# Nuclear Medicine Clinical Education Manual

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Accreditation Standards for Nuclear Medicine Technologist Education
SNM-TS Scope of Practice for the Nuclear Medicine Technologist
SNM-TS Code of Ethics
Professional Organizations for Nuclear Medicine Technology
COURSE TITLE          Nuclear Medicine Clinical Education I-V
COURSE CREDIT         2 S.H. for each Clinical Course
INSTRUCTOR           Affiliate Clinical Instructor
SITE                 Assigned Clinical Site
DAYS                 Monday through Friday
TIME                 8:00 a.m. to 4:30 p.m. (30 minutes for lunch)
PREREQUISITE         RADS 3501
COURSE DESCRIPTION   Supervised clinical practice in performing Nuclear Medicine procedures.
                     Radiologic Sciences Department Manual
REQUIRED TEXT (S)     Nuclear Medicine Technology Departmental/Clinical Handbook
                     Principles and Practice of Nuclear Medicine, 2nd Ed.
                     Mettler, Fred A. & Guiberteau, Milton J. (2006)
                     Essentials of Nuclear Medicine Imaging, 5th Ed.

COMPETENCY AREAS     At the end of the course the student will:
1. Maintain and operate Nuclear Medicine Imaging Equipment.
3. Employ appropriate methods in identifying patients for procedures.
4. Communicate effectively with patients, their families, and the clinical site staff.
5. Demonstrate the proper lifting techniques.
6. Provide appropriate monitoring of patients during Nuclear Medicine procedures.
7. Know departmental operations at the assigned site.
8. Select and administer the appropriate radiopharmaceutical via the correct route.
10. Prepare the proper equipment to image and process the patient’s procedure.
11. Prepare and perform cardiac monitoring and and/or stress testing.
12. Prepare and administer interventional pharmacological agents.
13. Obtain samples for non-imaging studies.
14. Calculate and evaluate results on non-imaging studies.
Course Descriptions

RADS 3531 – Nuclear Medicine Clinical Education I (0-20-0)
Prerequisite: RADS 3501
Supervised clinical practice in performing nuclear medicine procedures.

RADS 3532 – Nuclear Medicine Clinical Education II (0-20-0)
Prerequisite: RADS 3531
Supervised clinical practice in performing nuclear medicine procedures.

RADS 4533 – Nuclear Medicine Clinical Education III (0-20-0)
Prerequisite: RADS 3532
Supervised clinical practice in performing nuclear medicine procedures.

RADS 4534 – Nuclear Medicine Clinical Education IV (0-20-0)
Prerequisite: RADS 4533
Supervised clinical practice in performing nuclear medicine procedures.

RADS 4535 – Nuclear Medicine Clinical Education IV (0-20-0)
Prerequisite: RADS 4534
Supervised clinical practice in performing nuclear medicine procedures.

Grade Derivation
- Each student’s final clinic grade will be derived by taking an average of each listed criteria within the grade category (competencies, continued competencies, clinical forms, clinical experience papers, attendance, and the Nuclear Medicine CE-I Clinic Exam).
- All averages will then summed and divided by the number of total averages.
- There will not be any rounding of averages prior to or after totaling the individual averages.
- Once the final grade average has been derived, each category rule will be applied to the final grade. This may change the final letter grade and grade for the course.

To earn an grade of A:
- Competencies
  - Completion of more than the minimum number of competencies assigned for the clinical rotation. There are 6 competencies assigned for this rotation.
  - Each of these competencies must average a minimum grade of 91%.
- Clinical Forms
  - All clinical forms must be filled out, signed in the appropriate spaces by the preceptor and the student and completed in a timely manner.
  - If the clinical forms are not completed with signatures they will not be counted and a grade of zero (0) will be given.
  - All clinical forms must be available upon request or random site visit.
  - Example: midterm evaluations must be filled out by the midterm to receive credit.
  - Minimum score of 91% on the Midterm
  - Minimum score of 91% on the Exit Evaluation
• Clinical Experience Papers
  o Must be at least one full page in length (typed and double spaced)
  o All clinical experience papers must be performed in a timely manner and available upon request or random site visit
  o There should be a total of 6 clinical experience papers (papers should begin in the first full week of the clinical rotation).
  o The electronic submissions of the CE paper are due on each Monday during the clinical rotation beginning with the first full week of the clinical education course.
  o Printed versions of the Clinical Education Paper must be submitted with the clinical notebook at the end of the clinical education experience to receive credit for submission.

• Attendance
  o 1 day absent
  o 1 day tardy
  o Daily verification of attendance by clinical preceptor via the PDA.

To earn a grade of B:

• Competencies
  o Completion of the number of competencies assigned for the clinical rotation. There are 6 competencies assigned for this rotation.
  o The number of assigned competencies will vary for each clinical rotation.
  o Each of these competencies must average a minimum grade of 82%.

• Clinical Forms
  o All clinical forms must be filled out, signed in the appropriate spaces by the preceptor and the student and completed in a timely manner.
  o If the clinical forms are not completed with signatures they will not be counted and a grade of zero (0) will be given.
  o All clinical forms must be available upon request or random site visit
  o Example: midterm evaluations must be filled out by the midterm to receive credit.
  o Minimum score of 82% on the Midterm
  o Minimum score of 82% on the Exit Evaluation

Clinical Experience Papers
  o Must be at least one full page in length (typed and double spaced)
  o All clinical experience papers must be performed in a timely manner and available upon request or random site visit
  o There should be a total of 6 clinical experience papers (papers should begin in the first full week of the clinical rotation).
  o The electronic submissions of the CE paper are due on each Monday during the clinical rotation beginning with the first full week of the clinical education course.
  o Printed versions of the Clinical Education Paper must be submitted with the clinical notebook at the end of the clinical education experience to receive credit for submission.

• Attendance
  o 2 days absent
  o 2 days tardy
  o Daily verification of attendance by clinical preceptor via the PDA.
To earn a grade of C:

- Competencies
  - Completion of the number of competencies assigned for the clinical rotation. There are 6 competencies assigned for this rotation.
  - The number of assigned competencies will vary for each clinical rotation.
  - Each of these competencies must average a minimum grade of 75%.

- Clinical Forms
  - All clinical forms must be filled out, signed in the appropriate spaces by the preceptor and the student and completed in a timely manner.
  - If the clinical forms are not completed with signatures they will not be counted and a grade of zero (0) will be given.
  - All clinical forms must be available upon request or random site visit
  - Example: midterm evaluations must be filled out by the midterm to receive credit.
  - Minimum score of 75% on the Midterm
  - Minimum score of 75% on the Exit Evaluation

- Clinical Experience Papers
  - Must be at least one full page in length (typed and double spaced)
  - All clinical experience papers must be performed in a timely manner and available upon request or random site visit.
  - There should be a total of 6 clinical experience papers (papers should begin in the first full week of clinic rotations).
  - The electronic submissions of the CE paper are due on each Monday during the clinical rotation beginning with the first full week of the clinical education course.
  - Printed versions of the Clinical Education Paper must be submitted with the clinical notebook at the end of the clinical education experience to receive credit for submission.

- Attendance
  - 3 days absent
  - 3 days tardy
  - Daily verification of attendance by clinical preceptor via the PDA.

To earn a grade of D:

- Competencies
  - Completion of less than the number of competencies assigned for the clinical rotation. There are 6 competencies assigned for this rotation.
  - Each of these competencies must average a less than the minimum grade of 75%.

- Clinical Forms
  - Incomplete clinical forms that are not filled out signed in the appropriate spaces by the preceptor and the student and not completed in a timely manner.
  - If the clinical forms are not completed with signatures they will not be counted and a grade of zero (0) will be given.
  - Clinical forms that are not available upon request or random site visit
  - Example: midterm evaluations must be filled out by the midterm to receive credit.
o Minimum score of less than 75% on the Midterm
o Minimum score of less than 75% on the Exit Evaluation
o Clinical Experience Papers
  o Must be at least one full page in length (typed and double spaced)
  o All clinical experience papers must be performed in a timely manner and available upon request or random site visit.
  o There should be a total of 6 clinical experience papers (papers should begin in the first full week of clinic rotations).
  o The electronic submissions of the CE paper are due on each Monday during the clinical rotation beginning with the first full week of the clinical education course.
  o Printed versions of the Clinical Education Paper must be submitted with the clinical notebook at the end of the clinical education experience to receive credit for submission.

• Attendance
  o Greater than 3 days absent
  o Greater than 3 days tardy
  o Daily verification of attendance by clinical preceptor initials on attendance verification form.

**CLINICAL NOTES:**

**ACCEPTANCE:** Students are responsible for knowing the contents of this syllabus; continued enrollment in this course constitutes awareness and acceptance of all requirements and policies discussed herein.

**HONOR CODE:** All sections of the AASU Student Honor Code and Code of Conduct will apply to this course. Under the Honor Code, plagiarism, cheating, facilitating academic dishonesty, and fabrication in any form or manner are forbidden. Additional restrictions or instructions given in class on any individual assignment, whether verbal or written, will also fall under the Honor Code. Absence from the class when any additional instructions are given is not a valid excuse if a violation of the instructions result in an Honor or Conduct Code violation. Continued enrollment in the class after receiving this syllabus constitutes acceptance of these provisions.

**HONOR VIOLATION POLICY:** I will accuse no student of violating the Honor Code unless I can prove beyond a doubt that the student is guilty. At that time, the student will be dropped from the course. His or her name will transmitted to the Dean of Student Affairs along with the proof, for a formal hearing before the Honor Court. Although the Honor Code permits a professor an option to handle the transgression in an "informal" manner vice submitting the case to the Honor Court, I will not do so. Before the Honor Court, I will urge that the student receive the maximum penalty possible according to the circumstances, to include an F for the course, suspension for at least one semester, and a record of the Honor Court to be me a permanent part of the student’s record.

**Admission to Clinical Education Courses**

Admission to all clinical education courses is limited to individuals who have met the following criteria:

• Successfully completed all radiologic sciences courses required to that point. A single grade of “D” is permissible in a RADS course EXCEPT for RADS 3000 and RADS 3071, which must earn a grade of “C” or better.
• Concurrently enrolled in all required RADS and non-RADS courses for that semester
• Permission of faculty of record.

COMPETENCIES

The minimum number of competencies required for each Clinical Education Course and cumulatively is listed in the tables below. If the student does not meet the specified number of competencies for a CE Course an Incomplete grade will be given for Clinical Education Course. Students who have received an incomplete will be prevented from progressing to the next Clinical Education Course.

<table>
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<th>Clinical Education Courses</th>
<th>Required Specific Competencies</th>
<th>Elective diagnostic competencies required</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>1. Diagnostic – minimum required</td>
<td>(May be chosen from any category- MUST be a different procedure)</td>
</tr>
<tr>
<td></td>
<td>2. Patient care – required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Quality control – required</td>
<td></td>
</tr>
<tr>
<td>CE-I</td>
<td>1. Minimum 6 diagnostic competency</td>
<td>1. One (1)</td>
</tr>
<tr>
<td>Total of 6 exam competencies</td>
<td>2. CPR, Vital Signs, Venipuncture, ECG lead placement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Dose calibrators, survey meters, gamma cameras</td>
<td></td>
</tr>
<tr>
<td>CE-II</td>
<td>1. Minimum 7 diagnostic competencies</td>
<td>1. One (1)</td>
</tr>
<tr>
<td>Total of 7 exam competencies</td>
<td>2. Well counter/ uptake probe</td>
<td></td>
</tr>
<tr>
<td>CE-III</td>
<td>1. Minimum 7 diagnostic competencies</td>
<td>1. One (1)</td>
</tr>
<tr>
<td>Total of 7 exams competencies</td>
<td>2. ECG Recognition of common dysrhythmias</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Demonstrate proficiency in quality control</td>
<td></td>
</tr>
<tr>
<td>CE-IV</td>
<td>1. Minimum 7 diagnostic competencies</td>
<td>1. One (1)</td>
</tr>
<tr>
<td>Total of 7 exam competencies</td>
<td>2. Recognize common EKG dysrhythmias</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Demonstrate proficiency in quality control</td>
<td></td>
</tr>
<tr>
<td>CE-V</td>
<td>1. Minimum 3 diagnostic competencies</td>
<td></td>
</tr>
<tr>
<td>Total of 3 exam competencies</td>
<td>2. Recognize common EKG dysrhythmias</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Demonstrate proficiency in quality control</td>
<td></td>
</tr>
<tr>
<td>Graduation</td>
<td>1. Competency in all required diagnostic competencies 25(twenty-five) total.</td>
<td>Electives may be difficult to accomplish due to clinical site patient schedules</td>
</tr>
<tr>
<td></td>
<td>2. Competency in required number from elective procedures 4 (four).</td>
<td>Total – 4</td>
</tr>
<tr>
<td></td>
<td>3. Competency in general patient care</td>
<td></td>
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<td></td>
<td>4. Demonstrate competency in quality control of gamma cameras, dose calibrators, well counters/uptake probes, and survey meters.</td>
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* See detailed list of required and possible competencies for further explanation. This list will be provided with the syllabus for the nuclear medicine clinical education portion of the program.
<table>
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<tr>
<th>Category*</th>
<th># Procedures in Category</th>
<th># That Must Be Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess and Infection</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Skeletal</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Endocrine/Exocrine</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Respiratory</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Tumor/Antibody</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>SPECT</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Therapeutic Procedures</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Central Nervous System (elective)</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>42</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

+7 from any category
+5 departmental electives

30
CLINICAL EDUCATION OUTLINE
(RADS 3531, 3532, 4533, 4534, 4535)

1. Orientation
   a. Program Policies and Procedures
      i. Student handbook
      ii. Evaluation mechanism/forms
   b. Facility Policies and Procedures
      i. Facility/Departmental policies and procedures
      ii. Department protocol/policy manual
      iii. Facility layout and organization
      iv. Routine daily operations
   c. Safety Policies
      i. Fire safety
      ii. Emergency codes
      iii. Emergency cart and other emergency supplies
      iv. Disaster procedures
      v. Occupational Safety and Health Administration (OSHA) policies
      vi. Other policies
   d. Departmental Organization and Administration
      i. Supplies
         1. Procurement
         2. Inventory/location
      ii. Patient Scheduling
      iii. Records management (ex. Patient record, quality control documents)
      iv. Licenses

2. Patient Care
   a. Patient communications and interactions
      i. Explaining exams and answering questions
      ii. Age/group specific
      iii. Situation specific
   b. Verification of requisition
   c. Patient Identification and assessment
   d. Patient transportation and safety
   e. Infection control
   f. Controlling contamination
   g. Patient support
      i. Basic needs
      ii. Support equipment (IV pumps, oxygen tubing)
      iii. Pulse, respiration, and blood pressure
      iv. Cardiopulmonary resuscitation certification
   h. Routes of administration (according to facility policy and state regulations)
      i. Intravenous administration
      ii. Intravenous catheter set-up
iii. Phlebotomy
iv. Oral administration
v. Intramuscular injection
vi. Intrathecal and Intracavitary (assisting physician)
vii. Inhalation

3. Affective Domain
   a. Professional relationships
      i. Cooperation and teamwork
      ii. Professional etiquette
      iii. Conflict prevention and resolution
      iv. Dealing with difficult people/situations
   b. Profession issues
      i. Attitude
         1. Open to learning
         2. Taking initiative
         3. Assuming responsibility
         4. Shows confidence
      ii. Physical appearance
      iii. Recognizes limitations
   c. Ethics and Medicolegal considerations
      i. Respects patient privacy
      ii. Patient confidentiality
      iii. Consent forms (where applicable)

4. Radiation Protection
   a. Uses survey meter properly
   b. Personnel monitoring
      i. Wears monitoring devices
      ii. Performs personal surveys
      iii. Reads and understands radiation exposure reports
   c. Practical methods of radiation protection
   d. Radioactive package receipt and shipping
   e. Radioactive waste disposal
   f. Monitoring for contamination
   g. Decontamination following a spill
   h. Radionuclide therapy room preparation and clean-up

5. Instrumentation: Nonimaging
   a. Geiger-Muller counter (survey meter)
      i. Checking function status
      ii. Standard operation
   b. Well counter operation and quality control
   c. Uptake probe operation and quality control
d. Dose Calibrator
   i. Standard operation
   ii. Constancy
   iii. Linearity
   iv. Accuracy
   v. Geometry

e. Proper use of pipettes and semi-automatic pipettes

6. Instrumentation: Imaging
   a. Select appropriate camera and collimator
   b. Select acquisition parameters on camera/computer
   c. Quality control
      i. Uniformity
      ii. Linearity
      iii. Resolution
      iv. Uniformity correction map
      v. Center of rotation

7. Instrumentation: Computers
   a. Process data
      i. Drawing/placing regions-of-interest
      ii. Cardiac axis orientation
      iii. Histogram/curve production
      iv. Proper use of filters
      v. Appropriate comparative display of images
      vi. Subtraction studies
      vii. Contrast adjustment
   b. Present computer data in appropriate form

8. Radiopharmacy
   a. Select and confirm appropriate radiopharmaceutical
   b. Quality control
   c. Generator elution
   d. Labeling syringe shields and vials
   e. Kit reconstruction
   f. Dose calibration
   g. Dose preparation
      i. Drawing up dose
      ii. Withdrawing blood
      iii. Tagging red blood cells
      iv. Record management

9. Diagnostic Procedures
   a. Imaging procedures
      i. Patient safety considerations
      ii. Acquire images at appropriate time
      iii. Correct projections
      iv. Additional view/adaptations when applicable
      v. Process data when applicable
      vi. Format images
vii. Analyze images/data for artifacts and errors
viii. Print images/data in proper format
ix. Label images properly
x. Present completed study

b. Nonimaging Procedures
   i. Sample collection at appropriate intervals
   ii. Sample preparation
   iii. Counting samples Standard preparation
   iv. In vivo counting
   v. Data manipulation
   vi. Analyze data for artifacts and errors
   vii. Present completed study

c. Radionuclide Therapy
   Due to liability and state/federal regulations and facility policy, students may only be able to observe these procedures.
   i. Confirmation of patient identification
   ii. Confirmation of written directive
   iii. Dose calibration
   iv. Patient instructions
COMPETENCY BASED CLINICAL EDUCATION

Philosophy of Competency Based Clinical Education

Clinical Education is a competency-based system. Which means, students progress through the clinical education system based on demonstration of acquired skills. Additionally, competency based education implies that the student is introduced to new information and skills in a step-wise, planned fashion with skill verification at each level before students may progress to the next level.

Competency based clinical education begins before the student ever enters a clinical education course. For each skill or procedure, the student follows the following process:

- Receives didactic (classroom) instruction on anatomy and procedures as part of the Procedures courses.
- Observes a demonstration of the procedure in the laboratory
- Peer positions in the laboratory
- Simulate nuclear medicine procedures in the laboratory
- Participates in role-playing with other students
- Reviews nuclear medicine anatomy and pathology
- Demonstrates competency in lab with peer positioning
- Evaluates simulated nuclear medicine procedures
- Participates in calculation labs

Clinic Committee Role

The clinic committee’s purpose is to review the clinical education process to assure that the student graduates with the best possible education, necessary skills and proper attitudes. The committee also has the function of reviewing the process to assure that clinical education is carried out at all clinical education centers in as uniform a manner as possible. Another function of the committee is to act as a review body for any disciplinary action specific to the clinical education process. (Student representatives are excluded from these proceedings.)

The clinic committee is made up of Radiologic Science faculty and Preceptors from each clinical facility. One student representative from the junior and senior class may be invited to attend a portion of the meeting. The clinical coordinator serves as chair for the meeting. The committee will consider requests from students for changes in the clinical education system or in the handling of specific student situations. The committee meets once a semester, usually at the end of the semester.
Clinical Evaluations

The clinical evaluation form will be used to evaluate the relevant personal traits (affective objectives) in the clinical setting. Every student will receive 6 evaluations each 7 weeks they are in clinic beginning with the second week. An evaluation MUST come from the technologist to which the student is assigned. Students will have an alternate technologist in the event their assigned technologist is absent. If neither assigned technologist is present, the student shall contact the clinical preceptor or the clinical instructor for an assignment. In the event a student turns in an evaluation from someone other than his or her assigned or alternate technologist, the evaluation is not counted and the student is given a zero for that evaluation.

The clinical evaluation form is graded on the average of the responses on the form that range from one (1) [the lowest] to three (3) [the highest].

