

# Non-Ionising Radiation Safety Policy

<b>Approved By:</b>	Policy and Guideline Committee
<b>Date of Original Approval:</b>	21 June 2019
<b>Trust Reference:</b>	B25/2019
<b>Version:</b>	Version 2
<b>Supersedes:</b>	Version 1, June 2019
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<b>Date of Latest Approval</b>	12 August 2022 – Policy and Guideline Committee
<b>Next Review Date:</b>	November 2025

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## **REVIEW DATES AND DETAILS OF CHANGES MADE DURING THE REVIEW**

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The following changes were made to the June 2019 Version 1, after reviewing the document on August 2022:

- i. Updated CONTENTS table p2.
- ii. Updated KEY WORDS list p4.
- iii. Updated NIR sources list in section 2.1. p6.
- iv. Updated DEFINITIONS AND ABBREVIATIONS p6, including NatSSIP in 3.12, noted that radiofrequency is also used for varicose vein ablation in 3.15, and added UVC sterilisation devices in section 3.16.
- v. Updated table with list of examples of NIR sources and moved the table to Appendix 4.
- vi. Updated Figure 1 Governance structure for NIR safety across the Trust, including role of the Head of Non-Ionising Radiation and Non-Ionising Radiation Specialists having NIR Advice responsibilities, in section 4.1, p8.
- vii. Updated role of the NIR Advisors in section 4.6. p9.
- viii. Corrected paragraph formatting and numbering in sections 4.7 and 4.8. p10.
- ix. Included clarifying statement in section 4.8 v. “Lasers are not to be used in any new locations without a prior risk assessment, which is to be carried out in consultation with the LPA”.
- x. Included clarifying statement in section 4.8 w “Ensuring that local non-ionising radiation protection supervisors, including staff with LPS and UVPS roles have the appropriate training and resources to carry out their functions”.
- xi. Updated LPS roles and responsibilities in section 4.9. p12.
- xii. Updated roles and responsibilities related to NIR safety of UV Radiation Protection Supervisors (UVPS), Sonographer leads and Quality Control Leads, Clinical Laser Expert (CLE), Lead UV Dermatologist / Phototherapy Clinical Lead (PCL), MRI Responsible Person, All Employees, to reflect guidelines and current local rules, in sections 4.10-4.15. p13-14.
- xiii. Updated sections 5.6, 5.7 and 5.8 for policy implementation of lasers, UV in phototherapy, and other sources of non-coherent light p17.
- xiv. Updated section 5.9 and 5.10 for policy implementation of ultrasound and MRI, p18, 19.
- xv. Reference to the UHL ‘Transdermal Patch Policy’ included in section 5.10(k) on page 19.
- xvi. Updated under section 5.11 the risks of diathermy, p19.
- xvii. Updated section 5.12 for policy implementation of other NIR risks, p20.
- xviii. Inserted safety training requirement for working in MR Controlled Access Areas.. section 6.9, p21.
- xix. Updated POLICY MONITORING TABLE, p24.
- xx. Updated ROLE OF LASER PROTECTION ADVISOR. Appendix 1. p25.
- xxi. Updated ROLE OF MR SAFETY EXPERT . Appendix 2. P26.
- xxii. Inserted APPENDIX 4: EXAMPLES OF NON-IONISING RADIATION SOURCES. p28.

## **KEY WORDS**

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Radiation

Non-ionising radiation

Nonionising radiation

MRI

Magnetic Resonance Imaging

CEMFAW

CAORAW

Intense Pulsed Light

IPL

Laser

Ultrasound

Phototherapy

Ultraviolet radiation

UV

NIR

Near Infra-red

Radiowaves

Radio wave

Radiofrequency

Diathermy

## 1 Introduction and Overview

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- 1.1 This document sets out the University Hospitals of Leicester (UHL) NHS Trust's Policy and Procedures for the safe use of Non-Ionising Radiation (NIR) throughout the Trust.
- 1.2 Sources of Non-ionising radiation are used throughout the Trust for the benefit of patients.
- 1.3 UHL 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 NIR.
- 1.4 The aim of this policy is to ensure that devices are installed, maintained and operated in such a way to ensure the safety of staff, public and patients, and in compliance with national legislation. Patients will only undergo treatment or diagnosis using NIR where the benefits outweigh the risks, which are kept As Low As Reasonably Practicable.
- 1.5 A summary of the relevant legislation on which this policy is based can be found in section 9.
- 1.6 Failure to comply with this policy may lead to disciplinary action and/or prosecution of the individual and/or the Trust.

## 2 POLICY SCOPE –WHO THE POLICY APPLIES TO AND ANY SPECIFIC EXEMPTIONS

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- 2.1 This document covers work with the following:
  - a) Static magnetic fields
  - b) Time varying magnetic fields
  - c) Non-coherent artificial optical radiation
  - d) Laser radiation
  - e) Radio waves
  - f) Microwaves
  - g) Ultrasound

Examples of the use of each of these sources are given in Appendix 4. However, they will not cover all examples across the Trust. If in doubt please contact the Leicester Radiation Safety Services (LRSS) for further advice.

- 2.2 This document covers all staff, contractors, students, locum workers, voluntary workers, those with honorary contracts and all other workers of employers working

on the site (under the supervision of internal staff) that work directly and indirectly with these sources of radiation.

- 2.3 Staff working in these areas may require additional training. This is detailed in the education and training section of the document.

