# JOB IDENTIFICATION

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| **Job Title** | **Clinical Technologist****Band 5** |
| **Responsible To:** | **Head of Nuclear Cardiology** |
| **Department(s):** | **Nuclear Cardiology, Glasgow Royal Infirmary** |
| **Directorate:**  | **Diagnostics** |

# JOB PURPOSE

To support the scientific and technical aspects of the nuclear medicine service. This includes:

1. To work in Nuclear Cardiology, ensuring a high quality diagnostic imaging service within a safe environment for staff and patients.
2. To perform all types of scan and assist with specialist stress testing. This includes working in other sections of the Service. This may extend to other hospitals in Glasgow.
3. To contribute to the development and implementation of new procedures and protocols and to participate in the research of the department.
4. To assist in the training of other staff to ensure continuity of service.

# ROLE OF THE DEPARTMENT

The Department of Nuclear Cardiology provides a comprehensive and wide ranging Nuclear Imaging (over 6,500 procedures) and stress testing (over 3,000 procedures) service to Glasgow Royal Infirmary as well as providing a tertiary service to other hospitals from Dumfries to Stornoway covering the whole of the West of Scotland. Both in-patients and outpatients are investigated.

# ORGANISATIONAL POSITION

For this post the immediate structure is:



# SCOPE AND RANGE

Patient stress testing is an integral part of the service and is performed by all Nuclear Cardiology technical and scientific staff, with senior technologists leading on this. A large proportion of these are highly specialised pharmacological stress tests. The reporting of all rest and stress ECGs is the responsibility of Nuclear Cardiology staff. Many patients are at high risk of cardiac arrest and/or may have severe heart failure.

All scans require the use of radioisotopes injected intravenously. Results of scans determine if further invasive investigations leading to coronary bypass surgery or angioplasty are performed. All scans are complex Nuclear Medicine investigations requiring detailed quantitative computer analysis.

The department has 2 solid state gamma cameras along and a large associated imaging network (Total capital cost is > £1,000,000). Analysis and reporting of all scans is the responsibility of Nuclear Cardiology staff.

As the department has no nursing input and limited clerical resources, all staff have to perform clerical, nursing, secretarial and other duties (often during imaging time) to allow for an efficient delivery of service. This requires staff to be competent on an even wider range of equipment, and they must be able to work on their own without immediate local support.

The department is managed by Consultant Clinical Physics Scientific staff with limited input from Cardiology staff and Nuclear Medicine Physicians (Lead IRMER Practitioner).

The department is integrally involved in the training of Medical staff (specialist registrars and SHO staff from Radiology, Nuclear Medicine and Cardiology), Clinical Scientist staff (including national trainees), Medical Technical Officers and other Professionals allied to Medicine. In addition nursing staff are given general background training in Nuclear Cardiology. All members of staff contribute to this training. The department is active in research, supporting MSc/MEng projects, PhDs and Cardiac Medical Research Fellows funded from grant applications.

The following gives some examples of relevant regulations with abbreviations used subsequently: Ionising Radiations Regulations 2017 (IRR 2017), Ionising Radiations (Medical Exposure) Regulations 2017 (IRMER 2017) and Environmental Authorisations (Scotland) Regulations 2018 (EASR 2018).

# MAIN DUTIES/RESPONSIBILITIES

## Supervisory within area of responsibility (~10%)

1. Responsible on a day-to-day basis, within area of work being performed for ensuring service is delivered to the highest professional and clinical standards.
2. Assists in planning and scheduling the patient workload of a number of complex, highly specialised tests, which has to take account of emergencies and life threatening issues, which can arise during the performance of these tests. This also requires responding flexibly to demands for urgent cases.
3. Ensure that all work undertaken complies with statutory requirement, policies and procedures with respect to patient care are followed (including IRR2017, IRMER 2017, local rules).
4. Makes senior staff aware of unusual or abnormal situation/events during clinical imaging and stress testing.
5. Participates in departmental audit and quality assurance systems, results of which may change working practice and departmental procedures.
6. Works with other staff to fulfil departmental procedures and optimise patient investigations.
7. Assists delivering teaching and training to Nursing staff, trainee Clinical Scientists, Trainee Clinical Physics Technologist staff and Medical staff.
8. Co-ordinates leave with colleagues to ensure continuity of patient services.
9. Assists in amending local rules and procedures as requested by and in collaboration with managerial staff.
10. Actively promotes health and safety issues with all staff.
11. Documents equipment problems.
12. Participates in service review meetings and takes appropriate follow-up action to improve procedures.
13. Assists in patient appointment system in absence of secretarial staff to ensure continuity of the service.
14. Responsible for the safe use of equipment in the department.
15. Assists in the daily testing of equipment in the department.
16. Uses spreadsheets and data-bases for recording technical and clinical results.
17. Ensures patient records and confidentiality are maintained in accordance with health board policies and regulations including the Data Protection Act and Caldicott Guidelines.

