GOALS AND OBJECTIVES
OVERTON BROOKS VAMC – NUCLEAR MEDICINE ROTATION

I. Nuclear Medicine Curriculum, Goals and Objectives for each rotation

PGY 1

Patient Care Skills

1. Review histories of patients to be imaged each day to determine the relevance of the study to clinical symptoms, to evaluate for contraindications to the study, and to advise technologists about special views or specific parameters of the study that require special attention.
2. Assist technologists in the determination of the radiopharmaceutical dosage when patient conditions do not fit the criteria of the standard dose.
3. Make a preliminary review of the images and advise technologists when additional views or repeat views are needed.
4. Active participation with faculty in exam interpretation.

Education

1. Ask the attending questions during rotation.
2. Participation in Journal Club
3. Radiation safety and nuclear medicine physics lectures (C. Killgore, DABR)
4. Observe at least one of each of the different scans routinely performed, as well as all the infrequently ordered studies. Using most morning time to learn items listed on the attached form of “Nuclear Techniques and Pharmacy Proficiency Evaluation”.

Assessment

1. Global ratings by faculty
2. Place evidence of your accomplishments in your department portfolio
3. ACR In-service examination

Medical Knowledge

Skills - At the end of the rotation, the resident should be able to:

1. Demonstrate a thorough knowledge of the clinical indications, general procedures (including radiopharmaceutical and dose), and scintigraphic findings in:
   a. Pulmonary (emboli) ventilation and perfusion imaging
   b. Hepatobiliary imaging and functional studies
   c. GI blood loss imaging
   d. Bone imaging
e. Learn basic nuclear tests and indications for cardiac imaging and great aortic aneurysms. Learn normal relevant cardiac/great vessel anatomy and physiology.

2. Discuss the basic physical principles of nuclear medicine imaging and instrumentation.

3. Identify the isotopes (including physical and chemical properties) that are used routinely in the compounding of radiopharmaceuticals for nuclear radiology procedures.

4. Familiarize yourself with the RSNA’s Internet nuclear medicine information portal at http://www.rsna.org/education/related/nuclear.html

Education

Recommended Reading (see Part IV for details):

-----------
3. Didactic lecture series
4. Participation in the clinical activities of the Nuclear Medicine Imaging Section
5. Review a portion of the nuclear cases in the department teaching file
6. Join daily review sessions of cardiac cases

Assessment
1. Global ratings by faculty
2. ACR in-training examination
3. Raphex physics exam
4. Place evidence of your accomplishments in your department portfolio

Interpersonal and Communication Skills
1. Provide a clear report based
2. Provide direct communication to referring physicians or their appropriate representative, and documenting communication in report for emergent or important unexpected findings
3. Demonstrate the verbal and non-verbal skills necessary for face to face listening and speaking to physicians, families, and support personnel

Education
1. Participation as an active member of the radiology team by communicating with clinicians face to face, providing consults, answering phones, problem solving and decision-making
2. Practical experience in dictating radiological reports
Assessment
1. Global ratings by faculty
2. Place evidence of your accomplishments in your department portfolio

Professionalism

Skills
1. Recognize limitations in personal knowledge and skills, being careful to not make decisions beyond the level of personal competence.
2. Demonstrate altruism
3. Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
4. Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
5. Demonstrate honesty with patients and staff
6. Demonstrate honor and integrity: avoid conflict of interests when accepting gifts from patients and vendors
7. Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual or educational differences, and without employing sexual or other types of harassment
8. Demonstrate knowledge of issues of impairment
9. Demonstrate positive work habits, including punctuality and professional appearance
10. Demonstrate the broad principles of biomedical ethics
11. Demonstrate principles of confidentiality with all information transmitted during a patient encounter
12. Teaching of medical students

Education
1. Discussion of above issues during daily clinical work
2. Resources listed in Radiology Resident Handbook

Assessment
3. Global ratings by faculty
4. Attendance at the above conferences with logs as necessary
5. Place evidence of your accomplishments in your department portfolio

Practice Based Learning and Improvement
1. Review all cases and dictate a preliminary report. Then review your interpretation with faculty and then correct report as needed before sending it to the faculty members report queue.
2. Share good learning cases and missed diagnosis with others in the
Education
1. Participate in Journal club, clinical conferences, and independent learning
2. Active participation in quality control and quality assurance activities.
3. Submit form quality improvement to supervising technologist, residency review coordinator and department quality improvement secretary.
4. Become aware of other quality improvement activities and cases in the department. The chief resident is present at most QA/QC meetings. All residents are involved with this during frequent residency meetings held by the residency program director.