### 3 DEFINITIONS AND ABBREVIATIONS

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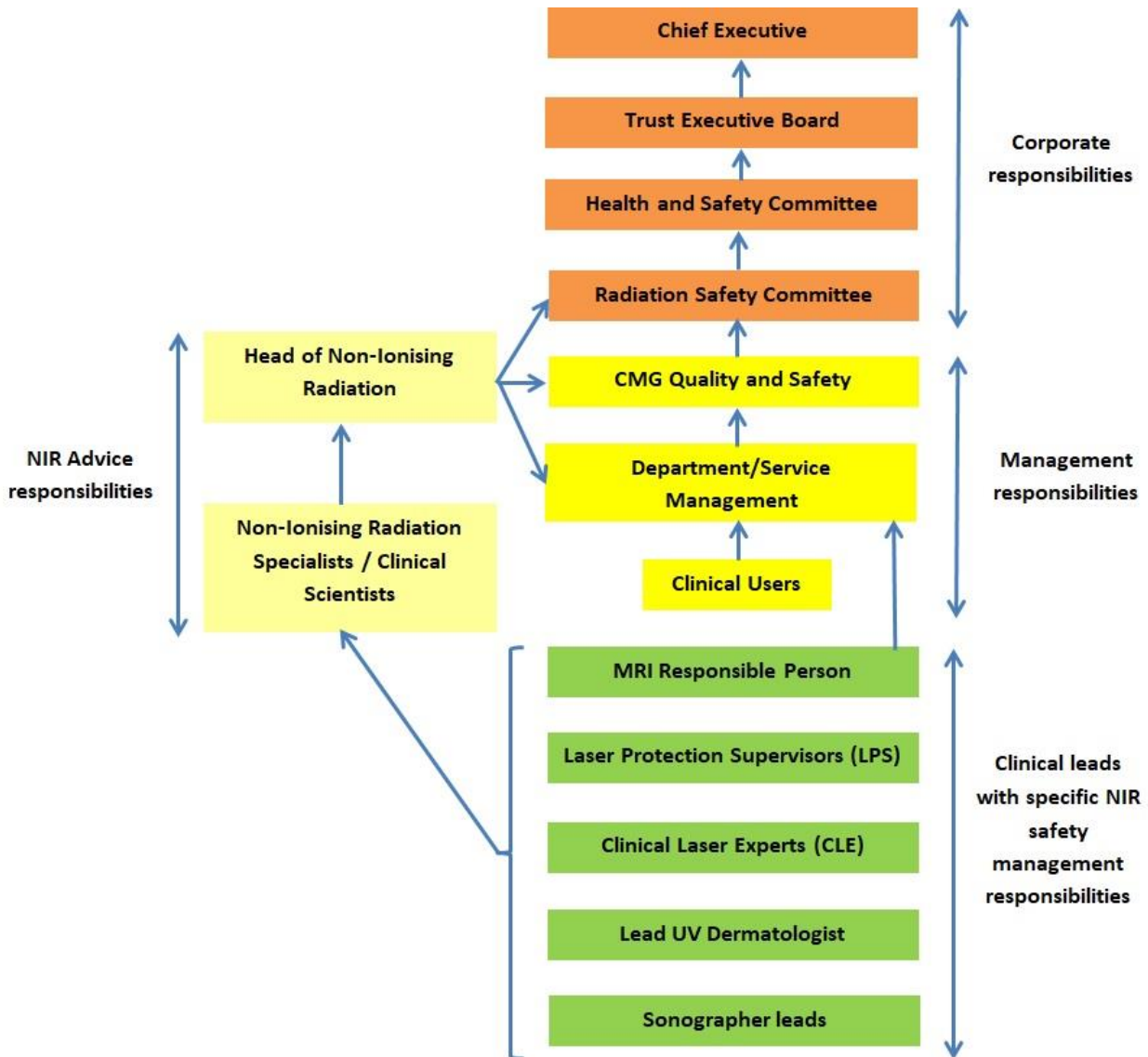
- 3.1 Definitions of roles are within the roles section (Section 4).
- 3.2 **Non-ionising radiation (NIR):** is defined within this policy as static magnetic fields, time varying magnetic fields, artificial optical radiation, radio waves, microwaves and ultrasound. It is acknowledged that this extends the standard definition and is done for clarity throughout the policy.
- 3.3 **Artificial optical radiation:** any electromagnetic radiation in the wavelength range between 100 nm and 1mm which is emitted by non-natural sources.
- 3.4 **Curing lights:** a piece of equipment that is used for polymerization of **light cure** resin based composites.
- 3.5 **Diathermy:** a medical and surgical technique involving the production of heat in a part of the body by high-frequency electric currents, to stimulate the circulation, relieve pain, destroy unhealthy tissue, or cause bleeding vessels to clot.
- 3.6 **Intense Pulsed Light sources (IPL):** a technology used by cosmetic and medical practitioners to perform various skin treatments for aesthetic and therapeutic purposes, including hair removal, photorejuvenation (e.g. the treatment of skin

pigmentation, sun damage, and thread veins) as well as to alleviate dermatological diseases.

- 3.7 **Laser:** Any device emitting intense optical radiation produced by light amplification by stimulated emission.
- 3.8 **Lithotripsy:** a treatment, typically using ultrasound shock waves, in which a kidney stone or other calculus is broken into small particles that can be passed out by the body.
- 3.9 **LocSSIP:** Local Safety Standards for Invasive Procedures.
- 3.10 **Optical radiation:** laser radiation, UV radiation, visible and infra-red radiation, incoherent intense pulsed light (IPL).
- 3.11 **Magnetic Resonance Imaging (MRI):** a type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.
- 3.12 **NatSSIP:** National Safety Standards for Invasive Procedures.
- 3.13 **Non-coherent radiation:** means any artificial optical radiation other than laser radiation.
- 3.14 **Photodynamic therapy:** is a **treatment** that uses a drug, called a photosensitizer or photosensitizing agent, and a particular type of light. When photosensitizers are exposed to a specific wavelength of light, they produce a form of oxygen that kills nearby cells.
- 3.15 **Radiofrequency ablation:** is a procedure used to reduce pain. An electrical current produced by a radio wave is used to heat up a small area of nerve tissue, thereby decreasing pain signals from that specific area. Radiofrequency is also used for varicose vein ablation.
- 3.16 **UVC sterilisation devices:** Sterilisation, disinfection and sanitisation units that use short-wavelength ultraviolet band C radiation (UVC) to damage genetic materials in microbes, to reduce the level of harmful germs.