## Operational – Nuclear Imaging (~65%)

1. Maintains a high level of professional practice and attention to detail to ensure high quality diagnostic information and correct patient record keeping.
2. Handles all radioactive substances safely within the local rules/procedures
3. Perform daily QA on radionuclide calibrators.
4. Maintains inventory on all isotopes in the department on a daily basis.
5. Performs routine contamination monitoring.
6. Performs all work within the principles of radiation protection dose reduction.
7. Performs routine radioactive waste management tasks.
8. Reports all incidents involving unsealed radioactive substances to the Radiation Protections Supervisor.
9. As a trained operator, identifies patients and the appropriateness of a requests for investigations under IRMER 2017.
10. Explains all procedures to patients.
11. Performs a range of highly specialised cardiac scans.
12. Performs routine nursing procedures within the department as required (patient handling, care management, etc.).
13. Assists patients on and off scanning couches and exercise bikes.
14. Works in a clean and tidy manner to ensure no cross infection between patients.
15. Backs up images at the end of each patient study to ensure no loss of data.
16. Operates gamma cameras with associated complex computing systems.
17. Operates a range of radiation monitoring devices.
18. Liaises with porters, ambulance and ward staff to ensure efficient patient imaging.
19. Records accurately all data by adding radioisotope activities onto patient records.
20. Reassures anxious patients, carers and relatives attending the Department.
21. Maintains patient confidentiality at all times, particularly as this includes taking a detailed clinical history essential for the interpretation of scans and diagnosis of their condition.
22. Works in a flexible manner to ensure all patient imaging is performed.
23. Performs routine QA on all gamma camera systems.
24. Checks activities of unsealed radioactive substances prior to administration to ensure correct patient doses.
25. Ensures the area they work in has adequate supplies for all imaging patient studies.
26. Ensures all scans are adequate for clinical analysis before the patient leaves the department.
27. Performs scans unsupervised if senior staff are available in the department for support. This requires intense observational skills to recognise any clinical problems that are likely to occur.
28. Performs intravenous cannulation of patients to allow administration of radiopharmaceuticals.
29. Administers radiopharmaceuticals intravenously.
30. Calculates and dispenses the appropriate activity of radioisotope for individual patients.
31. Performs analysis on complex radionuclide investigations to be included in reports.
32. Performs and analyses scans being performed as part of local and National research protocols.
33. Works as appropriate in response to demands of the service. This may extend to other Nuclear Imaging departments in Glasgow.
34. Brings to the attention of staff reporting scans any abnormal or unexpected findings.
35. Authorises scans under written authorisation for a range of procedures agreed and documented by the IRMER Practitioner.
36. Works (with a senior member of staff available for support) out of hours when required to cover emergencies or delayed.

## Operational – Physiological Measurement (~65%)

1. Performs daily QA on defibrillators.
2. Performs daily stock checks on emergency and stress testing drugs.
3. Prepares patients for all investigations after formally identifying them.
4. Prepares patient for stress tests by explanation of procedures, skin preparation, electrode placement, blood pressure measurement and cannula insertion.
5. Acquires resting ECGs and ensures they are of diagnostic quality.
6. Assists, after suitable training, with stress testing and prepares exercise test reports.
7. Acts as the first line help if a patient is unwell as there is no nursing backup.
8. Has Immediate Life Support Skills to assist in case of cardiac arrest.
9. Measures blood pressure as required by clinical situations.
10. Acts as an initial reporter for ECGs - after suitable training.
11. Assists in ensuring that the local policy for stress testing is followed.
12. Prepares drugs for pharmacological stress testing jointly with attending physician.

## Educational (~5%)

1. Delivers training and actively undertakes continuous personal development.
2. Contributes to the training and education of other members of staff and trainees.
3. Presents results of audit and reports of other meetings to departmental staff.
4. Attends local and national meetings to gain expertise in the field.
5. Undertakes structured in-house training in areas requiring highly specialised knowledge.
6. As required, undertake the IPEM training scheme leading to DiplIPEM(T). This will be assessed primarily by work based competencies but will include formal educational placements as necessary.
7. Participate in mandatory training and actively pursue Continuous Professional Development, keeping an up to date personal record.

## Quality System (extra duties) (~5%)

Takes a role in one of the following areas, to facilitate efficient running of the department.

1. Goods inward officer.
2. Calibration officer.
3. Forms and documentation officer.
4. Isotope supplies/waste disposal officer.
5. Quality control officer.

# SYSTEMS AND EQUIPMENT

The post holder will be highly proficient in a wide range of specialist imaging, radiation, monitoring and computerised equipment. A thorough knowledge of radio-isotopes and associated regulations is essential. Other IT systems are also used on a daily basis to appoint patients, schedule workload and perform statistical analyses The postholder must be aware of and comply with the Data Protection Act, CRIS, Caldicott Guidelines and local policies regarding confidentiality and access to patient records.

