the appropriate examinations are performed, the clinical indication for the examination is recorded, and sufficient clinical data are available for intelligent interpretation of the study. This work has priority over all other activities.
2. On-Call: Nuclear medicine resident on-call rotations will be assigned with attending physician backup. Any study left for the On-Call resident must be communicated directly to them.
3. Conference attendance: residents will attend at least 70% required conferences (exceptions granted for illness and scheduled vacation time). Radiology residents will be excused from 12:30-1:30 for Radiology Noon Conference. Nuclear Medicine Residents are encouraged to attend but coverage must be obtained for optional conferences.
4. Conference preparation: Nuclear Medicine Residents/Fellow will prepare a noon conference over the course of their residency. You will be given a schedule for the assigned date and time. Residents will periodically be assigned protocol reviews, journal club articles and teaching conferences.
5. Courses: Requirements for each individual course will be at the discretion of the instructor.
6. Quality Assurance:
 - a. Therapy follow-up. Residents will maintain a case log of thyroid and other therapy patients. For HIPAA reasons, this will be kept in the program coordinators office. Follow-up done at the end of the month for 6-12 months should be reviewed with the attending. Completed follow-up sheets will be kept with the resident's learning portfolio.
 - c. During their residency, each resident is responsible for completing one QC project related to patient care or image quality. These projects may be used for presentation or publication, but this is not necessary. Possible topics will be discussed with the Program Director.
 - d. Monthly Rad/Path Follow-up case conference: each resident will present interesting cases with radiographic and/or pathologic follow-up at the end of the month conference.
 - e. Patient case log. Residents are responsible for maintaining a procedure log of pediatric, cardiac, PET/CT, and CT (as applicable) cases they have personally participated in. These should be HIPAA compliant and are reviewed with the residency director on a semi-annual basis. Date, attending, diagnosis and modality should be included.
 - f. Residents will maintain a learning portfolio of pertinent conferences, therapies, research, etc.
7. Research

Residents are required to complete at least one research project during their residency. The results should be suitable for publication but presentation at a scientific meeting or educational meeting is acceptable. Research training courses are held by the University and will be made available to residents. Completion of computer training modules for HIPAA and should be completed during the first year.

8. Chief Resident Duties

The Nuclear Medicine Chief Resident is responsible for:

- a. Assisting the Program Director or his designee in arranging conferences, resident on-call coverage, clinical rotations, preparing schedules for each of these activities and insuring full coverage of all areas at all times. If a resident has called in sick, the Chief Resident will also notify the Attending Physician of that resident's rotation and the residency records keeper. The chief will then schedule coverage for that resident.
- b. Keeping an attendance book for each conference.
- c. Representing the residents on the Resident Education Committee.

GENERAL READING ROOM DUTIES OF NUCLEAR MEDICINE AND RADIOLOGY RESIDENTS

1. **Attendance:** All residents are expected to report for duty by 7:45 A.M. and remain on duty until the last study of the day has been reported. Residents are responsible for maintaining full coverage of the reading room, including the lunch hour, but will be relieved by the faculty member for required conference attendance. The senior nuclear medicine resident present is responsible for coordinating duties with the radiology residents rotating through nuclear medicine.
2. **Reading Room Etiquette:** Computers in the reading room are for work related/patient care purposes only. **DO NOT CHANGE SETTINGS OR DOWNLOAD PROGRAMS ONTO READING ROOM COMPUTERS.** Many programs critical to patient care will only work with certain programs or versions of software. Personal phone calls should be made in the lounge, resident's office, or library. Reading newspapers, crosswords, sudoku, magazines, etc. should not be done in the reading room or patient care areas. Use the lounge for these activities. Eating and drinking is not allowed in patient care areas.
3. **Residents must supervise all aspects of the nuclear medicine study.** Each patient must have a written order from the requesting physician and a written order from the nuclear medicine attending before receiving a radiopharmaceutical dose. Residents will perform a preliminary review to assess appropriateness of the order and notify technologists of special/additional views that will be needed before the attending signs off on the written order. Residents will interview all patients as needed and review all charts and radiographs, and will write a concise, relevant history. See section N: Resident Supervision (page 14 above) for additional information.
4. **Other Reading Room Clinical Duties:**
 - a. Physical exam should be performed on all thyroid scan and uptake patients.
 - b. Thyroid therapy patients: must have negative pregnancy test (and TSH when applicable) documented on their chart. Residents must complete training prior to consenting therapy patients. Consult with the nuclear medicine faculty (and have them sign it off) and review procedure with the technologist prior to giving a therapy dose. All in-patient orders must be checked. A physician must be present at the time of dosing to check identifying patient information and confirm dose. Unless resident is pregnant, they will administer the dose to the patient they have received informed consent from, following all the appropriate precautions. All in-patients should be interviewed daily and status charted. Radiation Safety should be notified with any emergencies. Radiation Safety will call the nuclear medicine physicians when patients are to be discharged.
 - c. All patients with suspected renovascular hypertension must have baseline blood pressure checked and medications reviewed to decide on ACE inhibitor dose. Blood pressure must be checked at least every 15 minutes when an oral ACE inhibitor (such as Captopril) is administered to the patient.
 - d. Any study known to be carrying over after hours must be cleared with the supervising faculty and the on-call team should be notified. Pertinent clinical history will be relayed to the "receiving" team to be responsible for the study.
5. **Image assessment:** Each exam must be reviewed by a physician for quality control before the patient leaves the department. Any extra views ordered must be reviewed before the patient leaves.
6. **Patient schedule:** Throughout the day, maintain a current copy of scheduled patients. The resident is responsible for ensuring emergency add-ons are handled in a timely manner.
7. **Reports and dictations:** Residents are responsible for dictating all exam reports. These should be carefully proof read. If verbal reports are rendered to the ordering clinician, this should be documented with name, time, and date. Any change to preliminary reports must be carefully documented according to UAB Department of Radiology policy. The format of the reports should include: Header/type of exam, patient name, date performed, type of exam, radiopharmaceutical, dose and route of administration; a FINDINGS section; and an IMPRESSION.