## 4 ROLES – WHO DOES WHAT

4.1 UHL is committed to protection against NIR hazards. It will effect this through organisational arrangements, clear actions and through the involvement of senior staff. Below is a diagram of the governance structure for NIR safety within the Trust.



**Figure 1. Governance structure for NIR safety across the Trust.**

4.2 **Chief Executive:** The Chief Executive has overall responsibility for ensuring the health, safety and welfare of all persons who are, or may be affected by the Trust's business and for compliance with all non-ionising radiation regulations. The practicalities of ensuring these responsibilities are delegated as detailed below however the legal responsibility cannot be delegated.

The Chief Executive will:

- Ensure that sufficient resources including staff and finance are made available for compliance with this policy.
- Ensure that the Trust appoints in writing the Radiation Advisor(s) required to ensure compliance. These written appointments should include their responsibilities and the scope of their role.
- Ensure systems are in place to monitor and escalate radiation safety issues where necessary.
- Ensure that the culture within the Trust is conducive to good radiation safety.



- 4.3 **Director of Safety and Risk:** The Director of Safety and Risk has delegated responsibility from the Chief Executive for practical implementation of the policy, policy review and compliance with the applicable regulations.

The Director of Safety and Risk will:

- a) Report directly to the Chief Executive and Trust Board on matters regarding radiation safety within the Trust.
  - b) Be responsible for co-coordinating the implementation of risk management initiatives and policies.
  - c) Chair the Trust Radiation Safety Committee.
  - d) Act as the Executive Lead for Radiation Safety.
  - e) Be responsible for co-ordinating the reporting of incidents under the relevant legislation to the relevant body. This responsibility may be further delegated to an individual that the Director deems adequately trained.
  - f) Take advice from the Non Ionising Radiation (NIR) Advisors on matters of compliance.
  - g) If the arrangements for provision of NIR Advisors change, it is the responsibility of the Director to ensure continuous cover for such services.
  - h) Ensure that there are mechanisms in place such that when advised of issues with radiation safety within the Trust there is adequate redress.
- 4.4 **The Executive Quality and Performance Board (EQB):** The EQB is responsible for health, safety and welfare of staff and those affected by the activities of the Trust. Receives reports from the Director of Safety and Risk about matters that require the attention of the board.
- 4.5 **Radiation Safety Committee:** The Radiation Safety Committee (RSC) reports through the Trust's Health and Safety Committee to the EQB. The RSC will implement and monitor compliance with the NIR regulations. There will be a clearly defined Terms of Reference.
- 4.6 **NIR Advisors:** The Non-Ionising Radiation (NIR) Advisors have responsibility for providing advice related to non-ionising radiation safety. All NIR Advisors must have the relevant professional qualifications. The Head of Non-Ionising Radiation is the lead NIR Advisor and Clinical Scientist specialising in Imaging with Non-Ionising Radiation Physics. UHL will establish good communication and co-operation between managers and NIR Advisors, and will give each Advisor sufficient resources to carry out their duties and any supporting work.

The NIR Advisors operate from within the Leicester Radiation Safety Services (LRSS), which is part of the Medical Physics Department. The NIR Advisors include the following (i) Laser Protection Advisor (LPA), (ii) Magnetic Resonance Safety Expert (MRSE), (iii) MR Physicist (iv) UV Radiation Physicist, (v) Ultrasound Physicist.

- 4.6.1 **Laser Protection Advisor (LPA):** The LPA is RPA200 certificated and must be appointed by the Trust in writing with their scope of practice clearly defined. The LPA has responsibilities listed in Appendix 1, for advising managers,

departmental heads, staff and the public. The LPA must be consulted on matters related to the use of all class 3B and class 4 lasers in the Trust.

**4.6.2 MRI Safety Expert (MRSE):** has responsibilities as listed in Appendix 2 and must be particularly consulted during site planning for new MRI installations and in the development of the MRI safety framework and local rules.

**4.6.3 UV Radiation Physicist:** Is responsible for providing advice related to the safe use of UV radiation sources across the Trust, which includes sources used in phototherapy and in equipment or room disinfection applications.

**4.6.4 Ultrasound Physicist:** Provides advice related to ultrasound safety in clinical applications and manages the ultrasound physics quality assurance.

**4.7 CMG Clinical Director:** The CMG Clinical Director is delegated to ensure that the Trust NIR Safety Policy is implemented within their respective areas.

The CMG Clinical Director is responsible for ensuring implementation of the Trust's NIR Safety Policy, including in particular:

- a) An awareness of their own responsibilities and ensuring that Heads of Service / Managers within their area are aware of their responsibilities under law, under this Policy and carry out these responsibilities.
- b) There are sufficient local mechanisms in place to ensure the prompt escalation of NIR issues.
- c) The advice of the appropriate Advisors is sought in the situations listed in Appendices 1 (LPA) and 2 (MRI Expert). Advice regarding other use of NIR can be obtained by contacting the Leicester Radiation Safety Service.
- d) Systems are in place to ensure any invasive procedure is subject to Local Safety Standard for Invasive Procedures (LocSSIP) or National Safety Standards for Invasive Procedures (NaSSIP).
- e) All NIR equipment is installed, critically examined, commissioned and maintained to satisfy regulatory requirements, and included in the equipment replacement programme of the Directorate.
- f) No NIR generating equipment is requisitioned, loaned, moved or procured without consultation with the appropriate NIR Advisors and, where applicable, the locally appointed Laser Protection Supervisors (LPS) and MR Responsible Person.
- g) Provide the relevant Advisors with a list of the departments they are responsible for, the responsible individuals and the scope of their responsibilities and keep this list up-to-date. Where the Head of Service for

an area using NIR changes, the relevant NIR advisor or Head of Non-Ionising Radiation must be informed.

