The radiologist and nuclear medicine
Second edition
Purpose

This paper addresses the specific issues related to radiologists working in a nuclear medicine environment. The range of radiologist input varies from ad hoc sessional reporting (for example, one-hour session per day) to committed direct clinical care (DCC) activity within a formal job plan. The purpose of this document is to guide members and Fellows of The Royal College of Radiologists (RCR), clinical and medical directors and regional specialty advisors in job planning and at appointment committees. This document replaces The Radiologist and Nuclear Medicine (BFCR(07)5) which is now withdrawn.

Clarification on legislative aspects

- A radionuclide radiologist (Certificate of Completion of Training [CCT] in Clinical Radiology with Level 1 Competency in Radionuclide Radiology\(^1\)) has specialty training to satisfy the requirements for a diagnostic Administration of Radioactive Substances Advisory Committee (ARSAC) certificate for imaging procedures included in Appendix 1 Part A from the Notes for Guidance on the Clinical Administration of Radiopharmaceuticals and Use of Sealed Radioactive Sources.\(^2\) Requests for other diagnostic serials will require additional supporting information.\(^3\) Level 2 competency in radionuclide radiology may satisfy the requirements for a diagnostic serial in FDG PET-CT.\(^1\) This is also dependent on having the necessary service support infrastructure in place for PET-CT such as medical physics expertise.

- A nuclear medicine physician (CCT in Nuclear Medicine) has specialty training in diagnostic and therapeutic aspects of nuclear medicine to satisfy requirements for a diagnostic certificate for all procedures included in Appendix I Parts A and B and a therapy certificate for all procedures included in Appendix I Part C of ARSAC Notes for Guidance.\(^2\)

- A dual-accredited radiologist has comprehensive training in all aspects of nuclear medicine (CCTs in Clinical Radiology [with Level 2 Competency] and Nuclear Medicine).

- PET-CT services can be run and scans justified by a radiologist (with Level 2 Competency in Radionuclide Radiology\(^1\)) or a nuclear medicine physician who has the appropriate serials included in the Schedule to the issued certificate.

- Radiologists who do not hold an ARSAC certificate can report conventional nuclear medicine procedures and PET-CT scans in accordance with their entitlement, under the Ionising Radiation (Medical Exposure) Regulations (IR(ME)R).\(^3\) from their employer. Entitlement will depend on adequate training and agreement with a local ARSAC certificate holder. Maintenance of competence will require sufficient volumes of scans to be reported annually. For PET-CT, it is envisaged that such radiologists will require additional training.

Historical perspective

Guidance already exists from the Royal College of Physicians (RCP) regarding consultants who undertake substantial commitments within nuclear medicine departments.\(^4\) The following guidance is applicable to consultants working in smaller departments who have flexible commitments to nuclear medicine and to those involved in larger departments which provide a wider range of services fuelled by the rapid growth in hybrid imaging (SPECT-CT and PET-CT), nuclear cardiology and to a lesser extent radionuclide therapy.

These recommendations may also be of value for Appointment Committees where there is a requirement for nuclear medicine service provision. Medical directors and clinical directors may wish to use dedicated nuclear medicine sessions to form physician posts rather than radiology posts where deemed suitable for the needs of the trust.

Radionuclide radiology specialty

Radionuclide radiology involves the practice of nuclear medicine combined with the interpretation of anatomical imaging. The advent of PET-CT and SPECT-CT and the prospect of PET-MR require specialist interpretation and training. The development of these techniques has resulted in a restructuring of radionuclide radiology subspecialty training in recognition of these requirements.\(^1,5\) In addition, the role of radionuclide therapy is increasing; for example, selective internal radiotherapy with Yttrium-90 microspheres for patients with inoperable liver metastases. The imaging aspects of radionuclide therapy are complex and also mandate proper training and experience.

\(^{*}\) Radiologists completing Year 6 training in nuclear medicine who entered the specialty on or after 2007 are now awarded Certificate of Eligibility for Specialist Registration (CESR) in Nuclear Medicine rather than a CCT. These individuals will satisfy requirements for ARSAC certification as per a nuclear medicine physician.
The sessional radiologist

Many district general hospital departments undertaking radionuclide imaging procedures have a radiologist with an ARSAC certificate who carries out reporting in a flexible fashion. Several of these radiologists are approaching retirement and it is vitally important that their commitments are recognised in job plans. It may be possible to combine this aggregate commitment with DCC sessions. However, recognition needs to be made of the time taken in the attendant administration involved in nuclear medicine, particularly with respect to ARSAC duties. New appointees should have undertaken radionuclide radiology subspecialty training or its equivalent.

The radiologist in a smaller single camera department

Many departments working at this level are undertaking a mix of procedures in the range of 800–1,500 per year. This commitment should be recognised in the form of flexible DCC sessions; for example, combining with other reporting so that when service commitments increase this can be translated into formal sessions in a more specialist job plan.