Students are encouraged to collect the forms from the staff members and discuss the evaluation with the staff member. It is acceptable for the staff member to return the completed evaluation to the preceptor or clinical instructor without discussing it with the student. If a student fails to turn in an evaluation for any given week at the specified time, the student will be given a zero (0) for that evaluation. It is the student's responsibility to make sure this form is submitted on time.

Clinical Affective Objectives

While in the clinical setting, the student will:

1. Maintain appropriate dress and hygiene habits
2. Communicate with faculty, staff and patients in a clear and concise manner
3. Show initiative by performing above and beyond assigned tasks
4. Follow directions
5. Come prepared to clinic by having all necessary items
6. Conduct oneself in a professional manner
7. Demonstrate an excellent attitude by being interested in learning new skills and accepting constructive criticism
8. Follow through on all tasks to completion
9. Work well with others by being willing to help staff and other students
10. Maintain self-confidence by not being overly confident or possessing no confidence
11. Be in attendance in clinic and in assigned area
12. Retain composure under most conditions by not becoming agitated or upset when confronted with new or difficult situations
Rotational Objectives

During each clinical education course students will be assigned to a specific clinical education site for the duration of the semester. Specific nuclear medicine objectives will accompany all assigned sites. Students will receive six (6) evaluations each semester beginning in the second week.

**The evaluation must come from the clinical affiliate preceptor to which the student is assigned.** Students will have an alternate clinical affiliate preceptor in the event the assigned preceptor is absent. If neither assigned preceptor is present, the student shall contact clinical instructor. In the event a student turns in an evaluation from someone other than their assigned or alternate preceptor, the evaluation is not counted and the student is given a zero (0).

These objectives include:

- Demonstrate proficiency in computer protocol.
- Follow call-report protocol.
- Demonstrate patient assessment (including vital signs if applicable).
- Follow O² protocol for the department.
- Demonstrate critical thinking/problem solving skills.
- Demonstrate knowledge of patient transport protocol.
- Demonstrate basic file room procedures.
- Process films and/or film procedures.
- Use proper telephone etiquette.
- Use proper body mechanics.
- Demonstrate professional interpersonal skills.
- Practice infection control protocol.
- Restock nuclear medicine rooms.
- Safely manipulate stretchers and wheelchairs.
- Safely move patient on and off nuclear medicine table.

**CLINICAL EDUCATION OBJECTIVES**

*Upon completion of the clinical education component the student should be able to perform all of the listed objectives in each category.*

**ORIENTATION TO THE CLINICAL SITE**

1. Locate the facility policy manual, the department procedure manual, and the fire and emergency equipment.
2. Perform fire safety, health emergency, and disaster procedures according to facility policies and procedures.
3. Adhere to OSHA and state health department safety polices.
4. Locate supplies within the department and obtain supplies, as necessary, from in-house sources.
5. Schedule patients for nuclear medicine studies following facility procedures.
6. Maintain patient and department records as required by state and federal regulations and facility procedures.
PATIENT CARE

Objectives:
1. Demonstrate effective communication and patient interaction
2. Identify, verify, and assess medical records
3. Practice proper patient transport and safety
4. Practice proper infection control techniques
5. Assess, respond to, and manage patient needs
6. Differentiate and perform various routes of radiopharmaceutical and pharmaceutical administration
7. Perform proper phlebotomy techniques

Health Sciences Research
Research methods are important because the health care profession is continually changing, which requires the Nuclear Medicine Technologist to adapt procedures and practices to the changing environment. The Nuclear Medicine Technologist needs to contribute to the body of knowledge and be able to effectively analyze resources to promote best practice in the profession.

Objectives:
1. Apply the foundations of research methodology
2. Critique and analyze research articles to determine the accuracy and validity of research findings
3. Differentiate between qualitative and quantitative research methodologies
4. Evaluate and apply statistical models in research
5. Compose and present research findings
6. Differentiate and calculate sensitivity, specificity, prevalence, negative and positive predictive value, and accuracy of tests based on results

Ethics and Law
This section focuses on the interaction of Nuclear Medicine Technologists with their patients, coworkers, and community in accordance with ethical standards and laws of the health care professional. Technologists need to interact with and have respect for individuals from different cultures, beliefs, gender orientations, and socioeconomic backgrounds. Legal and compliance issues, scopes of practice, and patients’ rights are addressed.

Objectives:
1. Assess situations to determine if a Nuclear Medicine Technologist performed ethically based on personal, professional, and societal standards within the United States
2. Analyze scenarios to determine if Nuclear Medicine Technologists are working within their scope of practice and using appropriate practice standards
3. Distinguish between the different types of law
4. Outline the legal proceedings and define the burden of proof
5. Appraise a scenario to determine if the Nuclear Medicine Technologist is violating the patient’s rights
6. Differentiate between the employer’s and employees’ legal responsibilities
7. Argue and discuss medical-legal issues

Cross-sectional Anatomy
The ability to locate and identify structures in the axial (transverse), sagittal, and coronal planes is critical in all imaging modalities. Volumetric data sets and 3-dimensional reconstruction of the body structures are increasingly important to the critical diagnosis and treatment of diseases. To enhance
patient care and assist physicians with the prognosis, Nuclear Medicine Technology professionals must understand cross-sectional anatomy in each of the imaging modalities.

Objectives:
1. Distinguish normal anatomical structures on computed tomography, magnetic resonance imaging, ultrasonography, nuclear medicine, fusion interventional, and cardiac catheterization laboratory images in the transverse axial, coronal, sagittal, and orthogonal (oblique) cross-sectional imaging plane, within the
   a. Head
   b. Neck
   c. Thorax
   d. Abdomen
   e. Pelvis
   f. Body
   g. Extremities and large joints
2. Distinguish common pathologies recorded on multiplanar images

Systems-Based Practice
As the role of the health care professional continues to expand and systems-based practice continues to evolve, the fundamentals of health care policy and regulations of delivery systems must be understood. Factors for future key health policy and ethical viewpoints regarding the access of health care must be explored.

Objectives:
1. Review and discuss the history and evolution of US health care systems
2. Review and discuss health care institutional economics and organization
3. Discuss and describe the role and function of present-day health care delivery systems
4. Describe the scope of practice of the Nuclear Medicine Technologist in relation to the interprofessional health care team
5. Describe and explore factors affecting the future of health care delivery systems

Medical Informatics
Medical informatics is essential for the future implementation of clinical system data entry and development. The engaged process of enhancing the student’s knowledge, experience, and training in the creation and utilization of patient data, administration, and medical quality assurance will be the focus of this specialty. Patients, caregivers, and the health care community at large will benefit from the accessibility of ongoing medical information and data into a computerized system. Ongoing health care information and technology for health care delivery systems and subsequent interfacing, in conjunction with mandatory patient-centered documentation for federal, state, regulatory, and credentialing agencies, must be studied and maintained.

Objectives:
1. Apply and practice Joint Commission standards in the health care environment
2. Apply and practice Health Insurance Portability and Accountability Act regulations in the health care environment
3. Recognize the different information systems used in the health care environment and manage patient information appropriately
Radiobiology
This section covers the interactions of ionizing radiation with human tissue, its potential effects, and dosimetry. This is background knowledge needed to understand more fully the concepts and importance of radiation protection.

Objectives:
1. Review the characteristics and sources of different types of radiation
2. Differentiate appropriate radiation measurements, including internal and external exposure
3. Distinguish different types of radiation interactions with matter
4. Recognize cellular response of radiation on micro and macro level
5. Discuss the risk-to-benefit ratio of radiation exposure in terms of diagnostic and therapeutic nuclear medicine procedures
6. Recognize factors influencing absorbed dose to the general public and occupationally exposed workers
7. Explain radiation hazards and use protection techniques for pregnant women and breast-feeding mothers

Radiation Protection
This section covers the principles and applications of radiation protection as well as applicable regulations, including an awareness of how to apply the “As Low As Reasonably Achievable” (ALARA) philosophy to ionizing radiation exposure. Individual regulations are also covered in detail in content areas where they apply, such as radiopharmacy, instrumentation, and radionuclide therapy.

Objectives:
1. Describe the characteristics of radiation and define radiation measurement units
2. Identify the agencies and interpret/comply with the appropriate regulations associated with radiation exposure and receipt, use, and disposal of radioactive materials
3. Define radiation exposure limits and apply safe radiation protection techniques in accordance with the ALARA philosophy
4. Utilize appropriate radiation detection and monitoring equipment and evaluate readings
5. Employ the practical and appropriate methods of radiation protection (time, distance, and shielding) and predict exposure levels based on calculations
6. Assess a scenario and utilize proper protocols to prevent a medical event
7. List what constitutes an error, excess exposure, and medical event and employ appropriate course of action
8. Identify and manage radioactive material spills and contamination
9. Describe the Nuclear Medicine Technologists’ role and responsibility in radionuclide therapy procedure

Radiation Physics
This section covers concepts and physical principles that govern radioactivity and the interactions of ionizing radiation with matter.

Objectives:
1. Define and describe basic atomic physics concepts
2. Illustrate modes of radioactive decay and decay schemes
3. Describe and calculate decay of radionuclides
4. Explain production methods of radionuclides and X-rays
5. Describe the characteristics of an X-ray beam
6. Compare and contrast photon and particulate interaction with matter
7. Perform calculations using the attenuation equation

Instrumentation: Nonimaging
This section includes the principles of operation and quality control for nonimaging instruments, including monitoring equipment, dose calibrators, well counters, uptake probes, liquid scintillation systems, laboratory equipment, and the gamma probe. Laboratory and clinical experience should be included in the learning process.

Objectives:
1. Describe and apply the principles and operation of gas-filled detectors
2. Describe and apply the principles and operation of scintillation detectors
3. Describe and apply the principles and operation of laboratory equipment
4. Demonstrate operation of nonimaging equipment
5. Perform quality control procedures and analyze the results

Instrumentation: Counting Statistics
This section includes the principles and applications of statistics as they relate to nuclear medicine instrumentation. The learning experience should include laboratory and clinical experience.

Objectives:
1. Analyze and apply statistical data used in Nuclear Medicine Technology

Instrumentation: Computers
This section covers the configuration, function, and application of computers and networks in nuclear medicine. Students should have extensive laboratory and clinical experience performing data acquisition, manipulation, and processing.

Objectives:
1. Describe the configuration, function, and application of picture archiving and communications systems (PACS)
2. Acquire, manipulate, and process information using nuclear medicine computer systems

Instrumentation: Imaging
This section deals with in-depth information on the components, use, and quality control of the various types of systems used for gamma, positron, and X-ray imaging. The learning experience should include laboratory and clinical experience.

Objectives:
1. Describe and apply the principles and operation of Anger scintillation cameras
2. Describe and apply the principles and operation of multicrystal scintillation cameras
3. Describe and apply the principles and operation of solid state detector systems
4. Describe and apply the principles and operation of SPECT and SPECT/computed tomography (CT)
5. Describe and apply the principles and operation of positron emission tomography (PET)/CT
6. Describe and apply the principles and operation of CT
7. Demonstrate operation of imaging equipment
8. Perform quality control procedures and analyze the results
Nuclear Pharmacy and Pharmacology
This section covers the theory and practice of radiopharmacy, including preparation and calculation of the dose to be administered, quality control, radiation safety, and applicable regulations. In addition, it deals with nonradioactive interventional drugs and contrast media that are used as part of nuclear medicine procedures. For all administered materials, it addresses the routes of administration, biodistribution mechanisms, interfering agents, contraindications, and adverse effects. Students need to have experience in laboratories, the clinical setting, or a centralized radiopharmacy in order to become proficient in this area.

Objectives:
1. Explain the basic concepts of radionuclides and radiopharmaceuticals
2. Identify and list the characteristics of the ideal radiopharmaceutical
3. Describe the Food and Drug Administration and US Pharmacopeia control of pharmaceuticals and radiopharmaceuticals
4. Describe the basic concepts of radiochemistry
5. Describe generator kinetics in the production of radionuclides
6. Demonstrate appropriate generator elution techniques
7. Describe quality control procedures, including radionuclide purity, radiochemical purity, and chemical impurities
8. Demonstrate proper compounding of radionuclide-labeled kits
9. Discuss the production and characteristics of positron emitters and positron-labeled radiopharmaceuticals
10. Prepare and store radioactive volatiles and gases in accordance with federal regulations
11. Determine and calculate appropriate patient doses
12. Explain the normal and altered biodistribution properties of radiopharmaceuticals
13. Describe the characteristics, proper use, and pharmacokinetics of radiopharmaceuticals, pharmaceuticals, and contrast media
14. Analyze patient information to determine adverse reactions, interfering drugs, and contraindications for administration of radiopharmaceuticals, pharmaceuticals, and contrast media

Diagnostic Procedures
This section covers diagnostic procedures, including anatomy and physiology, pathophysiology, and protocols for routine and non-routine nuclear medicine procedures. Some of the procedures addressed may not be assessed by credentialing agencies but are included as essential to the theory and understanding of nuclear medicine. Clinical experience must be acquired to enhance the didactic learning of all commonly performed diagnostic procedures.

Objectives:
1. Review anatomy and physiology for each organ system
2. Describe the pathology and pathophysiology associated with each organ system
3. Recognize and explain clinical indications for diagnostic procedures
4. Describe and apply the appropriate diagnostic protocols
5. Evaluate images and quantitative data for technical quality, including artifacts and normal variants
AFFECTIVE DOMAIN
1. Demonstrate cooperation and act as a team member at both the departmental and institutional level.
2. Demonstrate professional etiquette in dealing with patients, families, visitors, other health care workers, support staff, and in communications with other facilities.
3. Demonstrate conflict prevention and resolution behaviors and techniques in the work setting.
4. Demonstrate the ability to handle difficult people and work situations, using behaviors and techniques that diffuse or solve the problem or prevent the situation from worsening.
5. Demonstrate professional behaviors including showing openness to learning; taking initiative and assuming responsibilities as appropriate to training.
6. Demonstrate calmness when the department is busy and multiple demands are made on the student.
7. Perform two or more tasks simultaneously when training and skill level have increased.
8. Recognize problems in the clinical setting and demonstrate a rational, step-wise process to analyze and attempt to solve the problem.
9. Respect the patient’s privacy and maintain patient confidentiality.
10. Obtain consent for a test from a patient or the appropriate person as required and/or allowed by regulation and/or facility policy.

RADIONUCLIDE THERAPY
Due to liability and state/federal regulations and facility policy, students may only be able to observe these procedures.

2. Confirm written directive.
3. Calibrate therapy dose.
4. Reiterate instructions given to the patient by the physician.

SKELETAL SYSTEM SCINTIGRAPHY
The student will:
1. Perform dynamic, static and total body imaging of the skeletal system.
2. Perform computer acquisition set-up for dynamic, static and total body imaging of the skeletal system.
3. Evaluate pathological states from nuclear medicine patient consult as to special views needed in the performance of bone scintigraphy.
4. Identify and document the correct radiopharmaceutical and dosage before injecting the patient for bone scintigraphy.
5. Perform computer processing of dynamic, static and whole body imaging of the skeletal system.
6. Observe any bone marrow or joint imaging procedures if available.

NUCLEAR CARDIOLOGY
The student will:
1. Define terms relating to cardiac circulatory anatomy.
2. Chart the function of the different regions of the heart.
3. Label the different structures of the heart given a diagram.
4. Label the major blood vessels of the circulatory system when given a diagram.
5. Compare and contrast the indications for performing different cardiac imaging procedures in nuclear medicine.
6. Identify by matching the radiopharmaceuticals used for each type of cardiac scintigraphy.
7. Compare and contrast the cardiac pharmacological stress
8. Compare and contrast cardiac perfusion and function
9. Match EKG abnormalities with definition

CARDIAC SPECT

The student will:
1. Describe by essay or solve by multiple choice the concept of single photon emission computed tomography in the nuclear medicine laboratory.
2. Compare and contrast the tomographic orientations (transverse, coronal & sagittal) and the tomographic planes of the heart (short, horizontal long & vertical long).
3. Describe by essay the acquisition matrix sizing in the nuclear medicine laboratory.
4. List and describe the uses of the various SPECT filters used in cardiac scintigraphy.
5. Describe by essay the concept of number crunching (array processing) in image reconstruction data.
6. Compare and contrast the resolution aspects of SPECT (180 vs. 360), peanut orbit.
7. Describe by essay the importance of workstations, networking and PACs in a nuclear medicine laboratory utilizing SPECT.
8. List the parameters of Quality Assurance of SPECT imaging.

BRAIN SCINTIGRAPHY

The student will:
1. Observe brain flow & static images on brain scintigraphy (planar) in the clinical nuclear medicine laboratory.
2. Perform SPECT brain scintigraphy in the clinical nuclear medicine laboratory.
3. Identify correct radiopharmaceutical and dosage in the nuclear pharmacy preparation, quality control & dispensing for planar and SPECT brain scintigraphy.
4. Adhere to radiation protection techniques regarding time, distance, and shielding in performing brain scintigraphy.
5. Observe proper patient prep for SPECT brain scintigraphy injection.

HEPATOBILIARY SCINTIGRAPHY

The student will:
1. Perform hepatobiliary flow and imaging acquisitions in the nuclear medicine clinic.
2. Evaluate patient history to identify indications, testing orders and/or allergies before beginning acquisition.
3. Identify and acknowledge correct patient, radiopharmaceutical and dosage before commencing hepatobiliary scintigraphy.
4. Perform hepatobiliary computer processing (ejection fraction) in the nuclear medicine clinic.

GASTROINTESTINAL (GI) SCINTIGRAPHY

The student will:
1. List the indication for each GI scintigraphy performed in the nuclear medicine clinic.
2. Describe the radiopharmaceutical used for each GI scintigraphy study performed in the nuclear medicine clinic.
3. Specify the dose range for each GI scintigraphy study performed in the nuclear medicine clinic.
4. Discuss the kit and dose preparation and any special precautions that should be taken to assure the quality of the GI study agents.
5. Discuss any physical or pathological conditions, prior procedures, or medications that could contraindicate or interfere with GI scintigraphy studies performed in the nuclear medicine clinic.
6. Describe the preparation of the patient for each GI scintigraphy studies performed in nuclear medicine clinic.
7. Describe the process or procedure for each GI scintigraphy studies performed in the nuclear medicine clinic.
8. Describe the normal distribution and normal variants seen on GI scintigraphy studies performed in the nuclear medicine clinic.

THYROID SCINTIGRAPHY AND THERAPY
The student will:
1. Perform thyroid uptake and scan in clinical nuclear medicine.
2. Perform iodine total body and static images in the clinic.
4. Identify and document the correct radiopharmaceutical and dosage for thyroid scintigraphy.
5. Observe therapeutic dosing of thyroid patient.
6. Manipulate and set-up the thyroid function uptake probe.

RENAL SCINTIGRAPHY
The student will:
1. Perform renal flow and imaging acquisitions in the nuclear medicine clinic.
2. Evaluate patient history to identify indications, testing orders and/or allergies before beginning acquisition.
3. Identify and document the correct patient, radiopharmaceutical and dosage before commencing renal scintigraphy.
4. Perform renal computer processing in the nuclear medicine clinic.
5. Observe ACE inhibitor administration and monitoring for renal scintigraphy.

ANTIBODIES, CELL LABELING & IMAGING
The student will:
1. Perform labeled red blood cell scintigraphy (GI & cardiac).
2. Perform red blood cell labeling in the nuclear pharmacy in vitro.
3. Identify correct radiopharmaceutical and dosage in the nuclear pharmacy preparation and dispensing of In-111 labeled white blood l.
4. Identify correct radiopharmaceutical and dosage in the nuclear pharmacy preparation and dispensing of Tc-99m labeled red blood cells (GI & cardiac).
5. Perform monoclonal antibody scintigraphy (planar and SPECT), if possible.

GALLIUM SCINTIGRAPHY
The student will:
1. Perform whole-body gallium imaging according to the procedural guidelines of the clinical site.
2. Identify in patient history and proper indications for gallium scintigraphy.
4. Prepare proper instrumentation in the performance of gallium scintigraphy.
5. Identify and document the correct radiopharmaceutical and dosage for gallium scintigraphy.

BREAST and SENTINEL NODE IMAGING
The student will:
1. Observe each type of scan.
2. Participate in the positioning of a patient (may be simulated).
3. Assist in the acquisition set up.
4. Explain the injection technique.
5. Process a study and film the images.

LYMPHOSCINTIGRAPHY
The student will:
1. Observe a scan.
2. Assist in a scan and perform one.
3. Assist in the positioning, and acquisitioning of the scan.
4. Process and display the images.
5. Complete a competency in lymphoscintigraphy.