- h) Staff operating NIR equipment, specifically MRI, lasers, ultraviolet radiation emitting devices, and ultrasound units must undergo Continuous Professional Development (CPD) and training with respect to the use.
- i) Maintaining a record of training of duty holders, including other staff carrying out procedures on Trust premises.
- j) Staff are provided with appropriate specialist personal protective equipment (PPE) and/or devices where it has been identified that employees may be exposed to risks to their health and safety from non-ionising radiation.
- k) Individual departments develop their own safe systems of work, complete risk assessments, as appropriate, for the safe use of NIR and that arrangements are in place for local audits.
- l) Laser Protection Supervisors (LPS), if applicable, are appointed in relevant work areas to monitor application of the systems of work and NIR safety standards, and to inform and advise staff on safe working practices.
- m) To ensure adequate resources are provided to areas using NIR to ensure compliance with these requirements.
- n) To escalate persistent non-compliance to the Director of Safety and Risk and the Medical Director as appropriate.
- o) All clinically used equipment will be covered by appropriate service agreements, and that routine quality control tests will be performed at the intervals required by national guidelines or determined locally.
- p) Ensure that an equipment inventory is held.

**4.8 Head of Service (HoS) / Area Manager (AM):** Where there is a NIR facility and / or activities are undertaken involving NIR the Head of Service / Area managers are responsible for ensuring that safety and protection measures are carried out.

The managers in each relevant area are responsible for ensuring implementation of the Trust's NIR Safety Policy in their area, including in particular:

- a) Awareness of their own responsibilities and ensuring that staff within their area are aware of their responsibilities under law and under this Policy.
- b) That the advice of the relevant NIR Advisor is sought in the situations listed in Appendices 1, 2 and 3 respectively.
- c) All staff undertake the safety training appropriate to their role. This training must be reviewed periodically and a record of training maintained.
- d) Risk Assessments are carried out, documented, and the findings implemented in line with this Policy. These must be reviewed on an annual basis.
- e) Controlled or supervised areas are established, where necessary, based on the findings of risk assessments and the advice of the relevant Advisor and that local rules/systems of work are established for this area and that these are read by individuals entering the area.
- f) Ensuring that sufficient and suitably trained and experienced LPSs, where applicable, are appointed to ensure compliance with the systems of work within each area and that these individuals are named within the local rules.

Large areas may require multiple LPSs to ensure adequate supervision. This should be determined by the area manager.

- g) There are sufficient local mechanisms in place to ensure the prompt escalation of radiation issues including regular communication with those working with NIR.
- h) Equipment is part of a Quality Assurance programme and as part of this quality control of the equipment is required as advised by the relevant Advisor. Local Quality Control Leads must be appointed to assist with this.
- i) Ensuring that local audits for compliance with this policy and local procedures created under it are carried out at the intervals specified by the CMG Medical Lead on the advice of the relevant Advisor.
- j) That there are sufficient local mechanisms in place to ensure the prompt escalation of NIR issues.
- k) Ensure that all individuals working within the vicinity of the NIR source whether employed by the Trust or not are subject to the same levels of safety. This may require co-operation with another employer.
- l) Where PPE is provided it must be appropriate and staff must receive adequate training, instruction, information and supervision regarding the use of this PPE and that the suitability of PPE is reviewed annually.
- m) That employees carrying out medical exposures to NIR are appropriately trained and that the training is recorded.
- n) All NIR equipment is subject to service agreements where required.
- o) Ensuring that an equipment handover procedure has been produced, approved by the relevant Advisor and implemented for use when NIR equipment is serviced.
- p) Ensuring all staff are aware of the need to inform their employer in writing when they become pregnant and work in an area using MRI to ensure that a risk assessment is undertaken and that the appropriate control measures are applied.
- q) Ensure that there are adequate protocols in place for all exposures to patients of NIR. This includes the use of LocSIPPS and NaSIPPS where applicable.
- r) Advice of the relevant Advisor is sought when new or loan equipment is to be procured.
- s) An appropriate audit system is in place.
- t) Updating the equipment inventory.
- u) Any equipment which has been deemed to be unsafe is immediately removed from use in a manner that prevents inadvertent use, until it can be returned to use safely. The advice of the relevant NIR advisor may be required.
- v) Lasers are not to be used in any new locations within the department without a prior risk assessment, which is to be carried out in consultation with the LPA.
- w) Ensuring that local non-ionising radiation protection supervisors, including staff with LPS and UVPS roles have the appropriate training and resources to carry out their functions.

#### 4.9 **Laser Protection Supervisor (LPS):** Laser Protection Supervisors (LPS) will be appointed in writing for individual areas of work with lasers following joint approval

by the Head of Service / Area Manager. This appointment must detail their legal duties as well as any additional delegated duties identified as part of the appointment.

The LPS responsibilities to be in accordance with the laser local rules include:

- a) To ensure that the laser local rules are adhered to.
- b) To review and amend the laser local rules in collaboration with the Laser Protection Advisor.
- c) To supervise the work with lasers so that it is in accordance with the local rules.
- d) Maintaining the standards for laser safety.
- e) To inform the LPA if the existing local rules require amending.
- f) To seek the advice of the LPA before any change in operating procedures or equipment is envisaged.
- g) To inform the LPA immediately in the event of an incident occurring and to complete an appropriate incident form.
- h) To review and or complete risk assessments for the safe use of lasers.
- i) To ensure that all Authorised Assisting Staff have signed to indicate that they have read and understood the local rules.
- j) To ensure that the laser key (if applicable) or key code is stored in the safe place specified in Section 6.
- k) To ensure that the key (if applicable) or key code is released only to a nominated user, an authorised maintenance engineer or to the LPA.
- l) To ensure that only authorised users operate the Laser.
- m) To ensure that staff (including new starters) within the department receive appropriate level of laser safety training.
- n) Maintain up to date copies of the staff laser safety training records or certificates in the laser safety file.
- o) Carry out periodical checks of the laser leads and accessories as necessary.
- p) Investigate and report on any laser safety incidents in liaison with the LPA.