8. Read out session: The time and method of attending readout will be set by the covering physician. Examples of read out sessions include real time interaction with the resident(s) as cases are completed, and/or a “pooling” of cases that the resident missed while at conference. At any rate, each exam and report will be reviewed by the attending, and the attending will provide verbal or written feedback to the resident.
9. HIPAA: The reading room should be locked after hours and when unoccupied. All paperwork containing identifying patient information should be removed to the shredder daily. Do not place in the trash.
10. Maintain a list of interesting cases or cases requiring follow-up in a follow-up case book. Keep a personal list of cases to present at the end of the month Rad-Path Follow-up case conference.

Appendix D: On Call Checklist:

___ Demonstrated proficiency in use of electronic medical records, paging system, dictation equipment, and image manipulation.

___ Received didactic instruction and satisfactorily interpreted cases regarding the following common call studies:

- ___ V/Q Scan
- ___ GI Bleeding Scan
- ___ Renal Scan
- ___ HIDA Scan
- ___ Brain Death Scan
- ___ Resting Radionuclide Myocardial Perfusion Imaging

___ Performed supervised lymph node scintigraphy injections for both breast cancer and melanoma

Name of technologist: _____

Name of attending: _____

___ Read and acknowledged on-call procedures regarding notification of technologist and nuclear medicine attending physician of call study.

___ Read and acknowledged on-call procedures regarding notification of the requesting physician of preliminary results.

Date checklist completed: _____

Name of Resident/Fellow: _____

Signature of Resident/Fellow: _____

Program Director Signature: _____

Appendix E: Nuclear Medicine On-Call Suggestions

- The requesting physician will contact you via your pager. When you call them back, you should obtain the following information:
 - Patient's name, medical record number, and location (room number)
 - A brief history about the patient and the reason they are ordering the exam
 - Additional information specific to the type of exam being ordered (here are some examples):
 - V/Q scan
 - Was there a chest radiograph within the past 24 hours and its results
 - Pulse ox and/or ABG
 - Has the patient had a Doppler US of the extremities for DVT?
 - Patient's risk factors for PTE
 - Renal transplant scan
 - When was the transplant done, and was it cadaveric, living related or living unrelated donor.
 - Remember, if this is an older allograft, and prior studies have been performed, you will need to compare that day's study with the prior studies. Check to see if the images are on PACS. If they are not, you may only be able to compare to the report until you can have Asha pull the image for you on the next workday.
 - GI Bleeding scan
 - Is the patient **actively bleeding now**? Remind the requester that the test is accurate for localizing bleeding when the patient is actually bleeding at the time.
 - Is the bleeding melena, hematochezia, or bright red blood? If it is melena, remind the requester that the test is less sensitive for localizing upper GI bleeds, and that an upper endoscopy may be the more appropriate test.
 - Has the patient had a recent upper endoscopy or colonoscopy?
 - Is the patient currently on heparin? (Heparin will interfere with the tagging efficiency of the study)
 - HIDA scan
 - When was the last time the patient eaten? Remember that the amount of time that the patient has not eaten can affect the outcome of the test.
 - Has the patient recently has morphine or other narcotics?
 - (Remember that Demerol (meperidine) does not close the sphincter of Oddi)
 - Resting Radionuclide Myocardial Perfusion Study (Chest Pain Study)
 - These will only be performed between the hours of 8 AM and noon on weekends/holidays, on patients from the Emergency Department experiencing chest pain. These patients will have had at least one set of negative cardiac markers.
 - A dictation need not be done at the completion of the study; rather, preliminary results are faxed to the appropriate POD in the Emergency Department (look for the POD # on the request). Any resting MPI studies will be reviewed by the nuclear cardiology faculty on Monday.
 - Fax numbers: POD 2: 5-2641; POD 3: 5-3147; POD 4: 5-5391; POD 6: 6-2189