Assessment
1. Global ratings by faculty
2. Place evidence of accomplishments in your department portfolio

Systems Based Practice
1. Demonstrate ability to design cost-effective care plans
2. Demonstrate knowledge of the government regulation (e.g. NRC)

Education
1. Review of literature related to nuclear imaging tests listed in the Medical Knowledge Skills section for this rotation, including ACR Appropriateness Criteria and ACR Practice Guidelines and Technical Standards
2. Interaction with department administrators
3. Discussions with faculty about cost-effective care plans and regulation
4. Journal Club articles on Issues related to Systems Based Practice
5. Louisiana State University Health Sciences Center - Shreveport Clinical Practice Management Lectures on issues such as JCAHO inspections, corporate compliance, medication ordering and errors, patient safety, etc.
6. ACR/APDR Initiative for Residents in Diagnostic Radiology Modules

Assessment
1. Global ratings by faculty
2. Membership in professional radiology societies
3. Place evidence of your accomplishments in your department portfolio

PGY 2
Continue to master the skills of Rotation 1

Patient Care
1. Read and/or dictate films with the assistance/review of the faculty
radiologists.
2. Assist with radioactive therapy treatments, making sure the consent form is completed properly and that the appropriate dose is administered, giving particular attention to radiation safety practices during the procedure.
3. Using most morning time to learn items listed on the attached form of “Nuclear Techniques and Pharmacy Proficiency Evaluation”.

**Medical Knowledge**
1. Demonstrate a thorough knowledge of the clinical indications, general procedures (including radiopharmaceutical and dose) and scintigraphic findings in:
   a. Renal and urinary tract studies
   b. Liver/spleen imaging
   c. GI tract imaging and functional studies
   d. Thyroid imaging and functional studies
   e. Brain imaging and functional studies
   f. Tumor and abscess imaging
2. Identify and discuss indications for isotopes used for therapeutic purposes.
3. Describe the protocol for using 1-131 for treatment of hyperthyroidism and thyroid malignancies, including protocol for hospitalization and monitoring of patients who receive over 30 mCi of activity.
4. Learn indications and role of PET/CT
5. Learn normal variants of cardiac nuclear and vascular imaging

**Interpersonal and Communication**
1. Apply the same interpersonal and communication skills in rotation 1 to the new areas of patient care in rotation 2
2. Assist with preparation/presentation of cases for biweekly resident noon film review.

**Professionalism**
1. Apply the same professional skills in rotation 1 to the new areas of patient care in rotation 2
2. Teach junior residents from radiology

**Practice Based Learning and Improvement**
1. Apply the same practice based learning and improvement skills in rotation 1 to the new areas of patient care in rotation 2

**Systems Based Practice**
1. Review of literature related to nuclear imaging tests listed in the Medical Knowledge section for this rotation, including ACR Appropriateness Criteria and ACR Practice Guidelines and Technical Standards
PGY 3

Continue to master the skills of Rotation 1 and 2

Patient Care
1. Evaluate all thyroid patients clinically and learn to estimate the size of their thyroid glands by palpation
2. Make preliminary decisions on all matters of film interpretation and consultation, recognizing need for and obtaining assistance in situations that require the expertise of the faculty radiologist.
3. Follow patients admitted to the hospital for the administration of radiopharmaceuticals.
4. Using most morning time to learn items listed on the attached form of “Nuclear Techniques and Pharmacy Proficiency Evaluation”.

Medical Knowledge
1. Learn variants of PET/CT
2. Begin to learn to interpret abnormal findings cardiac and vascular imaging and functional studies
3. Understand the advantages and disadvantages of various types of blood pool imaging radiopharmaceuticals
4. For the studies learned to date on previous rotations be able to discuss all aspects of nuclear studies, including indications, pathologies, protocols, correlative studies, radiopharmaceuticals used for each study, and various parameters that might interfere with the results of the procedure.