The radiologist in a larger single camera department

Radiologists in this category will be undertaking around 1,500–2,400 examinations per annum, which is the recommended guideline for a single gamma camera. It is recommended that they have a minimum of two or three sessions of DCC/supporting professional activity (SPA) related to radionuclide imaging. There should be a lead radionuclide radiologist with formal sessional allocation. Often, workload is divided among more than one ARSAC certificate holder.

The radiologist in a twin camera department

A formal structured job plan should be in place reflecting the precise nature of the studies such as dedicated cardiac sessions. The radiologist may be involved in reporting PET-CT examinations and current college (RCP/RCR) guidelines should be implemented. Such departments would be carrying out in the region of the 3,000–4,000 examinations per annum and typically have a lead radiologist accredited in radionuclide radiology.

The radiologist in a large department

Activities are often in excess of 4,800 patients per annum with three cameras. These departments usually have an established nuclear cardiology facility and undertake SPECT-CT and PET-CT reporting. There may be a significant requirement for attendance at cancer multidisciplinary team meetings (MDTMs) to provide specialist input regarding PET-CT and radionuclide imaging. Job plans for these consultants may follow the guidance for nuclear medicine physician job plans more closely.

Radionuclide radiologists can undertake the imaging component of the workload, but these departments often also require one or more dual-accredited consultant(s) or nuclear medicine physician(s) if a comprehensive service including therapy is to be undertaken (for example, treatments for thyrotoxicosis; Samarium/Strontium therapy for prostate and breast cancer; and Iodine-131 mIBG for phaeochromocytoma and neuroblastoma). New appointees should ideally have the breadth of training and experience associated with that provided by nuclear medicine physician training or dual training in radionuclide imaging and nuclear medicine or its equivalent. Some departments may also work collaboratively with colleagues in cardiology, endocrinology and clinical oncology.

Clinical networks

The presence of a ‘hub-and-spoke’ model facilitates the exchange of clinical expertise across a number of departments. Teleradiology allows such image exchange.

Standards

It is a legal requirement that all procedures are carried out in accordance with written procedures and protocols, and these are usually derived from national (British Nuclear Medicine Society [BNMS]), European or American guidelines.

Single-handed specialists working independently cannot easily fulfil the requirements of clinical governance. A minimum of 0.4 whole-time consultant overlap within single-handed practices is encouraged to avoid clinical isolation. In some cases, this may be achieved by ensuring that the practitioner rotates to another unit as part of their weekly commitment or another practitioner rotates in to the unit if that is more appropriate to the caseload. Collaborative links with larger regional centres offers a means of sharing experience and opinions between...
departments and facilitates a wider audit of performance than possible in a single smaller department. This could theoretically involve teleradiology depending on individual circumstances.

The training standards for doctors working in the subspecialty of radionuclide radiology have been specified in the appropriate curriculum documents. The National Institute for Health and Clinical Excellence (NICE) guidelines

The appropriate use of nuclear medicine services in specific circumstances has been referred to in NICE guidelines into the management of specific diseases; for example, in lung cancer. In addition, the NICE technology appraisal on myocardial perfusion scintigraphy has identified some guidelines for its appropriate use. More recently, NICE has published clinical guidelines on assessment and diagnosis of recent onset chest pain or discomfort of suspected cardiac origin and the management of stable angina. NICE is currently evaluating the role of SeHCAT (Tauroselcholic acid) for the investigation of bile acid malabsorption (BAM) and measurement of bile acid pool loss. It is likely that this guidance will increase the demand for this test and there will be implications for nuclear medicine departments across the country. Strictly SeHCAT is classed as a non-imaging test and may not be included as a routine diagnostic serial on ARSAC certificates.

Continuing professional development (CPD)

Radiologists should ensure that they undertake CPD accreditation in proportion to the nuclear medicine activities they supervise and report. This is particularly true of mixed sessions of radiology and nuclear medicine.

Research

Nuclear medicine techniques are used extensively in medical research. All consultants are expected to take an active interest in research, although the time commitment to this activity will vary according to individual interest and hospital type.

Local management duties

Many consultants have managerial duties as heads of department and budget holders and undertake appraisals of medical staff. Protected time is necessary for departmental and directorate meetings. Clinical directors may have responsibility for service planning, requiring additional time allocation. Radionuclide radiologist consultants have unique legal responsibilities with respect to ARSAC certification for diagnostic, therapy and research procedures. This, and their expertise in radiation protection, often requires their participation on committees such as radiation protection and research ethics.

Regional and national work

Adequate provision for local and off-site managerial duties and committee work should be included in the job plan. Depending on the frequency, this may be included as a weekly programmed activity (PA) if necessary, but agreement on how this leave for external duties will be handled should be included in the job plan.

Workforce requirements

The workload of radiologists involved in the provision of radionuclide imaging and nuclear medicine covers a broad spectrum, ranging from reporting and MDTM attendance providing specialist input on interpretation of radionuclide imaging, managing departments, overseeing service development, and in some cases directing radionuclide therapy. Adequate time must be incorporated into the job plan for correlative imaging. Workload estimates must balance the time element required for procedures grouped by type and allow for variations between consultants.

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References