PULMONARY SCINTIGRAPHY
The student will:
1. Identify and prepare the correct radiopharmaceutical and dose in the nuclear medicine pharmacy for ventilation procedures.
2. Identify and prepare the correct radiopharmaceutical and dose in nuclear pharmacy for perfusion procedures.
3. Perform ventilation and perfusion studies for lung scintigraphy in the clinical setting.
4. Scintigraphy.
5. Set up ventilation equipment for performing patient procedures.
6. Set up computer acquisition for ventilation and perfusion studies.
8. Identify and document the correct radiopharmaceutical and dosage before injecting patients.

POSITRON EMISSION TOMOGRAPHY (PET)
PET Imaging (PET and PET/CT)
A. Indications
1. Solitary pulmonary nodule
2. Non–small cell lung cancer
3. Small cell lung cancer
4. Mesothelioma
5. Myeloma
6. Lymphoma
7. Colorectal cancer
8. Head and neck cancer
9. Esophageal cancer
10. Breast cancer
11. Brain cancer
12. Prostate cancer
13. Cervical cancer
14. Ovarian cancer
15. Testicular cancer
16. Thyroid cancer
17. Pancreatic cancer
18. Future indications
B. Radiopharmaceutical
1. Tracer
   a. Fluorine-18 fluorodeoxyglucose
2. Route of administration
3. Biodistribution
   a. Uptake
   b. Distribution
   c. Excretion
4. Dosimetry
C. Contraindications and adverse reactions
1. Physical conditions
2. Interfering studies
3. Precautions
4. Adverse reactions
D. Patient preparation
E. Equipment
1. Imaging
   a. Emission
   b. Transmission
2. Glucometer
F. Protocols
1. Dose range and administration technique
2. Acquisition parameters
3. Positioning and views
4. Data processing
5. Image display/format
6. Sources of error
G. Interpretation of images
1. Normal
2. Normal variants
3. Abnormal
4. Artifacts
5. Diagnostic/prognostic value of the study
6. Evaluation of technical quality
7. Correlative tests
   a. Imaging
   b. Nonimaging
Diagnostic Procedures: Pediatrics

I. Technical Considerations
   A. Instrumentation
   B. Patient safety and care
   C. Immobilization techniques
   D. Patient-parent interaction
   E. Injection technique
   F. Radiopharmaceutical administered dose
   G. Positioning

II. Clinical Applications
   A. Skeletal system
   B. Genitourinary system
   C. Gastrointestinal system
   D. Cardiovascular system
   E. PET imaging

III. Potential Sources of Error in Pediatric PET

Clinical Education
Clinical experience integrates didactic learning into the practical setting. During their clinical education, students shall be under the supervision of certified or licensed technologists. Clinical experience should include rotations through general, cardiac, pediatric, positron emission tomography and positron emission tomography/computed tomography, single-photon emission computed tomography, and single-photon emission computed tomography/computed tomography. Ancillary rotations in magnetic resonance imaging and computed tomography to include the administration of contrast media are recommended. Students should observe and/or participate in the administration of contrast media. Students should progress through levels of responsibility/involvement moving from observation to performing as an entry-level technologist. They should become proficient in all aspects of Nuclear Medicine Technology.

Objectives:
1. Comply with relevant policies and procedures
2. Provide safe and proper patient care
3. Act in a professional and ethical manner
4. Practice safe and effective radiation protection techniques
5. Select the appropriate instrumentation for imaging procedure, perform quality control, and set up the proper protocol for use
6. Select the appropriate instrumentation for nonimaging procedure, perform quality control, and set up the proper protocol for use
7. Use the computer for processing and data analysis, perform quality control, and display the data in the appropriate format
8. Receive, prepare, administer, and properly dispose of the appropriate radiopharmaceutical in accordance with federal regulations
9. Perform diagnostic procedures according to accepted protocol
10. Participate in radionuclide therapy procedures according to accepted protocol
Radionuclide Therapy
There are an increasing number of clinical nuclear medicine procedures involving radionuclide therapy. These procedures demand special expertise for safe use and proper care of the patient. Students should understand the technologist's role in the administration of radiopharmaceuticals in therapeutic doses, as well as associated imaging protocols.

Objectives:
1. Describe the common causes of pathologies of malignant diseases as they relate to radionuclide therapy
2. Recognize and explain clinical indications for therapeutic procedures
3. Describe and apply the appropriate therapeutic protocols
4. Evaluate images and/or quantitative data for technical quality, including artifacts, normal variants, and normal and altered biodistribution

Emerging Technologies
The field of Nuclear Medicine Technology is experiencing change at an exponential rate. While it is difficult to anticipate what new and emerging technologies will become tomorrow's standard of practice, the student should be given an introduction to these ideologies.

Objectives:
1. Describe and discuss instrumentation in emerging technologies and how it relates to current practice
2. Describe and discuss diagnostic and therapeutic procedures in emerging technologies and how they relate to current practice
3. Describe and discuss radiopharmaceuticals in emerging technologies and how they relate to current practice
4. Recognize and identify artifacts and their causes found in emerging technologies
5. Discuss issues related to schedule sequence, reimbursement, and regulations associated with emerging technologies

All clinical education objectives are adapted from the Society of Nuclear Medicine Technologist Section's (SNMTS):

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Participations

Participations are defined as “a sharing or taking part in” an examination. The student does not have to independently perform the examination but must be an active participant. Students are encouraged to “participate” in numerous examinations prior to performing a competency. A student must successfully perform at least two formally evaluated (2) participations on each examination prior to a competency. Eighteen (18) areas are evaluated during participation. The student must successfully complete at least twelve (12) of those areas in order for the participation to be counted (See Procedures-General Competency Form).

Competencies

Student demonstrates mastery of performing the procedure. Competency occurs when a student receives no less than 44/59 points (or 74.8) on the Competency Evaluation Form and none of the critical areas have been marked as “NO”. Critical areas are:

- Correctly identifying patient
- Obtains appropriate medical history and determines pregnancy status
- Patient/detector placed in correct position
- Selects correct collimator
- Selects correct energy calibration
- Selects correct imaging parameters
- Procedure completed in a timely manner
- Computer formatting/processing performed correctly
- Essential structures properly positioned in the field of view

The number of competencies required is based on requirements set by the Society of Nuclear Medicine-Technologists Section for the national certification examination and is listed on the Clinical Education Form.

Once a student has completed the minimum number of competencies for any given clinical education course, they may proceed to work on competencies for future clinical education courses.

Continued Competencies

Continued Competency is defined as, the ability of the student to perform a procedure they have proved competent in without any assistance. A registered/certified nuclear medicine technologist will indirectly supervise students. Nuclear Medicine procedure performed must be deemed acceptable by the clinical faculty.

The clinical faculty at each facility will determine the number of continued competencies to be accomplished for each examination. Students are encouraged to perform as many Continued Competency examinations as possible.

The student’s first priority should be to achieve the competencies associated with the current clinical education experience.
Clinical Experience Papers

Clinical Experience papers will be required for CE I-V. Students are required to write six (6) papers beginning the second week of clinic. The clinical experience papers shall meet the following criteria.

- One (1) page in length
- Dealing with either clinical experiences or procedures
- Acceptable level of clarity

  - Clinical Experience papers will not be assigned a grade but will impact the overall grade of the course by a small percentage. They will be read for clarity, use of language, understanding of technical processes, and to give insight into the student’s understanding of the psychological aspects of patient care and the learning process. Papers that are deemed unacceptable due to length, clarity, grammar, and content will be returned to the student and a zero (0) will be given for that paper. Moreover, papers not turned in on the appointed day and time will receive a grade of zero (0).
  - The electronic submissions of the CE paper are due on each Monday during the clinical rotation beginning with the first full week of the clinical education course.
  - Printed versions of the Clinical Education Paper must be submitted with the clinical notebook at the end of the clinical education experience to receive credit for submission.

Final Examination, Case Studies or Special Projects
(Case Studies or special projects will be required for CE I, III, and IV).

The case studies should include patient clinical histories, nuclear medicine applications (clinical indications), pertinent laboratory tests, other pertinent diagnostic exams performed and their results, the nuclear medicine impression as dictated by the reading physician, anatomy, physiology, pathology, medical terminology, patient care, and positioning analysis (See Nuclear Medicine Case Study Format).

Each student will be responsible for developing a creative, interactive tutorial or project for nuclear medicine technology. The purpose of this project is to clarify, reinforce, and synthesize nuclear medicine concepts. This project must include information covered in all nuclear medicine courses (including RADS 3501 through RADS 4540).

The final examination for Clinical Education II will be the Rising Senior Examination. This examination will consist of five separate parts and each student must make a minimum of 60% on each part. In the event a student does not make 60% on all parts, that student is required to receive faculty mandated remediation during the summer of their senior year. The faculty for each specific area of the test determines the specific remediation required. If the student who did not earn a grade of 60% on any section of the test fails to complete the assigned remediation they will not be allowed to enter any RADS course in the fall semester of the senior year.

The final examination grade for Clinical Education V will be the score earned for the Grand Rounds Presentation held in the Spring Semester.


NUCLEAR MEDICINE CLINICAL POLICIES

Dress Code

A uniform is an external indication of professionalism. Consequently, all uniforms must be neat, clean, and professional in appearance. The department will select the uniform style to be purchased by the student. Uniforms will be worn with white leather lace-up athletic shoes and white socks or stockings. Underwear must be worn and will not show through the uniform. Students are required to purchase the program approved uniforms and lab coat(s).

Hair will be neat, clean and of acceptable length (acceptable length will be determined by the Radiologic Sciences faculty) at all times. While in the clinic, the hair will be kept away from the face and off the collar. Hair adornments or accessories may not be worn in the clinic. Hair barrettes must match hair color or uniform color and be of acceptable size. Makeup may only be used discreetly; heavy eye shadow, mascara and rouge shall be avoided. Male students will maintain a neat hairstyle consistent with good taste. Male students having a beard or a mustache will keep it clean and neatly trimmed.

All fingernails shall be short, neat, and clean. Nail polish and/or acrylic nails are not acceptable in clinical education centers. Perfumes, colognes and any other fragrances may not be used in the clinical education center.

Jewelry is limited to a watch, one (1) ring to include either a wedding set, engagement ring or class ring, one (1) pair of small stud earrings in the ear lobe, which are not to hang below the ear lobe. **No other piercing may be adorned with jewelry while in clinical education courses.**

Personal cell phones and/or pagers may not be worn in the clinical education centers.

Students may not use the telephone in the clinical education center for personal business (making or receiving). Pay phones may be used for necessary personal business with permission of the clinical faculty.

Students may not chew gum, eat or drink beverages while in the clinical setting.

The clinical instructors, individual hospitals and/or radiology departments may have dress codes that supersede the above dress code.

TLDs and Ring Badges and Dosimetry Reports

Students without thermoluminescent dosimeters (TLDs) will not be allowed in the clinical education center or into the nuclear medicine department. TLDs are to be worn at waist level on the lab coat pocket. Ring badges are to be worn on the index finger of the injection hand. The TLDs ring badges are in effect for 3 months and will be exchanged on the first class day of each quarter. Students are responsible for making the exchange. **The exchange of personal detection devices should be made with the Program Director or Clinical Coordinator of Nuclear Medicine only.**
If the TLD or ring badge is lost, damaged beyond usefulness, or unreturned, the student will be required to pay the $25.00 (per personal protection device) replacement fee and will not be allowed into clinical environment or laboratories until a replacement device is obtained.

If a student is missing a TLD or ring badge the following action will be taken:
- The student will be removed from the clinic/lab.
- The written notice of the occurrence will be noted in Progress Notes.

The department receives a quarterly Dosimetry (TLD and ring badge) Report of the previous quarter. After review by the Radiation Safety Officer (RSO), the report will be posted in the laboratory prep room. With student privacy in mind, all personal information is permanently covered. If any student exceeds more than 50 mrem for a given month, the RSO will meet with the student to determine the cause of the overexposure. Corrective actions will be discussed with the student. If any student exceeds a dose of 100 mrem per month, the RSO will begin a formal investigative process to determine why the dose is unacceptably high and what factors contributed to the incident. The RSO will determine a plan of action to prevent the incident from reoccurring. The meeting(s) with the student in question and the finding from the RSO will be documented in the student’s permanent record.

Identification

Students are required to wear appropriate identification in the clinical education centers at all times. Proper identification includes a regulation name badge and the Department of Radiologic Sciences arm-patch. Students not having proper identification on the uniform will be removed from the clinical education center. In the event the nametag becomes defective or lost, the student must report this finding to the Clinical Instructor and a new badge must be ordered. The clinical instructor must be notified within two (2) days of the occurrence.

Ascertainment Pregnancy Status of Patients

Any time a student performs a procedure on a woman of childbearing age (12-55 years of age), the pregnancy status of the patient must be determined. The departmental procedure in place at the clinical education center will be followed. In the event a departmental procedure is not in place, the ‘Ten Day Rule’ must be used. The rule states “the only time one can be relatively sure that a potentially pregnant patient is not pregnant is if the procedure is performed in the first ten days of the menstrual cycle.” Failure to ascertain pregnancy status is a violation of the Code of Professional Conduct.

Holding Patients during Procedures

All efforts must be made to prevent anyone from holding a patient during a procedure, however, students may hold patients but only if the following criteria are met:
1. No restraint device is adequate
2. Non-occupationally exposed individuals (family members, other health care professionals) are unavailable
3. The student is actively involved in the examination
4. The student is under direct supervision of a registered/certified nuclear medicine technologist. If a student must hold a patient during a procedure, proper time, distance, and shielding must be used.
Supervision of Students Policy

Students may not perform nuclear medicine procedures on any patient unless supervised, directly or indirectly. During the junior year, all students must be directly supervised for all examinations even if competency has been demonstrated. During the senior year, students who have not demonstrated competency of a particular procedure must have direct supervision. Direct supervision is defined as having a registered/certified nuclear medicine technologist in the examination room during the entire procedure while the student is performing. During the senior year, students who have demonstrated competency of a particular procedure may perform that procedure under indirect supervision. Indirect supervision is defined as having a registered/certified nuclear medicine technologist preview the request and patient to assure that the student is qualified to perform the specific examination. The registered/certified nuclear medicine technologist must also be immediately available while the student is performing the procedure. The registered/certified nuclear medicine technologist must review all procedures prior to presenting them to the Nuclear Medicine physician.

Students may NEVER perform portable procedures without a direct supervision of a registered/certified nuclear medicine technologist.

Clinical Assignments

The faculty makes assignments to specific Clinical Education sites. Students are assigned to the Clinical Education sites based upon the Master Clinical Rotation schedule. The clinical faculty at the clinical education center will make specific assignments within each facility. These assignments are based on the student's clinical needs during the course of their clinical education. Assignment to areas such as file room, front office, dark room, and patient transportation are required for limited periods of time to familiarize students with these areas.

The normal clinical schedule is typically from 7-8 in the morning to 3-5 during weekday afternoons. Students will be required to report to the Nuclear Pharmacy Clinical Education site as early as 3:00 a.m. These extraordinary assignments expose the student to procedures/situations not normally seen during routine scheduled times. Students should make arrangements to fulfill all clinical hours that are assigned. Students will not be assigned more than forty hours per week, and no more than twelve (12) hours per day. Students are not permitted to enter clinical education centers at times other than scheduled clinical rotations without permission of the clinical faculty.

In the event that any department administrator or his/her designee has barred a student from all Clinical Education sites, that student will be removed from the Department of Radiologic Sciences. Under these conditions, that student will not have an opportunity to meet clinical requirements necessary for graduation.

Clinical Attendance Policy

Attendance is mandatory! Student evaluations and/or objectives will reflect the failure to attend clinic when scheduled, tardiness, or removal from the clinical setting for lack of preparedness or dress code violations. The clinical faculty reserves the right to send students home. Students must call the Clinical Preceptor and the Program Coordinator if they are planning to be absent from clinic. Preceptors should provide students
with a telephone number/voice mail/pager where they can leave a message. If the student fails to call in, it will count as an additional tardiness for that student.

Clinical Attendance Documentation

All students are required to document their clinical time. Punching in and out on the time clock supplied, or by signing in and out on time sheets supplied and having the time initialed by the preceptor or their designee achieves this documentation. If clinic time is not documented, the student will be considered absent that day. If a student fails to clock in or clock out, they will be considered absent. The time sheet should be initialed or signed only by the clinical preceptor and should be accomplished daily.

Altering Clinical Schedules Due To Conflicts

A student's clinical schedule may be modified slightly due to conflicts with other required courses if the following criteria are met: The conflict course is

- A degree requirement for the Department of Radiologic Sciences
- Not offered at night
- A Regents Class/Examination requirement.

Scheduling accommodations are NOT made for work conflicts, daycare conflicts, etc. Students must make arrangements to be in attendance for clinical assignments during the required times.

Clinical Preparedness

Students are required to have a black, three ring pocket sized notebook, pens, and Sharpies for each clinical education rotation. Calculators and other items deemed necessary by the clinical instructor may also be required at each clinical education site. It is the student's responsibility to replace lost items. Failure to be properly prepared will result in a written warning. Upon receiving the second and subsequent written warning, the student will be removed from the clinic that day and counted absent.

Continuing Education Units

When a student earns continuing education units (CEUs) by attending a local, state, or national professional meeting, they will be given extra credit in their clinical education course for the semester in which the credits were earned. The student's Mid Rotation Evaluation or End Rotation Evaluation grade will be increased 1/2 percent (0.5%) for each CEU earned at a professional meeting up to a total of a 4% increase in the evaluation score. If the CEU is earned before the Mid Rotation Evaluation the points will be added to this evaluation. If the CEU is earned after the Mid Rotation Evaluation the points will be added to the End Rotation Evaluation. In order for the student to earn this extra credit, a CEU certificate for the meeting must be submitted to the clinical coordinator no later than the last day of the semester in which the CEUs are earned.
Early Clinic Release Policy

If a student misses less than a total of six (6) clinical days from CE I, II, III IV, and V and earns an 80 or higher on the first Exit Examination, they may exit Clinical Education V as soon as all clinical course requirements have been met.

Admission to CT Clinical Education Course (RADS 4172) for Nuclear Medicine Students

A nuclear medicine student will be allowed to register for CT clinical education provided that the student meets the following criteria:

• The student has successfully completed all of the assigned nuclear medicine clinical competencies prior to admittance to the CT clinical education course.
• The student has successfully completed (passed with a ‘C” or better) RADS 4112-Advanced imaging in CT.
• There are clinical seats available in CT (requires permission of the instructor of record).
Nuclear Medicine Clinical Education Time Sheet

INSTRUCTIONS:

- Please use a new student time sheet for each month the student is present at this facility.
- The time sheet should be initialed daily by the clinical preceptor.
- It is the responsibility of the student to make the preceptor aware of the arrival and departure times of the student.

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME IN</th>
<th>LUNCH-TIME OUT</th>
<th>LUNCH-TIME IN</th>
<th>TIME OUT</th>
<th>PRECEPTOR INITIALS</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Student Signature ________________________________

Clinical Preceptor Signature ________________________________

Program Coordinator Signature ________________________________
Nuclear Medicine Clinical Education

Please use this section of the clinical syllabus to track your progress. Document information by printing (legibly) on each line and in each section the Date and appropriate information.

Clinical Evaluations

1. 
2. 
3. 
4. Mid Rotation Evaluation
5. 
6. 
7. 
8. End of Rotation Evaluation
9. Student Evaluation of Clinical Site
10. 

Objectives—Clinical Experience Papers

1. 
2. 
3. 
4. 

Participations

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 

Competencies

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 

Continued Competencies (CE II-V)

1. 
2. 
3. 
4. 
5. 

Days Absent

1. 
2. 
3. 
4. 
5. 
6. 