Interpersonal and Communication
1. Apply the same interpersonal and communication skills in rotations 1 and 2 to the new areas of patient care in rotations 3 and 4
2. Teach residents and faculty from other departments as well as junior residents and medical students
3. Comment on anatomical findings, scanning technique, and reasons for doing the study to RAD 401 students in such a way that the students will be able to develop an appreciation for the value of nuclear radiology procedures in patient management.

Practice Based Learning and Improvement
1. Apply the same practice based learning and improvement skills in rotation 1 and 2 to the new areas of patient care in rotation 3 and 4.

Systems Based Practice
1. Review of literature related to nuclear imaging tests listed in the Medical Knowledge section for this rotation, including ACR Appropriateness Criteria and ACR Practice Guidelines and Technical Standards

PGY 4
Continue to master the skills of Rotations 1, 2, and 3

Patient Care
1. Select test for evaluation of cardiac disease on the basis of patient condition and clinical symptoms
2. Process computer data obtained in each of the different cardiac studies.
3. Correlate the results from various tests with interpretation of nuclear cardiology exams.
4. Provide preliminary interpretations of PET/CT scans.
5. Using most morning time to learn items listed on the attached form of “Nuclear Techniques and Pharmacy Proficiency Evaluation”.

Medical Knowledge
1. Demonstrate a thorough knowledge of the clinical indications, general procedures, and findings in:
   a. Myocardial perfusion studies (rest and stress)
   b. Myocardial infarct imaging
   c. Multigated acquisition imaging and function studies
2. Describe the radiopharmaceuticals used in cardiac nuclear studies, including the methods of red cell labeling, patient dosages, and physical properties of the isotopes.
3. Discuss patient conditions and patient monitoring requirements, particularly in relation to exercise and drug stress studies. Understand the appropriate anatomy and physiology underlying these examinations.
4. Discuss the range of invasive and noninvasive tests, test characteristics, and the prognostic value of tests used to evaluate cardiac disease.
5. Understand the various pathologic conditions that can be demonstrated by PET/CT and to recognize them on studies

Interpersonal and Communication
4. Apply the same interpersonal and communication skills in rotations 1, 2, 3 and 4 to the new areas of patient care in rotation 5
5. Teach nuclear medicine staff as well as residents, faculty from other departments, junior residents, and medical students

Practice Based Learning and Improvement
1. Apply the same practice based learning and improvement skills in rotations 1, 2, 3 and 4 to the new areas of patient care in rotation 5

Systems Based Practice
1. Review of literature related to nuclear imaging tests listed in the Medical Knowledge section for this rotation, including ACR Appropriateness Criteria and ACR Practice Guidelines and Technical Standards
II. General statements for achieving the goals and objectives on each rotation.

II-1. Clinical training in general nuclear medicine - 14 weeks. Contact Dr. Zhiyun Yang.

II-2. PET and PET/CT training -- 2 weeks. Contact Dr. David Lilien.

II-3. I-131 therapy:
A resident will have to participate with preceptors in three therapies involving oral administration _ 33 mCi of I-131 which will be done in this rotation. A form attached form-2 should be filled by the resident at the time of cases performed with attending signature.

II-4. Technology & Radiopharmacy Training:
1. Charged person: Jason Roberts

2. Schedule of techniques and radiopharmacy rotation – most morning when you are on general nuclear medicine rotation.

3. Sign each item on the check list with your initial and instructor’s initial. Sign your name and turn in the check list of “NUCLEAR TECHNIQUES & PHARMACY PROFICIENCY EVALUATION” before the NRC license will be granted.

III. Department of Radiology
Nuclear Medicine Curriculum

<table>
<thead>
<tr>
<th>LECTURES</th>
<th>SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Nuclear Medicine</td>
<td>2</td>
</tr>
<tr>
<td>Endocrine</td>
<td>2</td>
</tr>
<tr>
<td>Cardiac Imaging</td>
<td>2</td>
</tr>
<tr>
<td>CNS</td>
<td>1</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>2</td>
</tr>
<tr>
<td>Gastrointestinal Tract Imaging</td>
<td>2</td>
</tr>
<tr>
<td>Infection and Inflammation</td>
<td>1</td>
</tr>
<tr>
<td>Musculoskeletal: Bone/Soft Tissues and Lymphatics</td>
<td>3</td>
</tr>
<tr>
<td>PET/CT</td>
<td>1</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>1</td>
</tr>
<tr>
<td>Tumor Imaging and Radionuclide Therapy</td>
<td>1</td>
</tr>
<tr>
<td>Radioscintigraphic Assay and Volumetry (RIA)</td>
<td>1</td>
</tr>
<tr>
<td>Radiation Biology</td>
<td>1</td>
</tr>
</tbody>
</table>

