

PROFESSIONAL BOARD FOR RADIOGRAPHY AND CLINICAL TECHNOLOGY

SCOPE OF PRACTICE: NUCLEAR MEDICINE RADIOGRAPHERS/TECHNOLOGISTS

1. INTRODUCTION

This document serves as a guide of the performance roles in terms of the scope of practice for Nuclear Medicine Radiographers (NMRs)/Nuclear Medicine Technologists (NMTs) registered with the Health Professions Council of South Africa (HPCSA) as registered by Professional Board of Radiography and Clinical Technology (PBRCT). The basis of this scope of practice reflects the knowledge and skills acquired through theory and clinical experience by the NMRs/NMTs at Higher Educational Institutions (HEI) and work integrated learning (WIL) respectively during training.

2. PURPOSE AND SCOPE OF THE DOCUMENT

The purpose of this document is to outline the scope of practice for NMRs/NMTs in which theoretical and clinical knowledge has been acquired and is transitioned into performance roles that are governed by the HPCSA. Further, in this document, the expected performance roles and skills by NMRs/NMTs are defined with a specific reference to what is unique to the nuclear medicine technology profession. By defining the performance roles of NMRs/NMTs, a professional framework for the safe handling and use of radionuclides during radionuclide preparations, imaging, assisting in treatment plans and execution of procedures essential to nuclear medicine technology.

3. QUALIFICATION FOR NUCLEAR MEDICINE RADIOGRAPHERS/TECHNOLOGISTS

In South Africa, NMRs /NMTs practice after their competency to do so has been endorsed by a HEI and are registered by HPCSA. South African qualifications recognised for registration by the HPCSA are the National Higher Diploma, National Diploma, Bachelor of Technology (BTech), Bachelor of Radiography (Hons) and the four-year Professional Bachelor's Degree in Nuclear Medicine from the different HEIs in South Africa. Further, foreign qualifications are considered for registrations after passing the HPCSA Board examinations.

4. PROFESSIONAL DUTIES OF NUCLEAR MEDICINE RADIOGRAPHERS/TECHNOLOGISTS

The NMRs/NMTs are multi-skilled professionals whose duties begin from the booking of a nuclear medicine procedure to the release of the patient from the department when the procedure is completed. Some of the duties are shared with other professionals while others are exclusively performed by NMRs/NMTs. The exclusive duties are the core duties that underpin the scope of practice for NMRs/NMTs. The core duties include; ensuring the safe handling and use of ionising and nonionizing radiation, molecular imaging for diagnostic, therapeutic and research purposes. The NMRs/NMTs independently perform these core duties or assist authorised practitioners/users in the completion of nuclear medicine and molecular imaging procedures and treatment.

NMRs/NMTs must be competent in performing the core duties and seek skills enhancement should the need arise. They should read and understand patients medical history in order to perform the correct procedure to answer the clinical question. Understand the patient's condition with regards to illness, medical condition and pending diagnostic or treatment procedure in order to appropriately manage the patient while in their care. Explain the nuclear medicine procedures adequately to the patient before, during and after procedures. Prepare patients prior to nuclear medicine procedures and recognise patient conditions that require urgent attention and management.

The field of nuclear medicine and molecular imaging is dynamic and rapidly evolving through nuclear medicine instrumentation, radiopharmaceuticals, imaging techniques treatment and patient management. The professional duties of NMRs/MNTs are embedded in these evolving areas through procurement of nuclear medicine instrumentation including quality control procedures, operation of imaging , laboratory and computer instrumentation; preparation, dispensing, dose calibration, administration and disposal of radiopharmaceuticals; and adapting imaging techniques and assisting in treatment procedures.

5. SCOPE OF PRACTICE FOR NUCLEAR MEDICINE RADIOGRAPHERS/TECHNOLOGISTS

The scope of practice for NMRs/NMTs shall include but is not limited to:

5.1 Patient care

Exercise judgement in responding to patients' needs before, during and after diagnostic imaging and treatment procedures; including radioactive and non-radioactive patient medication reconciliation, where necessary.