Days Tardy

1. 
2. 
3. 
4. 
5.
CLINICAL EDUCATION CONTINUED COMPETENCY EVALUATION FORM

Student: __________________________ Facility: __________________________

Examination /Procedure: __________________________ Clinical Education: II  III  IV  V (Circle one)

Dates of continued competencies __________ __________ __________ __________ __________ __________ __________ __________

Initials of supervising technologist __________ __________ __________ __________ __________ __________ __________ __________

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
<th>CRITERIA FOR EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>The examination was performed without ANY assistance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Calling patient’s name; having patient repeat name and checking patient’s identity by one (1) other means</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Obtains appropriate medical history, correctly interprets all information on request form and determines pregnancy status</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient/detector placed in correct position</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintains appropriate communications with patient throughout exam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Selects correct imaging parameters (correct collimator, energy calibration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Procedure completed in a timely manner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computer formatting/processing performed correctly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Essential structures properly positioned in the field of view</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Completes necessary paperwork/informs radiologist of completion of procedure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dismisses patient as required by the department/facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restores order to the nuclear medicine room</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Critiques images for technical correctness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Identifies correct anatomy</td>
</tr>
</tbody>
</table>

41
FACULTY SIGNATURE: ________________________________  
Nuclear Medicine Psychomotor Assessment Form

Student: ___________________________  Location: ___________________________
Exam: ___________________________  Date: ___________________________
Evaluator’s signature: ___________________________

<p>| | | | | | | |</p>
<table>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Calling patient’s name; having patient repeat name and checking patient’s identity by one (1) other means*</td>
<td>1</td>
<td>Performed with great assistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Obtains appropriate medical history, correctly interprets all information on request form and determines pregnancy status*</td>
<td>2</td>
<td>Performed with minimal assistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Introduces self as student and explains examination to patient</td>
<td>3</td>
<td>Performed with no assistance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Assists patient into room and on/off scan table</td>
<td>0</td>
<td>Did not perform or did not perform adequately</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Necessary patient preparation completed</td>
<td>N/A</td>
<td>Item does not apply</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Patient/detector placed in correct position*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Maintain appropriate communications with patient throughout exam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Selects correct collimator*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Selects correct energy calibration*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Selects correct imaging parameters*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>All steps in procedure carried out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Procedure completed in timely manner*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Computer formatting/processing performed correctly*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Essential structures properly positioned in field of view*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Completes necessary paperwork</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Dismisses patient as required</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Restores order to nuclear medicine room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Critiques images for technical correctness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Identifies anatomy correctly</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* Critical area: Entire exam failed if grade of “0” earned in this area.
# Weekly Clinical Performance Evaluation Form

<table>
<thead>
<tr>
<th>Student</th>
<th>Date</th>
</tr>
</thead>
</table>

**Technologist's signature**

| C.E. Center |

**INSTRUCTIONS:** Your honest and accurate evaluation will be helpful to the student to improve their performance or to indicate that their performance is not up to acceptable standards. Please mark the box that best describes the student's performance. **EXAMPLES** are of the least desirable performance. Comments are requested for each section.

<table>
<thead>
<tr>
<th></th>
<th>CLEANLINESS - ATTIRE - GROOMING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>EXAMPLE:</strong> Fails to maintain a professional appearance in dress, jewelry, cleanliness, or general appearance. Wears perfumes or lotions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional in appearance</td>
<td>Unsatisfactory in appearance</td>
</tr>
<tr>
<td></td>
<td>What suggestions do you have for students to improve their professional appearance?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ABILITY TO COMMUNICATE</th>
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<tbody>
<tr>
<td>2</td>
<td><strong>EXAMPLE:</strong> Uses jargon or overly technical terms with patients; uses non-technical terms with staff and physicians; does not explain procedures to patients; does not listen to patients; does not transmit needed information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Makes an effort to learn and use appropriate terminology</td>
<td>Uses appropriate terminology with staff and patients</td>
</tr>
<tr>
<td></td>
<td>What suggestions do you have for the student to improve communication skills?</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>INITIATIVE</th>
<th></th>
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<tbody>
<tr>
<td>3</td>
<td><strong>EXAMPLE:</strong> Seldom or never does any task not assigned, does not respond to needed tasks unless asked, acts more as observer than participant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Takes initiative to perform beyond assigned tasks</td>
<td>Performs only assigned tasks</td>
</tr>
<tr>
<td></td>
<td>List example of how this student could improve initiative.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ABILITY TO FOLLOW DIRECTIONS</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>EXAMPLE:</strong> Refuses to follow directions; does not respond appropriately to directions; or fails to comprehend but does not ask for clarification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inconsistent</td>
<td>Follows directions</td>
</tr>
<tr>
<td></td>
<td>How could this student improve in following directions?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PREPAREDNESS</th>
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<tbody>
<tr>
<td>5</td>
<td><strong>EXAMPLE:</strong> Student does not have items necessary for clinic (i.e., markers, sharpie, mini-Merrill's)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Has all items needed</td>
<td>Missing some items</td>
</tr>
<tr>
<td></td>
<td>What suggestions do you have for students to improve in preparedness/or what items would you suggest they bring to clinic?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PROFESSIONALISM</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td><strong>EXAMPLE:</strong> Student does not behave in a professional manner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conducts oneself in a professional manner</td>
<td>Needs improvement in professionalism</td>
</tr>
<tr>
<td></td>
<td>List examples of how this student could improve in professionalism</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ATTITUDE</th>
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<tbody>
<tr>
<td>7</td>
<td><strong>EXAMPLE:</strong> Does not appear to be interested in learning new or different skills, is defensive or discounts constructive criticism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Has willingness to learn, accepts constructive criticism, is positive with staff and patients</td>
<td>Reluctant to learn new skills, defensive or unwilling to accept criticism, not positive</td>
</tr>
<tr>
<td></td>
<td>List examples of this student's inappropriate attitude.</td>
<td></td>
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</tr>
<tr>
<td><strong>8. PERSEVERANCE</strong></td>
<td>EXAMPLE: Fails to complete basic assigned tasks, seldom follows through to completion of tasks, must be constantly reminded of tasks.</td>
<td>Occasionally needs to be reminded to complete assigned tasks</td>
</tr>
<tr>
<td></td>
<td>How can this student improve in perseverance?</td>
<td></td>
</tr>
<tr>
<td><strong>9. COOPERATION</strong></td>
<td>EXAMPLE: Is not willing to help staff and other students unless specifically asked; does not share information or spreads disruptive rumors.</td>
<td>Uncooperative</td>
</tr>
<tr>
<td></td>
<td>In what areas does this student need to demonstrate more cooperative behavior?</td>
<td></td>
</tr>
<tr>
<td><strong>10. SELF-CONFIDENCE</strong></td>
<td>no confidence or overly confident</td>
<td>Confidence at times</td>
</tr>
<tr>
<td></td>
<td>What can the student do to improve their self-confidence?</td>
<td></td>
</tr>
<tr>
<td><strong>11. ATTENDANCE</strong></td>
<td>Usually present in clinic and in assigned area</td>
<td>Always present in clinic and in assigned area</td>
</tr>
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<td>Please give examples where attendance or not being in the assigned area was a problem with this student.</td>
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<td><strong>12. COMPOSE</strong></td>
<td>Retains composure under most circumstances</td>
<td>Loses composure easily and/or often</td>
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<td>Please give examples where this student lost composure.</td>
<td></td>
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<tr>
<td><strong>13. PATIENT SAFETY</strong></td>
<td>Negligent of patient safety issues</td>
<td>Needs improvement regarding patient safety issues</td>
</tr>
<tr>
<td></td>
<td>Please give examples where this student needs improvement with patient safety.</td>
<td></td>
</tr>
<tr>
<td><strong>14. SITUATIONAL AWARENESS</strong></td>
<td>Rarely aware of changes in situation</td>
<td>Aware of significant changes or situation</td>
</tr>
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<td></td>
<td>Please give examples where this student needs improvement with situational awareness.</td>
<td></td>
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<tr>
<td><strong>15. ACTIVE LISTENING</strong></td>
<td>Actively engaged listener</td>
<td>Does not actively listen</td>
</tr>
<tr>
<td></td>
<td>Please give examples where this student needs improvement with active listening.</td>
<td></td>
</tr>
<tr>
<td><strong>16. RESPONSIVENESS</strong></td>
<td>Negligent of patient needs and environmental changes</td>
<td>Sometime responds appropriately to changes and needs</td>
</tr>
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<td></td>
<td>Please give examples where this student needs improvement with responsiveness.</td>
<td></td>
</tr>
<tr>
<td><strong>17. FUNCTIONS INDEPENDENTLY</strong></td>
<td>EXAMPLE: Needs constant supervision; unable to initiate required tasks without supervision; cannot work alone.</td>
<td>Can work independently</td>
</tr>
<tr>
<td></td>
<td>Please give examples where this student needs improvement with independent functioning.</td>
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</table>
NUCLEAR MEDICINE
CASE STUDY FORMAT

Patient History:

Nuclear Medicine Application (Clinical Indication):

Pertinent Laboratory Tests:
*Include results.

Other Pertinent Diagnostic Exams Performed & Results:
*If you are able to get copies of these exams provide for extra credit.

Nuclear Medicine Impression:

INSTRUCTIONS:
• Case studies are due at the end of the clinical rotation and should be handed in with all other clinical assignments.
• All case studies must be typed and in the above format. *Case studies that are not typed & are not in this format will not be accepted. The student will be given a grade of zero (0).
• All pathologies must include images of its normal anatomy counterpart.
• Include all nuclear medicine images and those of other pertinent diagnostic exams (if obtainable). Images must be placed in a folder or envelope to accommodate the size of the films. Folders or envelopes are to be labeled as follows:
  o Student Name
  o Date
  o Clinical Site
  o Pathology
NUCLEAR MEDICINE
RADIOPHARMACEUTICAL RESEARCH FORMAT

Radiopharmaceutical Name:

Chemical Name of Radiopharmaceutical:

Generic Name of Radiopharmaceutical:

Manufacturer:

Country of Origin:

FDA approved:

If no FDA approval---IND status or NDA status:

Nuclear Medicine Application:
*How is the radiopharmaceutical used in Nuclear Medicine?

Pertinent Laboratory Tests Required Prior To Use:

INSTRUCTIONS:
• Contact manufacturer of the radiopharmaceutical to request:
  o Package inserts
  o Marketing materials
• Radiopharmaceutical research is due the last day of the clinical rotation in which the research was performed.
• All radiopharmaceutical research must be typed and in the above format. *Radiopharmaceutical research that is not typed and not in this format will not be accepted. The student will be given a grade of zero (0).
• All Nuclear Medicine radiopharmaceutical research applications must include:
  o Images of the pathology indicated for the use of the radiopharmaceutical being researched
  o Images of its normal anatomy counterpart.
• Images must be placed in a folder or envelope to accommodate the size of the films. Folders or envelopes are to be labeled as follows:
  o Student Name
  o Date
  o Clinical Site
  o Radiopharmaceutical researched
  
Venipuncture Access Log
Instructions:
- Students please list each venipuncture attempted
- Check the appropriate box regarding access
- Have the venipuncture instructor or clinical preceptor sign after each venipuncture attempt.

<table>
<thead>
<tr>
<th>Date</th>
<th>Clinical Site</th>
<th>Venipuncture Site</th>
<th>Access Successful</th>
<th>Access Unsuccessful</th>
<th>Venipuncture Instructor/Clinical Preceptor Signature</th>
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</table>

Student name: ______________________________________

(Please print)

Student Signature: ______________________________________

Clinical preceptor signature: ______________________________________

Program Director Signature: ______________________________________

Venipuncture Access Log
Instructions:
- Students please list each venipuncture attempted
- Check the appropriate box regarding access
- Have the venipuncture instructor or clinical preceptor sign after each venipuncture attempt.

<table>
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<tr>
<th>Date</th>
<th>Clinical Site</th>
<th>Venipuncture Site</th>
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Student name: ____________________________________________

(Please print)

Student Signature: ____________________________________________

Clinical preceptor signature: ____________________________________________

Program Director Signature: ____________________________________________
**Student Evaluation of Clinical Experience Form**

<table>
<thead>
<tr>
<th>Clinic Site</th>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>Please circle a number from 1-5 indicating your feelings toward the following statements regarding clinical instruction in the hospital affiliates. (Number 1 being the lowest rating and the number 5 being the highest.)</td>
<td></td>
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</tbody>
</table>

1. The amount of time spent in the Clinical Education Center was adequate. How many hours per week would be best at this point in the Program?  
   1  2  3  4  5

2. The clinical routines and procedures were explained sufficiently to allow for thorough understanding. Which procedures, if any, could be explained better?  
   1  2  3  4  5

3. The staff technologists were interested and willing to take time to give instructions and assistance. What additional assistance could the technologists provide the student?  
   1  2  3  4  5

4. The clinical preceptor was interested and willing to take time to give instructions and assistance. What additional assistance could the clinical preceptor provide the student?  
   1  2  3  4  5

5. You were allowed ample opportunity to “work on your own”  
   1  2  3  4  5

6. Your time was well spent in the clinic.  
   1  2  3  4  5

7. The general radiation protection procedures of the department were adequate. How might the radiation protection procedures be improved?  
   1  2  3  4  5

8. The technologist acted as good examples in patient care.  
   1  2  3  4  5

9. You received adequate critique from the staff technologists in each of the following areas:
A. Patient positioning 1 2 3 4 5
B. Equipment operation 1 2 3 4 5
C. Radiation protection 1 2 3 4 5
D. Patient management 1 2 3 4 5

10. You received adequate critique from the clinical preceptor in each of the following areas:
   A. Patient positioning 1 2 3 4 5
   B. Equipment operation 1 2 3 4 5
   C. Radiation protection 1 2 3 4 5
   D. Patient management 1 2 3 4 5

11. You received adequate critique from the AASU Clinical Instructor in each of the following areas:
   A. Patient positioning 1 2 3 4 5
   B. Equipment operation 1 2 3 4 5
   C. Radiation protection 1 2 3 4 5
   D. Patient management 1 2 3 4 5

12. You received thorough feedback on your performance to enable you to strengthen weaknesses.
   1 2 3 4 5

13. The clinical faculty was available when you needed them. 1 2 3 4 5

14. Performance time (length of time required to perform a procedure) was appropriately stressed 1 2 3 4 5

15. You were provided adequate opportunity to apply what you had learned in the classroom. 1 2 3 4 5

16. What did you like best about clinic?

17. What did you like least about clinic?

18. What suggestions do you have for improving student clinical experiences?

_________________________  ________________________
Student’s Signature               Date
Student Counseling Form

_____ Midterm Counseling  __________Final Counseling _____ Special Counseling

Student Name:______________________________  Date:________________

As of the above date, your progress during this term is as follows:

Course ___________  Clinical Evaluations _____________ Objectives ________

Competencies ________________ Continued Competencies __________________

Comments:

Student Signature: __________________________________________

Instructor Signature: __________________________________________

51
Leave of Absence Request

Name: ___________________________________________________________

Date of Application: ________________________________

Start date of leave: ________________________________

Term of planned return: ________________________________

Clinical Education course last enrolled: ______________________________________

Reason for leave of absence: ________________________________________________

By my signature below, I agree to the stipulations of the leave of absence listed:

1. Readmission to the Department of Radiologic Sciences is not guaranteed.
2. Readmission will only be considered if I formally apply for readmission no later than midterm of the semester before my planned return. Application for readmission includes attaching a current copy of my transcript to the application.
3. All requests for readmission are on a space available basis and I may not be readmitted if no seat is available.
4. In order to qualify for readmission, I must have a minimum GPA of 2.3.
5. In order to qualify for readmission, I must have completed all non-RADS courses except as noted below:
6. If I am denied readmission because of the unavailability of a seat, I may still enroll in didactic courses and apply for readmission in subsequent semesters.
7. In the event I am not re-enrolled in the Department of Radiologic Sciences on the date stated above or refused readmission due to GPA or non-completion of courses, I have no further right to apply for readmission.
8. If I am readmitted, I understand that I may be required to repeat 1 or more clinical education classes as determined by the faculty and will be held to the current Program Manual and university catalog.

I accept the stipulations listed above if granted the Leave of Absence.

Signature

Approved ☐ Disapproved ☐

Reason: ________________________________________________

Date: ________________________________________________
Application for Readmission from Leave

Name: ____________________________________________________________
Current Address: ____________________________________________________________
Social Security Number: ___________________________ Date of Application: __________
Date of anticipated reentry (Semester/Year): __________________________
Date of departure from program (Semester/Year): __________________________
Last RADS courses successfully completed (e.g., RAD 3150 & 3000):

Reason for departure (check one): [ ] Approved leave of absence [ ] Suspension

Current GPA: __________________________
Current Hours completed: __________________________
Currently enrolled classes: __________________________

In order for your application for readmission to be considered, you must:

1. You must apply for readmission the semester before you wish to reenter the professional component but no later than midterm of that same semester. An application is not required to retake professional courses mandated by a suspension situation.
2. You must submit a current transcript with your application (a computer printout is NOT acceptable).
3. You must have a minimum GPA of 2.3.
4. You must have met all stipulations of your suspension or your leave.
5. All seats are on a space available basis. You are not guaranteed a seat in the Department of Radiologic Sciences based only on having met the criteria of your leave or suspension. If no seats are available, none will be awarded.
6. Seats are awarded on a competitive basis with GPA, hours of work completed, and reason for absence taken into consideration.
7. If you are denied readmission due to no availability of seats, you must reapply each semester you wish to be considered.
8. In the event you are denied readmission because of a failure to meet the stipulation of the leave or suspension or because of a GPA below 2.0, the student may not apply for readmission again and the Department of Radiologic Sciences has no further obligation to that student.
9. In the event a student is denied readmission because of no space availability, the student may continue in the didactic (non-clinic) courses and reapply the next semester for a clinical seat. Students who are returning from a suspension may apply for readmission a maximum of 2 times. Students returning from a leave may apply for readmission as long as space is potentially available in the Department of Radiologic Sciences.

I understand and accept the above criteria. All statements above are true and accurate.

Signature: __________________________ Date: _____________

Approved [ ] Disapproved [ ]

Reason: __________________________ Date: _____________
<table>
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<th>Date</th>
<th>Note</th>
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PREGANANCY DECLARATION FORM

I, ____________________________, officially declare myself to be pregnant. This information is being given to the Department of Radiologic Sciences in order to have appropriate measures taken relative to my pregnancy and potential radiation exposure.

The projected due date is ____________________________.

I understand that I must meet with the designated Radiation Safety Officer for the department and discuss the issues involved, the current research, required safety procedures during my pregnancy, and to review federal documentation relative to effects of radiation exposure to the embryo/fetus.

Signature:

___________________________    _____________________________
Student                                    Date
Rising Senior Examination Report and Remediation Record

Student Name: ____________________________________________________________

Date: ____________________________________________

Based on the Rising Senior Examination, you were found to be deficient in the area(s) indicated below. As you have been found to be in need of remediation, you are required to contact the responsible faculty for each of the areas checked below and set up a remediation process acceptable to the responsible faculty. By the end of the summer semester, you must be signed off by all responsible faculty indicated below as having successfully completed the required remediation as defined by the faculty member. If you are not signed off by all faculty by the end of the summer semester you will not be allowed to maintain your enrollment in any RADS class in the fall semester of your senior year.

<table>
<thead>
<tr>
<th>Remediation Required</th>
<th>Remediation Completed (Initials)</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Patient Care</td>
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<tr>
<td>NM Procedures</td>
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<tr>
<td>NM Physics</td>
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<tr>
<td>Radiopharmacy</td>
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<tr>
<td>Radiation Protection/Biology</td>
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</tbody>
</table>

Responsible Faculty:

- Patient Care: Ms. Smith
- NM Procedures: Ms. Lee
- NM Physics: Mrs. Lee
- Radiopharmacy: Mrs. Lee
- Radiation Protection: Dr. Tilson
CHECKLIST FOR QUALITY CONTROL OF IMAGING INSTRUMENTATION

1. Select radionuclide source of appropriate activity and energy
2. Calibrate pulse height analyzer
3. Perform field uniformity intrinsically
4. Perform field uniformity extrinsically
5. Perform spatial and linearity resolution checks
6. Perform QC on SPECT systems
7. Analyze and compare with prior images
8. Maintain the required records for all quality control checks

The student has completed and passes all the performance objectives for Quality Control of Imaging Instrumentation.

______________________________  ___________________________
Clinical Supervisor                  Date

______________________________  ___________________________
Student                              Date
**Clinical Imaging Participation Form**

Participations are defined as "a sharing or taking part in" an examination. The student does not have to independently perform the examination but must be an active participant. Students are encouraged to "participate" in numerous examinations prior to performing a competency. A student must successfully perform at least two (2) participations on each examination prior to a competency. Eighteen (18) areas are evaluated during participation. The student must successfully complete at least twelve (12) of those areas in order for the participation to be counted (See Procedures-General Competency Form).