LECTURE 1 - General Nuclear Medicine
Session 1
Characteristics of radionuclides
Production of radionuclides
Generators
Radiopharmaceutical Quality Control
  Sterility
  Chemical purity
  Radionuclide purity
  Radiochemical purity
Radiation Detection
  Ionizations
    Geiger Counter
    Dose Calibrator
      Constancy
      Linearity
      Accuracy
      Geometry
Scintillators
  Well counter
  Scintillation counter
  Thyroid uptake probe
  Camera

Session 2
Gamma Camera Characteristics
  Spatial Resolution
  Sensitivity
  Temporal Resolution
Collimators
  Resolution and Sensitivity
  Types of collimators
    Parallel hole
    Converging and diverging
    Pinhole
SPECT Imaging
Camera Quality Control
  Field Uniformity
  Center of Rotation
  Spatial Resolution
  Temporal Resolution
  Detector Alignment
  Patient Motion
  Tomographic Reconstruction
    Attenuation Correction
LECTURE 2 – Endocrinology

Session 1 - Thyroid
  Physiology
  Indications for uptake/scan
  Imaging protocols
    Uptake and scan
      Normal values
      Findings
      Factors affecting
      Thyroid survey
        Dose
        Patient prep
          Hormone withdrawal
          Thyrogen stimulation
      When to skip initial survey
      Stunning
      Artifacts

Radiopharmaceuticals
  $^{123}$I
  $^{131}$I
  Tc$^{99m}$-pertechnetate
  FDG

Precautions
  Patient prep

Congenital Lesions of the Thyroid Gland
  Thyroiditis
  Thyroid Nodules
  Hyperthyroidism: Graves/MNG
    Therapy
  Thyroid Neoplasms
    Therapy

Other thyroid conditions and Hypothyroidism

Session 2 - Parathyroid
  Embryology and Anatomy
  Physiology/pathology
  Methods for localization
  Radiopharmaceuticals
  Imaging protocols
    Sestamibi dual phase exam
Subtraction exam
Sestamibi / pertechnetate
$^{123}\text{I}/\text{Iodine}$
$^{201}\text{Tl}$ / pertechnetate
False positives/negatives
Cases

Session 3 - Adrenal cortex / medulla
Anatomy/physiology
Radiopharmaceuticals
Cortex/medulla
Indications
Cortex/medulla
Cortical imaging
Patient preparation
Medullary imaging
Patient Preparation
Drug contraindications
Cases
MIBG
Octreotide

LECTURE 3 - Nuclear Cardiology

Session 1 - Myocardial perfusion
Radiopharmaceuticals
Technetium agents
Thallium
Protocols
Stress
Treadmill
Pharmacologic
Viability
Stress protocol/procedure
Anatomy
Indications
SPECT vs. PLANAR
SPECT alignment
Quantification
False positives/negatives
Cases

Session 2 – Myocardial perfusion (continued)
MUGA
Gating principle
Indications
Positions
Functional imaging
Qualitative data analysis
Cases
First Pass Studies
Characteristics
Anatomy
Curves
Cases
Infarct Avid Imaging
Radiopharmaceuticals
Scan interpretation
Uptake
Cases
Myocardial Viability
Thallium
Protocol
PET
Protocol
Isotopes

**LECTURE 4 - CNS Scintigraphic Imaging**

SPECT Brain imaging
Radiopharmaceuticals
Patient prep
Normal characteristics

PET
Radiopharmaceuticals
Patient prep
Normal characteristics

Clinical Indications
Dementia
Trauma
Psychiatric disorders
Seizure
Tumors/infection

