

**AGENDA FOR CHANGE
NHS JOB EVALUATION SCHEME**



1. JOB IDENTIFICATION

Job Title:	Principal Clinical Scientist (Nuclear Medicine)
Reports to:	Section Head (Nuclear Medicine)
Department, Ward or Section:	Medical Physics and Bio-Engineering
CHP, Directorate or Corporate Department:	Clinical Support Division
Job Reference:	SSCLSSRAIGPNUC05
No of Job Holders:	1
Last Update:	December 2019

2. JOB PURPOSE

To provide expert scientific support to a broad range of highly specialised, complex Nuclear Medicine procedures, services and developments.

To assist the Section Head and the Consultant in Nuclear Medicine and to deputise for the Section Head in his/her absence, with full accountability to the Head of Medical Physics for all aspects of the work of the Section during the absence of the Section Head.

Ensures that work undertaken complies with the relevant statutory requirements including the highly regulated area of ionising radiation.

3. DIMENSIONS

The Section is the sole provider of Nuclear Medicine services to a population of approximately 300,000 in the Highland Health Board, Western Isles Health Board and West Grampian Health Board areas. It is a multidisciplinary team consisting of a medical Consultant in Nuclear Medicine, Clinical Scientists, Specialist Clinical Technologists, Nurses, Nursing Auxiliaries and Admin and Clerical staff.

Approximately 2000 patient examinations are performed each year covering a wide range of Nuclear Medicine studies.

Major facilities include:

- Two dual head Gamma Cameras for patient imaging, including one SPECT/CT system.

- Network of GE Xeleris workstations and a Link Medical workstation for processing, analysis and display of diagnostic patient images.
- Onsite radiopharmacy suites for aseptic preparation of radiopharmaceuticals and labelled blood products for patient injection.
- Gamma counter for measuring small quantities of radioactivity in patient samples.
- Sentinel Lymph Node Biopsy probe systems.

4. ORGANISATIONAL POSITION

Organisational chart attached (see end of file)

5. ROLE OF DEPARTMENT

The role of the Department of Medical Physics and Bioengineering is to provide specialist medical physics and bioengineering services to the populations served by NHS Highland, NHS Western Isles and the west part of NHS Grampian. Services are provided in the following fields: Clinical Measurement, Electromedical Equipment Services, Nuclear Medicine, Radiation Protection, Assistive Technology, Clinical Engineering, Cardio-Respiratory and Medical Illustration.

The Nuclear Medicine section provides both a diagnostic and therapeutic Nuclear Medicine service. It is staffed by a multidisciplinary team consisting of a full time medical Consultant Physician in Nuclear Medicine, Clinical Scientists, Technologists, Nurses and Admin and Clerical staff.

The majority of the work consists of diagnostic imaging of patients using radioactive materials. Radiopharmaceuticals are prepared on-site in a purpose-designed Radiopharmacy suite, which has been licensed by the Medicines and Healthcare products Regulatory Agency (MHRA) and administered to patients usually by intravenous injection or, sometimes by mouth or inhalation.

For imaging studies, once administered to the patient, the distribution of the radiopharmaceutical in the body may be imaged using a gamma camera. Various methods for counting radioactive samples are employed in non-imaging studies.

Typical examples of diagnostic examinations performed include:

- Myocardial perfusion imaging to diagnose coronary artery disease and assess prognosis.
- Bone scanning to assess whether cancer has spread to the skeleton.
- Neuroimaging to investigate patients with Alzheimer's disease or other forms of dementia and patients with suspected Parkinson's Disease.
- Renal imaging and measurement of the glomerular filtration rate for the assessment of kidney function prior to chemotherapy.
- Paediatric studies.
- Lung imaging to diagnose the presence of potentially fatal blood clots in the lung (pulmonary embolism).
- SeHCAT studies in the investigation of bile acid malabsorption.
- Sentinel node studies.

- Neuroendocrine imaging e.g. In111 Pentetreotide and I123 mIBG.

The other main aspect of the Section's work involves radionuclide therapy. Here, larger amounts of longer-lived radioactive substances are administered to patients with the aim of curing their disease or providing a palliative treatment. Examples include:

- Iodine-131 for an overactive thyroid gland or thyroid cancer
- Radium-223 to alleviate bone pain due to metastatic prostate cancer

Altogether a total of 30 different diagnostic and therapeutic procedures are currently offered, with new applications under development and introduced when clinically indicated.