- When you have obtained the needed information, inform the requester that you will notify the technologist to do the study, and it may be some time before the study actually begins. Get the requester's name and pager number so you can page them with the results.
- Page the on call technologist by calling 934-3411 and telling them to page beeper number 6822. You could also page the technologist yourself over the Internet by going to the UAB paging website (www.paging.uab.edu).
- Give the technologist the patient's name, medical record number, and location. Coordinate the logistics of the study with the technologist. You need to be present while the patient is in the department, in case the technologist has questions or the patient's condition worsens.
- When you interpret and dictate the study, you should put the study in the queue of the on-call attending physician (let them know by email or a call on Monday morning [at the latest] that there are call studies that they need to look at, assuming they don't already know. Less experienced residents should let the attending know once a day, to give the attending an opportunity to review the resident's work if they so choose). After your impression in the report, you should document who you reported the preliminary results to, and the day and time you reported them (there is a macro titled "on call" you can use if you wish).

OTHER CONSIDERATIONS:

- Second call radiology residents interpret nuclear medicine on-call studies Monday through Thursday (except holidays). If you are mistakenly paged, direct the ordering physician to page the second call radiology resident.
- You **MUST** contact the nuclear medicine attending on call if a "brain death" scan has been ordered. Coordinate with the attending when you anticipate the scan will be completed so they can confirm your impression. **DO NOT** release preliminary results without their authorization.
- You should contact the nuclear medicine attending on call if you have a concern about a scan with which you are not familiar or that is infrequently ordered (for example, a testicular scan) or if you have questions about procedures or protocols.
- Clinicians will sometimes order a bone scan or other study on the weekend because "the patient is here" or "we need it before discharge." In general these studies do not constitute an emergency and should not be considered on-call studies. Try to convince the clinician to wait until Monday or schedule the patient as an outpatient. If they insist on having it done, tell them to contact the nuclear medicine attending. You can also use your discretion—although it is extremely rare, we have done a bone scan on a Saturday before. Sometimes it is often easier just to do the study than listen to them complain about it; just be careful about setting precedents for your colleagues.
- Remember that in the middle of the night, many of the doors in the hospital are locked. Don't forget your ID badge, as you will need it to gain access to the hospital or the department.
- Occasionally you will get requests for nuclear medicine studies from the VA. Inform the requester that he must contact the administrator on call at the VA and arrange for the patient to be transported by ambulance to the nuclear medicine department here at UAB. When and if the requester is able to accomplish that task, you follow the protocol as above for on call studies.
- We sometimes cover the nuclear medicine departments of other hospitals (usually Cooper Green) over the weekend. In all the time I've been here, I personally have never had a study from an outside facility on call. If it does occur, there is a stringent protocol they have to follow; here is a copy of it:

- The Department of Radiology at UAB has agreed to provide “Call Back” emergency coverage for Nuclear Medicine during this period.
- The resident on call for Nuclear Medicine at University Hospital should be notified **prior to sending** any patients to UAB for emergency studies. The matter has been discussed with the Chief of the Medical Staff, and for any Emergency Nuclear Medicine study, the request must be reviewed and approved by the Chairman of the Department of Medicine at Cooper Green Hospital and/or the department chairperson.
- **Appropriate billing procedures** must be done prior to referring these patients. Again, since these are emergency situations, a **physician must accompany the patients** from Cooper Green Hospital.
- Occasionally you will get a request for results from a cardiac study. Inform the requester to page the cardiac fellow on-call; alternatively the results can be found in the cardiac reading room (in the log book for cardiac studies). I believe they can page security to have them unlock the door. The room number is J252.

Appendix F: Evaluations

Subject:	
Evaluator:	
Site:	
Period:	
Dates of Activity:	
Activity:	
Evaluation Type:	Resident Evaluation of Faculty

Evaluation information entered here will be made available to the evaluated person in anonymous and aggregated form only.

Clinical presentation (Question 1 of 15 - Mandatory)

Teaches residents how to integrate clinical presentation with nuclear medicine/radiographic findings

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Viewbox teaching (Question 2 of 15 - Mandatory)

Effectively incorporates "view box" teaching into daily work

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Resident conferences (Question 3 of 15 - Mandatory)

Presents educational resident conferences that are well organized and informative:

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Radiologic techniques and literature (Question 4 of 15 - Mandatory)

Keeps abreast of current nuclear medicine/radiologic techniques and literature:

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Promotes active learning (Question 5 of 15 - Mandatory)

(For example, suggests reading, provides reference material, asks relevant questions):

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Dictations (Question 6 of 15 - Mandatory)

Teaches residents how to provide accurate, concise, and prompt dictations:

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Relationships with staff (Question 7 of 15 - Mandatory)

Maintains cordial and effective relationships with technologists, nurses, and others on the healthcare team

NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
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Evaluate					
0	1	2	3	4	5
Interaction with patients (Question 8 of 15 - Mandatory)					
Interacts with patients in a compassionate and respectful manner					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5
Interaction with residents (Question 9 of 15 - Mandatory)					
Interacts with residents and other clinicians in a helpful and respectful manner:					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5
Scheduled service availability (Question 10 of 15 - Mandatory)					
Is available for scheduled service (including call) and relieves residents for noon conference:					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5
Evidence-based medicine (Question 11 of 15 - Mandatory)					
Incorporates and teaches evidence-based medicine in daily clinical activities:					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5
Medical literature (Question 12 of 15 - Mandatory)					
Critically discusses medical literature:					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5
Cost-effective healthcare (Question 13 of 15 - Mandatory)					
Practices and teaches cost-effective healthcare:					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5
Electronic patient information systems (Question 14 of 15 - Mandatory)					
Demonstrates an understanding of electronic patient information systems:					
NA/Cannot Evaluate	Failing	Poor	Satisfactory	Good	Excellent
0	1	2	3	4	5

Subject:
Evaluator:
Site:
Period:
Dates of Activity:
Activity: Annual Faculty Evaluation of Residency Program
Evaluation Type: Faculty of Program

Training Program (Question 1 of 7 - Mandatory)

The UAB Nuclear Medicine Residency Program effectively trains competent Nuclear Medicine Physicians.

N/A	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Goals and Objectives (Question 2 of 7 - Mandatory)

Rotation goals and objectives are clear and readily available to all resident and attending physicians.

N/A	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Conference curriculum (Question 3 of 7 - Mandatory)

Conference curriculum is appropriate and well-organized.

N/A	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Teaching Quality (Question 4 of 7 - Mandatory)

Teaching at the viewbox/workstation is of good quality.

N/A	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Program Director (Question 5 of 7 - Mandatory)

The Program Director provides effective overall leadership of the residency program and assures that ACGME guidelines are followed.

N/A	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Program Coordinator (Question 6 of 7 - Mandatory)

The Program Coordinator effectively supports the residency training program.

N/A	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Suggestion for Improvement (Question 7 of 7)

Please list at least one suggestion for improvement for the Radiology Residency Program.

Subject:	
Evaluator:	
Site:	
Period:	
Dates of Activity:	
Activity:	Faculty Evaluation of Resident
Evaluation Type:	Resident

Patient Care: (Question 1 of 23 - Mandatory)

Develops a diagnostic/therapeutic plan based on the clinical question(s) and relevant clinical and radiologic information.

NA/Cannot Evaluate	Poor Performance	Satisfactory Performance (Most Residents)		Exceptional Performance	
0	1	2	3	4	5

Patient Care: (Question 2 of 23 - Mandatory)

Performs examinations appropriately and safely, demonstrating good technique and understanding of existing protocols.

NA/Cannot Evaluate	Poor Performance	Satisfactory Performance (Most Residents)		Exceptional Performance	
0	1	2	3	4	5

Patient Care: (Question 3 of 23 - Mandatory)

Employs measures to minimize radiation dose.

NA/Cannot Evaluate	Poor Performance	Satisfactory Performance (Most Residents)		Exceptional Performance	
0	1	2	3	4	5

Medical Knowledge: (Question 4 of 23 - Mandatory)

Demonstrates good fund of relevant medical and nuclear medicine knowledge.

NA/Cannot Evaluate	Poor Performance	Satisfactory Performance (Most Residents)		Exceptional Performance	
0	1	2	3	4	5

Medical Knowledge: (Question 5 of 23 - Mandatory)

Generates meaningful differential diagnoses.

NA/Cannot Evaluate	Poor Performance	Satisfactory Performance (Most Residents)		Exceptional Performance	
0	1	2	3	4	5

Practice-Based Learning and Improvement: (Question 6 of 23 - Mandatory)

Engages in teaching opportunities with residents, medical students, and technologists without being prompted.

NA/Cannot Evaluate	Never	Most of the time (Most Residents)		Always	
0	1	2	3	4	5

Practice-Based Learning and Improvement: (Question 7 of 23 - Mandatory)

Seeks out clinical activities and gains experience whenever possible.

NA/Cannot Evaluate	Never	Most of the time (Most Residents)		Always	

0	1	2	3	4	5
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Practice-Based Learning and Improvement: (Question 8 of 23 - Mandatory)

Recognizes and corrects personal errors.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Practice-Based Learning and Improvement: (Question 9 of 23 - Mandatory)

Responds appropriately to constructive criticism.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Practice-Based Learning and Improvement: (Question 10 of 23 - Mandatory)

Demonstrates evidence of outside reading and progressive learning.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Systems-Based Practice: (Question 11 of 23 - Mandatory)

Can effectively manage the reading room.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Systems-Based Practice: (Question 12 of 23 - Mandatory)

Bases practice and consultations on cost-effective, outcomes-based imaging.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Interpersonal and Communication Skills: (Question 13 of 23 - Mandatory)

Interacts with patients in a professional and sympathetic manner.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Interpersonal and Communication Skills: (Question 14 of 23 - Mandatory)

Maintains cordial and effective relationships with all members of the healthcare team.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Interpersonal and Communication Skills: (Question 15 of 23 - Mandatory)

Generates clear, concise, and grammatically correct reports.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Interpersonal and Communication Skills: (Question 16 of 23 - Mandatory)

Effectively communicates urgent, emergent, or unexpected findings to other clinicians without being prompted and documents appropriately in report.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Professionalism: (Question 17 of 23 - Mandatory)

Resident is punctual.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Professionalism: (Question 18 of 23 - Mandatory)

Resident completes assigned tasks and leaves no work unfinished.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Professionalism: (Question 19 of 23 - Mandatory)

Takes responsibility for their patients and the service.