4.10 **UV Radiation Protection Supervisors (UVPS):** The Head of Department or Area Manager at the location of the UV radiation application is responsible, for the implementation of the UV radiation safety procedures in the area. They may be assisted in this duty by delegation of appointing in writing a suitable individual to act as a local UVPS, where they can ensure compliance with the Local Rules

and implementation of UV radiation safety procedures in the area. The UVPS responsibilities to be in accordance with the UV local rules include:

- a) To ensure that the UV local rules are adhered to.
- b) To review and amend the UV local rules in collaboration with the UV radiation physicist.
- c) To supervise the work with UVR to ensure it is done in accordance with the local rules.
- d) To inform relevant persons if the existing local rules require amending.
- e) To inform the relevant persons in the event of an incident occurring and to ensure completion of an incident form.
- f) To inform the UV radiation physicist before any change in technique, practice or modification of equipment.
- g) Ensure risk assessments are kept current and periodically reviewed.
- h) To ensure that all relevant persons have signed to indicate they have read and understood the local rules.
- i) To ensure staff are suitably trained to perform their role, including equipment competency.
- j) To be involved with periodic audits of practice compliance and relevant document review.
- k) To arrange that PPE is routinely inspected, with results documented and actions noted.
- l) Report and investigate any UV safety incidents in liaison with the appropriate NIR advisor and manager.

**4.11 Sonographer leads and Quality Control Leads:** are appointed in writing in each area to ensure compliance with the local Quality Control regime and to ensure escalation of any issues as required.

**4.12 Clinical Laser Experts (CLE):** are responsible for assessing and confirming the competence of all clinical staff using lasers within their area of responsibility and for the supervision of the safe working practices of all staff.

The CLE must:

- a) Ensure prior risk assessments have been completed and local rules are in place before any use of the laser radiation.
- b) Ensure that all staff wishing to undertake specific laser procedures are authorised in writing and that a copy of that authorisation is held by the Laser Protection Supervisor.
- c) Supervise clinical work with lasers
- d) Ensure training programs for clinical users are adequate.
- e) Ensure there are systems in place to ensure the safe implementation of new techniques.
- f) Provide clinical input into all procedures developed around the use of lasers in their area.
- g) Approve all research undertaken involving radiation within their area.
- h) Ensure there is adequate key control in place.
- i) Confirm competence of authorised users by ensuring they:
  - i. Complete laser core of knowledge safety training and any necessary laser training required, advised by the LPA.
  - ii. Undertake Continuous Professional Development.
  - iii. Undertake practical training in the use of the specific laser to be used.
  - iv. Undertake training from the Laser Protection Supervisor to ensure compliance with the Laser Local Rules.

- j) Ensure that suitable training records are in place to support the written authorisation.
- k) Ensure that the LPA is informed of any new proposed laser devices, to ensure a prior risk assessment is performed.
- l) Ensure appropriate medical surveillance is carried out when incidents with lasers occur.

**4.13 Lead UV Dermatologist / Phototherapy Clinical Lead (PCL):** A phototherapy clinical lead (PCL) is appointed with scope of practice covering the clinical use of the UV sources. The PCL may be a Consultant Dermatologist expert in the clinical use of UV radiation for phototherapy. The PCL is responsible for ensuring adequate patient protocols and that the governance is in place to ensure safe treatment of patients.

**4.14 MRI Responsible Person and Superintendent Radiographers:** are responsible for the day to day Health and Safety in the MRI unit, in accordance with the Policy and Procedures for the Operation of Magnetic Resonance Imaging Units.

**4.15 All Employees:** Employees are responsible for exposure control and patient safety. All Employees who are involved with the storage, handling and use of substances or equipment related to non-ionising radiation must:

- a) Exercise reasonable care in carrying out their duties and follow all relevant protocols and local rules. Read and sign local rules. Be aware of and rehearse contingency plans if appropriate.
- b) Ensure that they inform their employer of any potential sensitivity to NIR such as an implantable pacemaker, pregnancy.
- c) Inform their employer if they undertake work in any other employer's controlled area e.g. bank work or site visits.
- d) Use, as instructed, any personal protective equipment (PPE) provided by the employer and as instructed within applicable systems of work.
- e) Report any damage or loss of PPE to the appropriate manager.
- f) Undertake any training deemed necessary by the employer.
- g) Ensure that doses resulting from the diagnostic use of NIR are as low as reasonably practicable and consistent with the intended purpose. Be aware of dose limits if applicable.
- h) Report any faults in equipment, facilities or procedures that may adversely affect the health and safety of any person, or cause any untoward radiation exposure of an individual.
- i) Report any incident in which an individual may have received a NIR exposure greater than intended; this includes those incidents where an exposure was not intended.
- j) Report any adverse health effects that they develop during employment that may be associated with an exposure to non-ionising radiations and attend medical surveillance appointments.
- k) Only carry out activities involving radiation for which they have had appropriate training. Responsibilities for specific radiation work must be included in job descriptions.
- l) Not intentionally expose themselves or others except as part of a valid exposure.

- m) Anyone working with NIR who becomes pregnant must inform their manager in writing as soon as possible so that an individual risk assessment can be performed and a dose assessment undertaken.
  - n) Not work outside of their scope of practice.
  - o) Be aware of the location and contents of all relevant documentation.
  - p) Implement security and access restriction procedures if relevant. For example: keeping the key to laser equipment in a secure location.
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## **5. POLICY IMPLEMENTATION AND ASSOCIATED DOCUMENTS –WHAT TO DO AND HOW TO DO IT**