CSF Imaging
Radiopharmaceutical
Patient prep
Normal characteristics
NPH

**LECTURE 5 - Genitourinary System**
Session 1.
Renal and Urinary Tract Imaging
Radiopharmaceuticals
Patient prep
Function and anatomy
Clinical indications
Imaging
Lasix Renography
VCUG
Cortical imaging

Session 2.
Captopril Scan
Transplant Evaluation
Testicular Imaging

LECTURE 6 - Gastrointestinal Imaging

Session 1.
Liver/Spleen Imaging
Hepatobiliary Imaging

Session 2.
GI and Hepatic labeled RBC imaging
Gastroesophageal Motility Studies
Salivary Gland Imaging

LECTURE 7 - Infection and Inflammation Imaging

Gallium
Indium WBC Scan
Te\textsuperscript{99m} HMPAO WBC scan
Immunoglobulin Imaging

LECTURE 8 - Musculoskeletal

Session 1.
Bone Imaging
Pharmacology
Neoplastic diseases

Session 2.
Infection / Inflammation
Fractures/Similar Disorders
Metabolic Bone Disease
Vascular Osseous Disorders
Post-operative Conditions
Reflex Sympathetic Dystrophy

Session 3.
Soft Tissue Abnormalities
  Mechanism of tracer uptake
  Etiologies
  Myositis Ossificans
Common Findings / Artifacts
Bone Marrow Scanning
Bone Mineral Densitometry
Lymphoscintigraphy
  Chemistry/pharmacology
  Lymphedema
  Sentinel Node Detection

LECTURE 9 - Positron Emission Tomography

Characteristics
Tracers
Clinical indications (Medicare)
  Lung nodule
  Lung ca, NSC
  Lymphoma
  Melanoma
  Head and neck (except CNS & thyroid)
  Colorectal
  Breast
  Esophageal
Patient prep
Requirements
Artifacts
Cases

LECTURE 10 - Pulmonary

Pulmonary anatomy and physiology
Perfusion and ventilation Examination
  Agents
  Technique
  Artifacts
Pulmonary Embolism
  Discussion
  PIOPED study
LECTURE 11 - Tumor Imaging and Radionuclide Therapy

Gallium
CEA-Scan
Neotect
Octreotide
Prostascint
Tc$^{99m}$ Sestamibi
Thallium
Radionuclide Therapy for Tumors
$^{32}P$
$^{89}$Strontium (Metastron)
$^{186}$Rhenium (HEDP)
$^{153}$Samarium
Monoclonal Antibody Therapy
Zevalin

LECTURE 12 - Radioimmunoassay
1. Schilling Test
   B12 absorption physiology
   Indications
   Pre-test preparation
      False negatives/positives values
   Schilling I
      Technique
      Calculations
      False negative/positive values
   Schilling II
   Schilling III
   Dual-Isotope Schilling
2. Blood Volume Determination
   Physiology
   Plasma volume
      Technique
      Calculations
   RBC volume
Calculations
Sources of possible error
Reporting results
Diagnosis
Relative polycythemia
Polycythemia vera
Secondary polycythemia

3. Red Blood Cell Survival
   Technique
   Calculations

4. Splenic Sequestration Study

LECTURE 13 - Radiation Biology

Radiation effects
   Stochastic effects
   Non-stochastic effects
Potential effects of in utero exposure
   Mental retardation
   Malignancy
Low level radioactive waste
Acceptable radiation dose levels
   Radiation Workers
   Non-radiation workers
Acute radiation Sickness
Radiation Posting
Misadministration
Receipt of radioactive material

References:

Association of Program Directors in Radiology (www.apdr.org)

Stony Brook University Radiology Residency

Nuclear Medicine Core Lectures: Zhiyun Yang, M.D.