<table>
<thead>
<tr>
<th>Clinical Imaging Examination</th>
<th>Date</th>
<th>Rotation</th>
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<tbody>
<tr>
<td>Student Name</td>
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<tr>
<td>Site</td>
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<tr>
<td>Clinical Procedure</td>
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</tbody>
</table>

**Examination Key:**

- 0 = task performed incorrectly
- 1 = incomplete/partially correct
- 2 = task performed correctly
- N/A = task not applicable to procedure or to clinical site's policy

Evaluator ____________________________

Student Signature ____________________________

Additional Comments: ____________________________
ARMSTRONG ATLANTIC STATE UNIVERSITY
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

GENERAL COMPETENCY FORM

This form has been designed to assist the clinical instructor in evaluating the student's performance of a specific nuclear medicine procedure. Please complete the form honestly. After completion place the form in the student's file that has been issued by the Nuclear Medicine Program. The student is responsible for the objectives assigned to their current semester, as well as the previous semester(s)' objectives. THE STUDENT FAILS THE COMPETENCY IF HE/SHE DOES NOT SUCCESSFULLY COMPLETE 44/59 POINTS (each point has a value of 1.7). Please contact the Program Director, or review the Clinical Objectives for the current semester in the Student Clinical Handbook if there are any questions.

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>Clinical Site:</td>
<td>Procedure from Checklist:</td>
</tr>
<tr>
<td>Room/Equipment:</td>
<td>Levels: PASS FAIL N/A=not applicable</td>
</tr>
</tbody>
</table>

Knowledge Assessment:

| P F N/A | 1. Describes the procedure to the technologist (ex. views, radiopharmaceutical and dose, etc.). [Fresh/Fall] |
| P F N/A | 2. Describes the indications (and/or contraindications) for the procedure to the technologist. [Fresh/Fall] |
| P F N/A | 3. Explains the factors that may affect the test to the technologist. [Fresh/Fall] |
| P F N/A | 4. Describes the patient preparation to the technologist. [Fresh/Fall] |
| P F N/A | 5. Able to locate and name the structures in the field-of-view. [Fresh/Spr] |
| P F N/A | 6. Able to describe the calculations performed, if necessary. [Fresh/Summ] |

Patient Care:

| P F N/A | 1. Demonstrates an understanding of the schedule by preparing the room appropriately (ex. IV set-ups, flushes, etc.). [Fresh/Fall] |
| P F N/A | 2. Identifies the correct patient (ex. checks the wristband on in-patients). [Fresh/Fall] |
| P F N/A | 3. Checks and reviews requisition before proceeding with the exam. [Fresh/Fall] |
| P F N/A | 4. Explains the procedure to the patient before, during, and after the exam. *At a level the patient can understand, and loud enough for the patient to hear. [Fresh/Spr] |
| P F N/A | 5. Examines and questions the patient in order to remove attenuating objects, or to assess unknown areas of pain which may require a flow study. [Fresh/Spr] |
| P F N/A | 6. By reviewing the patient's chart, and/or through conversation with the patient, the student makes note of any information pertinent to the study, and notifies the physician interpreting the scan. [Fresh/Spr] |
| P F N/A | 7. Properly prepares the patient for the exam (ex. fasting, when to return following injection, emptying bladder, etc.). [Fresh/Spr] |
| P F N/A | 8. Keeps the patient as comfortable as possible throughout the exam (ex. wedge beneath the knees to decrease low back pain, extra blankets, etc.). [Fresh/Fall] |
### NUCLEAR MEDICINE TECHNOLOGY PROGRAM

**General Competency Form**

#### Patient Care (cont.):

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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>9. Dismisses the patient. Shows the patient how to get back to the main lobby, or arranges for transportation back to their room. [Fresh/Fall]</td>
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<tr>
<td>P</td>
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<td>N/A</td>
<td>10. Maintains contact with the patient waiting to go back to their room. Makes the patient comfortable, and calls transport again if necessary. [Fresh/Fall]</td>
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<td>N/A</td>
<td>11. Maintains patient dignity (ex. covers the patient with a blanket if they become exposed, or by finding an empty room for the patient to use a bedpan, and closing the doors). [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>12. Maintains confidentiality of patient information. [Fresh/Fall]</td>
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<td>N/A</td>
<td>13. Maintains patient safety at all times (ex. siderails, locks wheelchairs or stretchers, keeps Foley bag below bladder level). [Fresh/Fall]</td>
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<td>P</td>
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<td>N/A</td>
<td>14. Contacts appropriate personnel if the patient’s condition should change, or a piece of equipment (ex. IV pump, respirator) is malfunctioning. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>15. Refers to the patient as Mr/Mrs/Ms, not as “honey,” or “the bone,” or “the thallium in the PRISM,” or any other demeaning term. [Fresh/Fall]</td>
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<td>P</td>
<td>F</td>
<td>N/A</td>
<td>16. Refrains from personal or negative conversations that exclude the patient, or that include unprofessional subject matter (ex. what the student did the night before, discussing another patient’s case within hearing distance of patients, etc.). [Fresh/Fall]</td>
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<td>P</td>
<td>F</td>
<td>N/A</td>
<td>17. Keeps the patient as the primary focus. [Fresh/Fall]</td>
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<td>P</td>
<td>F</td>
<td>N/A</td>
<td>18. Remains calm if a stressful situation occurs. [Fresh/Fall]</td>
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#### Procedures:

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<tbody>
<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>1. Proper collimator selection. [Fresh/Fall]</td>
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<td>P</td>
<td>F</td>
<td>N/A</td>
<td>2. Proper peak selection. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>3. Proper orientation selection. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>4. Proper computer set-up for acquisition, if applicable. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>5. Utilizes correct intensities. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>6. Proper camera set-up for acquisition (or probe if thyroid uptake). [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>7. Prepares, assays, and records the radiopharmaceutical and dose. [Fresh/Summ]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>8. Performs safe administration* of the radiopharmaceutical. *Please circle: a. direct venipuncture; b. injected through existing IV line; c. inhalation; d. oral. [Senior/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>9. Completes all the necessary paperwork (ex. radiopharmacy logs, fills out the forms in the Cardiac Nuc. Med. chart). [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>10. Checks all views or images for quality before the patient leaves the department (ex. motion, poor repositioning of rest or redistribution views, wrong intensity, etc.). Troubleshoots, makes adjustments, and repeats study (or view(s)) if necessary. [Fresh/Summ]</td>
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<td>P</td>
<td>F</td>
<td>N/A</td>
<td>11. Performs extra views when necessary (ex. is creative when the patient has abnormal anatomy, and performs extra views to get the highest quality study possible). [Senior/Fall]</td>
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<td>P</td>
<td>F</td>
<td>N/A</td>
<td>12. Properly develops and labels the films, and presents them to the physician in the correct order. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>13. Completes the study in the Radiology Information System (DecRad), if applicable. [Fresh/Fall]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>14. Archives computer data, and records the location of the data in the appropriate logbook, if applicable. [Fresh/Spr]</td>
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<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
<td>15. Enters the study in the “Wet Reading Book,” and places the completed chart...</td>
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NUCLEAR MEDICINE TECHNOLOGY PROGRAM

General Competency Form

in the "To Be Read Bin," if applicable. [Fresh/Fall]

Procedures (cont.):

P   F   N/A  18. Locates the patient's film jacket, and presents the study to the physician, if applicable. [Fresh/Fall]
P   F   N/A  17. Performs the study in a timely manner, keeping the room on schedule as much as possible. [Senior/Fall]
P   F   N/A  18. Brings the camera as close as possible to insure high quality images when applicable. [Fresh/Vpr]

Radiation Safety:

P   F   N/A  1. Follows ALARA (as low as reasonably achievable) guidelines (ex. time, distance, and shielding). [Fresh/Fall]
P   F   N/A  2. Wears and removes gloves appropriately (ex. does not type on keyboard with potentially contaminated gloves). [Fresh/Fall]
P   F   N/A  3. Wears film and ring badges properly. [Fresh/Fall]
P   F   N/A  4. Wears labcoat at all times while in radiation areas. [Fresh/Fall]
P   F   N/A  5. Handles radioactivity safety (ex. uses syringe shields, lead boxes, and lead "pigs."). [Fresh/Fall]
P   F   N/A  6. Disposes of radioactive materials in the proper containers (ex. doesn't put gauze contaminated with the patient's radioactive blood in the biohazard trash, or doesn't put Ga-67 in the short-lived radioactive trash, etc.). [Fresh/Fall]

Safety:

P   F   N/A  1. Operates the camera in a safe manner. [Fresh/Fall]
P   F   N/A  2. Uses proper body mechanics. [Fresh/Fall]
P   F   N/A  3. Practices universal precautions. [Fresh/Fall]
P   F   N/A  4. Practices an acceptable level of personal hygiene. [Fresh/Fall]
P   F   N/A  5. Maintains a clean and orderly work area. [Fresh/Fall]
P   F   N/A  6. Properly handles needles. [Fresh/Fall]
P   F   N/A  7. Disposes of "sharps" and biohazardous waste in the correct containers. [Fresh/Fall]

General Competency Objectives: These objectives should be used for any competency that does not have scan specific objectives.

P   F   N/A  1. Positions the patient correctly on the imaging table (supine), or on a stool (upright). [Fresh/Fall]
P   F   N/A  2. Performs the appropriate views required for the procedure. [Fresh/Spr]
P   F   N/A  3. Positions the camera correctly. [Fresh/Spr]
P   F   N/A  4. Performs computer analysis accurately, if applicable. [Senior/Fall]

Additional Comments:
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

General Competency Form

Technologist(s) signature: __________________________ Date: ____________

Student Comments:

Student signature: __________________________ Date: ____________

Program Director/Clinical Coordinator Comments:

Program Director's signature: __________________________ Date: ____________

Clinical Coordinator's signature: __________________________ Date: ____________
This form has been designed to aid the clinical instructor in evaluating the student's understanding of a specific nuclear medicine procedure. Please complete the form honestly. **SIGN IT AND MAIL IT TO THE PROGRAM DIRECTOR IMMEDIATELY.** Please contact the Program Director, or review the Clinical Objectives for the current semester in the Student Guide if there are any questions.

**Student Name:** ___________________________ **Date:** ___________________________

**Clinical Site:** ___________________________

**Knowledge Assessment**

1. What is the half-life and energy of iodine-131?
2. What are the main reasons for its use?
3. What determines whether or not a patient is hospitalized for the iodine treatment?
4. What determines when a patient can be released from the hospital?
5. What precautions are taken in the patient's room to minimize contamination?
6. What precautions are taken to protect visitors and hospital staff from receiving unnecessary radiation exposure?
7. Describe the procedures that the RSO and the physician use in the administration of iodine, beginning from when they enter the radiopharmacy area to obtain the dose.
8. The physician gives the patient instructions on what to do after the dose is administered. What are they?
9. What precautions will the patient practice at home after they are released from the hospital?
10. If the patient is on thyroid medication, must it be discontinued before the treatment; why or why not?

The student was able to answer these questions to my satisfaction, and has received a passing grade for this competency.

**Additional Comments:**
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

I-131 Therapy Observation

Student Comments:

Student signature: ___________________________ Date: __________

Program Director/Clinical Coordinator Comments:

Program Director's signature: ___________________________ Date: __________
Clinical Coordinator's signature: ___________________________ Date: __________
ARMSTRONG ATLANTIC STATE UNIVERSITY
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

RADIOPHARMACY WEEKLY PERFORMANCE EVALUATION

Student Name__________________________________________

Site________________________________ Rotation 1 2 3

Evaluate the following characteristics or tasks using the scale of 0-4 described below. Indicate N/A for any tasks which are not applicable to your department.

4 - Consistent performance (outstanding - A)
3 - Frequent performance (very good - B)
2 - Occasional performance (satisfactory - C)
1 - Rare or seldom performance (unsatisfactory - D)
0 - Failure to perform (poor - F)

Behavioral Objectives

Cooperation - ability to work harmoniously with coworkers at all levels ...........................................

Dependability - completes assigned work; follows task through to completion ....................................

Adaptability - ability to modify procedure to a given situation ...........................................................

Motivation - puts forth enthusiastic effort and displays a desire to learn ..............................................

Personal Appearance - follows dress code, neat in appearance, practices good hygiene ....................

Punctuality - reports to radiopharmacy and is ready to begin work on time ........................................

Other ...............................................................................................................................................

Administrative and Clerical Skills

Demonstrates ability to maintain radiopharmaceutical records: receipt, use, disposition ......................

Assists in routine radiopharmacy maintenance tasks: wipe tests, restocking supplies ........................

Other ................................................................................................................................................

Technical Skills

Conforms with ALARA principle: wears film badges, gloves, uses shielding .......................................

Correctly performs radiopharmacy quality control procedures ............................................................

Correctly prepares radiopharmaceuticals ..............................................................................................

Accurately calculates patient doses .....................................................................................................

Accurately draws doses .......................................................................................................................

Other ..................................................................................................................................................

Comments:

Evaluator Signature ___________________________________ Date ____________________________

Student Signature _________________________________ Date ____________________________
**ARMSTRONG ATLANTIC STATE UNIVERSITY**  
**NUCLEAR MEDICINE TECHNOLOGY PROGRAM**  

**RADIOPHARMACY EXIT EVALUATION**

This form has been developed to assist the clinical evaluator in assessing the student's performance in the radiopharmacy. Please complete the form honestly. After completion place the form in the student's file that has been provided by the Nuclear Medicine Program. The student is responsible for the objectives and competencies associated with this rotation. **IF THE STUDENT FAILS THE COMPETENCY IF HE/SHE DOES NOT SUCCESSFULLY COMPLETE 19/25 POINTS (each point has a value of 2).** Use this form to evaluate the student's overall performance at the end of the radiopharmacy rotation.

Student's Name: ___________________________ Date: ___________________________

Clinical Site ___________________________

<table>
<thead>
<tr>
<th>Levels: Pass</th>
<th>Fail</th>
<th>Not applicable = N/A</th>
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<tbody>
<tr>
<td>P</td>
<td>F</td>
<td>N/A</td>
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1. Wears whole body and ring badge daily.  
2. Wears gloves.  
3. Wears labcoat.  
4. Uses pre-established technique in preparing radiopharmaceutical kits.  
5. Uses aseptic technique.  
6. Performs quality control procedures on radiopharmaceutical kits.  
7. Demonstrates proper record keeping and labels vials and syringes.  
8. Checks expiration dates on radiopharmaceutical kits.  
9. Calculates and draws up patient doses.  
10. Demonstrates ability to handle contamination.  
12. Arrives on time and follows assigned schedule.  
13. Disposes of radioactive materials properly  
14. Performs quality control procedures on dose calibrator and survey meter.  
15. Performs wipe tests and surveys packages.  
17. Performs Mo-99 assay.

18. Selects and confirms the appropriate radiopharmaceutical for various studies in nuclear medicine.

19. Performs thin layer chromatography.

20. Checks reconstituted kits and tagged blood cells for acceptable appearance.

21. Labels syringes and vials containing radiopharmaceuticals as required by regulation and facility protocols.

22. Prepares radiopharmaceuticals from freeze-dried lots, including calculating amount of eluate and saline to be added.

23. Prepare radiopharmaceutical doses from bulk kits, including calculating volume to be drawn.

24. Adjusts unit doses different from that provided at the calibration time, including calculating volume to be discarded.

25. Calculates/adjusts pediatric doses.

Additional Comments:

Pharmacist's Signature: ________________________________ Date: ____________________

Student's Comments:

Student's Signature: ________________________________ Date: ____________________

Program Director/Clinical Coordinator Comments:

Grade: _________

Program Director's Signature: ________________________________ Date: ____________________

Clinical Coordinator's Signature: ________________________________ Date: ____________________
Nuclear Medicine Technology Program
Mid-Rotation Student Evaluation Form

Name: 
Rotation: 
Site: 
Date: 

Please indicate the level of student performance in the following areas:

Motivation:
PoorBelow Average Average Above Average Excellent

Dependability:
PoorBelow Average Average Above Average Excellent

Radiation Safety Awareness:
PoorBelow Average Average Above Average Excellent

Technical Skills:
PoorBelow Average Average Above Average Excellent

Patient Care:
PoorBelow Average Average Above Average Excellent

Please check ( ) if the student has observed or practiced the following:

Quality Control: 
Radiopharmacy: 
Computer: 

Recommendations to the Student:

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<tr>
<th>Check if Need Work</th>
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<tbody>
<tr>
<td>Make better use of clinical time</td>
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<tr>
<td>Show more initiative</td>
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<td>Pay more attention to patient schedule</td>
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<tr>
<td>Pay more attention to procedural details</td>
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<tr>
<td>Stay with assignment given</td>
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<td>Ask more questions</td>
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<td>Ask less repetitive questions</td>
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<tr>
<td>Less social conversation</td>
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<td>More patient communication</td>
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Please add additional comments on the back of this form.

Evaluated by ____________________________ Date ____________
Student Signature ____________________________ Date ____________
Clinical Coordinator ____________________________ Date ____________
ARMSTRONG ATLANTIC STATE UNIVERSITY
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

END OF ROTATION EVALUATION

This form has been designed to assist the clinical instructor in evaluating the student’s overall performance during the Nuclear Medicine Clinical Education Rotation. Please complete the form honestly. After completion place the form in the student’s file that has been issued by the Nuclear Medicine Program. The student is responsible for the objectives assigned to their current semester, as well as the previous semester(s)’ objectives. THE STUDENT FAILS THE ROTATION IF HE/SHE DOES NOT SUCCESSFULLY ACQUIRE AN OVERALL SCORE 48/64 POINTS (each point has a value of 1.156). Please contact the Program Director, or review the Clinical Objectives for the current semester in the Student Clinical Handbook if there are any questions.

| Student Name: ____________________________ | Date: ____________________________ |
| Clinical Site: ____________________________ | Room: ____________________________ |

**Patient Care:**

| P | F | N/A | 1. Identifies the correct patient (ex. checks the wristband on in-patients). [Fresh/Fall] |
| P | F | N/A | 2. Checks and reviews requisitions before proceeding with exams. [Fresh/Fall] |
| P | F | N/A | 3. Examines and questions patients in order to remove attenuating objects, or to assess any unknown areas of pain which may require flow studies. [Fresh/Spring] |
| P | F | N/A | 4. Properly prepares patients for exams (ex. fasting, when to return following injection, emptying bladder, etc.). [Fresh/Spr] |
| P | F | N/A | 5. Maintains patient dignity (ex. covers the patient with a blanket if they become exposed, or by finding an empty room for the patient to use a bedpan, and closing the doors). [Fresh/Fall] |
| P | F | N/A | 6. Maintains confidentiality of patient information. [Fresh/Fall] |
| P | F | N/A | 7. Maintains patient safety at all times (ex. siderails, locks wheelchairs or stretchers, keeps foley bags below bladder level, etc.). [Fresh/Fall] |
| P | F | N/A | 8. Contacts appropriate personnel if the patient’s condition should change, or a piece of equipment malfunction (ex. IV pump, respirator, etc.). [Fresh/Fall] |
| P | F | N/A | 9. Refers to the patient as Mr./Mrs./Ms., not as “honey,” or “the bone,” or “the thallium in the PRISM,” or any other demeaning term. [Fresh/Fall] |

**Procedures:**

| P | F | N/A | 1. Proper camera (or probe) set-up for acquisitions, including peak, collimator, orientation, and intensity selections. [Fresh/Fall] |
| P | F | N/A | 2. Proper computer set-up for acquisition, if applicable. [Fresh/Fall] |
| P | F | N/A | 3. Prepares, assays, and records radiopharmaceutical(s) and dose(s). [Fresh/Summ] |
| P | F | N/A | 4. Performs safe administration* of radiopharmaceuticals. *Please circle: a. direct venipuncture; b. injected through existing IV line; c. inhalation; d. oral. [Senior/Fall] |
| P | F | N/A | 5. Completes all the necessary paperwork (ex. radiopharmacy logs, fills out the forms in the Cardiac Nuclear Medicine chart). [Fresh/Fall] |
| P | F | N/A | 6. Properly develops and labels the films, and presents them to the physician in the correct order. [Fresh/Fall] |
| P | F | N/A | 7. Completes studies in the Radiology Information System (DecRad), if applicable. [Fresh/Fall] |
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

