Administration

Position Description: Nuclear Medicine Technologist

Technologist Section, Society of Nuclear Medicine

Nuclear Medicine Technologists, under the direction of physicians licensed to possess radioactive materials, utilize radionuclides and radiopharmaceuticals to perform or assist in the performance of diagnostic examinations—including radionuclidic imaging of organs and organ systems of patients, dynamic studies, assays of body fluids and tissues, and radioassays. These responsibilities require appropriate knowledge of the field of Nuclear Medicine Technology, and those aspects of chemistry, physics, mathematics, and the biomedical sciences that relate to Nuclear Medicine Technology and its growth. Technologists perform studies to evaluate and standardize new or improved methods and equipment for use in Nuclear Medicine Laboratories and Clinics. They also assist the physician in therapeutic procedures using radionuclides. Nuclear Medicine Technologists transmit findings of studies, tests, and examinations to Nuclear Medicine Physicians, who are responsible for the care of the patient. They also participate in medical research. All duties and responsibilities are assigned by Nuclear Medicine Physicians.

(Editor's note: The scope of practice of Nuclear Medicine Technology varies widely across the country. This is most probably due to the varied backgrounds of Technologists and Nuclear Medicine Physicians—and the fact that essentials for educational programs in Nuclear Medicine Technology provide for different types of structured education routes into the profession. Because of this variation, and hence some confusion, members of the Technologist Section requested the Section to develop position (or job) descriptions to define the scope of practice in a more uniform manner. These descriptions are intended to be guidelines for members and others to use and modify as they see fit for their purposes. The descriptions were written to reflect the broadest scope of practice—with knowledge of the great range of duties and the understanding that modification would be necessary in many instances.)

Level I (Staff Technologist):
(A career-entry technologist who performs either in vivo or in vitro routine tasks, or both, under close supervision)

Level II (Senior Technologist):
(A staff technologist who performs most diagnostic work in the department with limited supervision)

Level III (Chief Technologist/Technical Administrator):
(Additional levels on the Nuclear Medicine Technology career ladder may include Educational Coordinator, Computer Technologist, etc.)

Level I (Staff Technologist)

Principal Duties and Responsibilities:

A. Dose Calculation and Administration—

1. Obtains radionuclides by eluting generator systems maintaining sterile technique.
2. Measures eluant for total activity and checks for contamination.
3. Prepares appropriate dosages of radiopharmaceuticals in preparation for diagnostic procedures.
4. Performs quality control procedures to ensure pharmaceutical quality of agents before administering to patients. This step may include such techniques as paper chromatography, pH determination, and tests for radionuclidic purity. The technologist is responsible for maintaining sterility and integrity of prepared radiopharmaceutical compounds.
5. Calculates amount and volume of activity to be administered following prescribed procedures, according to information on age, weight, and examination.
6. Administers the dose of radiopharmaceuticals to patients undergoing nuclear medicine procedures—either intravenously (where legally permitted), orally, or by inhalation.

B. Imaging Procedures—

1. Receives patients and explains procedure to them in order to obtain cooperation and allay anxieties during performance of procedure. It is the responsibility of the technologist to continually assess the immediate needs and conditions of assigned patients.
2. Visually inspects the patient in order to record any observations that may contribute additional information in the evaluation of test results, e.g., pregnancy, incontinency, surgery, interfering medications, etc.
3. Reviews and abstracts data from patient's chart.
4. Places the patient on the examination table and

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explains, as necessary, positioning and instrumentation operating characteristics, time to complete testing, etc.

