

**NHS GREATER GLASGOW & CLYDE**

**JOB DESCRIPTION**

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| 1. **JOB IDENTIFICATION**
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| **Job Title:****Responsible to:** | Dosimetrist (Practitioner Clinical Technologist) Lead Dosimetrist |
| **Department:** | Radiotherapy Physics, Beatson West of Scotland Cancer Centre, Gartnavel & Monklands Hospitals, Diagnostic Directorate, Acute Services Division |

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| 1. **JOB PURPOSE**
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| The Dosimetrist (Practitioner Clinical Technologist) contributes to the work of a team of Clinical Technologists (Dosimetrists) in the Treatment Planning and Imaging Section of Radiotherapy Physics, the Department of Clinical Physics and Bio-Engineering (DCPB). The postholder contributes to day to day technical work in Clinical Planning and Imaging, principally to the planning of routine radiation treatments designed for individual radiotherapy patients at the Beatson West of Scotland Cancer Centre and the Lanarkshire Beatson. The post holder prepares highly complex external beam and brachytherapy treatment equipment for daily clinical use. |

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| 1. **ROLE OF THE DEPARTMENT**
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| Radiotherapy Physics provides a comprehensive clinical physics service to the Beatson West of Scotland Cancer Centre, which is one of the largest UK cancer treatment centres providing radiotherapy treatment for more than 7,000 patients per annum in the west of Scotland. Its main base is at Gartnavel General Hospital, Glasgow with a Satellite Facility located at Monklands Hospital in Airdrie.The Department of Clinical Physics and Bioengineering (DCPB) provides specialist medical physics and clinical engineering services to NHS Greater Glasgow & Clyde and other West of Scotland Health Boards. These include Medical Equipment Management, Clinical Engineering, Imaging Physics (Nuclear Medicine and MRI), Core Services (Health Physics, Radionuclide Dispensary and PET Radiopharmaceutical Production Unit) and Radiotherapy Physics. It is one of the largest medical physics and clinical engineering departments in the UK, comprising over 350 staff.   |