End of Rotation Evaluation

Procedures (cont.):

| P | F | N/A | 8. Archives computer data, and records the location of the data in the appropriate logbook, if applicable. [Fresh/Spr] |
| P | F | N/A | 9. Enters the study in the “Wet Reading Book,” and places the completed chart in the “To Be Read Bin,” if applicable. [Fresh/Fail] |
| P | F | N/A | 10. Locates the patients' film jackets, and presents studies to the physician, if applicable. [Fresh/Fail] |
| P | F | N/A | 11. Brings the camera as close as possible to insure high quality images when applicable. [Fresh/Spr] |
| P | F | N/A | 12. Positions patients correctly on imaging tables (supine), or on stools (upright). [Fresh/Fall] |
| P | F | N/A | 13. Performs the appropriate views for the procedure. [Fresh/Spr] |
| P | F | N/A | 14. Positions the camera correctly. [Fresh/Spr] |
| P | F | N/A | 15. Performs the computer analysis accurately, if applicable. [Senior/Fall] |

Radiation Safety:

| P | F | N/A | 1. Follows ALARA (as low as reasonably achievable) guidelines (ex. time, distance, and shielding). [Fresh/Fall] |
| P | F | N/A | 2. Wears and removes gloves appropriately (ex. does not type on keyboard with potentially contaminated gloves). [Fresh/Fall] |
| P | F | N/A | 3. Wears film and ring badges properly. [Fresh/Fall] |
| P | F | N/A | 4. Wears labcoat at all times while in radiation areas. [Fresh/Fall] |
| P | F | N/A | 5. Handles radioactivity safety (ex. uses syringe shields, lead boxes, and lead "pigs."). [Fresh/Fall] |
| P | F | N/A | 6. Disposes of radioactive materials in the proper containers (ex. doesn't put gauze contaminated with the patient's radioactive blood in the biohazard trash, or doesn't put Ga-67 in the short-lived radioactive trash, etc.). [Fresh/Fall] |

Safety:

| P | F | N/A | 1. Operates the camera in a safe manner. [Fresh/Fall] |
| P | F | N/A | 2. Uses proper body mechanics. [Fresh/Fall] |
| P | F | N/A | 3. Practices universal precautions. [Fresh/Fall] |
| P | F | N/A | 4. Practices an acceptable level of personal hygiene. [Fresh/Fall] |
| P | F | N/A | 5. Maintains a clean and orderly work area. [Fresh/Fall] |
| P | F | N/A | 6. Properly handles needles. [Fresh/Fall] |
| P | F | N/A | 7. Disposes of "sharps" and biohazardous waste in the correct containers. [Fresh/Fall] |

II. Affective Domain: 40% of Total Score.

Ratings: 2=Exceeds Objectives 1=Meets Objectives 0=Does Not Meet Objectives N/A=Not Applicable

A. Integrity

_____ 1. Accepts responsibility for his/her actions, and admits errors. [Fresh/Fall] |

B. Adaptability

_____ 1. Changes existing protocols to meet patients' needs. [Senior/Spr]
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

End of Rotation Evaluation

B. Adaptability (cont.):

2. Prioritizes patient scheduling. [Senior/Fall]
3. Incorporates new procedures and methods. [Senior/Fall]
4. Performs multiple tasks when necessary. [Senior/Fall]
5. Responds effectively to interruptions. [Fresh/Summer]

C. Professional Demeanor and Interpersonal Skills

1. Conducts all work activities with respect for rights and wishes of others, including the maintenance of a pleasant, quiet work environment. [Fresh/Fall]
2. Fosters mature, professional relationships with the technologists, instructors, supervisors, and fellow students at all times. As exhibited in such behaviors as remaining calm during stressful situations, admitting personal error, and controlling emotions during frustrating or anger-provoking situations. [Fresh/Fall]
3. When in the situation to do so, answers telephone, responds to inquiries, and greets visitors in department in a polite and courteous manner. [Fresh/Fall]
4. Accepts constructive criticism. [Fresh/Fall]
5. Demonstrates good listening skills. [Fresh/Fall]

D. Reliability

1. Arrives on time. [Fresh/Fall]
2. Notifies technologist when leaving clinical site. [Fresh/Fall]
3. Is prepared for clinical tasks. [Fresh/Fall]
4. Completes assigned work. [Fresh/Fall]

E. Initiative

1. Prepares room for next patient without being asked. [Fresh/Spring]
2. Volunteers to assist others in the department. [Fresh/Fall]
3. Stocks rooms, cleans, or organizes work areas when assigned room is slow. [Fresh/Fall]
4. Makes constructive use of downtime in assigned room (ex. practices processing skills, uses the videodisc in Cardiac Nuc. Med., asks a technologist to explain a specific scan or procedure, prepares the radiopharmacy for the next day, etc.). [Fresh/Fall]
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

End of Rotation Evaluation

F. Patient Care

1. Explains procedures to the patients before, during, and after the exam. "At a level the patients can understand, and loud enough for the patients to hear." [Fresh/Spr]

2. By reviewing patients' charts, and/or through conversation with the patients, the student makes notes of any information pertinent to the study, and notifies the physician interpreting the scan. [Fresh/Spr]

3. Keeps patients as comfortable as possible throughout the exams (ex. wedge beneath the knees to decrease low back pain, extra blankets, etc.). [Fresh/Fall]

4. Dismisses patients. Shows patients how to get back to the main lobby, or arranges for transportation to their room. [Fresh/Fall]

5. Maintains contact with patients waiting to go back to their rooms. Makes the patients comfortable, and calls transport again if necessary. [Fresh/Fall]

6. Refrains from personal or negative conversations that exclude the patient, or include unprofessional subject matter (ex. what the student did the night before, discussing another patient within hearing distance of patients, etc.). [Fresh/Fall]

G. Procedures

1. Checks all views or images for quality before the patient leaves the department (ex. motion, poor repositioning of rest or redistribution views, wrong intensity, etc.). Troubleshoots, makes adjustments, and repeats study (or view(s)) if necessary. [Fresh/Summ]

2. Performs extra views when necessary (ex. is creative when the patient has abnormal anatomy, and performs extra views to get the highest quality study as possible). [Senior/Fall]

3. Performs the study in a timely manner, keeping the room on schedule as much as possible. [Senior/Fall]

Additional Comments:
NUCLEAR MEDICINE TECHNOLOGY PROGRAM

End of Rotation Evaluation

Technologist(s) signature: ___________________________ Date: __________

Student Comments:

Student signature: ___________________________ Date: __________

Program Director/Clinical Coordinator Comments:

Grade:

Program Director's signature: ___________________________ Date: __________

Clinical Coordinator's signature: ___________________________ Date: __________
Candidates for certification are required to meet the Professional Requirements specified in Article II of the ARRT Rules and Regulations. This document identifies the minimum didactic and clinical competency requirements for certification referenced in the Rules and Regulations. Candidates who complete a formal educational program accredited by a mechanism acceptable to the ARRT will have obtained education and experience beyond the requirements specified here.

Didactic Requirements

Candidates must successfully complete coursework addressing the topics listed in the ARRT Content Specifications for the Examination in Nuclear Medicine Technology. These topics are presented in a format suitable for instructional planning in the SNM Curriculum Guide for Educational Programs in Nuclear Medicine Technology (2002).

Clinical Requirements

As part of their educational program, candidates must demonstrate competence in the clinical activities identified in this document. Demonstration of clinical competence means that the program director or designee has observed the candidate performing the procedure, and that the candidate performed the procedure independently, consistently, and effectively. Candidates must demonstrate competence in:

- Four patient care activities.
- Five quality control procedures.
- Twenty-five diagnostic and therapeutic procedures.

Documentation

The following pages identify specific clinical competency requirements. Candidates may wish to use these pages, or their equivalent, to record completion of the requirements. The pages do NOT need to be sent to the ARRT.

To document that the didactic and clinical requirements have been satisfied, candidates must have the program director (and authorized faculty member if required) sign the ENDORSEMENT SECTION of the Application for Certification included in the Certification Handbook.

* Note: Candidates who complete their educational program during 2011 or 2012 may use either the previous requirements (effective 2005) or the current requirements (effective 2011). Candidates who graduate after December 31, 2012 may no longer use the previous requirements.
Nuclear Medicine Technology
Clinical Competency Requirements

The clinical competency requirements include the patient care activities, quality control procedures, and diagnostic and therapeutic procedures identified below. Demonstration of competence should include variations in patient characteristics (e.g., age, gender, medical condition).

1. General Patient Care

Requirement: Candidates must demonstrate competence in all four patient care activities listed below. The activities should be performed on patients; however, simulation is acceptable (see endnote) if state or institutional regulations prohibit candidates from performing the procedures on patients.

<table>
<thead>
<tr>
<th>Patient Care Activity</th>
<th>Date Completed</th>
<th>Competence Verified By</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vital Signs (BP, pulse, respiration)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venipuncture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECG (lead placement; recognition of common dysrhythmias)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Quality Control Procedures

Requirement: Candidates must demonstrate competence in all five quality control activities listed below.

<table>
<thead>
<tr>
<th>Quality Control Procedure</th>
<th>Date Completed</th>
<th>Competence Verified By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma Camera or SPECT (uniformity, resolution, center of rotation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose Calibrator (constancy, linearity)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well Counter/Uptake Probe (energy calibration)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey Meter (daily check)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PET or PET/CT (daily check)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dy
Nuclear Medicine Technology
Clinical Competency Requirements (cont.)

3. Diagnostic and Therapeutic Procedures

Requirement: Candidates must demonstrate competence in 25 different nuclear medicine procedures. Candidates should demonstrate the following skills when performing the procedures: evaluation of requisition; patient instructions, preparation, and care; selection, handling, and administration of radiopharmaceutical; equipment configuration and patient positioning; radiation safety; and image processing and evaluation. All procedures must be performed on patients, with the exception of thyroid therapy which may be simulated (see endnote).

The 25 procedures to be performed are selected from the categories (cardiovascular, endocrine, etc.) listed in the table below. Candidates must select 18 of the 25 procedures from the categories as specified in the table. The remaining 7 procedures may be chosen from any category. The table indicates the procedures in each category, and specifies the minimum number of procedures that must be performed in each category.

<table>
<thead>
<tr>
<th>Category*</th>
<th># Procedures in Category</th>
<th># That Must Be Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess and Infection (elective)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Skeletal</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Endocrine/Exocrine</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Respiratory</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Tumor</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>SPECT</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Therapeutic Procedures</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Central Nervous System (elective)</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>18</td>
<td>+7 electives from any category</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>25</td>
</tr>
</tbody>
</table>

Example: Assume a candidate demonstrates competence in the 3 cardiovascular procedures (myocardial perfusion, gated blood pool, and PET or PET/CT). This means that the candidate has fulfilled the cardiovascular requirement of 2 procedures, and has also completed 1 elective.

* Note: The specific nuclear medicine procedures within each category are identified on the following two pages.
<table>
<thead>
<tr>
<th>Nuclear Medicine Procedure</th>
<th>Date Completed</th>
<th>Competence Verified By</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abscess and Infection</strong> (0 procedures are elective)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gallium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC Imaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Skeletal</strong> (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three-Phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Body</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cardiovascular</strong> (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gated Blood Pool Studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myocardial Perfusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PET or PET/CT</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Endocrine/Exocrine</strong> (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid Uptake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid Scan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid Metastatic Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parathyroid</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gastrointestinal</strong> (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatobiliary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastroesophageal Reflux</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastric Emptying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI Bleeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meckel’s Diverticulum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Genitourinary</strong> (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal: Dynamic Perfusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal: Cortical Imaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Respiratory</strong> (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perfusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ventilation (gas or aerosol)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative</td>
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</tr>
</tbody>
</table>
Nuclear Medicine Technology
Clinical Competency Requirements (cont.)

<table>
<thead>
<tr>
<th>Nuclear Medicine Procedure</th>
<th>Date Completed</th>
<th>Competence Verified By</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tumor</strong> (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gallium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peptide Receptor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymphoscintigraphy (breast or melanoma)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PET or PET/CT</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPECT</strong> (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tumor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Therapeutic Procedures</strong> (1) (all may be simulated)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid: Ablation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thyroid: Hyperthyroidism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palliative Bone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hodgkin’s Lymphoma</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Central Nervous System</strong> (0 procedures are elective)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain: Planar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain: Dynamic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain: PET or PET/CT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisternography: Routine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisternography: CSF leak</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The ARRT requirements specify that certain clinical procedures may be simulated. Simulations must meet the following criteria: (a) the student is required to competently demonstrate skills as similar as circumstances permit to the cognitive, psychomotor, and affective skills required in the clinical setting; (b) the program director is confident that the skills required to competently perform the simulated task will generalize or transfer to the clinical setting. Examples of acceptable simulation include: demonstrating CPR on a mannequin; performing venipuncture by demonstrating aseptic technique on another person, but then inserting the needle into an artificial forearm or grapefruit.
Early Shift Objective: Participate in the manufacturing of radiopharmaceutical kits

**Behavioral Objectives:**

Cooperation-Ability to work harmoniously with coworkers at all levels

Dependability- Completes assigned work: follows task through to completion

Adaptability- Ability to modify procedure to a given situation

Motivation-Puts forth enthusiastic effort and displays a desire to learn

Personal Appearance-Follows dress code, neat in appearance, practices good hygiene

Punctuality-Reports to radiopharmacy and is ready to begin work on time

**Administrative and Clerical Objectives**

Demonstrates ability to maintain radiopharmaceutical records, receipt, use, and disposition

Assists in routine radiopharmacy maintenance tasks: Wipe tests, restocking supplies

**Technical Objectives**

Conforms to ALARA principle: wears film badges, gloves, uses shielding

Correctly performs radiopharmacy quality control procedures

Correctly prepares radiopharmaceuticals

Accurately calculates patient doses

Accurately draws doses

Student ___________________________ Date ____________

Clinical Supervisor ___________________________ Date ____________

Program Director ___________________________ Date ____________
Acknowledgement of Clinic Manual

By signing my name below, I acknowledge that I have received, read, and reviewed the Nuclear Medicine Clinical Manual. I further acknowledge that I understand the policies and procedures and have been allowed to ask questions regarding the content this Clinical Manual. I agree to abide by and adhere to the policies and procedures as outlined in the manual.

________________________________________  ______________________
Printed Name                                      Date

________________________________________  ______________________
Signature                                        Date
APPENDIX
Accreditation Standards for Nuclear Medicine Technologist Education

Joint Review Committee on Educational Programs In Nuclear Medicine Technology
©2010
# JRCNMT Standards

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<td>A1.1 Sponsoring Institution Qualifications &amp; Responsibilities</td>
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<td>A1.2 Program Location</td>
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<tr>
<td>A1.3 Program Responsibilities</td>
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### Standard B: Resources

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<tr>
<td>B2 Sponsor Personnel</td>
<td>4-5</td>
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<tr>
<td>B2.1 Program Director</td>
<td>4-5</td>
</tr>
<tr>
<td>B2.2 Clinical Coordinator</td>
<td>5</td>
</tr>
<tr>
<td>B2.3 Medical Advisor</td>
<td>5</td>
</tr>
<tr>
<td>B2.4 Faculty and/or Instructional Staff</td>
<td>5</td>
</tr>
<tr>
<td>B2.5 Administrative Support Staff</td>
<td>6</td>
</tr>
<tr>
<td>B3 Clinical Affiliate Personnel</td>
<td>6</td>
</tr>
<tr>
<td>B3.1 Affiliate Clinical Supervisor</td>
<td>6</td>
</tr>
<tr>
<td>B4 Clinical Affiliate Resources</td>
<td>6</td>
</tr>
<tr>
<td>B4.1 Clinical Affiliate Requirements</td>
<td>6</td>
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<tr>
<td>B4.2 Clinical Affiliate Categories</td>
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</table>

### Standard C: Curriculum

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<tbody>
<tr>
<td>C1 Instruction</td>
<td>6</td>
</tr>
<tr>
<td>C1.1 Master Instruction Plan</td>
<td>6</td>
</tr>
<tr>
<td>C1.2 Course Syllabi</td>
<td>7</td>
</tr>
<tr>
<td>C1.3 Materials and Orientation for Clinical Instructors</td>
<td>7</td>
</tr>
<tr>
<td>C2 Curriculum</td>
<td>7</td>
</tr>
<tr>
<td>C2.1 Postsecondary Educational Content</td>
<td>7</td>
</tr>
<tr>
<td>C2.2 Professional Curriculum</td>
<td>7</td>
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<tr>
<td>C2.3 Personal and Professional Attributes</td>
<td>7</td>
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<td>C2.4 Clinical Education</td>
<td>8</td>
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<td>C2.5 Curriculum and Educational Competencies</td>
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### Standard D: Operational Policies

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<thead>
<tr>
<th>Standard D.1: Fair Practices</th>
<th>8</th>
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</thead>
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<tr>
<td>D1 Fair Practices</td>
<td>8</td>
</tr>
<tr>
<td>D1.1 Announcements and Advertising</td>
<td>8</td>
</tr>
<tr>
<td>D1.2 Personnel and Student Policies</td>
<td>8</td>
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<td>D1.3 Admissions Process</td>
<td>8</td>
</tr>
<tr>
<td>D1.4 Published Policies</td>
<td>8</td>
</tr>
<tr>
<td>D1.5 Clinical Assignments</td>
<td>9</td>
</tr>
<tr>
<td>D1.6 Student Work During the Program</td>
<td>9</td>
</tr>
<tr>
<td>D1.7 Grievance Policies Available to Faculty</td>
<td>9</td>
</tr>
<tr>
<td>D1.8 Health &amp; Safety</td>
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</table>
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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2</td>
<td>Integrity of Distance Education</td>
<td>9</td>
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<tr>
<td>D3</td>
<td>Program Capacity</td>
<td>9</td>
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<td>D4</td>
<td>Student Records</td>
<td>9</td>
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<td>Student Health</td>
<td>10</td>
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<td>Guidance and Counseling</td>
<td>10</td>
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<td></td>
<td><strong>Standard E: Assessment</strong></td>
<td></td>
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<tr>
<td>E1</td>
<td>Program Assessment</td>
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<td>E1.1</td>
<td>Collection and Analysis of Outcomes</td>
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<td>Certification Exam Pass Rate</td>
<td>10</td>
</tr>
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<td>E1.3</td>
<td>Advisory Committee</td>
<td>10</td>
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<td>E1.4</td>
<td>Results of Ongoing Program Evaluation</td>
<td>10</td>
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<tr>
<td>E2</td>
<td>Student Evaluation</td>
<td></td>
</tr>
<tr>
<td>E2.1</td>
<td>Basis for Student Evaluation</td>
<td>10</td>
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<tr>
<td>E2.2</td>
<td>Frequency of Evaluation Process</td>
<td>10</td>
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<tr>
<td></td>
<td><strong>Standard F: Accreditation Maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>Sponsor and Program Responsibilities</td>
<td></td>
</tr>
<tr>
<td>F1.1</td>
<td>Initiation of Accreditation Process</td>
<td>11</td>
</tr>
<tr>
<td>F1.2</td>
<td>Components of the Accreditation Process</td>
<td>11</td>
</tr>
<tr>
<td>F1.3</td>
<td>Application for Affiliates</td>
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</tr>
<tr>
<td>F1.4</td>
<td>Voluntary Withdrawal from Accreditation Process</td>
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</tr>
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<td>F1.5</td>
<td>Failure to Meet Administrative Requirements</td>
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</tr>
<tr>
<td>F1.6</td>
<td>Deadlines</td>
<td>11</td>
</tr>
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<td>F1.7</td>
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<td>F1.8</td>
<td>Notification of Program Personnel Changes</td>
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Introduction

The Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT) accredits qualified educational programs in nuclear medicine technology offered by, or located within, institutions chartered by and physically located within the United States and its territories.

This document, previously referred to as Essentials and Guidelines, was initially adopted in 1970; revised in 1976, 1984, 1991, 1997, 2003 and 2010 and endorsed by the:

- American College of Radiology
- American Society of Radiologic Technologists
- Society of Nuclear Medicine
- Society of Nuclear Medicine-Technologist Section

These Standards should be used for the development and self-evaluation of programs. They constitute the minimum requirements to which an accredited program is held responsible and they are the criteria which the JRCNMT utilizes to award or deny program accreditation. Program accreditation is recognized as providing a basic assurance of the scope and quality of professional education.

Terms in bold within the Standards are defined on the Definitions page of this document.