The Department of Medical Physics and Bioengineering is one of the consortia members of the Scottish training scheme for Medical Physics. Following the completion of a one year Masters degree at the University of Aberdeen, pre-registration Clinical Scientists spend three months in the Nuclear Medicine section undergoing training. MSc students may also undertake their research project within Nuclear Medicine. The Section is accredited by the Institute of Physics and Engineering in Medicine (IPEM) as a Training Centre for Nuclear Medicine Technologists.

The Section assists with the National Arrangements for Incidents Involving Radioactivity (NAIR) Scheme, an arrangement for obtaining expert advice in the event of any incident involving radiation in the local area and also participates in the local arrangements for handling radiation casualties in the event of an incident at Dounreay or on a nuclear submarine berthed in waters off Highland region.

6. MAIN TASKS, DUTIES AND RESPONSIBILITIES

To assist the Section Head in managing the resources used by the Section in order to provide a high quality Nuclear Medicine service to the population served. This includes deputising for the Section Head in his/her absence.

To evaluate, modify and develop (in liaison with medical and nursing staff) existing and new investigations, including imaging and data processing methods, to maintain or improve standards of care. This involves leading some projects and participating in others.

To provide scientific advice, interpretation and action to clinicians regarding the appropriateness of particular diagnostic and therapeutic procedures.

To take responsibility for the daily management of the routine work of the Section which includes the need to deal with frequent queries from hospital staff, patients and patient's relatives or problem situations and equipment fault conditions.

To interpret and independently report the results of quantitative studies and some imaging studies.

To provide highly specialised advice on the interpretation of quantitative results to referring medical staff.

To evaluate clinical images in the absence of the Consultant in Nuclear Medicine and decide whether a SPECT-CT study is indicated. Authorises this as an Operator adhering to written guidelines as required by IR(ME)R 2017

To determine patient outcomes through:

- Reporting of results of investigations to clinicians in the absence of the Consultant in Nuclear Medicine when deemed by the postholder to be urgent or when requested urgently by the clinician;
- Assisting the Consultant in Nuclear Medicine when reporting scans on a daily basis;
- Checking scan reports, including interpretation when necessary, before they are despatched to the requesting clinicians.

To undertake the role of Specialist Clinical Technologist when necessary due to staff absence or when developing new techniques, in order to maintain a satisfactory level of service.

To perform complex, specialist analysis and image processing on Nuclear Medicine studies.

To carry out Radiopharmacy duties involving the preparation and dispensing of a wide range of radiopharmaceuticals under aseptic conditions.

To administer oral radioactive therapy to patients, to be closely involved in the administration of intravenous radioactive therapy, and to organise the individual radiation protection arrangements for each patient according to extant radiation legislation and risk assessments.

To administer radiopharmaceuticals to patients for diagnostic purposes.

To provide advice to patients and referrers on the effect of Nuclear Medicine investigations.

To assist the Section Head in the teaching, training and supervision of Section staff, pre-registration Clinical Scientists, medical staff, medical students, nurses and visiting staff, and in the writing of appropriate manuals and procedures to ensure that all relevant staff are aware of and follow agreed protocols and practice.

To contribute to the continuing professional development of Nuclear Medicine staff.

To participate in the research programme of the Section and the wider Medical Physics department. This may include projects undertaken as part of the MSc in Medical Physics.

To undertake various advisory roles which arise from time to time in the hospital and at national level in order to contribute to the continuing and improving standards of practice.

To jointly work in the specification, procurement and installation of new highly specialised and complex imaging equipment, computing systems and software.

To ensure procedures for the accumulation, storage, use and disposal of radioactive materials are adhered to within the Nuclear Medicine Section. To ensure that radioactive waste is correctly handled and that monthly limits for accumulation and disposal of radioactive materials are not exceeded. To provide a monthly record of the accumulation, use and disposal of all radioactive material in Nuclear Medicine to the Radiation Protection Section for notification to the Scottish Environment Protection Agency (SEPA).

To deal with and advise on radioactive decontamination of any contaminated personnel, equipment and areas and restriction of access to affected areas of the department to ensure the safe containment of radioactive contamination, including the reporting of any radiation incidents to the Radiation Protection Adviser (RPA) and Head of Medical Physics.