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| 1. **ORGANISATIONAL POSITION**
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| Based at the Beatson Gartnavel or Monklands, the Practitioner Dosimetrist, whose organisational position is shown on the attached organisation chart, is: * 1. Accountable to the Chief Executive through the General Manager of Diagnostics Directorate, and responsible for the work and duties assigned through the Head and Deputy Head of Radiotherapy Physics, the Clinical Scientific Lead and Planning Services Manager
	2. Responsible for the duties specified below through the Planning Services Manager and Lead Dosimetrists, contributing to the work of the Dosimetrist Teams and Clinical Physicists in Treatment Planning.
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| 1. **SCOPE AND RANGE**
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| Referrals for radiotherapy treatment across a wide range of malignant disease, originate from Health Boards (Ayrshire and Arran, Borders, Dumfries and Galloway, Forth Valley, Greater Glasgow & Clyde and Lanarkshire) and for non-routine specialised treatments from all the Scottish Health Boards. * 1. Radiotherapy Physics consists of Clinical Physicists, Dosimetrists and Clinical Technologists organised in distinct groups: Treatment Delivery, Clinical Planning & Imaging, Brachytherapy Physics, and the Clinical Physicist Pool. Radiotherapy Physics has its own program of ongoing scientific research and development.
	2. External beam radiotherapy treatments are provided using eleven linear accelerators at the Beatson (Glasgow) and two accelerators based in Monklands, which together with CT simulators and treatment simulators, treatment verification systems and a low energy x-ray treatment unit have a capital value in excess of £30M.
	3. Radiotherapy Physics staff work closely with Multidisciplinary Teams of Clinical Oncologists, Radiographers and Nurses. Radiotherapy Physics staff support a wide range of specialist clinical services by carrying out a wide range of duties across radiotherapy treatment planning, brachytherapy physics, radiation dosimetry, equipment management, quality assurance, medical imaging and supporting networked radiotherapy patient information systems. Staff lead and support clinical developments and research, and provide education for multidisciplinary staff, trainees and students.
	4. Within Clinical Planning & Imaging, Dosimetrists are organised into site specific team, providing a comprehensive technical service for the planning, validation and quality assurance of routine and highly complex radiation treatment plans for individual Beatson patients. Staff will support clinical developments and research, and assist in the training of other staff, trainees and students.
	5. Work carried out within the Service complies with the Beatson’s ISO 9001:2015 Quality Management System and with legislation, including the Ionising Radiation Regulations (2017) and the Ionising Radiation (Medical Exposures) Regulations (2017), and staff participate in the ongoing development of quality systems and procedures.
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| 1. **MAIN DUTIES/RESPONSIBILITIES**
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| The Dosimetrist contributes to the delivery of specialist technical support to the Beatson and contributes to the smooth operation of the services provided by Clinical Planning and Imaging. The postholder, who works closely with Clinical Scientists:1. **Managerial**
	1. Participates in a team of Dosimetrists and helps to ensure that work undertaken is carried out efficiently and to a high standard.
	2. Contributes to the technical support services provided in accordance with local and national requirements, assists with the implementation of quality standards and acts in accordance with written protocols within the Beatson’s Quality System.
	3. According to a team rota, is allocated work undertaken within Clinical Planning, contributing to the management of patient workflow and the wide range of specialist support required for image interpretation, tumour localisation; the preparation and calculation of routine treatment plans (external beam and brachytherapy), radiation field placement, in-vivo patient radiation dosimetry and quality control testing of radiotherapy equipment summarised in Section 6.
	4. Participates in quality assurance procedures and ensuring that all associated documentation is kept up to date.
	5. Ensures high standards of communication particularly when dealing with complex and sensitive clinical information about the planning of radiotherapy treatments.
	6. Works with multidisciplinary clinical, scientific, technical and radiographic staff and contributes to the provision of an efficient and effective treatment planning service.
2. **Clinical Technical**
	1. Acts as an Operator, under the Ionising Radiation (Medical Exposures) Regulations (2017), with responsibility for complying with the employer’s procedures for work with ionising radiation.
	2. Where deemed competent, prepares highly complex external beam and brachytherapy treatment equipment, and treatment planning systems for daily clinical use by checking safety features, ensuring correct technical operation, undertaking quality assurance, according to standard operating procedures and documenting work undertaken in appropriate records.
	3. Helps to ensure that all the patient information required for treatment planning (medical images, data and documentation) is available, properly organised and prepared for use with the treatment planning software. This includes manipulating computer images and outlining anatomical structures, patient surfaces, tumour volumes and organs at risk in accordance with Physics Quality Procedures.
	4. Where deemed competent, undertakes routine, manual and computerised dosimetric and planning calculations. Generates choices of clinically acceptable treatment plans for individual patients receiving radiotherapy or brachytherapy in accordance with Clinical Protocols and Physics Quality Procedures.
	5. Participates with in-vivo patient dosimetry using thermoluminescence dosimeters and solid state devices.
	6. Contributes to the routine technical work involved in the provision of Brachytherapy Physics that may involve highly complex remote manipulation and the indirect handling of sealed and solid radioactive materials.
	7. Participates in patient treatments within theatre and ward areas, involving sterile work, providing technical support during brachytherapy treatments and delivers sterile radioactive sources for patient administrations.
	8. Helps to ensure that test equipment is maintained and checked according to Physics Quality Procedures, with emphasis on dosimetry and dose monitoring equipment, and participates in spares, source and stock control.
	9. Helps to ensure that all equipment faults are reported to senior staff for continuing safe operation and performance of relevant equipment within manufacturers’ published technical specifications. Contributes in appropriate quality control testing prior to returning equipment to clinical use in consultation through the Clinical Scientific Lead.
	10. Helps maintain the Section’s information systems, patient databases and paper record systems.
	11. Ensures that the work undertaken complies with the Radiotherapy Physics Quality System, Health and Safety at Work etc, Act and with other legislation, national quality standards and Trust Procedures, as appropriate. Adheres to written protocols for localisation, simulation, treatment planning and radiotherapy treatments as part of the Department’s ISO Quality System. Assists with system maintenance.
3. **Teaching and Training**
	1. The post holder ensures that they maintain and develope appropriate experience by undertaking suitable training, work rotation, and through the Knowledge and Skills Framework (KSF), Continuing Professional Development (CPD) and Personal Development Planning (PDP).
	2. Participates in programmes for the training and continuous development for Dosimetrists, as required to ensure their on-going career development and to comply with extant legislation and quality standards.
	3. Demonstrates the safe operation and use of treatment planning systems to Dosimetrists, Clinical Technologists, Radiographers, other staff and students.
4. **Research and Development**