Nuclear Medicine Technology

Nuclear medicine is the medical specialty that utilizes the nuclear properties of radioactive and stable nuclides to make diagnostic evaluations of the physiologic and/or anatomic conditions of the body and to provide therapy with unsealed radioactive sources. The nuclear medicine technologist is an allied health professional who, under the direction of an authorized user, is committed to applying the art and skill of diagnostic evaluation and therapeutics through the safe and effective use of radiopharmaceuticals and pharmaceuticals. The nuclear medicine technologist exhibits professionalism in the performance of duties, demonstrates an empathetic and instructional approach to patient care and maintains confidentiality of information as required. Responsibilities include, but are not limited to: preparation, quality control testing and administration of radioactive compounds; execution of patient imaging procedures including computer processing and image enhancement; laboratory testing; patient interviews; instruction and preparation for administration of prescribed radioactive compounds for therapy; quality control; and radiation safety. The nuclear medicine technologist applies knowledge of radiation physics and safety regulations to limit radiation exposure of the general public, patients, fellow workers, and self to as low as reasonably achievable (ALARA). Professional growth and development is achieved through appropriate utilization of new technologies, participation in continuing education and involvement in research to enhance the quality of patient care.

Program Accreditation

Accreditation of nuclear medicine technology programs is a voluntary process that includes an in-depth analysis of the program relative to the Standards. Published institutional and program mission statements are considered by the JRCNMT in its application and enforcement of the Standards. Accreditation decisions are based on JRCNMT Board review of information provided in the accreditation application and self-study report, the report of site visit evaluation team and any additional information requested from the program in writing or at the time of the site visit. New information submitted after the site visit will not be accepted or considered by the JRCNMT Board of Directors.
Definitions

Terms defined here are bolded within the Standards. For terms that are not defined their definitions are at the discretion of the Board of Directors of the JRCNMT.

**Academic Affiliate**
A regionally-accredited post-secondary educational institution recognized by the JRCNMT to provide academic credits for completion of the professional nuclear medicine technology curriculum and award a degree.

**Academic Program Faculty**
Program faculty who teach didactic courses in the classroom or laboratory.

**Affiliation Agreement**
A formal written document between a program sponsor and another institution that agrees to provide educational experiences or academic credits to students.

**Affiliate Sharing Agreement**
A formal written document signed by the program directors and affiliate clinical supervisor describing how the approved student capacity at the affiliate will be distributed amongst the programs sharing it.

**Assessment**
The systematic collection, review and application of information to improve student learning, educational quality and program effectiveness.

**Authorized User**
Within these Standards, refers to a physician authorized by appropriate state or federal authorities for the medical use of radioactive materials.

**Clinical Faculty**
Those who teach and supervise students in the clinical education setting.

**Competencies**
The knowledge; professional behaviors; clinical, technical and interpersonal skills; and critical thinking and reasoning skills required of a nuclear medicine technologist.

**Competency-Based Education**
Learner-centered education in which the focus is on the development of proficiencies.

**Effectiveness**
Producing or resulting in the stated outcomes.

**Extramural Quality Assurance Program**
An independent organization that publishes standards for clinical quality and evaluates facilities regarding compliance with the standards. Those recognized by the JRCNMT include the Joint Commission, American College of Radiology (ACR), the Intersocietal Commission on Accreditation of Nuclear Medicine Laboratories (ICANL) and state Boards of Pharmacy.

**Medical Informatics**
Structure, function and implementation of PACS, teleradiology and other systems used in the healthcare setting to manage, store and transmit information.

**Postsecondary Education**
Education offered by institutions after the completion of high school.

**Quality Assurance**
A structured program designed to maintain and improve all aspects of patient care. A quality control program is part of the broader quality assurance program.

**Quality Control**
A program of technical procedures routinely performed to ensure that equipment meets established performance standards and radiopharmaceuticals demonstrate accepted properties.
Standards for Accreditation

Standard A: Administration

The nuclear medicine technology program shall be conducted in an institution that has documented its commitment to quality, integrity and performance.

A1.1  Sponsoring Institution Qualifications and Responsibilities

   a) The sponsoring institution must be accredited by or have candidate status from a recognized regional, national and/or state agency and be legally authorized to provide a program of postsecondary education.

   b) JRCNMT accreditation is granted to the sponsoring institution that assumes primary responsibility for curriculum planning and selection of course content; coordinates classroom teaching and supervised clinical education; appoints faculty to the program; receives and processes applications for admission; and grants the certificate or degree documenting completion of the program.

   c) The sponsoring institution must provide the opportunity and financial support for ongoing professional development of the academic faculty of the program to ensure they are able to fulfill their instructional and administrative responsibilities.

A1.2  Program Location

  Accredited nuclear medicine technology programs must be located in:
  - colleges and universities
  - postsecondary vocational technical schools
  - hospitals and medical centers
  - a branch of the United States Armed Forces or other governmental educational or medical service that meets postsecondary educational standards
  - other institutions or consortia that meet comparable standards for education in nuclear medicine technology.

A1.3  Program Responsibilities

  The program shall be responsible for:
  a) Maintaining and documenting effective supervision, coordination and continuing communication with all affiliated academic and clinical institutions to ensure students receive equivalent and adequate instruction and clinical experiences.

  b) Initiating a formal affiliation agreement whenever another institution provides academic and/or clinical education to students as part of the professional program. The agreement must clearly describe the responsibilities of the respective institutions for administration, instruction and supervision. Each written agreement, signed by the appropriate executive officers, should address the following items:

      a) reason for the agreement  
      b) responsibilities of each individual party  
      c) joint responsibilities  
      d) student supervision responsibilities  
      e) student professional liability coverage  
      f) student health and safety policies  
      g) periodic review of the affiliation agreement  
      h) termination clause providing for program completion by enrolled students
c) Signing and adhering to the terms of an **affiliate sharing agreement** to ensure that the approved student capacity is never exceeded at a clinical affiliate that is shared by more than one educational program.

d) Ensuring that prerequisites are met. When an **academic affiliate** provides prerequisites and/or awards credit for the professional curriculum, the responsibilities of the sponsor and the academic affiliate shall be clearly described in written agreements initiated by the program.

e) Ensuring that the activities assigned to students in the clinical setting are educational.

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**Standard B: Resources**

The sponsor’s human, physical, financial and learning resources must be sufficient to support the educational goals and number of students admitted into the program.

**B1 Sponsor Resources**

B1.1 Classrooms, laboratories, administrative offices, and other facilities shall be adequate to achieve the educational objectives, ensure safety, and provide barrier-free access for students, faculty, and staff.

B1.2 The sponsor must have an accessible print and/or electronic library collection to foster an atmosphere of inquiry, study and learning. It should contain both current and historical books in addition to recent journals, periodicals and other reference materials related to all subject areas of the professional curriculum.

B1.3 Computer hardware and software, models, laboratory equipment, reference materials and audiovisual resources shall be available in sufficient quantity and quality to support the program’s mission and goals.

B1.4 Financial resources for continued operation of the educational program shall be demonstrated by an institutionally approved budget or by a statement of continued financial support from an executive officer of the sponsoring institution.

**B2 Sponsor Personnel**

The sponsor must have a qualified program director, clinical coordinator, and medical advisor for the nuclear medicine technology program. Primary responsibilities shall include program development, organization, administration, evaluation and revision.

**B2.1 Program Director**

a) **Responsibilities**

The director of the educational program shall be responsible for the organization, administration, periodic review, planning, development, and general effectiveness of the program. The director shall have input into budget preparation and provide supervision and coordination to the clinical coordinator(s).

The program director may assume the responsibilities of the clinical coordinator or assign a clinical coordinator to supervise and coordinate the clinical phases of the program. Site visits to the clinical affiliates by the program director or clinical coordinator must be conducted at least twice per year and a record of these visits must be maintained.
b) **Qualifications**

The program director position must be filled by a nuclear medicine technologist knowledgeable of current nuclear medicine technology and educational methodology. The program director must demonstrate effectiveness in instruction, curriculum design, program planning, evaluation and academic advisement. The program director must:

- hold a master's degree*,
- be certified by a nationally recognized certifying body,
- have a minimum of four years of post-certification nuclear medicine technology experience and
- have at least one year experience teaching or instructing in a nuclear medicine technology program.

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**B2.2 Clinical Coordinator**

a) **Responsibilities**

The clinical coordinator shall perform duties as assigned by the program director e.g., provide supervision, administration, and coordination of the instructional faculty in the clinical phase of the educational program.

b) **Qualifications**

The clinical coordinator shall be a nuclear medicine technologist knowledgeable of current nuclear medicine technology. The Clinical Coordinator must:

- hold a bachelor’s degree or higher*,
- be certified by a nationally recognized certifying body and
- have a minimum of two years of post-certification experience in nuclear medicine technology.

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**B2.3 Medical Advisor**

a) **Responsibilities**

The medical advisor of the program shall provide competent medical guidance to ensure that the medical components of the curriculum meet current acceptable standards. The medical advisor coordinates with the program director to assure physician interaction is included within the clinical education component of the curriculum.

b) **Qualifications**

The medical advisor must be a licensed physician who is

- an **authorized user** on a radioactive materials license and
- recognized as a diplomate of an American Board of Medical Specialties (ABMS) approved certifying board in Nuclear Medicine or Radiology, or possess suitable equivalent qualifications.

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**B2.4 Faculty and/or Instructional Staff**

a) **Responsibilities**

The faculty shall participate in teaching courses, supervising laboratory learning experiences, evaluating student achievement, developing curriculum, formulating policies and procedures, and evaluating program effectiveness.

b) **Qualifications**

Faculty designated by the program must be qualified, by education, certification, and experience, to teach assigned courses at the appropriate nuclear medicine technology educational level.

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*Persons holding this position at the time these Standards go into effect who do not meet this qualification have seven (7) years from the effective date of the Standards to comply with the qualification.*
B2.5 Administrative Support Staff
There must be sufficient administrative and technical support staff so that faculty can accomplish the tasks required of them.

B3 Clinical Affiliate Personnel
Affiliate Clinical Supervisor
a) Responsibilities
   The affiliate clinical supervisor shall be responsible for the clinical education, supervision and evaluation of students assigned to the clinical affiliate.

b) Qualifications
   The affiliate clinical supervisor must be certified by a nationally recognized certifying board in nuclear medicine technology or possess suitable equivalent qualifications and have at least two years of post-certification clinical experience. Clinical supervisors in radiopharmacies must possess a current pharmacy license from the state in which they practice or must be a certified nuclear medicine technologist if the radiopharmacy is located within a clinical nuclear medicine department.

B4 Clinical Affiliate Resources
B4.1 The clinical component of the program shall provide an environment for supervised, competency-based clinical education and offer a sufficient and well-balanced variety of nuclear medicine procedures. Nuclear medicine equipment, accurately calibrated, in working order and meeting applicable national and state standards must be available for the procedures identified in the approved curriculum. Clinical education sites must document satisfactory participation in extramural quality assurance programs appropriate to the practice. In the event that a single affiliate is unable to provide the total clinical education experiences needed, additional clinical affiliates, recognized by the JRCNMT, must be utilized.

B4.2 Clinical education affiliates are designated in one of the following categories based on the criteria indicated:

a) Major affiliate – A facility that provides a required portion of the clinical education experience outlined in the Standards. The length of time assigned to the clinical affiliate must be sufficient for completion of the essential education assigned to this facility.

b) Minor affiliate - A facility that provides clinical education experiences that enhance the curriculum requirements of the Standards. A student would be assigned to a minor affiliate for not more than the equivalent of ten working days (80 hours).

Clinical competencies may only be obtained at a major affiliate.

Standard C: Curriculum
The professional curriculum shall provide the student with a comprehensive body of knowledge and the necessary skills expected of a competent, entry-level nuclear medicine technologist.

C1 Instruction
C1.1 The program must develop a master instructional plan that describes learning experiences, curriculum sequencing, and integration of clinical assignments to develop the necessary competencies for graduation. The plan should include a curriculum sequence, didactic course schedules and clinical education schedules and should explain how the components integrate with one another.
C1.2 The program must provide students with a syllabus for each academic and clinical course. At a minimum each syllabus should contain learning objectives and performance criteria for satisfactory completion of the course.

C1.3 The program must provide a student handbook, clinical course syllabi and student evaluation documents to clinical supervisors and orient them to the documents and specific competencies students are expected to obtain.

C2 Curriculum

C2.1 Postsecondary educational content for the nuclear medicine technologist shall include as a minimum the following areas:

Prerequisite Science & Mathematics Core Courses
a) chemistry with laboratory
b) college algebra
c) general physics
d) human anatomy and physiology with laboratory

General Prerequisite or Program Co-Requisite Core
e) humanities course
f) medical terminology content
g) oral and written communications courses
h) social science course

Students may demonstrate competency in postsecondary coursework as permitted by institutional policy.

C2.2 The professional nuclear medicine technology curriculum shall include as a minimum the following didactic content areas:

a) methods of patient care k) immunology
b) cross-sectional anatomy l) radionuclide therapy
c) nuclear medicine statistics m) positron emission tomography (PET)
d) nuclear medicine and radiation physics n) computed tomography (CT)
e) radiation biology o) radionuclide chemistry and radiopharmacy
f) radiation safety and protection p) medical ethics and law
g) nuclear medicine instrumentation q) healthcare administration
h) quality control and quality assurance r) health sciences research methods
i) computer applications for nuclear medicine s) medical informatics
j) general diagnostic nuclear medicine procedures t) pharmacology

C2.3 The program shall include learning opportunities for students to develop personal and professional attributes and values relevant to clinical practice. These attributes include:

a) problem solving, critical-thinking and decision-making skills
b) a commitment to make a significant contribution to the healthcare team
c) appreciation and respect for cultural diversity
d) knowledge of departmental organization and function in relation to the healthcare delivery system
e) knowledge of the value and responsibilities entailed in being a professional healthcare provider
C2.4 Supervised clinical education shall include the following:

a) patient care and patient recordkeeping in accordance with the Health Insurance Portability and Accountability Act (HIPAA)
b) radiation safety techniques that will minimize radiation exposure to the patient, public, fellow workers and self
c) participation in a quality control program
d) preparation, calculation, identification, administration (where permitted), and disposal of radiopharmaceuticals and the performance of all radionuclide quality control procedures
e) performance of an appropriate number and variety of diagnostic nuclear medicine procedures, including PET, to achieve desired clinical competencies
f) observation and assistance with an appropriate number and variety of therapeutic nuclear medicine procedures to achieve desired clinical competencies
g) observation of interpreting physicians to develop an understanding of the clinical correlation of nuclear medicine procedures with other diagnostic procedures

C2.5 A program's professional curriculum must address all JRCNMT-recognized educational competencies, as published in the accompanying JRCNMT Accreditation Manual.

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**Standard D: Operational Policies**

A program is responsible for ensuring integrity in all operations dealing with students, staff, patients, and the public.

**D1 Fair Practices**

**D1.1** Announcements and advertising must accurately reflect the program offered.

**D1.2** All personnel and student policies must be consistent with federal and state statutes, rules and regulations.

**D1.3** The admission process, including advanced placement, must be conducted in accordance with clearly defined and published practices of the sponsoring institution and program.

**D1.4** The following must be accurately stated, published and available to students:

a) academic and non-academic admission criteria including prior education, professional certification and work experience
b) academic and technical performance standards
c) academic credit, academic calendar and estimated costs for the program
d) all didactic and clinical curricular components, including program goals, course descriptions, clinical education assignments and professional competencies to be obtained
e) evaluation process including criteria for successful completion of each segment of the academic and clinical curriculum and for graduation from the program
f) academic and behavioral standards including causes for dismissal
g) student appeal procedures that permit neutral evaluation and ensure due process
h) policies and procedures for student withdrawal
i) tuition and fees with related refund policies
j) transfer of credit policies that include a statement of the criteria established by the institution regarding the transfer of credit earned at another higher education institution
D1.5 Clinical assignments outside the normally scheduled clinical experience (e.g., evenings, weekends, and holidays) shall be justified by documenting their purpose. The document must be signed by the student, the clinical supervisor and a representative of the program. Specific objectives and evaluations must be developed to address the uniqueness of these learning experiences.

D1.6 Policies and processes by which students may work in the nuclear medicine department while enrolled in the program must be published and made known to all concerned to avoid substitution of students for regular staff. Students may not assume the responsibility or take the place of qualified staff. Class credit cannot be awarded for clinical hours in which the student is an employee of the facility.

D1.7 The following must be accurately stated, published and readily available to faculty:
   a) student grievance policies and procedures
   b) faculty grievance policies and procedures

D1.8 The health and safety of patients, students and faculty must not be jeopardized in any way by activities of students.

D2 **Integrity of Distance Education**
Programs offering courses by distance education must have processes through which they can establish that a student who registers in such a course is the same student who participates in, completes and receives academic credit for the course. Student identity may be verified by methods including, but not limited to, secure log-in methodologies or proctored exams. These processes must protect student identity and students must be informed of associated costs.

D3 **Program Capacity**
The number of students admitted must be based on the capacity of the clinical facilities and program resources to accommodate students. The instructor/student ratio shall be adequate to achieve the stated objectives of the curriculum.

The student capacity at clinical affiliates must clearly assure that space, personnel, equipment, and procedure load will enable each student's experience to satisfy the program objectives for clinical education. Student capacity in a clinical facility is calculated according to the following criteria:

   a) One full-time student for each imaging instrument which completes procedures on 5 or more patients per day, and/or 1 full-time student for a radiopharmacy where adequate numbers and varieties of radiopharmaceuticals are prepared.

   b) Student capacity may not exceed more than 1 full-time student per full-time certified nuclear medicine technologist, pharmacist, chemist, or person possessing suitable equivalent qualifications.

D4 **Student Records**
D4.1 Individual grades and credits for courses shall be recorded and permanently maintained by the sponsoring institution.

D4.2 Student records shall be maintained for admission, evaluation, and counseling/advisement sessions. The program shall maintain student records in compliance with federal, state and institutional regulations. Ideally, student files should be maintained permanently.
D5  **Student Health**

Students shall be informed of and have access to the usual student health care services of the institution. The health and safety of students, faculty, and patients associated with educational activities shall be adequately safeguarded. Emergency medical care shall be available for students while in attendance.

The program will maintain compliance with federal and state health and radiation protection regulations. Radiation exposure records shall be discussed with the students at regular intervals (not less than quarterly). Documentation of these reviews shall be maintained.

D6  **Guidance and Counseling**

Guidance shall be available to assist students in understanding and observing program policies and practices and in handling professional career issues and personal problems that may interfere with progress in the program.

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**Standard E: Assessment**

**E1 Program Assessment**

**E1.1** The program must routinely collect and analyze the following quantitative and qualitative outcomes as part of an ongoing process of monitoring and documenting program effectiveness:

a) student attrition  
b) faculty attrition  
c) student evaluations of individual didactic courses, clinical experiences and faculty  
d) clinical supervisor evaluation of student performance as well as suggestions for curriculum improvement  
e) graduate evaluation of program effectiveness  
f) employer evaluation of graduate preparedness to enter the workforce  
g) graduate performance on the national certification examinations

**E1.2** Programs must maintain at least an 80% pass rate over consecutive five year periods for their graduates on national certification examinations. This pass rate is to include all examination attempts by program graduates.

**E1.3** The appointed affiliate supervisors shall constitute the program’s Advisory Committee, along with any other members required by institutional policy. The function of the Advisory Committee is to provide feedback at least semi-annually for on-going improvement of program policies, procedures and curriculum. Suggestions from the Committee must be documented by the program.

**E1.4** The results of ongoing evaluation must be appropriately reflected in the curriculum and other dimensions of the program. In particular, the program must systematically document the application of assessment results in the process of program improvement.

**E2 Student Evaluation**

**E2.1** Clinical and didactic evaluation of students shall be based on the objectives and competencies identified in course syllabi.

**E2.2** The evaluation system shall be employed frequently enough to provide students and program officials with timely indication of student progress and academic standing, and to serve as a reliable indicator of the effectiveness of course design and instruction.
Standard F: Accreditation Maintenance

The sponsor, the program and the JRCNMT all have responsibilities in relation to the accreditation process. Fulfillment of these responsibilities provides assurance that accreditation of a program is conducted and maintained in an appropriate manner.

F1 Sponsor and Program Responsibilities

F1.1 The accreditation process conducted by the JRCNMT can be initiated only at the written request of the chief executive officer or an officially designated representative of the sponsoring institution.

F1.2 The accreditation process includes submission of the Application for Accreditation, completion and submission of a self-study, payment of appropriate fees, and agreement to a site visit date near the end of the period for which accreditation is awarded.

F1.3 The program must submit an application for all academic and clinical affiliates. A program may not use its accredited status to utilize affiliates that are not recognized by the JRCNMT. An application for a clinical affiliate must be received 90 days prior to the assignment of students.

F1.4 An institution sponsoring a program may voluntarily withdraw from the JRCNMT accreditation process at any time.