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- 5.1 The precautions around the different NIR risks are slightly different and so will be dealt with separately here. However, the main principles which apply to all uses are:
- a) Use an alternative, safer source if it can achieve the desired result.
  - b) No potentially hazardous NIR source shall be purchased or loaned without prior approval of the relevant NIR Advisor. This opinion can be sought using the form in Appendix 3.
  - c) Use engineering controls where possible such as filters, screens, remote viewing, curtains and safety interlocks.
  - d) Use systems of work to reduce the risk.
  - e) Appoint a supervisor or responsible person to ensure safe use of the source.
  - f) Use PPE where there remains a risk.
  - g) Ensure only trained authorised users are able to operate the equipment.
  - h) Use correct safety signs to warn those in the area of the risk.
  - i) Train all workers in the area best practice.
  - j) Ensure that all staff are aware of their responsibilities.
  - k) Ensure equipment is regularly serviced and, where appropriate, quality controlled.
- 5.2 All functions detailed in the responsibility section must be undertaken.
- 5.3 Incidents involving NIR must be reported in line with the Trust's incident reporting policy (Incident and Accident Reporting policy A10/2002) and the relevant NIR Advisor must be informed. If an incident could have led to an injury to the eye an ophthalmologist must carry out an examination on the injured party within 24 hours. Dermatologists must be contacted for any skin injury. Methods of dealing with potential incidents should be detailed within local systems of work.
- 5.4 Incidents which must be reported to external agencies should be reported through the Director of Safety and Risk.
- 5.5 Procurement of potentially hazardous NIR equipment
- a) No potentially hazardous NIR equipment will be purchased/loaned without the prior approval of the relevant NIR Advisor.
  - b) The manager of the area purchasing the equipment must provide the NIR Advisor with:

- i. Equipment details/brochure
  - ii. Details of clinical use
  - iii. Proposed location
  - iv. Contact details of manager, clinical lead, any safety supervisors
  - v. Details of PPE
  - vi. Risk assessment details
  - vii. Proposed servicing agreement
  - viii. Training requirements
  - ix. Pre-Acquisition Questionnaire (PAQ)
  - x. Systems of work
  - xi. Clinical use procedures
  - xii. Fire safety considerations.
- c) To aid with this a form is provided in Appendix 3.
- d) The equipment should not be purchased or loaned until approved by the relevant NIR Advisor.

## 5.6 Lasers

- a) Are subject to the requirements of the Control of Artificial Optical Radiation at Work Regulations 2010.
- b) MHRA Device Bulletin 2015 guidance must also be followed.
- c) Risk assessments must be carried out for all lasers.
- d) The LPA must be informed of all Class 3B or 4 lasers and the following must be arranged:
  - i. Regular LPA audit of the area.
  - ii. The advice of the LPA must be sought for Class 3R, 3B and 4 lasers, to complete the risk assessments.
  - iii. Appropriate training related to laser safety must be completed and recorded by all staff working in the laser controlled area, as advised by the LPA.
  - iv. Competency must be assessed and recorded against set standards prior to use of the equipment which must only be given to authorised users.
  - v. Laser safe tracheal tubes must be used during surgery using lasers.
  - vi. Precautions must be taken to ensure that users are not exposed to viable particulate matter during laser surgery, which should be considered in a separate COSHH risk assessment.
- e) Local rules are required for areas using class 3B or 4 lasers which must cover:
  - i. Contact details for the LPA
  - ii. Contact details for the Laser Protection Supervisor
  - iii. Contact details for the Clinical Laser Expert.
  - iv. Key control to ensure it is only issued to authorised persons
  - v. Method of access control for the area.

## 5.7 Phototherapy

- a) Phototherapy is subject to the requirements of the “Control of Artificial Optical Radiation at Work Regulations 2010”. The “British Association of Dermatologists (BAD) guidelines and standards” should also be followed.

- b) Written and signed off treatment schedules must be in place. These must consider dose limits mentioned in standards and guidance.
- c) Risk assessments must be completed after consultation with the appropriate NIR advisor prior to use of ultraviolet radiation.
- d) Appropriate training related to UV radiation safety must be completed and recorded.
- e) Ultraviolet radiation risks to consider include skin erythema, cataract induction and potentially skin cancer.
- f) Regular audits of the area must be undertaken.
- g) Local rules must be implemented covering:
  - i. Contact details for the LPA (although not a laser)
  - ii. Contact details for the UV radiation physicist
  - iii. Contact details for the UV Protection Supervisor.
  - iv. Contact details for the Phototherapy Clinical Lead (PCL)
  - v. Requirements for carrying out risk assessments, training and equipment servicing.
  - vi. Method of access control for the area.

### 5.8 Other sources of non-coherent light

- a) All other sources of artificial non-coherent light must be risk assessed. It is the responsibility of the area manager to ensure that this is undertaken. An NIR advisor must be contacted prior to purchase of any high risk devices such as UVC sterilisation units, to provide necessary expert advice for adequately completing the risk assessment.
- b) Advice on assessing the level of risk can be found in the Guidance for Employers on the Control of Artificial Optical Radiation at Work Regulations 2010.  
<https://www.hse.gov.uk/radiation/nonionising/employers-aor.pdf>
- c) Other published data on the same model of equipment may be used where available.
- d) The advice of the manufacturer should be sought.
- e) If a source is not listed as safe within this document or there are concerns about the effect of the source on staff then a NIR advisor should be consulted.

### 5.9 Ultrasound

- a) Ultrasound does not pose a NIR risk to staff.
- b) There are biological effects of ultrasound on the body resulting from heating and mechanical effects and so the values of TI (Thermal Index) and MI (Mechanical Index) should be presented by all units used within the Trust and observed by the user. The advice of the ultrasound physicist must be sought if there are any concerns.
- c) The main risk associated with ultrasound is the misdiagnosis of patients if equipment is not functioning correctly. There is also risk related to electrical safety. Therefore, ultrasound must be subject to quality control checks:
  - i. Acceptance tests: Must be completed by the Ultrasound NIR advisor prior to first clinical use of a new ultrasound system or a new transducer.
  - ii. Monthly local Quality Control (QC) tests should be performed as advised by the Ultrasound expert. The results of these should be recorded and if there are any concerns about function of the equipment the Ultrasound NIR advisor should be contacted.

- iii. Annual/bi-annual ultrasound QC checks. These will be performed at intervals depending on the requirements of the area and in accordance to the NIR advisor. The area will be provided with a report and any actions identified must be undertaken.