Research and development are essential for continuous service improvement and to ensure that the potential of complex new equipment, facilities and treatment modalities is fully realised. The postholder:* 1. Supports appropriate research and development projects in radiotherapy, as requested through the line management structure and in accordance with corporate direction.
1. **Professional**
	1. Undertakes the personal development necessary to maintain the high quality of the service provided and participates in service developments. This includes attending suitable seminars and specialist courses in order to keep up to date with the latest technical developments and the application of clinical technology in radiotherapy.
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| 1. **SYSTEMS AND EQUIPMENT**
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| Practitioner Dosimetrists have practical knowledge and understanding of the function and broad operating principles of radiotherapy systems and equipment. The postholder is expected to become a technical specialist in one or more of the following area(s): * 1. All equipment related to radiation treatment delivery including linear accelerators, remote Afterloading systems, dosimetry calibration systems, radiation room safety systems and laser alignment systems.
	2. Patient radiotherapy treatment recording and verification systems, including associated networked systems used to manage and store patient treatment data and medical images.
	3. Other radiation equipment including kilovoltage x-ray equipment, remote source handling equipment and dose measurement equipment.
	4. Equipment used in the design of patients’ radiation treatments including x-ray treatment simulators, CT simulators, diagnostic x-ray equipment, digital x-ray systems and electronic contouring systems and other medical equipment imaging systems such as CT, MRI and PET scanners
	5. Complex networked computerised Radiotherapy Treatment Planning systems used to prepare 3D and 4D treatments.
	6. Complex computerised systems and dedicated software applications used to support Treatment Planning, including those produced in house by Radiotherapy Physics staff
	7. Radiation treatment measurement systems including in vivo radiation dosimetry and quality assurance equipment including ion chambers, thermoluminescence dosemeters and readers, solid state dosimeters and other dosimetry equipment.
	8. Networked computer technologies, including the Radiotherapy R&V Management system, PC systems, critical data archiving systems, medical image digitisers and computer peripherals.
	9. Networked databases, spreadsheets and a range of quality assurance and medical equipment software and systems used extensively by Radiotherapy Physics staff
	10. Software systems include Microsoft Word, Excel, Access and PowerPoint.
	11. ISO9001:2015 Quality Management System and associated documentation.
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| 1. **DECISIONS AND JUDGEMENTS**
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| The Practitioner Dosimetrist is expected to prioritise action and make the decisions and judgements required to:* 1. Contribute to Dosimetrists’ daily activities including the technical analysis and interpretation of complex multifaceted patient and imaging data to help design and prepare optimal radiation treatment plans tailored to the specific requirements of individual patients.
	2. Contribute to the preparation of written operating procedures relevant to Treatment Planning under supervision.
	3. Provide effective technical support to the Lead Dosimetrist.
	4. Participate in brachytherapy stock control.
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| 1. **COMMUNICATIONS AND RELATIONSHIPS**
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| The postholder works closely with the Lead Dosimetrist and other Dosimetrists and communicates internally and externally as follows: |
| **People/Organisation** | **Purpose** |
| Radiotherapy Physics Staff | 1. Communicates with Clinical Scientists and Dosimetrists on treatment planning matters including discussing decisions of a routine and occasionally complex nature where thorough justification is essential.
2. Participates in Dosimetrist Team discussions on routine and service matters.
3. Participates in Treatment Planning meetings.
4. Communicates as necessary with Clinical Physicists on the results of quality assurance and safety issues.
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| Therapy Radiographers | 1. Communicates on the preparation and specification of patient treatment plans, helping to manage changes in workflow to accommodate eg major equipment breakdowns to minimise the adverse effect on patient treatments.
2. Communicates regarding requested amendments to treatment plans.
3. Communicates to gain a clear understanding of problems with patient simulations and treatments.
4. Assists with technical developments and new procedures in clinical practice.
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| Mould Room Staff | 1. Communicates on the requirements for patient immobilisation equipment and preparation of radiation shielding, determined by treatment planning staff.
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| Clinical Oncologists | 1. Communicates on technical aspects of treatment planning, including patient scheduling, treatment techniques, localisation, radiation dose distributions, the selection of treatment plans, protocols.
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| 1. **PHYSICAL DEMANDS OF THE JOB**
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| * 1. Frequent requirement to maintain high levels of intense concentration over long periods when using highly complex computerised treatment planning systems, which demands maintaining a controlled posture throughout.
	2. Demonstrate highly developed physical accuracy and hand eye co-ordination, for example when performing quality assurance of radiotherapy and brachytherapy equipment. High level of analytical and judgement skill is required when evaluating computerised treatment plans and dose volume histograms.
	3. Mental agility, numerical competency and advanced spatial awareness, with ability to visualise three dimensional structures and radiation dose distributions.
	4. Frequent requirement to exert moderate physical effort for manual skills when undertaking routine quality control checks on treatment and simulation equipment (frequently at height), involving manual handling of heavy equipment including radioactive source in lead containers or waste drums (10-15kg).
	5. Requirement to change tasks, often at short notice that arises in a busy, demand led service.
	6. Frequent exposure to distressing or emotional circumstances while working in close proximity to cancer patients during treatments in theatre, ward and other clinical areas.
	7. Work in close proximity to highly radioactive sources and equipment, where the consequences of an error in judgement or inadvertent loss of a source may be significant to the individual, or other members of staff or the public.
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| 1. **MOST CHALLENGING/DIFFICULT PARTS OF THE JOB**
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| The challenges are:* 1. Contributing effectively to the daily activities of the Dosimetrist Team to achieve an effective outcome for individual patients and when clinical pressures are applied by users to prioritise clinical urgencies.
	2. Helping to ensure that all radiotherapy treatment plans are prepared accurately according to clinical specification, written protocols and designed to meet the specific individual requirements.
	3. Helping to maintain an effective service which delivers to specification and on time in a rapidly changing environment characterised by competing, changing priorities and timescales.
	4. Maintaining specialist knowledge continuously, across a broad range of highly technical areas in line with constantly changing technical developments in treatment planning and dosimetry.
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| 1. **KNOWLEDGE, TRAINING AND EXPERIENCE REQUIRED TO DO THE JOB**
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| **Qualifications**ESSENTIAL:BSc in Therapeutic Radiography, Degree in Medical Technology or other relevant discipline is essential. An HNC/HND or equivalent qualifications in Applied Physics or Electrical and Electronic Engineering will be accepted provided the knowledge, training and experience profile matches the requirements of the post.DESIRABLE:Registration on the Voluntary Register for Clinical Technologists (VRCT) held by the Institute of Physics and Engineering in Medicine (IPEM) or State Registration by the Health Professions CouncilKnowledge and TrainingThe postholder will demonstrate the following knowledge and skills:DESIRABLE:* 1. Knowledge of the operation, function and purpose of medical equipment, including electromechanical systems, computer systems, electronic engineering, radiotherapy treatment equipment, computerised treatment planning systems, radiation dosimetry equipment and their main principles of radiation safety including quality control and safety testing and knowledge of relevant legislation, national standards and quality systems.
	2. Knowledge of radiotherapy treatment planning, associated physiology and anatomy, medical imaging, quality control and safety testing and a knowledge of relevant legislation, national standards and quality systems.
	3. An understanding of the risks arising from errors in the preparation, planning, calculation and checking of radiotherapy treatment plans and of the measures required to manage these risks.
	4. An understanding of patient and staff risks arising from equipment failure or misuse and how these can be minimised.
	5. Evidence of continuing commitment to Continuing Professional Development (CPD) by the ongoing attendance at relevant study days, short courses and presentations for generic and specific competency on a wide range of complex medical equipment and their impact on clinical management, fulfilling the requirements of the Health Professions Council (HPC) as appropriate.

ExperienceRelevant experience and skills includes numerical competency, spatial awareness, mental agility and practical experience on a broad range of medical equipment and/or computerised systems. Experience of participating in teams, including contributing to managing resources, effective communication, writing standard operating procedures and knowledge of working policies and procedures.DESIRABLE:* 1. Experience of the application of radiotherapy and/or medical equipment in healthcare.
	2. Experience of participating in Teams, including effective communication, writing standard operating procedures and knowledge of working policies and procedures.
	3. Record of competency training on a wide range of medical equipment would be an advantage.
	4. Knowledge of relevant legislation, national standards, professional and other guidelines, including workplace practice, quality management, health and safety legislation.
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