

Radiation Safety Guidance

Introduction:

NHS Greater Glasgow and Clyde (The Board) recognises its obligations under the Management of Health & Safety Regulations 1999 to assess the workplace risk to staff, patients, visitors, 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. Board's Radiation Safety Policy sets out a framework to restrict the risks as far as is reasonably practicable while being consistent with a clinical outcome favourable to the patient. This document is a summary of certain requirements and does not cover all the requirements that need to be complied with.

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.

The NHSGGC policy relating to radiation safety can be found using link below:

<https://www.nhsggc.scot/downloads/radiation-non-ionising-radiation-and-laser-pointers/?wpdmdl=67638&refresh=63f49c051e2b61676975109&ind=1676975067308&filename=radiation-safety-policyv25.pdf>

Ionising Radiation

Ionising radiations occurs as either electromagnetic rays (such as X-rays and gamma rays) or particles (such as alpha and beta particles). It occurs naturally (e.g. from the radioactive decay of natural radioactive substances such as radon gas and its decay products) but can also be produced artificially. People can be exposed externally, to radiation from a radioactive material or a generator such as an X-ray set, or internally, by inhaling or ingesting radioactive substances. Wounds that become contaminated by radioactive material can also cause radioactive exposure.

Everyone receives some exposure to natural background radiation and much of the population also has the occasional medical or dental X-ray.

The Health and Safety Executive (HSE) is concerned with the control of exposure to radiation arising from the use of radioactive materials and radiation generators in work activities in the medical industry and non-destructive testing.

The main legal requirements enforced by HSE are detailed in the Ionising Radiations Regulations 1999 Approved code of practice and guidance which can be viewed using link below:

[Work with ionising radiation: Ionising Radiations Regulations 1999 Approved code of practice and guidance.](#)

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Local Rules for Departments:

The production of 'Local Rules' at Departmental level is the responsibility of the General Manager.

Responsibility for the task of supervising the work with radiation and ensuring that it is done in accordance with these 'local rules' lies with the Radiation Protection Supervisor (RPS).

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 is responsible for ensuring that radiation risk assessments are performed and reviewed, and the findings implemented. They are 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 are prepared in consultation with the RPS, Medical physics expert (MPE) and Radiation Protection Advisor (RPA).

All radiation incidents that occur within the Board must be documented and logged through the DATIX reporting system or if appropriate through Beatson Quality Systems. (The Beatson do not use DATIX for all their incidents).

Any incident which leads to an unintended over-exposure of patients, staff or members of the public must be reported to the RPS, local service lead and the lead clinician who will be responsible for ensuring that an investigation is undertaken. The MPE will be responsible for carrying out a dose assessment where required.

Incidents involving loss or spillage of radioactive materials above certain thresholds must be reported to the RPS, MPE, RPA and the relevant lead clinician and general manager.

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 for reporting to the Board's Radiation Safety Committee.

Non-ionising radiation (NIR)

NIR is the term used to describe the part of the electromagnetic spectrum covering two main regions, namely optical radiation (ultraviolet (UV), visible and infrared) and electromagnetic fields (EMFs) (power frequencies, microwaves and radio frequencies).

Optical radiation

Optical radiation is another term for light, covering ultraviolet (UV) radiation, visible light, and infrared radiation. The greatest risks to health are probably posed by:

- UV radiation from the sun. Exposure of the eyes to UV radiation can damage the cornea and produce pain and symptoms similar to that of sand in the eye. The effects on the skin range from redness, burning and accelerated ageing through to various types of skin cancer.
- the misuse of powerful lasers. High-power lasers can cause serious damage to the eye (including blindness) as well as producing skin burns.

Laser Safety

Use of lasers and other non-ionising radiations is governed by the Board's Non-ionising radiation safety policy. Lasers are categorised by a system of classification to indicate the degree of hazard and level of precautions that should be taken. The hazard to the eye in general terms from the various classes is given in the table below.

Table: Laser Safety Classes

Laser Safety Class	Potential Eye Hazard
Class 1	Safe under all circumstances.
Class 1M	Safe for long term intra-beam viewing, but potential hazard with magnifiers
Class 2	Safe for brief direct exposure. Prolonged staring may cause eye injury.
Class 2M	Safe for brief exposure, but potentially hazardous when exposure occurs with magnifiers.
Class 3R	Eye injury possible from intentional intra-beam viewing.
Class 3B	Direct exposure may cause serious eye injury, viewing of diffuse reflections generally safe.
Class 4	Hazardous to the eyes and skin under all conditions. Fire risk.

Laser pointers should only be of classes 1 or 2. Class 3 lasers must not be used as pointers.

The following are required by departments using class 3B and class 4 therapeutic or surgical lasers:

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- Each department will ensure that the master keys for their lasers are kept in safe custody and only issued to authorised personnel.
- Risk Assessments and Local rules must be in place for all lasers used in treatment and diagnosis. Local Rules must contain any control measures identified in the relevant risk assessment.
- Each clinical laser has a Laser Protection Supervisor who has day to day responsibility for overseeing laser safety, and a Clinical Laser Expert who has responsibility for assessing and confirming the competence of all clinical therapeutic laser users.
- An annual audit of laser/IPL safety compliance must be undertaken. Results should be reported to the Non-Ionising Radiation Safety Committee.

References, Further Guidance and Information:

Radiation Protection pages:

<http://www.staffnet.ggc.scot.nhs.uk/Acute/Diagnostics/Radiation%20Protection/Pages/RadiationProtection.aspx>

Optical Radiation

<http://www.hse.gov.uk/radiation/nonionising/optical.htm>