NA/Cannot Evaluate	Never		Most of the time (Most Residents)		Always
0	1	2	3	4	5

Comments and Suggestions for Improvements: (Question 20 of 23)

Please list any additional comments regarding the resident's performance. **If a score below 3 is given above, please give an explanation and suggestions for improvement.**

This evaluation was discussed with the resident prior to submission. (Question 21 of 23 - Mandatory)

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

The resident met the goals and objectives for the rotation. (Question 22 of 23 - Mandatory)

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

The resident completed rotation specific reading assignments and/or RSNA physics assignments. Completion was demonstrated as either discussion of content with attending physician or presentation of printed certificate as applicable. (Question 23 of 23 – Mandatory)

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	N/A

Subject:
Evaluator:
Site:
Period:
Dates of Activity:
Activity:
Evaluation Type: Resident Evaluation of Rotation

Volume (Question 1 of 7 - Mandatory)

Volume

- Felt case load was OK
- Felt case load was too high
- Felt case load was too low

Staff Availability (Question 2 of 7 - Mandatory)

Staff availability

Cannot Evaluate	Poor	Fair	Good	Very Good	Excellent
0	1	2	3	4	5

Learning Environment (Question 3 of 7 - Mandatory)

Learning environment

Cannot Evaluate	Poor	Fair	Good	Very Good	Excellent
0	1	2	3	4	5

View Box Teaching Resources (Question 4 of 7 - Mandatory)

Staff and time resources for "view box" teaching

Cannot Evaluate	Poor	Fair	Good	Very Good	Excellent
0	1	2	3	4	5

Procedures (Question 5 of 7)

Overall assessment of the quality, quantity and level of independence allowed for interpreting studies and performing procedures.

Cannot Evaluate	Poor	Fair	Good	Very Good	Excellent
0	1	2	3	4	5

General comments (Question 6 of 7)

Please provide any additional comments or suggestions which you feel may be helpful.

Rotation Value (Question 7 of 7 - Mandatory)

Overall educational value of this clinical activity.

Cannot Evaluate	Poor	Fair	Good	Very Good	Excellent
0	1	2	3	4	5

Subject:
Evaluator:
Site:
Period:
Dates of Activity:
Activity: Peer Evaluation - Semi-Annual
Evaluation Type: Peer (Trainee to Trainee)

Dependable and trustworthy (Question 1 of 16 - Mandatory)

This resident is dependable and trustworthy.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Professional attitude (Question 2 of 16 - Mandatory)

This resident demonstrates a professional attitude and demeanor.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Education (Question 3 of 16 - Mandatory)

This resident is interested in his/her education.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Respectful (Question 4 of 16 - Mandatory)

This resident treats others with respect and courtesy, even in stressful situations.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Image interpretations (Question 5 of 16 - Mandatory)

This resident's image interpretations are accurate for his/her level of training.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Radiologic literature (Question 6 of 16 - Mandatory)

This resident stays informed about current nuclear medicine literature.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Political issues in radiology (Question 7 of 16 - Mandatory)

This resident is interested and informed regarding political issues in nuclear medicine.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Assigned work (Question 8 of 16 - Mandatory)

This resident routinely completes his/her assigned work and rarely leaves work for others.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree

Disagree					
0	1	2	3	4	5

Attitude (Question 9 of 16 - Mandatory)

This resident has a positive outlook and is rarely unnecessarily critical.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Compassion (Question 10 of 16 - Mandatory)

This resident is compassionate.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Teacher (Question 11 of 16 - Mandatory)

This resident is a good teacher.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Interaction (Question 12 of 16 - Mandatory)

This resident interacts effectively with referring clinicians.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Advice (Question 13 of 16 - Mandatory)

This resident is someone I would go to for advice or help.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Resident as partner (Question 14 of 16 - Mandatory)

I would like to have this resident as a partner.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

This resident deserves commendation for (Question 15 of 16)

Subject:
Evaluator:
Site:
Period:
Dates of Activity:
Activity: Semi-Annual Resident Survey
Evaluation Type: Semi-Annual Program

Viewbox Teaching (Question 1 of 8 - Mandatory, Confidential)

The faculty members provide adequate "view box" teaching

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Didactic and Case Conferences (Question 2 of 8 - Mandatory, Confidential)

Didactic conferences are of good quality and educational.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Didactic and Case Conferences (Question 3 of 8 - Mandatory, Confidential)

Case conferences are of good quality and educational.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Faculty Teaching (Question 4 of 8 - Mandatory, Confidential)

Overall faculty teaching is good.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Faculty Responsiveness (Question 5 of 8 - Mandatory, Confidential)

Faculty members are responsive to residents' problems and concerns.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Overall Satisfaction (Question 6 of 8 - Mandatory, Confidential)

Overall satisfaction with the residency training program at this time is good.