F1.5 In accordance with JRCNMT policy, failure of a program to meet the administrative requirements for maintaining accreditation will result in the program being placed on Administrative Probation. If the issues are not corrected as directed by the JRCNMT, this will ultimately lead to an action of Accreditation Withdrawn.

F1.6 The sponsor must submit fees and reports by the deadline published by the JRCNMT.

F1.7 The program must inform the JRCNMT in writing within 30 days of the date of notification of any adverse accreditation action received from the sponsoring institution’s regional or specialized/professional accrediting agency.

F1.8 The program must inform the JRCNMT in writing of changes in the program director, medical advisor, clinical coordinator or affiliate clinical supervisor within 30 days of the date of the effective change. If a position becomes vacant and is not filled within 60 days, or the incumbent is absent or unable to serve for 60 days, the program shall send the JRCNMT a description of the actions taken to maintain the continuity and effectiveness of the program.

F1.9 The sponsoring institution must inform the JRCNMT of its intent to transfer program sponsorship as soon as it begins considering transfer.

F2 JRCNMT Responsibilities

Administering the Accreditation Review Process

F2.1 At the written request of a sponsoring institution’s chief executive officer or other officially designated representative, the JRCNMT assesses an applicant program’s relative compliance with the Standards.

F2.2 If the performance of a site visit team is deemed unacceptable, the institution may request a second site visit.
F2.3 Before the JRCNMT determines an accreditation action, the sponsoring institution is given an opportunity to comment in writing on the report of the site visit team and to correct factual errors.

F2.4 Before awarding Probationary Accreditation, the JRCNMT provides the sponsoring institution with an opportunity to respond in writing to the cited deficiencies in the program's compliance with the Standards. The JRCNMT's reconsideration of Probationary Accreditation is made on the basis of conditions existing when the JRCNMT arrived at its accreditation decision.

F2.5 JRCNMT awards of Probationary Accreditation are final and not subject to further appeal.

Withholding or Withdrawing Accreditation
F2.6 Before determining that accreditation be withheld or withdrawn, the Review Committee provides the sponsoring institution with an opportunity to request reconsideration. JRCNMT decisions to withhold or withdraw accreditation may be appealed. A copy of the JRCNMT Appeals Procedures is enclosed with the letter notifying the sponsoring institution of one of these actions. When accreditation is withheld or withdrawn, the sponsoring institution's chief executive officer is provided with a clear statement of each deficiency and is informed that the institution may apply for accreditation whenever the program is believed to be in compliance with the Standards.

F2.7 In the event of program closure, the JRCNMT regards as graduates of an accredited program only those students who meet the criteria listed below for the two categories of program closure:

Voluntary Closure – The JRCNMT regards as graduates only those students who have successfully completed the program prior to the effective date of closure.

Involuntary Closure – The JRCNMT regards as graduates of the program only those students who have already successfully completed 75% of the published curriculum as of the date of involuntary withdrawal and then successfully complete the remaining 25% of the curriculum in the scheduled time frame.

F3 Inactive Programs
The sponsoring institution may request inactive status for a program that does not enroll students for up to two years. The program and its sponsoring institution must continue to pay required annual fees. Should a program be inactive for two years and not reactivated, it will be considered discontinued and accreditation will be withdrawn.
Scope of Practice for the Nuclear Medicine Technologist 2007
(Revised September 2008)

Presidential Task Force, SNM Technologist Section

An SNM Technologist Section (SNMTS) Presidential Task Force established in the summer of 2006 developed the following revised SNMTS Scope of Practice for nuclear medicine technologists. Members of the task force were: Giuliana Arcovio, BS, CNMT, RT(N); Michelle Beauvais, RPh, BCNP; David Gilmore, MS, CNMT, NCT, RT(N,R); Scott Holbrook, BS, CNMT, PET, FSNMTS; Art Hall, CNMT FSNMTS; Kent Hutchings, MS, CNMT; Lyn Mehlberg, BS, CNMT, FSNMTS; Robert Pagnanelli, BS, CNMT NCT, RT(N); David Perry, CNMT, PET, FSNMTS; George Segall, MD. The task force was chaired by Cindi Luckett-Gilbert, BHS, CNMT, PET, RT(N).

This document is not intended to modify or alter existing tort law; rather it should serve as a concise outline of nuclear medicine technology skills and responsibilities.

NUCLEAR MEDICINE TECHNOLOGY

Nuclear medicine technology is the medical specialty that utilizes sealed and unsealed radioactive materials in the diagnosis and treatment of disease. This practice also includes the utilization of pharmaceuticals and other imaging modalities to enhance the evaluation of organ and molecular function. In addition, it includes the delivery of therapeutic radiopharmaceuticals to treat a number of pathologies.

The practice of nuclear medicine technology encompasses multidisciplinary skills, which use rapidly evolving instrumentation, radiopharmaceuticals and techniques. The responsibilities of the nuclear medicine technologist include, but are not limited to, an empathetic and instructional approach to patient contact, care, and monitoring; the procurement, preparation, quality control, dispensing, dose calibration, administration, and disposal of radiopharmaceuticals; the administration of pharmaceuticals including adjunct oral and IV contrast (under the direction of an authorized user); the performance of quality control procedures; and the operation of imaging, laboratory, and computer instrumentation.

In order to perform these tasks the nuclear medicine technologist must successfully complete didactic and clinical education. Education includes, but is not limited to, anatomy, physiology, pathophysiology, pharmacology, chemistry physics, mathematics, computer applications, biomedical sciences, ethics, and radiation health and safety. Direct patient contact hours are obtained by training in a clinical education setting.
Graduates of accredited programs are eligible to sit for certification examinations offered by the Nuclear Medicine Technology Certification Board and/or the American Registry of Radiologic Technologists.

The spectrum of nuclear medicine technology skills and responsibilities varies widely across the country and often goes beyond the basic skills outlined in the technologist’s initial education and certification. Practice components presented in this document provide a basis for establishing the areas of knowledge and performance for the nuclear medicine technologist. It is assumed that for all activities included in this scope of practice, the nuclear medicine technologist has received the proper education (in compliance with federal, state, and institutional requirements) supported with the proper documentation of initial and continued competency in those practices and activities. Continuing education is a necessary component in maintaining the skills required to perform all duties and tasks of the nuclear medicine technologist in this ever-evolving field of new equipment, radiopharmaceuticals, and applications.

THE SCOPE OF PRACTICE

The scope of practice in nuclear medicine technology includes, but is not limited to, the following areas and responsibilities:

- **Patient Care**: Requires the exercise of judgment to assess and respond to the patient’s needs prior to, during, and after procedures in the nuclear medicine department, and in patient medication reconciliation.

- **Quality Control**: Requires the evaluation and maintenance of a quality control program for all instrumentation to ensure its proper performance and stability.

- **Diagnostic Procedures**: Requires the utilization of appropriate techniques, and administration of non-radiopharmaceutical agents when part of standard procedures, to ensure quality diagnostic images and/or laboratory results.

- **Radiopharmaceuticals**: Involves the procurement, preparation, quality control, dispensing, dose calculation, identification, documentation, administration, disposal, storage, and safe handling of radioactive materials used by the nuclear medicine technologist.

- **In Vivo Diagnostic Testing**: Involves the procurement, preparation, quality control, dispensing, dose calibration of radiopharmaceuticals and oral, inhalation, or intravenous administration. In some cases radiopharmaceuticals may be administered by other routes under the direct supervision of a physician.

- **In Vitro Diagnostic Testing**: Involves the procurement, preparation, quality control, dispensing, dose calibration of radiopharmaceuticals and oral, inhalation, or intravenous administration.

- **Transmission Imaging**: Involves, but is not limited to, the operation of gamma cameras with sealed sources of radioactive material for transmission imaging with single photon emission computed tomography (SPECT) or positron emission tomography (PET) and operation of cameras with x-ray tubes for transmission imaging when performed as part of SPECT/CT or PET/CT. Additionally includes diagnostic CT when performed on SPECT/CT or PET/CT cameras, including the administration of oral and intravenous contrast (requires education in CT) and the operation of scanners with x-ray tubes for the measurement of bone density.
• **Radionuclide Therapy**: Involves, but is not limited to, assisting an authorized user in the application, management, preparation, and administration of radiotherapeutic procedures and administration of nonradiopharmaceutical agents by oral and intravenous routes when part of standard procedures required for treatment.

• **Radiation Safety**: Involves, but is not limited to, educating the public while practicing techniques that will minimize radiation exposure to the patient, general public, and health care personnel, through consistent use of protective devices, shields, monitors, and other devices consistent with ALARA (as low as reasonably achievable), as well as decontaminating spills and other inappropriate releases of radiation.

I. **Patient Care**

   A. A nuclear medicine technologist provides patient care, including but not limited to:

   1. Providing for proper comfort and care of the patient prior to, during and after a procedure, including but not limited to monitoring of intravenous lines (i.e., central lines, Peripherally Inserted Central Catheters [PICC]), oxygen supplies, drains, and patients who are under sedation; and operation of blood pressure cuffs, electrocardiogram (ECG) machines, pulse oximeters, intravenous pumps, and oxygen delivery regulators.

   2. Insertion of peripheral intravenous catheters required for performance of a nuclear medicine procedure.

   3. Establishing and maintaining proper communication with patients (e.g., proper introduction, appropriate explanation of the procedure, etc.).

   4. Behaving in a professional manner in consideration of patients’ rights, and resulting in the provision of the highest quality patient care possible.

   5. Providing a safe and sanitary working environment for patients and the general public, using proper infection control practices in compliance with accepted precaution policies.

   6. Recognizing and responding to an emergency situation at a level commensurate with one’s training and competency including cardiopulmonary resuscitation (CPR) and the use of automatic external defibrillators (AED).

   B. The tasks a nuclear medicine technologist must perform when preparing the patient for an examination include, but are not limited to:

   1. Verifying patient identification, pregnancy status, breast-feeding status, and written orders for the procedure.

   2. Ensuring that informed consent has been obtained, as prescribed by the institution, whenever necessary.
3. Confirming that the indication for the procedure is appropriate, and consulting with the authorized user and/or referring physician whenever necessary to ensure that the proper procedure is performed.

4. Obtaining a pertinent patient history.

5. Ensuring that any preprocedural preparation has been completed, including but not limited to fasting, hydration, thyroid blocking, voiding, bowel cleansing, and suspension of interfering medications.

6. Explaining the procedure to the patient and/or family and, where appropriate, to the parents and/or legal guardian, including but not limited to patient involvement, length of study, and radiation safety issues.

7. Collecting samples for laboratory procedures and performing pertinent waived In vitro diagnostic testing laboratory analyses, including urine pregnancy testing and fasting blood sugar. Additionally, In vitro diagnostic testing laboratory procedures include, but are not limited to, secretions, saliva, breath, blood, and stool, to measure biodistribution of radiopharmaceuticals.

C. A nuclear medicine technologist performs administrative procedures, including but not limited to:

1. Maintaining an appropriate inventory of medical/surgical supplies, radiopharmaceuticals, storage media, and other items required to perform procedures in a timely manner.

2. Scheduling patient procedures appropriate to the indication and in the proper sequence.

3. Maintaining appropriate records of administered radioactivity, quality control procedures, patient reports, and other required records.

4. Developing and revising when necessary policies and procedures in accordance with applicable regulations.

5. Actively participating in total quality management/continuous quality improvement programs (i.e., age-specific competencies, patient education, and patient restraint and immobilization).

II. Quality Control—Nuclear Instrumentation

A nuclear medicine technologist ensures the proper performance of imaging systems, storage media, and radiation detection and counting devices, including but not limited to scintillation cameras, dose calibrators, survey instruments, scintillation probes and well counters, and data processing and image production devices.

III. Diagnostic Procedures

A. A nuclear medicine technologist performs imaging procedures, including but not limited to:
1. Preparing, evaluating and properly administering the appropriate radiopharmaceuticals and/or pharmaceuticals and contrast (under the direction of an authorized user).

2. Establishing and/or properly maintaining venous access routes of various configurations (in accordance with hospital policies and procedures).

3. Selecting the appropriate imaging or data collection parameters.

4. Administering radiopharmaceuticals/pharmaceuticals through various routes, including but not limited to oral, intravesical, inhalation, intravenous, intramuscular, subcutaneous, and intradermal (under the direction of an authorized user).

5. Positioning the patient for imaging, adapting the protocol to patient limitations, and acquiring diagnostic quality images.

6. Positioning and verifying the proper placement of electrocardiographic leads.

7. Reviewing images to ensure that required information has been acquired, processed properly, and is of the highest quality.

8. Assisting in cardiac stress testing procedures when performed in conjunction with nuclear medicine procedures.

9. Performing data collection, processing, and analysis.

10. Archiving data to and from storage media.

B. A nuclear medicine technologist performs nonimaging in vivo and/or radioassay studies, including but not limited to:

1. Operating laboratory equipment including well counters, probes, and other detection devices to measure the biodistribution of radiopharmaceuticals.

2. Preparing doses and standards.

3. Collecting the appropriate specimen for procedures using standard precautions.

4. Gathering, validating and documenting data.

5. Managing biohazardous, chemical, and radioactive waste in accordance with applicable regulations and specific facility policies.

IV. Radiopharmaceuticals

A. A nuclear medicine technologist procures and maintains radiopharmaceutical products and adjunct supplies.

B. A nuclear medicine technologist properly prepares and administers diagnostic radiopharmaceuticals under the direction of an authorized user in accordance with all federal, state and institutional guidelines.
V. Radionuclide Therapy

A nuclear medicine technologist properly prepares and administers therapeutic radionuclides, radiopharmaceuticals, and pharmaceutical agents by oral and/or intravenous routes when these agents are part of a standard procedure that is required for treatment under the direction of an authorized user in accordance with federal, state, and institutional regulations.

VI. Radiation Safety

A nuclear medicine technologist performs all procedures utilizing ionizing radiation safely and effectively, applying federal, state, and institutional regulations, including but not limited to:

A. Maintaining compliance with all applicable regulations.
B. Performing appropriate radioactive contamination monitoring and decontamination procedures.
C. Disposing of radioactive waste in accordance with federal, state and institutional regulations.
D. Participating in programs designed to instruct other personnel about radiation hazards and principles of radiation safety.

REFERENCES


SNMTS Code of Ethics

Nuclear Medicine Technologists, as members of the health care profession, must strive as individuals and as a group to maintain the highest of ethical standards.

The Principles (SNMTS Code of Ethics) listed below are not laws, but standards of conduct to be used as ethical guidelines by nuclear medical technologists.

Principle 1  
The Nuclear Medicine Technologist will provide services with compassion and respect for the dignity of the individual and with the intent to provide the highest quality of patient care.

Principle 2  
The Nuclear Medicine Technologist will provide care without discrimination regarding the nature of the illness or disease, gender, race, religion, sexual preference or socioeconomic status of the patient.

Principle 3  
The Nuclear Medicine Technologist will maintain strict patient confidentiality in accordance with state and federal regulations.

Principle 4  
The Nuclear Medicine Technologist will comply with the laws, regulations, and policies governing the practice of nuclear medicine.

Principle 5  
The Nuclear Medicine Technologist will continually strive to improve their knowledge and technical skills.

Principle 6  
The Nuclear Medicine Technologist will not engage in fraud, deception, or criminal activities.

Principle 7  
The Nuclear Medicine Technologist will be an advocate for their profession.

PROFESSIONAL ORGANIZATIONS

Several professional organizations have been established for individuals practicing in the field of Nuclear Medicine Technology. Membership in these organizations is strictly voluntary; however, students are encouraged to join and become actively involved. The primary purpose of these societies is to provide continued educational opportunities for technologists. Numerous seminars, workshops, etc. are held throughout the year to serve this purpose. An additional benefit associated with membership is the camaraderie established with technologists and students. Opportunities for professional growth, or potential employment, often result from communication with or recognition by other members of the societies. These organizations also serve as the primary representative for our profession in legislative and socio-economic developments.

Participation in events sponsored by these and other professional organizations is encouraged and time away from academic and clinical classes will be given. This time off must be approved by the Program Director. In the event academic classes are canceled so that students may attend an educational function, those students not attending must report to the assigned clinical site. A field trip release form must be signed by each student in attendance to meetings.

American Registry of Nuclear Medicine Technologists The national examination offered by the American Registry of Nuclear Medicine Technology is conducted throughout the year in designated locations throughout the United States. The exact time and place of examination is forwarded to each applicant upon proof of his/her eligibility. Nuclear medicine students will apply to take the exam with the application fee of $150. Applications will be made available through the Program Director.

Nuclear Medicine Technology Certification Board The certification exam is offered by the Nuclear Medicine Certification Board. This exam is offered throughout the year in designated testing centers. The student may choose a test site closest to his/her location and a testing time. Nuclear medicine students will apply to take the board with an application fee of $145. Applications will be made available through the Program Director.

Eligibility to sit for the examination ARRT (N) and/or the NMTCB depends on the following:

a) Completion of all requirements for graduation from CVTC
b) Each student taking responsibility to complete applications for the exams.

American Society of Radiologic Technology This organization is made up of radiologic technologist, other radiology professionals and nuclear medicine technologists. Its purpose is to provide support to technologist and provide continuing education opportunities and to promote and represent the radiography profession, which includes nuclear medicine. "ASRT" was formed in 1920 to provide its members with educational opportunities promote radiologic technology, as well as nuclear medicine, as careers and monitor state and federal legislation that affect the profession.

Nuclear Medicine Certification Board The Nuclear Medicine Technology Certification Board (NMTCB) was founded in 1977 to establish and maintain a voluntary program for certification of nuclear medicine technologists by nuclear medicine technologists. The NMTCB endeavors to promote quality patient care and to serve the public, the profession, and employers by establishing and developing standards and procedures for individuals to enter, continue, and advance in nuclear medicine technology.

Society of Nuclear Medicine and Molecular Imaging It is the Mission of the Society of Nuclear Medicine to be the recognized world leader in providing knowledge that advances and promotes the use of nuclear medicine. The society offers continuing education through seminars and nuclear medicine journals. The society is a multi disciplinary professional medical organization dedicated to the advancement of excellence in the education, research and clinical practice of nuclear medicine.

American Society of Nuclear Cardiology ASNC was founded in 1993 by a group of nuclear cardiology specialists who sensed the need for a professional society dedicated solely to the needs of those who perform nuclear cardiology procedures. It is a professional medical society, international in scope, which provides its members a variety of continuing medical education programs related to Nuclear Cardiology, develops standards and guidelines for training and practice, promotes accreditation and certification in this sub-specialty field, and is the principal advocacy voice for Nuclear Cardiology.

Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT) This organization develops essentials for nuclear medicine technology schools, performs inspections of those schools through accreditation site visits and review of Accreditation Self Studies and grants accreditation.
Professional Organizations for Nuclear Medicine Technologist

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<tr>
<th><strong>American Society of Radiologic Technologists</strong></th>
<th><strong>Society of Nuclear Medicine</strong></th>
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<tr>
<td>15000 Central Ave. SE</td>
<td>1850 Samuel Morse Drive</td>
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<tr>
<td>Albuquerque, NM 87123-3909</td>
<td>Reston, VA 20190-5316</td>
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<tr>
<td>Fax 505-298-5063</td>
<td><a href="http://www.snm.org">www.snm.org</a></td>
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<th><strong>Joint Review Committee on Educational Programs in Nuclear Medicine Technology JRCNMT</strong></th>
<th><strong>Southeastern Chapter of Society of Nuclear Medicine</strong></th>
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<tr>
<td>2000W. Danforth Rd., Ste 130 # 203</td>
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<th><strong>American Society of Nuclear Cardiology</strong></th>
<th><strong>National Licensure for Nuclear Medicine Examination</strong></th>
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<tbody>
<tr>
<td>4550 Montgomery Ave.</td>
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<tr>
<td>Suite 780 North</td>
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<td>Bethesda, MD 20814-3304</td>
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<td>Email: <a href="mailto:admin@asnc.org">admin@asnc.org</a></td>
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<td></td>
<td>The Nuclear Medicine Certification Board, Inc.</td>
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<td>Tucker, GA 30084</td>
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Many of the societies offer discounted rates to students. Upon graduation it is highly
recommended that the graduate will continue membership in these professional societies.
The societies offer excellent continuing education and a superb environment to meet
other nuclear medicine professionals.
With the changing facets of nuclear medicine it is vital that today’s technologists stay
abreast of the latest technologies and techniques to ensure one’s marketability and
expertise.