5. Sets up imaging devices for studies in accordance with prescribed procedures.
6. Performs standard nuclear medicine dynamic and static imaging procedures on patients, which includes assisting patients in assuming required anatomical body positions and positioning and adjusting the equipment to encompass the area to be studied. The technologist adjusts controls on equipment in accordance with prescribed procedures to produce information of required diagnostic quality.
7. May consult with staff professionals to obtain information concerning the patient's physical condition, preliminary diagnosis, and care in order to take these factors into account while performing diagnostic procedures.
8. Observes patients for a change in status and follows prescribed procedures if a change is observed, which may include taking patient's vital signs or initiating cardiopulmonary resuscitation.
9. Evaluates needs and performs special positioning or examination techniques, certain technicalities, or additional views when necessary, or as requested by the Nuclear Medicine Physician or supervisor, or both.
10. Checks the quality of scans in general and is responsible for the quality control of work performed.
11. Communicates physician's written interpretation of tests, when indicated, to designated hospital personnel.
12. Schedules patients for Nuclear Medicine examinations.
13. Assists in maintaining current inventory of routine laboratory supplies and orders supplies in coordination with supervisor.
14. Maintains work areas in clean and orderly condition and ensures that examination rooms are properly supplied, equipped, and operational before each examination.

C. Instrumentation—

1. Operates imaging equipment (scintillation cameras, rectilinear scanners, portable cameras) and related accessories (videotape, multiformatting devices, xenon apparatus, computers, etc.) for routine studies.
2. Performs quality control procedures on all instruments, including voltage and linearity checks and tests of uniformity and resolution, to ensure that all equipment is in proper working order.
3. Records status and results of instrument checks in appropriate log books.
4. Performs minor routine preventive maintenance on instrumentation and suggests equipment repair to supervisor.
5. Acquires computer-generated data for patient studies.
6. Checks operation and calibrates survey and monitoring devices against known standards.

D. Nonimaging procedures—

1. Operates all laboratory auxiliary equipment (pipets, centrifuges, water baths, pH meters, balances, etc.) during the performance of routine laboratory procedures.
2. Prepares solutions and materials when applicable and performs serial dilutions as required.
3. Performs venipuncture at proper times, separates blood components, and stores specimens appropriately.
4. Furnishes nurses and outpatients with accurate instructions concerning urine, stool, and blood collections.
5. Prepares samples for counting in either a liquid or well scintillation detection system, or both.
6. Counts specimens in scintillation counting system, performs appropriate calculations, and records results in laboratory record books.
7. Maintains quality control program for all laboratory assays and maintains records of all quality control procedures.
8. Judges acceptability of results and decides on necessity of repetition.

E. Radiation Protection—

1. Receives and checks all radionuclide shipments for contamination according to radiation safety regulations.
2. Performs various tasks associated with receiving, processing, distributing, and storing radioactive materials.
3. Disposes of radioactivity and contaminated materials in accordance with departmental, hospital, and federal regulations, maintaining records of all disposition.
4. Using appropriate instrumentation or other devices, monitors personnel, work areas, and patient rooms where applicable to ensure that levels of radiation do not exceed those levels defined in institutional and NRC regulations. Reports all excessive radiation exposure to the proper authority.

Educational Requirements:

The basic education necessary to qualify for the Level I position in Nuclear Medicine Technology is one of the following:

1. Graduation from an approved school of Nuclear Medicine Technology or equivalent qualifications.

2. Certification in Nuclear Medicine Technology or eligibility for certification.

Supervisory Control over the Position:

The Level I Technologist is under the immediate supervision of the Level II Technologist, who, in turn, is directly responsible to the Level III Technologist. All routine duties are performed under supervision with all problems and complications reported to the Level III Technologist and the Nuclear Medicine Physician in that order.

LEVEL II (Senior Technologist)

The Level II Nuclear Medicine Technologist performs a more extensive range of nuclear medicine procedures and tasks that require an advanced level of job knowledge and skill, normally acquired through continuing education.

Principal Duties and Responsibilities:

In addition to the principal duties and responsibilities of the Level I Technologist, the Level II Technologist:

1. Plans, schedules, assigns, and coordinates the day-to-day work of technical assistants, technologists, and students.
2. Assists in the development of new computer applications in Nuclear Medicine.
3. Assists in development of new tests by performing comparison studies and clinical trials, and implements these new procedures in the absence of a Level III Technologist.
4. Assists in developing quality control procedures and instructs other technical personnel on technical aspects of their routine use.
5. Assists in clinical teaching, evaluation of students' performance, and may oversee the work of both staff and student Technologists.
6. Assists in the conduct of specialized tests and studies either in vitro or in vivo, or both.
7. Maintains regular contact with physicians and other health care personnel regarding the nature, scheduling, or results of procedures performed within the Nuclear Medicine Department.

Education Requirements

In addition to the basic educational requirements for a Level I Technologist, one or preferably two years experience in nuclear medicine technology at Level I is required for Level II Technologists, in which competence has been demonstrated in:

1. Performing all procedures with adequate quality to assist physicians in the care of patients.
2. Working with professional and other technical personnel in a unified team effort.
3. Identifying and assessing patient's needs.

Supervisory Controls over the Position:

Same as for Level I Technologist, however the Level II Technologist performs work assigned with limited supervision. The Level II Technologist is immediately responsible to the Level III Technologist, who is directly responsible to the Medical Director of Nuclear Medicine.

LEVEL III (Chief Technologist/Technical Administrator)

The Level III Technologist performs responsible administrative, supervisory, and advanced technical work in a Nuclear Medicine Department. In addition to all the duties and responsibilities of other Nuclear Medicine technical staff, the Level III Technologist must have the ability to recognize, anticipate, and solve problems in a prompt and efficient manner. The Level III Technologist must have the ability to supervise and guide employees and to meet and deal effectively with administrative and professional personnel of other services and divisions.

Principal Duties and Responsibilities

1. Develops short- and long-term goals for the Nuclear Medicine Department and upon approval by superiors, implements plans to accomplish these goals.
2. Develops usage of laboratory space for both existing and new equipment, and participates with hospital administration in planning or expanding a Nuclear Medicine Facility.
3. Develops and administers an operational budget for the Nuclear Medicine Department.
4. Prepares and maintains records relative to licensing requirements of the Nuclear Regulatory Commission and the Food and Drug Administration.
5. Counsels employees regarding performance, conduct, attendance, and related matters. The Level III Technologist is responsible for overall hiring, training, evaluation, discipline, and discharge of the Nuclear Medicine technical and clerical staff.
6. Communicates with various vendors of radiopharmaceuticals and equipment as to the needs of the laboratory.
7. Organizes and conducts technologist staff conferences.
8. Implements safety procedures to protect personnel and patients from radiation exposure in the event of a radioactive spill.
9. Evaluates equipment maintenance and orders repairs when needed. Evaluates new equipment available on the market and prepares budget statements, cost analysis, and justification figures.
10. Regularly reviews records of personnel radiation exposure, dose calibration, and results of assays of radionuclidic purity, sterility, and pyrogen-free status and, in case of discrepancy, takes appropriate action.
11. Assesses need for and orders radiopharmaceuticals for operation of the Nuclear Medicine Department.

12. Participates in formal in-service training programs in the department and conducts in-service education programs for hospital personnel orientation to Nuclear Medicine.
13. Determines and documents duties and responsibilities of each position under his or her direction, maintaining current and accurate position descriptions.
14. Coordinates the Nuclear Medicine Technology Training Program in the absence of an Educational Coordinator. The Level III Technologist instructs interns and students, reviews student applications and selects trainees, prepares and updates program curriculum, and oversees performance of students on training assignments to ensure satisfactory completion of the program, where applicable.
15. Directs preparation and maintenance of all pertinent department records.

Educational Requirements:

To qualify for the position of Level III Nuclear Medicine Technologist, certification in Nuclear Medicine Technology is mandatory. In addition, one of the following is necessary:

1. Four years of successful nuclear medicine technology practice, in any combination of Level I or Level II experience.
2. Two years of college desired, plus adequate experience as determined by the Medical Director of the Nuclear Medicine Department.

Supervisory Control over the Position:

The Level III Technologist is directly responsible to the Medical Director of Nuclear Medicine for all clinical activities and duties performed. Assigned duties and responsibilities are performed independently within the delegated authority. Guidance and clarification are provided when necessary and as unprecedented situations arise.