N/A	Strongly Disagree	Disagree	Neutral/Unsure	Agree	Strongly Agree
0	1	2	3	4	5

Comments (Question 7 of 8 - Mandatory, Confidential)

Please add any comment you feel would be helpful:

Subject:	Evaluation Type: Lecture	
Activity:	Site:	
Conference:	Conference Date:	
Evaluator:		

Clarity: (Question 1 of 7 - Mandatory, Confidential):
The lecture was organized and easy to understand.

NA	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Content: (Question 2 of 7 - Mandatory, Confidential):
The topic is informative and appropriate for resident education.

NA	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Delivery Methods: (Question 3 of 7 - Mandatory, Confidential):
The speaker was clear and concise in lecture presentation.

NA	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Delivery Methods: (Question 4 of 7 - Mandatory, Confidential):
The speaker uses appropriate speech patterns (tone, inflection, speed, pitch).

NA	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Delivery Methods: (Question 5 of 7 - Mandatory, Confidential):
The speaker conveys knowledge and enthusiasm about the lecture topic.

NA	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Delivery Methods: (Question 6 of 7 - Mandatory, Confidential):
Nuclear Medicine and radiographic images were illustrative and of good quality.

NA	Strongly Disagree	Disagree	Neutral/Undecided	Agree	Strongly Agree
0	1	2	3	4	5

Other Comments: (Question 7 of 7 - Mandatory, Confidential):

Appendix G: Therapy Assessment & Follow-Up

¹³¹I Hyperthyroid Therapy Assessment for Authorized User Eligibility

Coded Patient Identifier: _____
Date of ¹³¹I Therapy: _____
Patient diagnosis: _____
Prescribed ¹³¹I dose: _____
Administered ¹³¹I dose: _____

State reasoning for prescribed dose:

Pre-Therapy Information (fill in as applicable):
TSH (date): _____ T4 (date): _____ T3 (date): _____
Serum pregnancy (date): _____
Other pertinent lab values
(date): _____
Radioiodine uptake (date): 4 hour _____ 24 hour _____
Diagnostic imaging (date & findings):

Pre-Therapy Medications:
Thyroid-specific: _____ Date Stopped: _____
 β -blocker (date & dose)?: _____

Date of therapy:
Physical exam findings:

Potential challenges (e.g., recent contrast study, incontinence, children present at dosing, etc): _____

Complications (immediate/first 48 hours):

¹³¹I Hyperthyroid Therapy Follow-Up for Authorized User Eligibility

Coded Patient Identifier: _____
Date of Follow-Up _____

Post-Therapy Labs:
TSH (date): _____ T4 (date): _____ T3 (date): _____
Other pertinent lab values (date): _____

Medications:
Date β -blocker stopped: _____
Thyroid blocker medications used after therapy? (if yes, date & dose): _____
Synthroid replacement (date [re]started & dose) _____

Diagnostic Studies/Subsequent Therapies:
Radioiodine uptake repeated? (if yes, date & findings) _____
Other pertinent diagnostic study findings: _____
Need for ¹³¹I retreatment? (if yes, date & dose administered): _____

Narrative of Patient Outcome/Complications (as of follow up date):

Enter subsequent follow-up in same format.

¹³¹I Cancer Therapy Assessment for Authorized User Eligibility

Coded Patient Identifier: _____
Date of ¹³¹I Therapy: _____
Patient diagnosis: _____
Prescribed ¹³¹I dose: _____
Administered ¹³¹I dose: _____

State reasoning for prescribed dose:

Pre-Therapy Information (fill in as applicable):

TSH (date): _____ Thyroglobulin (date): _____ Anti-thyroglobulin (date): _____

Serum pregnancy (date): _____

Other pertinent lab values (date): _____

Date of surgery & Pathology Findings:

Diagnostic imaging (date & findings):

List risk factors for poor prognosis (e.g., age, tumor type, size of tumor, local invasion, + lymph nodes, known metastases, etc):

Pre-Therapy Medications:

Thyroid-specific: _____ Date Stopped: _____

rTSH given? (dates): _____

Date of therapy:

Physical exam findings:

Potential challenges (e.g., recent contrast study, incontinence, children present at dosing, etc):

Complications (immediate & first 48 hours):

¹³¹I Cancer Therapy Follow-Up for Authorized User Eligibility

Coded Patient Identifier: _____
Date of Follow-Up _____

Post-Therapy Labs:
TSH (date): _____ T4 (date): _____ Anti-thyroglobulin (date): _____
Thyroglobulin-unstimulated (date): _____
Thyroglobulin-stimulated (date): _____
CBC & other pertinent lab values (date): _____

Diagnostic WB scan? (if yes, date & findings)

Other pertinent diagnostic study findings:

Synthroid replacement (date [re]started & dose)

Need for ¹³¹I retreatment? (if yes, date & dose administered):

Narrative of Patient Outcome/Complications (as of follow up date):

Enter subsequent follow-up in same format.