<table>
<thead>
<tr>
<th></th>
<th>General nuclear medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Endocrine system</td>
</tr>
<tr>
<td>3</td>
<td>Cardiac imaging</td>
</tr>
<tr>
<td>4</td>
<td>CNS imaging</td>
</tr>
<tr>
<td>5</td>
<td>Genitourinary imaging</td>
</tr>
<tr>
<td>6</td>
<td>Gastrointestinal imaging</td>
</tr>
<tr>
<td>7</td>
<td>Infection and inflammation</td>
</tr>
<tr>
<td>8</td>
<td>Musculoskeletal system</td>
</tr>
</tbody>
</table>
### IV. Reading Suggestions:

   1 OR 2

For Reference

- Sandler MP Jr, et al. (eds), Diagnostic Nuclear Medicine, 3rd edition, 2002
- Treves ST, Pediatric Nuclear Medicine, 1995
- Gerson MC, Cardiac Nuclear Medicine.
- DePuey EG, Cardiac SPECT Imaging.
• Cherry SR, Physics in Nuclear Medicine, 3rd edition, 2003.
• MIR Digital Teaching File and procedure manual at http://gamma.wustl.edu/index2.html
• gamma.wustl.edu.
• Habibian MR, Nuclear Medicine Imaging: A Teaching File. 1999
• Nuclear radiology as outlined in 10CFR20 and other appropriate sources.
• Other resources available for nuclear medicine, such as the Society of Nuclear Medicine (www.snm.org), that can be found on the RSNA Educational Portal for Nuclear Medicine at http://www.rsna.org/education/related/nuclear.html

The following Compliance with NRC Training and Experience Requirements form should be completed prior to completion of the program.

Resident's Name:____________________

NUCLEAR TECHNIQUES & PHARMACY PROFICIENCY EVALUATION

<table>
<thead>
<tr>
<th>Task</th>
<th>Date Observed</th>
<th>Resident/Instructor Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Receive radiopharmaceuticals and log results of package wipe tests and monitoring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Assemble generator and position behind lead shield.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Elute generator using aseptic technique.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Assay an aliquot of the eluate using a dose calibrator to determine total eluate activity and concentration.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Record the generator assay results and time in a log book or computer record.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Check the eluate for radionuclidic purity and chemical contamination and record result.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Determine within activity limits the total volume and radioactivity to be added to a radiopharmaceutical kit and record the volume of the generator eluate used.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Prepare radiopharmaceutical assay for each lot of material.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Check total activity in radiopharmaceutical reaction vials with a dose calibrator and by the subtraction method.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Check all radiopharmaceutical preparations for proper pH, color, clarity, and particle size (if appropriate) and record on radiopharmaceutical assay form.</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Determine the radiochemical purity of radiopharmaceutical preparations by chromatography.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Determine elapsed time between initial and required assay of a radiopharmaceutical for quantification of activity.</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Calculate activity concentration remaining using the appropriate decay factor for time elapsed.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Calculate activity to be administered for diagnostic procedures.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Draw up correct volume of the radiopharmaceutical into a syringe, using aseptic technique and using proper radiation safety precautions.</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Monitor radioactive waste (held for decay) and determine if acceptable to discard.</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Test constancy of response of dose calibrator and determine if it is within acceptable limits.</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Test accuracy of dose calibrator for commonly used radionuclides that have adequate reference standards available.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Perform a linearity check of the dose calibrator over the entire range of radionuclide activity to be measured.</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Observe linearity testing of the dose calibrator using Calicheck tubes.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Check pulse height analyzer (PHA) photopeak adjustment on the scintillation camera to determine if photopeak is centered in window.</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Perform field uniformity check on a scintillation camera and identify if uniformity is acceptable.</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Observe a gas-filled detector for area surveys.</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Observe a Xenon-133 ventilation study.</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Observe a perfusion lung scan.</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Observe a renal scan.</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Process a diuretic renal study.</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Observe and process an RVG.</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Observe and process a myocardial SPECT study.</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Observe and calculate thyroid uptake.</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Observe a whole-body PET/CT scan.</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>Discuss concept of “agreement state”.</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Discuss issue of contamination or spill radioactive material, and decontamination.</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Discuss “hot lab” rules.</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>Discuss “postings” for radioactive materials.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discuss issue of medical event reporting requirements.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Discuss management of iv. radiopharmaceutical extravasation.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Discuss patient release policy.</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Discuss written directive policy.</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Discuss pregnancy-breast feeding policy.</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Discuss policy on dispensing of radiopharmaceutical doses.</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Observe cardiac stress test #1</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Observe cardiac stress test #2</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Observe cardiac stress test #3</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Observe cardiac stress test #4</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Observe cardiac stress test #5</td>
<td></td>
</tr>
</tbody>
</table>

_________________________  ____________________________
Resident's Signature       Date