Systems and software used on a daily basis to analyse and manipulate patient images, generate scientific measurements, access clinical information, maintain patient databases, plan daily workload, carry out statistical analysis and aid continuing professional development include:

Equipment

* Gamma cameras (including SPECT/CT scanners and solid state gamma cameras)
* Radionuclide dose calibrators
* Gamma counter
* Contamination monitors
* Dose rate meters
* Blood pressure monitors
* Stress testing equipment (bicycle ergometer, 12-lead ECG, defibrillator, crash drugs)
* Beds, chairs and patient handling equipment.

Systems

* Patient Administration System
* Radiology Iformation System
* Picture Archiving and Communication System (PACS\_
* Nuclear Medicine Processing systems (4DM, Xeleris, Hermes, Cedars-Sinai)
* PCs with MS Office
* Supplies ordering system.

# DECISIONS AND JUDGEMENTS

The post-holder, while part of a multidisciplinary team works within a planned overall framework, but has scope for independent action in dealing with the deliver of the service to patients. This requires sound judgement and initiative in decision making involving complex issues, particularly in this area of work dealing with the assessment of patients with, or suspected of having, significant cardiac problems and undergoing stress testing which is designed to precipitate patient’s cardiac symptoms.

The post-holder:

1. Is accountable for their own professional actions when working independently.
2. Plans work with others to optimise patient throughput.
3. Responds to clinical demands for urgent scans, modifying workload appropriately
4. Optimises the patient imaging whilst accommodating, in many patients, their physical or perceived concerns as to the performance of the scans.
5. Analyses complex Nuclear Imaging studies, results of which are incorporated in to the final clinical report. As these images are complex, sound judgement and skill is required to obtain accurate clinical results.
6. Recognises potential radioactive contamination and takes control of any incident involving a spill of unsealed radioactive substance.
7. Works to continually improve the systems and procedures in place to improve the service to patients.
8. Decides, through experience and knowledge, whether images are of sufficient quality or whether additional imaging is required.
9. Acting as an operator under IRMER 2017, decides whether the request for a patient study is authorised and appropriate.
10. Is acutely aware of clinical problems that can occur during these highly specialised tests. Uses keen observational skills to monitor the patient closely for any verbal or non-verbal signs of distress or symptoms.

# COMMUNICATIONS AND RELATIONSHIPS

Good communications on complex and sensitive matters on numerous occasions throughout the day is essential. This is with patients, relatives, carers, hospital staff and external agencies (GPs, interpreters, field engineers, etc). The post-holder must be aware of the sensitive nature and confidentiality of many of the topics discussed, and be continuously courteous, tactful, empathetic and diplomatic. As all scans involve the use of radioactive material, the common and significant fear of many patients need to be overcome.

In particular the post-holder must deal with the following:

**Patients**

1. Establish good rapport and explain complex and detailed procedures to patients attending for scans. This includes many anxious and nervous patients about to undergo stress testing and complex radionuclide imaging.
2. Obtain informed, signed signed confirmation that the procedure has been explained and reassure the patient (and often relatives) as to the associated risks and benefits of the use of unsealed radioactivity.
3. As the department has no nursing support, the staff have to deal with the many diverse needs of patients.
4. Deal with very ill patients (e.g. with severe heart failure) and patients who have only recently been informed they have cancer.
5. Call senior staff if they have any concerns as to the well-being of a patient.
6. Assist medical staff in obtaining good effort from patients during stress testing and monitor the patient closely for any non-verbal signs of distress.
7. Work flexibly in a team of diverse staff to obtain optimum diagnostic information.
8. Obtain a detailed clinical history from patients, requiring tact and confidentiality, as this information is of a highly personal nature.

 **Other Staff**

1. Consult scientific and medical staff and senior technologists for advice or assistance as required
2. Assist and liaise with staff servicing and repairing equipment if requested by senior staff.
3. Communicate with nursing staff and medical staff as to patient needs.
4. Present professional presentations to other groups of staff at local and national meetings.
5. Liaise with ambulance control and portering staff.
6. Work closely and effectively with other Clinical Physics Technologist staff.

# PHYSICAL DEMANDS OF THE JOB

**Physical Skills**

1. Skills to safely manoeuvre wheelchairs, trolleys and other test equipment (daily).
2. Administer intravenous injections including unsealed radioactive substance (many times daily).
3. Cannulation of patients (several times daily).
4. Excellent hand-eye co-ordination to accurately delineate cardiac structures when analysing complex scans (many times daily).
5. Manual dexterity to accurately, aseptically and safely dispense individual patient doses of radiopharmaceuticals for intravenous injection. (Many times per day).