Radiopharmaceutical Cancer Therapy Assessment for Authorized User Eligibility

Coded Patient Identifier: _____
Date of Therapy: _____
Patient diagnosis: _____
Radiopharmaceutical: _____
Administered dose: _____

State reasoning for prescribed dose:

Pre-Therapy Information (fill in as applicable):

CBC (date): _____

Serum pregnancy (date): _____

Other pertinent lab values (date): _____

Date of surgery & Pathology Findings:

Diagnostic imaging (date & findings):

List risk factors for poor prognosis (e.g., age, tumor type, size of tumor, local invasion, + lymph nodes, solid organ involvement, type of metastases, etc):

Prior Therapies:

Chemotherapy: _____ Date Started/Completed: _____

Radiation therapy: _____ Date Started/Completed: _____

Date of radiopharmaceutical therapy:

Physical exam findings:

Imaging exam findings (for ¹⁵³Sm, Bexaar, Zevalin):

Potential challenges (e.g., co-morbidities, etc):

Complications (immediate & first 48 hours):

Radiopharmaceutical Cancer Therapy Follow-Up for Authorized User Eligibility

Coded Patient Identifier: _____
Date of Follow-Up _____

Post-Therapy Labs:
CBC (date): _____
Other pertinent lab values (date): _____

Narrative of Patient Outcome/Complications (as of follow up date):

Pertinent diagnostic study findings:

Need for retreatment? (if yes, date & dose to be administered):

Enter subsequent follow-up in same format.

Appendix H: NRC Checklist

<u>Equipment</u>	<u>Date Observed/Discussed</u>	<u>Date Performed/Used</u>	<u>Verifying Faculty</u>
Dose Calibrator	_____	_____	_____
Well Counter	_____	_____	_____
Thyroid Probe	_____	_____	_____
Geiger Counter	_____	_____	_____
Ionization Chamber	_____	_____	_____
 <u>Gamma Camera Operations</u>			
Daily QC	_____	_____	_____
Collimators	_____	_____	_____
Study-specific head configuration for SPECT	_____	_____	_____
COR QC	_____	_____	_____
SPECT Image QC	_____	_____	_____
 <u>Radiopharmacy Visit</u>			
Generator Elution	_____	_____	_____
Moly Breakthrough Test	_____	_____	_____
Radiolabeling	_____	_____	_____
Dose QC	_____	_____	_____
Dose Dispensing/Packing	_____	_____	_____
 <u>PET Radiopharmacy Visit</u>			
Cyclotron operation	_____	_____	_____
Radiolabeling	_____	_____	_____
Dose QC	_____	_____	_____
Dose Dispensing/Packing	_____	_____	_____
 <u>Observation of Study Acquisition</u>			
Whole Body Bone Scan	_____	_____	_____
Spot View Bone Scan	_____	_____	_____
Dynamic Acquisition (HIDA, renal, etc)	_____	_____	_____
Pinhole Image	_____	_____	_____
Cardiac SPECT	_____	_____	_____
Non-cardiac SPECT	_____	_____	_____
Sentinel Lymph Node Injection	_____	_____	_____
 <u>Image & SPECT Processing</u>			
Bone scan image processing	_____	_____	_____
Dynamic study processing	_____	_____	_____
SPECT cardiac	_____	_____	_____
SPECT non-cardiac	_____	_____	_____
Filters	_____	_____	_____
 <u>Radiation Safety & I-131 Therapy</u>			
Radiation Spill	_____	_____	_____
Daily Area Survey/Wipes	_____	_____	_____
Incoming Shipments Survey/Wipes	_____	_____	_____

UAB Radiation Safety Meeting	_____	_____	_____
Alabama/NRC Patient Release Rules	_____	_____	_____
NRC exposure rules	_____	_____	_____
High dose therapy patient release	_____	_____	_____
High dose therapy room setup	_____	_____	_____
High dose therapy room release	_____	_____	_____
Medical Event Reporting	_____	_____	_____

Appendix I: Acknowledgment of Moonlighting Policy

- No moonlighting is allowed Monday through Friday during normal work hours while a resident is on service.
- No moonlighting should be scheduled during evening hours on a normal work day, as the work day may run into the early evening.
- No moonlighting is permitted on weekends when the resident is taking pager call from home.
- Moonlighting is permitted on weekends or holidays when a resident is not on call or during pre-approved vacation time.
 - This vacation time must not extend beyond normal allotted number of vacation days.
 - Use of sick days is not allowed.
- Since it is ACGME policy that moonlighting hours count towards the 80 hour limit, **Moonlighting must not interfere with duty hours; if moonlighting places the resident or fellow over ACGME duty hour limitations, it is the moonlighting hours that must be sacrificed. Residency training comes first!**
- The resident must notify the Nuclear Medicine Program Director if he/she decides to pursue or accept a moonlighting opportunity, including how many hours the resident expects to work (and actually works).
- All insurance coverage and DEA certification needed for any such venture is completely the resident's responsibility.
 - The resident must also provide the Director with documentation of malpractice coverage for this moonlighting opportunity.
 - UAB's institutional DEA number is not to be used by the resident for moonlighting purposes
 - UAB malpractice insurance does not cover unsupervised medical practice outside the scope of the UAB residency training program.
- If a resident decides to take the opportunity to moonlight, he or she must provide the Director of Nuclear Medicine with contact information including a reference name at the institution or practice at which he/she will be moonlighting.
- If the Program Director feels moonlighting activities are interfering with residency training or patient care, permission to continue moonlighting may be withdrawn.
- If a resident is moonlighting during routine workday hours (not on vacation) or while taking "sick leave", permission to continue moonlighting will be withdrawn, and the resident will be subject to disciplinary action, which may include probation, suspension, or termination.