To be a Medical Physics Expert for diagnostic and therapeutic uses of radiopharmaceuticals in Nuclear Medicine as required by the Ionising Radiation (Medical Exposure) Regulations 2017;

To work in accordance with relevant safety standards, codes of practice etc and to implement relevant recommendations contained in hazard warning notices, safety information bulletins etc to minimise risk to patients and to the hospital, its staff and its property.

To order non-stock radioactive materials as required for patient investigations or treatments.

7a. EQUIPMENT AND MACHINERY

The post holder requires knowledge and experience of the principles of operation and practical use of the equipment in the Nuclear Medicine Section. This involves practical use, quality control and first-line diagnosis of faults with the following equipment:

- 2 dual head gamma cameras with acquisition and processing computer workstations.
- 3 radionuclide calibrators, used to measure quantities of radioactivity e.g. the amount of radioactivity administered to patients.
- 4 computer workstations (a mix of Windows and UNIX), for processing, analysis, reporting and archiving of medical images.
- Several PC's (Microsoft Windows), for general office applications (MS Word, MS Excel, MS Powerpoint), internet/ intranet access, e-mail, access to the Radiology Information System and PACS, access to the SCI Store Clinical Results Reporting System, PECOS e-procurement system and departmental databases.
- 2 Amersham isolators, for aseptic dispensing of radiopharmaceuticals for patient injection.
- Needles, syringes, tungsten syringe guards and shielded containers for safely handling radioactive materials.
- Various radioactive sources, for calibration, testing and quality control of equipment.
- 2 centrifuges, for processing blood samples.

- 1 automatic gamma counter, for measurement of small amounts of radioactivity in body fluids.
- 1 SmartVent generator, for production of radioactive aerosol used to image lung ventilation.
- 2 ECG monitors, for synchronising image acquisitions with the patient's cardiac cycle.
- Various radiation monitors, for measurement of radiation dose rate and detection of radioactive contamination.
- General office equipment (photocopier, fax etc).

The postholder is responsible (in conjunction with the Section Head) for the maintenance of a quality control system for equipment in the Nuclear Medicine Section. This includes establishing regular QC procedures in accordance with manufacturers recommendations and professional standards and guidelines, the maintenance of up-to-date written protocols, the performance of monthly, annual and some of the daily QC procedures, and the keeping of adequate records.

The postholder is responsible (in conjunction with the Section Head) for the testing and calibration of radionuclide calibrators and participating in national calibrator intercomparison exercises.

The postholder provides assistance to the Radiation Protection Section in the testing of the multi-channel analyser and radiation detection equipment.

7b. SYSTEMS

The section operates two gamma cameras each with acquisition/processing workstations. These are interfaced by a network of workstations using GE Xeleris and Link Medical software. The postholder routinely uses acquisition and image/data processing applications on these for patient investigations and QC procedures and may be required to modify image processing software to meet the specific needs of the Section.

The postholder uses PC applications for word processing purposes or for data management/processing. This involves devising spreadsheets for the processing of in-vitro patient data.

All patient appointments, attendance details and clinical reports are managed on a Radiology Information System (RIS). The postholder routinely uses this.

The post holder use the PECOS e-procurement system for ordering and recording receipt of radiopharmaceuticals.

8. ASSIGNMENT AND REVIEW OF WORK

The postholder is accountable to the Section Head (Nuclear Medicine) and through him/her to the Head of Medical Physics.

Objectives are agreed with the Section Head and monitored by Personal Development & Review.

Section objectives are discussed, prioritised, assigned and monitored at regular Section meetings

(monthly).

The Section Head will assign project and development activities, some of which the postholder may lead.

The degree of day-to-day supervision by the Section Head will normally be slight. Direct supervision will be available to cover unusual (or new) circumstances.

The clinical work of the section, some of which is complex and non-routine, is generated by requests for investigations from Consultant and other medical staff.

9. DECISIONS AND JUDGEMENTS

The postholder is expected to deal with problem situations and equipment faults as well as frequent queries from patients and other hospital staff and to decide on the appropriate courses of action.

In the absence of the Section Head the post holder deputises for him/her, with full accountability to the Head of Medical Physics for all aspects of the work of the Section during the absence of the Section Head.