5.2 Quality Control

This includes evaluation and maintenance of quality control programs for all nuclear medicine instrumentation in order to ensure optimum performance and stability.

5.3 Instrumentation Operation

5.3.1 Gamma cameras and associated instrumentation with sealed and unsealed sources of radioactive material for transmission imaging with single photon emission computed tomography, computers for routine studies, lung ventilation apparatus according to manufacturers' specifications and operational procedures.

5.3.2 Hybrid imaging acquisition, processing, recording and analysing images. PET and SPECT imaging systems with computer tomography (CT) or magnetic resonance imaging (MRI) system for attenuation correction, transmission imaging, diagnostic CT or MRI.

5.3.3 Operation of scanners with X-ray tube for bone density measurement.

5.3.4 Non-imaging instrumentations

- a. Dose Calibrators
- b. Survey instrumentation for exposure and contamination
- c. Probe and Well counter instrumentation
- d. Infusion systems
- e. Radionuclide Generators
- f. All laboratory auxiliary equipment (pipettes, centrifuges, waterbaths, pH. meters, balancing scales) during the performance of routine laboratory procedures.
- g. Technetium-99m pseudo gas generators
- h. Nuclear Medicine information management system

5.4 Imaging Procedures

5.4.1 Utilising appropriate techniques and radiopharmaceuticals, and adjunctive medications as part of standard protocol to ensure optimum image quality.

5.4.2 The acquisition, processing, analysing and recording of images of cellular function, organ anatomy and physiology by means of the administration of radiopharmaceutical and adjunctive medication.

5.4.3 Ensure image quality through the performance of the various quality control tests and procedures.

5.4.4 Obtaining biological samples where necessary for the imaging procedure.

5.5 Radiopharmaceuticals / Radioisotopes

5.5.1 Safe handling and storage.

5.5.2 Procurement, preparation, identification, documentation, dose calculation, reconstitution, quality control, calibrations, administration and dispensing of radiopharmaceuticals.

5.5.3 Administer radiopharmaceuticals intravenously, orally, through inhalation, subcutaneously and instillation as required in respect of the resultant pharmacokinetics.

5.5.4 Appropriate disposal of radiopharmaceutical/radioisotope waste as for hazardous substances.

5.6 Radiation Safety

5.6.1 Practicing techniques that will minimise radiation exposure to patients, health care personnel and public by adhering to the As Low As Reasonably Achievable (ALARA) principle.

5.6.2 Managing all kinds of spills and unplanned release of radiation using established protocols under the authority of the relevant Radiation Safety Officer, where applicable.

5.6.3 Adhere to the recommendations of Radiation Control Directorate of the National Department of Health in South Africa.

5.7 Radionuclide Therapy

5.7.1 Receive, manage, record and store unsealed radionuclides and radiopharmaceuticals for therapeutic procedures and targeted molecular therapy;

5.7.2 Patient preparation and assisting in the administration of therapeutic radiopharmaceuticals and adjunctive medications under the supervision of a Nuclear Medicine Physician or Radiation Oncologist as part of standard procedures for treatment.

5.8 Non-imaging Procedures (In vivo and In vitro)

Requires the performance of all procedures including those requiring the acquisition of biological specimens for the determination of physiological function or biochemical processes by means of radioactive substances.

5.9 Training and Research

5.9.1 Supervise, teach and monitor students according to recommendation by HPCSA and the accredited HEI.

5.9.2 Supervising and teaching other NMRs/NMTs such as community service practitioners.

5.9.3 Actively participate in own or other research programmes in the division.

6. Sources/References Used

Consultations with NMRs and NMTs in Academic Hospitals, HEIs and Private. Input through google docs. See below for list.

Health Professions Act, 1974 (ACT No. 56 OF 1974). Regulations Defining The Scope Of The Profession Of Radiography. Department Of Health. Signed in 2020 by Dr Mkhize, Minister of Health.

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