## 5.10 MRI

- a) MRI exposes patients, staff and the public to significant static and time varying magnetic fields and radiofrequency fields.
- b) The main risks associated with MRI are ferromagnetic materials, which if brought within the vicinity of the equipment, could become missiles leading to serious injury, equipment damage, serious injury and fatalities.
- c) Other risks include interaction with implants and monitoring wires leading to device malfunction and injury including burns. Any individual entering the MR Controlled Access Area must fill out a screening questionnaire. Dose limits and safety measures mentioned in standards and guidance must be considered. There are also risks related to possible cryogenic gas expulsion in the event of MRI magnet quenching.
- d) Due to these risks entry to the areas around MRI units are controlled.
- e) MHRA Device Bulletin DB 2021 and MRI local rules and procedures must be available in all areas using MRI.
- f) The manager of each MRI unit must appoint a MR Responsible Person to ensure work in the area is carried out in a safe manner.
- g) The advice of an appointed MRI Safety Expert (MRSE) must be sought regarding all matters in Appendix 2.
- h) All equipment that will be taken into the MR Environment must be appropriately risk assessed and labelled.
- i) Staff that work in the MR Controlled Access Area must complete the appropriate level of MR Safety training in accordance with the MHRA guidelines.
- j) Prior to entering the MR Environment the MRI safety screening form must be completed and checked by a trained MRI authorised staff.
- k) Transdermal medicinal patches containing metal and those that may be affected by heat should be removed and replaced after scanning, following the process in the "Transdermal Patches UHL Policy".
- l) Equipment or devices must not be taken into the MR Environment without prior safety checks, in accordance with the MRI local rules.

## 5.11 Diathermy

- a) The main risks associated with diathermy units include, (i) interference with active or passive implanted or body worn medical devices, (ii) electric shocks, causing electro-explosive devices to initiate, (iii) sparks triggering explosions, (iv) auditory effects such as buzzing or clicks, and (v) thermal stress, (vi) burn risk particularly in a confined space when there is no visible flame.
- b) Therapeutic diathermy units may produce significant electromagnetic fields. Staff should not stand within 1 m of the electrodes or patient when in use.
- c) Surgical diathermy produces lower levels of NIR and therefore is less of a risk.
- d) Diathermy emissions can contain numerous toxic gases, particles that can adversely affect surgeons' and theatre staff's respiratory system. The risks vary according to the specific procedure, equipment, environment, technique and patient. If exposure to diathermy emissions can't be

prevented then it should be adequately controlled. This is usually achieved by effective local exhaust ventilation (LEV).

- e) Diathermy should not be applied, or only cautiously so, directly over most metal implants (dental fillings and bridgework excluded), as metal selectively heats and can burn the patient. Likewise, diathermy should not be used over anything wet, as the water is likely to turn to steam, potentially resulting in a burn. Dry towels should always be used and sensible precautions should be taken to ensure that the area to be treated is dried.
- f) Diathermy should not to be used if a patient has a pacemaker or implanted neurological device. Patients with a pacemaker or implanted neurological device should not be allowed within 7.5 m radius of an active diathermy unit as the radiofrequencies can interfere with the functions of these devices.

### 5.12 Other potential NIR risks

- a) Due to the variety of potential NIR risks in a hospital they cannot all be detailed in this document.
- b) Advice on other potential sources of risk can be obtained from LRSS. However, it is the responsibility of the local area manager to ensure that any potential NIR risks are identified.
- c) Other risks that may require additional support from NIR Advisors, although not exhaustive are included in the following guidelines, with information to help take reasonable steps to prevent harm in the workplace related to exposure from:
  - (i) Electromagnetic fields (EMFs).  
<https://www.hse.gov.uk/pubns/priced/hsg281.pdf>
  - (ii) Artificial Optical Radiation  
<https://www.hse.gov.uk/radiation/nonionising/employers-aor.pdf>

## 6 EDUCATION AND TRAINING REQUIREMENTS

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- 6.1 All staff must undertake an elearning package on Health and Safety on HELM which contains a page of information on non-ionising radiation risks and asks staff to self identify if they have implantable devices.
- 6.2 All visitors that do not work for the Trust but are entering an area where NIR is used must be adequately trained in the precautions required to ensure their safety. This is the responsibility of staff working in that area.
- 6.3 All staff operating NIR equipment must have documented relevant competency records.
- 6.4 All staff working in the vicinity of NIR must be adequately trained by the area to ensure that they are able to implement basic safety requirements. The local manager is responsible for ensuring that this has happened.
- 6.5 All NIR advisors must have the relevant qualification and be appointed in writing.
- 6.6 UHL will establish good communication and co-operation with those employers whose staff may be exposed to NIR by the Trust's work. Individual workers

must follow the NIR safety instructions in the local rules for the area they work in.

### **6.7 Lasers:**

- a) The Trust Laser Protection Advisor (LPA) must be adequately trained and should have appropriate certification from RPA2000 or equivalent.
- b) Workers in the laser controlled area must have undertaken an initial training course and refresher course as advised by the LPA.
- c) All local area supervisors of NIR safety such as Laser Protection Supervisors (LPS) must have undertaken appropriate levels of training including the basic laser safety training on HELM and “Core of Knowledge” training.
- d) All Clinical Safety Experts must be suitably trained and appointed in writing.
- e) All authorised laser users must be familiar with the Core of Knowledge for laser safety, have attended practical training and have undertaken sufficient supervised training prior to being signed off as competent to use the laser.
- f) All workers that may enter the laser controlled area must have induction training provided by the LPS.

**6.8 Phototherapy:** All staff carrying out phototherapy must have undertaken appropriate training and be signed off as competent in the procedures they will undertake. Training records should be held in the department and reviewed at performance appraisals.

**6.9 MRI:** All staff working in the MRI Controlled Access Area must take appropriate MRI safety training from the MRI responsible person or delegated authorised MRI staff member, and/or take the basic MRI safety training on HELM.

## **7 PROCESS FOR MONITORING COMPLIANCE**

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7.1 The method of monitoring compliance can be found in the policy monitoring table (page 22).

## **8 EQUALITY IMPACT ASSESSMENT**

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8.1 The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.