**Physical Demands**

1. Patient movement with use of mechanical aides, manoeuvre patients (weekly).
2. Push trolleys, wheelchairs (many times per day).
3. Patient movement on/off scanning equipment (many times daily).
4. Stand/walking for the majority of the shift whilst concentrating on patient wellbeing and accurately typing clinical and technical details to allow accurate diagnosis of patient conditions.
5. Standing at isotope preparation station for periods preparing intravenous injections.
6. Change heavy collimators on gamma cameras (using collimator carts & hand driven gearing).
7. Handling and carrying isotope delivery drums (weighing approximately 6 kg.).

**Mental Demands**

1. Concentration required when checking patient documentation prior to administration of radiopharmaceuticals including patient identity check prior to administration.
2. Intense concentration over long periods is essential to observe patients for verbal and non-verbal signs of distress or symptoms whilst operating gamma camera computing systems. Tests are designed to precipitate patient symptoms.
3. Observation of potential contamination incident.
4. Concentration required when explaining procedures to patients and obtaining signed confirmation of the explanation.
5. Concentration required performing complex computer analysis of cardiac scans.
6. Concentration required for long periods.

**Emotional Demands**

1. Performing effectively under pressure in a busy, cramped imaging facility.
2. Communicating with anxious/worried patients /relatives (daily)
3. Promptly coping with ill or severely hypotensive patients pre or post exercise (weekly).
4. Imaging severely ill and unwell patients. (daily)
5. Communication with patients unsure of diagnosis (daily)
6. Dealing with patients with severely challenging behaviour (approx 1/month)
7. Dealing with patients waiting for extended periods (daily)
8. Concentration and collaboration with team members to ensure smooth patient throughput.
9. Dealing with patients undergoing cardiac arrest, severe angina or heart attack during or after stress testing. Assisting with transfer to CCU if required.
10. Working as part of the crash team in case of cardiac arrest.

**Working Conditions**

1. Exposure to blood (daily – several times).
2. Exposure to unsealed radioactive substances (many times daily).
3. Exposure to verbal aggression (occasionally).
4. Exposure to physically aggressive behaviour (rare).
5. Imaging rooms are poorly ventilated and very warm.

# MOST CHALLENGING/DIFFICULT PARTS OF THE JOB

1. Assisting to encourage patients to perform good stress tests despite their reluctance.
2. Ensuring patient safety.
3. Communicating with worried/anxious patients and relatives (daily).
4. Communication with multidisciplinary team
5. Maintaining a safe environment within which there is a risk of radioactive/ contamination/external exposure for staff, visitors and patients.
6. Following standard procedures to make sure the many legislative parts of the job are fulfilled - particularly with respect to radiation legislation and data protection.
7. Radiation protection advice to staff in the absence of the radiation protection supervisor including dealing with spills.
8. Managing own workload to ensure smooth throughput of patients and calling for assistance if required.
9. Maintaining accuracy in all records taken, in a busy department with varied and continued demands on individuals
10. Awareness at all times of the patient’s well-being, particularly during stress tests which may lead to adverse cardiac events.
11. Ensuring all images are of diagnostic quality, particularly when dealing with distressed or unhelpful patients.

# knowledge, training and experience required to do the job

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|  | Essential | Desirable |
| EDUCATION/QUALIFICATIONS |
|  | A relevant science or technology-based degree (BSc) (e.g. Physics) or BSc in Diagnostic Radiography (or HNC/HND with profile of knowledge and training equivalent to BSc) | Registration (or eligibility for registration) with the Health Care Professions Council or on the Register for Clinical Technologists (RCT) held by the Institute of Physics and Engineering in Medicine (IPEM). (If not the post-holder will follow a training plan and is expected to achieve the award of DipIPEM (T) within the 2 years.)Membership of IPEM, at an appropriate level or membership of the Royal College of Radiographers. |
| EXPERIENCE/KNOWLEDGE |
|  | Evidence of training or experience in planning, investigating and performing technical projects. | Knowledge of physics / technology underlying Nuclear MedicineFamiliarisation with radiation protection principles and all current legislation including IRR 2017 and IRMER 2017Intravenous injection certificateILS trainedEvidence of additional post- graduate experience obtained in the clinical setting in analysing and documenting clinical studies and results.  |
| SKILLS/ABILITIES |
|  | Ability to work unsupervised.Good communication and Interpersonal skills with staff and patients.Good organisational skills.IT literate. | Advanced skills in handling and preparing radioactive materials and in the use of a wide range of nuclear medicine and associated equipment and computer applications |
| PERSONAL AND OTHER |
| . | Efficient and flexible attitude to work.Good timekeeper, smart appearance.Ability to work as part of a team or independently.Ability to work under pressure.Systematic, methodical approach to workAttention to detail |  |