I have read the above policy regarding moonlighting, and agree to follow its guidelines.

I do/do not (circle appropriate choice) plan to pursue moonlighting opportunities this academic year.

Print name: _____ Signature _____ Date _____

Program Director Receipt: _____

Appendix J: Nuclear Medicine Resident Self-Assessment Questionnaire

Name:						
Date:						
	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree	Not applicable
PATIENT CARE – I am able to.....						
Develop a differential diagnosis based upon scintigraphic, radiographic and clinical findings						
Recognize the symptoms and signs of hyperthyroidism						
Calculate therapy doses for various therapeutic indications						
Care for patients after therapeutic nuclear medicine administration						
MEDICAL KNOWLEDGE – I am able to						
Recognize and describe relevant scintigraphic and radiographic abnormalities						
Synthesize imaging and clinical information to form an impression						
Understand the concepts and protocols of the current practice of clinical nuclear medicine						
Apply safe radiation practice						
Understand quality control procedures for imaging equipment & radiopharmaceuticals						
INTERPERSONAL/COMMUNICATION SKILLS – I am able to.....						
Establish rapport with patients and patients						
Communicate effectively with all members of the health care team						
Appropriately obtain informed consent						
Produce reports that are relevant, accurate and concise						
Effectively teach medical students, residents and technology students						
PRACTICE BASED LEARNING AND IMPROVEMENT – I am able to:						
Attend and effectively present cases at conferences						
Appraise scientific evidence and quality of published literature.						
Work within the limits of my expertise						
Accept feedback constructively						
Utilize information technology to continuously gain medical knowledge						

PROFESSIONALISM - I.....						
Demonstrate a responsible work ethic with regard to work assignments and conference attendance						
Demonstrate an acceptable personal demeanor						
Wear appropriate work attire						
Exhibit professional and ethical behavior towards patients						
Exhibit professional and ethical behavior towards medical colleagues						
Respect patients' privacy						
SYSTEMS-BASED PRACTICE- I can apply....						
Knowledge of appropriateness criteria to the practice of nuclear medicine						
Knowledge of NRC regulations to the practice of nuclear medicine						

Which aspects of my performance are the weakest, and need the most improvement?

I propose the following self-improvement plan to remediate these weaknesses:

- 1.

- 2.

How well did I do in remediating those plans? Do I need to make adjustments in my self-improvement plan? (for residents that have filled out this form before)

I have the following short term (3-6 month) goals:

1.

2.

3.

I have the following intermediate (1-2 years) goals:

1.

2.

3.

I have the following long term/career goals:

1.

2.

3.

How effectively have I met my short and intermediate term goals (since last assessment)?

How well have I performed so as to place myself in good stead to attain my long term/career goals?

Appendix K: Evaluation of Resident Report Writing:

Resident name: _____

Training year of resident: _____

Evaluated by (faculty name): _____

Evaluation Date): _____

1. Description of findings:

Grossly inaccurate, incomplete, many errors		Few descriptive errors or some incomplete description		Highly accurate and complete
1	2	3	4	5

2. Use of language:

Rambling, difficult to understand		Somewhat unclear or prolix		Clear, concise
1	2	3	4	5

3. Grammatical correctness:

Many errors and/or non-standard usage		Moderate number of errors		Highly accurate
1	2	3	4	5

4. Differential diagnosis:

Unclear, incorrect, lacks judgment		Moderate lack of clarity and/or judgment		Clear, insightful, analytical and complete
1	2	3	4	5

5. Quality of final impression/conclusion:

Failure to answer clinical question, misleading		Some deficiency in answering clinical question		Concisely answers the clinical question, provides guidance
1	2	3	4	5

Comments: Elaborate on any rankings in the below competence or needs improvement categories. Also include any positive comments.

Jon A. Baldwin, D.O., M.B.S.
Nuclear Medicine Program Director
Revised & Final Approval: June 23, 2012
Minor Revision July 3, 2012

Resident Receipt of Resident Manual

I have received a copy of the 2012-2013 Resident Manual from the Program Director, and reviewed pertinent highlights with him. By signing below, I confirm I will read the manual and understand that I am expected to follow the policies and procedures outlined within. Additionally, I understand that periodically there may be updates to the manual, of which I will be informed.

Resident Name

Date