The postholder authorises requests for Nuclear Medicine investigations according to written procedures issued by the Practitioner in accordance with the Ionising Radiation (Medical Exposure) Regulations 2017.

The postholder judges the satisfactory completion of investigations before discharging the patient from the Section and, if required, provides a provisional report of the scan to the requesting clinician.

The postholder makes informed decisions and judgements in order to satisfy relevant statutory requirements when acting in the role of Medical Physics Expert, Operator and equivalent duties to those of a Radiation Protection Supervisor.

10. MOST CHALLENGING/DIFFICULT PARTS OF THE JOB

Prioritising the demands of participating in a consistently accurate, prompt and effective Nuclear Medicine service in the face of competing requirements.

Maintaining and developing theoretical and practical knowledge of Nuclear Medicine and remaining up-to-date with scientific and clinical practice of the specialty with changes introduced in a controlled manner.

Maintaining a safe environment for staff, patients, visitors and others where there is a risk of radioactive contamination and exposure to ionising radiation.

Responding to urgent requests for reports, technical or computing problems in an appropriate and timely fashion.

Communicating complex issues to a variety of groups including patients and other staff. Dealing with anxious patients.

11. COMMUNICATIONS AND RELATIONSHIPS

The postholder:

- Liaises directly with Consultant and other medical staff regarding the clinical requirements for individual patients' investigations;
- Liaises directly with the Consultant in Nuclear Medicine, local Medical Physics staff, nursing staff and other hospital staff regarding carrying out and reporting of patient investigations;
- Produces written reports of a complex and specialist nature;
- Liases with Medical Physics and Nuclear Medicine staff in other hospitals;
- Liaises with equipment manufacturers, suppliers and engineers;
- Communicates complex issues to patients, their representatives and others as required;
- Deals with queries, which may be complex, from patients, medical staff, hospital managers and others;
- Participates in local and national working parties/committees as required.

12. PHYSICAL, MENTAL, EMOTIONAL AND ENVIRONMENTAL DEMANDS OF THE JOB

Physical Effort

Certain radiopharmacy and QC procedures as well as radiation protection measures require lifting of heavy awkward objects (radionuclide generators, QC phantoms, lead shielding etc). Assistance to moving immobile patients from trolleys onto scanning beds may be required.

Mental Demands

The post requires a high level of concentration for the performing of patient investigations and QC procedures, calculation and validation of test results, checking of reports, documents and image data. Frequent phone and personal queries from hospital staff, patients and patient relatives and the need to respond to problem situations and equipment fault conditions make the work pattern unpredictable.

Emotional Demands

In the case of problems with equipment performance, radioisotope deliveries, unsatisfactory scan quality or similar issues the postholder occasionally has to inform patients of these and make alternative arrangements for the repeat or rescheduling of the investigations.

Environmental Conditions

The post involves exposure to ionising radiation from open and sealed radioactive sources, chemicals and occasional exposure to patient's body fluids through blood or urine samples or spillages.

13. KNOWLEDGE, TRAINING AND EXPERIENCE REQUIRED TO DO THE JOB

The postholder must have an honours degree in Physics or an equivalent subject. A higher degree (MSc in Medical Physics or PhD) is also a requirement.

The postholder must hold the Postgraduate Diploma of the Institute of Physics and Engineering (IPEM) or demonstrate equivalent experience.

Knowledge and experience to be entitled as a Medical Physics Expert (MPE) in Nuclear Medicine (or working towards this) is required.

Registration as a Clinical Scientist with the Health and Care Professions Council is essential and the postholder must undertake a programme of Continuing Professional Development (CPD).

The postholder must have extensive relevant experience (normally not less than 6 years) including:

- The supervision of scientific staff, technical staff and resources;
- The application of diagnostic and therapeutic nuclear medicine techniques;
- The use of relevant instrumentation including gamma cameras, computers, sample counters etc.

The postholder must have good oral and written communication skills.

The postholder must have good computing skills.

Membership of a Professional body e.g. IPEM is desirable.

14. JOB DESCRIPTION AGREEMENT

I agree that the above Job Description is an accurate reflection of my duties and responsibilities at the date of signing.

Job Holder's Signature:

Manager's Signature:

Date:

Date:

