Radiation Safety Policy

Lead Manager	Scientific Director, Department of Clinical Physics and Bioengineering
Responsible Director	Director of Diagnostics
Policy Lead	Chief of Medicine, Diagnostics
Approved by	NHS GG&C Radiation Safety Committee
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1. Introduction

NHS Greater Glasgow and Clyde (The Board) recognises its obligations under the Management of Health and Safety Regulations 1999 to assess the workplace risk to staff, patients, patients' families, contractors and the public. Within the general principles of prevention, the medical use of ionising radiation presents an acceptable risk, since it is an effective form of diagnosis and treatment. This document sets out a framework to restrict these risks as far as is reasonably practicable while being consistent with a clinical outcome favourable to the patient.

The Board will ensure, as far as reasonably practicable, the health and safety of its employees, of contractors working on the premises and of members of the public who may be exposed to the hazards arising from the use of ionising radiation. Medical exposures to radiation will be carried out only where justified and with the level of exposure being restricted so far as is reasonably practicable for achievement of the clinical purpose.

2. Scope

This policy sets out the framework to oversee health and safety relating to all uses of ionising radiation within the Board's area. Compliance with the policy is mandatory for all Board staff in all locations.

3. Licenses for Work with Ionising Radiation and Radioactive Substances

The Board will ensure that it holds sufficient:

- Registrations and Consents issued under the Ionising Radiations Regulations 2017 (IRR17),
- Site and Practitioner Licenses issued under the Ionising Radiations (Medical Exposures) Regulations (IRMER17)
- Permits, Registrations and Notifications issued under Environmental Authorisations (Scotland) Regulations 2018,

To conform with all legal requirements for radiation practices and to ensure the safety of patients, staff, members of the public and the environment.

4. Radiation Safety Roles and Responsibilities

Overall responsibility for ensuring that a radiation safety programme is established which complies with current legislation and regulation lies with the Chief Executive of The Board. The Chair of The Board Radiation Safety Committee will be responsible to the Chief Executive for the management and communication frameworks for Radiation Health and Safety and Clinical Governance. The Board Radiation Safety Committee will review this document biennially. The Board Radiation Safety Committee will report to the Board's Health and Safety Forum. The Board has an additional policy setting out arrangements for non-ionising radiation safety.

The Board's Chief Executive will appoint a Policy Lead for the Ionising Radiation (Medical Exposures) Regulations 2017 (IRMER17), who will chair the Board Radiation Safety Committee. The IRMER Policy Lead will have the responsibility for ensuring that the Board complies with the IRME Regulations. Responsibilities and duties under IRMER are clearly identified in Section 6.

Six Radiation Safety Sub-committees (two Radiology [North (inc. Clyde) and South], Radionuclide, Radiotherapy and two Non-ionising [MR and Optical]) will oversee local safety issues for individual specialties and these will report to the Board Radiation Safety Committee.

The Chair of the Board Radiation Safety Committee will delegate to the relevant Director the task of ensuring that the outcomes and decisions of the Board Radiation Safety Committee are promulgated and implemented.

The Board will appoint appropriately qualified members of Department of Clinical Physics and Bio-engineering (DCPB) as its Radiation Protection Advisers (RPAs) and Radioactive Waste Advisers (RWAs) and will appoint appropriately qualified members of DCPB as its Medical Physics Experts (MPEs) in radiotherapy, diagnostic and interventional radiology, nuclear medicine and PET. The Board will ensure that appropriate RPAs, RWAs and MPEs are involved in all plans for installing new radiation equipment, accepting it into service and for the maintenance of equipment (including Quality Assurance).

The Scientific Director, DCPB will be responsible for maintaining a list of designated Advisers and Experts (RPAs, RWAs and MPEs) and for ensuring that they are appropriately qualified, hold any necessary certificates of competence, and undertake appropriate continuing professional development in order to maintain their competence.

The Board will establish good communication and co-operation between managers and Advisers and Experts, and will give each:

a) Power to inspect and perform such tests as they may think appropriate.
b) Sufficient resources to carry out their duties and any supporting work.

5. Radiation Equipment Policy

(a) Installation/Maintenance/Replacement

Responsibility for the tasks of ensuring that all radiation equipment is installed, critically examined, commissioned and maintained to satisfy radiation safety requirements and is included in the equipment replacement programme of the Board will lie with the relevant Director.

(b) Inventory

Responsibility for ensuring that systems are in place for maintaining an inventory of all equipment used for medical exposures will lie with the Scientific Director, DCPB, through existing Board equipment management structures and procedures. It will be the responsibility of the Scientific Director to ensure that the inventory is updated on a regular basis and, in liaison with the MPEs and the Clinical Directors/Lead Clinicians, to ensure that the amount of equipment operated by the Board is limited to that necessary for *'the proper carrying out of medical exposures'*.
Responsibilities and scope are clearly specified in EP20 and Beatson Quality System.

(c) Purchasing

All equipment purchases will be routed through appropriate committees (e.g. CAPEX) established by the Board. In conjunction with the RPAs and MPEs, these committees will ensure that any equipment purchased is designed, constructed and installed so that it is capable of restricting exposure in line with the intended clinical purpose.

(d) Installation and Testing

Prior to installation of any equipment delivering ionising radiation to patients (including hire and loan equipment), an appointed RPA and MPE will be consulted. On installation, an RPA will be involved in the critical examination. DCPB will carry out a programme of appropriate testing prior to first clinical use, under the direction of the MPEs for the relevant specialty. DCPB will also ensure that appropriate testing has been carried out on any equipment on loan. All equipment used for imaging or detecting radiation, or delivering radiation therapy, will be subject to commissioning tests to verify performance under the direction of an appropriate MPE, and baseline levels of performance will be established.

(e) Training relating to new/replacement equipment

Responsibility for ensuring that relevant staff receives appropriate training will lie with the relevant Clinical Director/Lead Clinician for medical staff, Scientific Director, DCPB for physics staff, and with the appropriate General Manager for other health care professionals.

(f) Quality Assurance

The documentation for each department using ionising radiation equipment will contain details of the Quality Assurance programme, including the tests to be carried out, the appropriate frequency and procedures for evaluation of the data.

6. IRMER Procedures

(a) Employer's Written Procedures

Within The Board (but excluding the BWoSCC), there is a hierarchy of documentation as follows:-

Level 1 Documents: These are NHS GG&C Wide Policies and Procedures, e.g. the Radiation Safety Policy and the Employer's Procedures, and apply to all medical exposures carried out by the Board staff. The IRMER Level 1 Procedures will henceforth be referred to as the 'EPs'.
Level 2 Documents: These are Service Area wide and are specific to that Service Area or specialty.
Level 3 Documents: Within a Service Area there may be a need for either Sector of Site specific documentation, as required
Document Control is specified in EP19.

Radiotherapy services provided at the Beatson West of Scotland Cancer Centre (BWoSCC) are subject to the document quality control systems.

The document control structure for the Beatson Quality System shall be in accordance with QS.03, authorised by the General Manager. The Quality Manual is authorised by the Director of Regional Services, and the Director of Diagnostics. QS 11.34 describes the IRMER Employer's Procedures and systems implemented within the Beatson, mapped against the Regulations.

(b) IRMER Policy Lead

The IRMER Policy Lead will be responsible to the Chief Executive for ensuring that the Board complies with the IRME Regulations. The IRMER Policy Lead will ensure that the structures are in place for entitlement of IRMER duty holders, and for regular audit of compliance with these structures. The IRMER Policy Lead will authorise the 'Level 1' Employer's Procedures (EPs) and countersign BWoSCC QS 11.34.

(c) Entitlement

Entitlement of duty holders is specified in the relevant sections of EP1 and the Beatson Quality System.
Clinical Directors/Lead Clinicians, General Managers and Scientific Director, DCPB will maintain a Record of IRMER Entitlement for medical and dental practitioners, non-medical staff and physics staff respectively that details entitlement and scope of entitlement.

(d) Referrers

The IRMER Policy Lead will entitle as "Referrers" for appropriate ranges of diagnostic investigations all medical and dental practitioners, including those holding Honorary Board appointments. Medical and dental practitioners and registered health care professionals working outwith the Board who refer to clinicians within the Board will also be entitled as referrers.

The IRMER Policy Lead will entitle other named registered health care professionals to act as referrers for a limited range of medical exposures to fulfil a clinical need, according to procedures set out in Employer's Procedures (EP2).

Duties of Referrers are clearly specified in EP2 and the Beatson Quality System.

For therapeutic practice, referrers will be specified by local procedures.

(e) Practitioners

Entitlement of Practitioners is specified in relevant sections of EP1 and the Beatson Quality System. Duties of Practitioners are clearly specified in EP2 and the Beatson Quality System. Responsibility for the justification of each medical exposure will lie with the individual duty holder clearly identified in the Employer's Procedures.

(f) Operators

Entitlement of Operators is specified in relevant sections of EP1 and the Beatson Quality System. Duties of Operators are clearly specified in EP2 and the Beatson Quality System.
The local medical physics expert(s) will be entitled as operators.
Responsibility for the optimisation of each medical exposure will lie with the individual duty holder clearly identified in the Employer's Procedures.

(g) Additional Duty Holders

Other health care professionals employed by the Board may be entitled as duty holders (EP1). Such staff must be on a professional register for entitlement as referrer or practitioner. Competence will be assessed and scope will be agreed by IRMER Approval Panel.

(h) Training

Training and Training Records are specified in EP2 and EP-Guidance-002 and the Beatson Quality System (QS 10).

(i) Non-medical Imaging Exposures

The Employers Procedures for non-medical imaging Exposures are specified in EP17.

7. Protocols

The Board will ensure that, for each area utilising ionising radiation, there is appropriate documentation which includes protocols specifying the technical aspects of each type of exposure.

8. Referral Criteria

The Board will adopt the recommendations of the Royal College of Radiologists (RCR) with respect to diagnostic referral criteria in the first instance. For procedures for which RCR criteria are not available, the Board will ensure that specific referral criteria are

prepared and documented by the appropriate medical, surgical and dental staff and MPEs and agreed with the relevant Clinical Director/Lead Clinician, consistent with agreed National and professional guidance. Referral criteria will be included on the Board's intranet and Quality Systems, and will be made available to referrers from other organisations through NHSnet.

9. Diagnostic Reference Levels

The Board will adopt a set of diagnostic reference levels (DRLs), having regard to national and European values. These will be derived by agreement between the relevant MPEs, based on national recommendations with modifications appropriate to local practice. These will be reviewed annually by the MPEs and submitted to the relevant Radiation Safety Committee for approval (EP11).
The MPE's will be responsible for assessing patient dose surveys and will notify the appropriate General Manager and Clinical Director/Lead Clinician should any DRL be found to be exceeded consistently (EP12).

The Board will ensure that all diagnostic examinations involving medical exposures are performed with the radiation dose to the patient being as low as reasonably practicable (ALARP) to achieve the required clinical purpose, through entitled practitioners and operators, consistent with the employer's written procedures and protocols.

The Board will ensure that all exposures of target volumes for radiotherapy are individually planned, taking into account that doses to non-target volumes and tissues shall be ALARP, through entitled practitioners and operators, consistent with the intended radiotherapeutic purpose and the employer's written procedures and protocols.

10. Local Rules

The production of 'Local Rules' at Departmental level will be the responsibility of the General Manager, in consultation with the RPS, RPA and MPE.

Responsibility for the task of supervising the work with radiation and ensuring that it is done in accordance with these 'Local Rules' will lie with the Radiation Protection Supervisors (RPSs) appointed in writing by the appropriate General Manager with appropriate allocation of functions and resources.

Individual workers are required to work with radiation in such a way that they:

a) exercise reasonable care and follow any relevant Local Rules;
b) use, as instructed, any protective equipment and personal dosimeters provided by the employer;
c) report to their line manager and RPS any defect in such equipment and dosimeters;
d) undertake any training deemed necessary;
e) comply with the employer's procedures and protocols for medical exposures;

f) report immediately to their RPS if any incident occurs in which a patient may have received a radiation exposure greater than intended or any other incident in which a person is exposed to radiation;
g) do not recklessly endanger the safety of others.

The relevant General Manager will be responsible for ensuring that radiation risk assessments are performed and reviewed, and the findings implemented. They will be responsible also for ensuring that personnel dose returns are monitored on a regular basis, that appropriate investigations are instituted as required and that further controls are implemented where this is regarded as necessary. Risk assessments will be prepared in consultation with the RPS, MPE and RPA.

11. Radioactive Substances

Responsibility for ensuring that systems are in place for the use and safeguarding of radioactive materials, for the accumulation and safe disposal of radioactive waste and ensuring that all requirements of the Environmental Authorisations (Scotland) Regulations 2018 are satisfied will lie with the Chief Executive and the Scientific Director, DCPB. Responsibility for drawing up such systems and ensuring their implementation will lie with the relevant Director(s).

The Board will appoint appropriately qualified Radioactive Waste Advisers (RWA) to advise on the management of radioactive substances activities, the handling of radioactive materials and disposal of radioactive waste, as required by the. Permits and Registrations under the Environmental Authorisations (Scotland) Regulations 2018

The Board has a separate Site Security Policy for HDR Brachytherapy Sources, which has Restricted Distribution.

12. Transport of Radioactive Materials

The Board will appoint a Dangerous Goods Safety Adviser with appropriate qualifications to advise, in consultation with an RPA and RWA, on transport of radioactive materials and radioactive waste, and emergency arrangements.

13. Outside Workers and Classified Persons

Local Rules and Radiation Safety Documentation contain appropriate arrangements for outside workers and classified persons. Responsibility for the medical supervision of employees designated as classified persons will lie with the Appointed Doctor.

14. Research

It is a requirement of the Board that all exposures to volunteers to ionising radiation made as part of medical or biomedical, diagnostic or therapeutic research must first be approved by a Main Research Ethics Committee or a Research Ethics Committee. It is the responsibility of the Principal/Chief Investigator for each research project involving ionising radiation to ensure that an IRAS form is completed, an appropriate

Clinical Radiation Expert (IRMER practitioner as defined in 5(e) above) is involved in the justification of all exposures and that advice on dose levels is sought from an MPE. Other requirements are clearly specified in EP16 and the Beatson Quality System.

15. Incidents and Significant Accidental and Unintended Exposures (SAUE)

All radiation incidents that occur within The Board will be documented and logged through the DATIX or Beatson Quality Systems. Any incident which leads to an unintended under- or over-exposure of patients, staff or members of the public must be reported to the RPS, Local Service Lead and Lead Clinician. The Service Lead and RPS will be responsible for ensuring that an investigation is undertaken and for evaluating the information obtained in accordance with the appropriate Employer's Procedures (EP15), Standard Operating Procedure and National Guidance (SAUE). The MPE will be responsible for carrying out a dose assessment where required for medical exposures, and the RPA will be responsible for assessing doses incurred as a result of occupational exposures and to members of the public. In cases of over-exposure, and those SAUE incidents within notification criteria, the relevant General Manager (as identified below) will notify the HSE and/or Healthcare Improvement Scotland (HIS) as appropriate on the advice of the RPA/MPE, within notification deadlines. An MPE will be involved in investigations of patient exposure incidents involving equipment failure where a report is to be submitted to the HSE/HIS.

Incidents involving loss or spillage of radioactive materials must be reported to the RPS, MPE, RPA and the relevant Lead Clinician and General Manager. The RPS, MPE, RPA and Lead Clinician will be responsible for ensuring that an investigation is undertaken and evaluating the information obtained in accordance with Directorate policies.

Incidents which require to be notified to external agencies will only be reported by the General Manager (Imaging) or General Manager (Specialist Oncology Services), who are the General Managers responsible for reporting to external agencies. Additionally, notifiable incidents will be reported to the relevant Director, and thence to the Chief Operating Officer and Chief Executive.

Incident reports will be considered through Directorate structures and by the appropriate Radiation Safety Committee(s). General Managers will provide an annual summary of all reportable incidents and outcomes to the IRMER Lead and to the Board Radiation Safety Committee.

16. Radiation Emergency Preparedness and Public Information Regulations 2019 (REPPIR19)

Health Physics has produced REPPIR Site Assessment Reports for 9 sites in NHS GG&C, and communicated these to Senior Management. These Reports demonstrate that REPPIR2019 does not apply to these sites, and consequently, a Hazard Evaluation and an off-site emergency plan are not required.

As the NHS is a 1st Responder under the Civil Contingencies Act 2004, NHS GG&C will be involved in off-site emergency planning arrangements for Nuclear and MoD Operators, and in the planning and provision of Radiation Monitoring Units.