8.2 As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

## **9 SUPPORTING REFERENCES, EVIDENCE BASE AND RELATED POLICIES**

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### **Legislation**

- The Control of Artificial Optical Radiation at Work Regulations 2010

- The Health and Safety at Work Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Provision and Use of Work Equipment Regulations 1998
- The Control of Substances Hazardous to Health Regulations 2002
- The Personal Protective Equipment at Work Regulations 1992
- The Health and Safety (Safety Signs and Signals) Regulations 1996
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
- The Control of Electromagnetic Fields at Work Regulations 2016

## Standards

- MRI Static Magnetic Field Safety Considerations- the projectile effect caused by the influence of the static magnetic field of magnetic resonance imaging systems. MDA DB 9803: 1998.
- Electrical equipment Part 2: Particular requirements for safety, section 2.122 Specification for diagnostic and therapeutic laser equipment. BS EN 60601-2-22:1996.
- BS EN 60825-1:2014, Safety of laser products – Part 1 Equipment Classification and Requirements
- BS EN 60825-4:2006, Safety of laser products – Part 4 Laser Guards
- BS EN 60825-8:2006, Safety of laser products – Part 8 Guidelines for the Safe use of Lasers on Humans BSI 2007
- BS EN 60825-14:2004, Safety of laser products – Part 14 A User’s Guide BSI 2004
- BS EN 207:2009, Personal eye-protection – filters and eye protectors against laser radiation (laser eye-protection). British Standard 2009. Tracheal tubes designed for laser surgery. Requirements for marking and accompanying information. BS EN ISO 14408:2009
- Guide for airway management during laser surgery of the upper airway, technical report. ISO TR 11991:1995.

## Guidance

- Guidance for Employers on the Control of Artificial Optical Radiation at Work Regulations (AOR) 2010.

<https://www.hse.gov.uk/radiation/nonionising/employers-aor.pdf>

- Lasers, intense light source systems and LEDs. Guidance for safe use in medical, surgical, dental and aesthetic practices. Published by the Medicines and Healthcare products Regulatory Agency, 2015.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/474136/Laser\\_guidance\\_Oct\\_2015.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/474136/Laser_guidance_Oct_2015.pdf)

- A guide to the Control of Electromagnetic Fields at Work Regulations 2016. <https://www.hse.gov.uk/pubns/priced/hsg281.pdf>
- Magnetic resonance imaging equipment in clinical use: safety guidelines. Relevant safety information for users of magnetic resonance imaging (MRI) equipment in clinical use. Published by the Medicines and Healthcare products Regulatory Agency, 2021. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/958486/MRI\\_guidance\\_2021-4-03c.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/958486/MRI_guidance_2021-4-03c.pdf)

Service Guidance and Standards For Phototherapy Units. British Association of Dermatologists.

<https://cdn.bad.org.uk/uploads/2021/12/29200202/Phototherapy-Service-Guidance-and-Standards-20193.pdf>

## **UHL Policy**

- Health and Safety Policy A17/2002
- Incident and Accident Reporting policy A10/2002
- Policy and Procedures for the Operation of Magnetic Resonance Imaging Units

## **10 PROCESS FOR VERSION CONTROL, DOCUMENT ARCHIVING AND REVIEW**

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10.1 The updated version of the Policy will be uploaded and available through INsite Documents and the Trust's externally-accessible Freedom of Information publication scheme. It will be archived through the Trust's SharePoint system.

10.2 This Policy will be reviewed every three years or sooner in response to identified clinical risks/incidents.



## POLICY MONITORING TABLE

The top row of the table provides information and descriptors and is to be removed in the final version of the document

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of other professional groups	What tool will be used to monitor/check/observe/asses/inspect Authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report ? How often is the need to share the report?	How will each report be interrogated to identify the required actions and how thoroughly should this be documented in e.g. meeting minutes.
Phototherapy safety compliance with legislative requirements and guidance.	NIR Advisors & local UV supervisors.	Locally developed checklist. Issues discussed in local NIR meetings.	Frequency determined by the level of perceived risk.	Report provided to the area and issues discussed in the NIR and phototherapy MDT meetings. Summary provided to Radiation Safety Committee.
Laser safety compliance with legislative requirements and guidance.	NIR Advisors and local laser supervisors.	Locally developed checklist. Issues discussed in local NIR meetings.	Frequency determined by the level of perceived risk.	Report provided to the area. Summary provided to Radiation Safety Committee.
MRI safety compliance with legislative requirements and guidance.	NIR Advisors, MR Responsible person and MRI superindendants.	Locally developed checklist. Issues discussed in MRI Safety Group meetings.	Frequency determined by the level of perceived risk.	Report provided to the area. Issues discussed in MRI Safety Group meetings. Summary provided to Radiation Safety Committee.
Safety of high risk optical radiation sources, as identified by the areas.	NIR Advisors.	Locally developed checklist. Issues discussed in local NIR meetings.	Frequency determined by the level of perceived risk.	Report provided to the area. Summary provided to Radiation Safety Committee.

## APPENDIX 1: ROLE OF LASER PROTECTION ADVISOR

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The laser protection adviser (LPA) is given responsibility to oversee laser safety. The LPA will be knowledgeable and have expertise in matters related to optical radiation equipment safety. The Laser Protection adviser should be contacted to advise in accordance with the national guidelines and the laser local rules, on the following:

- Planning requirements for any new designated laser controlled areas.
- The prior examination of plans for installation and the acceptance into service of new or modified class 3B, class 4 laser and Intense pulse light (IPL) devices.
- The periodic examination and testing of engineering controls, design features, safety features and warning devices, and regular checking of systems of work including any written arrangements provided to restrict exposure to laser radiation.
- Review the content of risk assessments and local rules for use of class 3B, class 4 laser devices and Intense pulse light (IPL) equipment.
- The conduct of investigations and subsequent reports as necessary in the event of an adverse laser incident.
- Check the selection and use of appropriate personal protective equipment (PPE).
- Periodic examination of protective laser eyewear integrity.
- Staff training as appropriate for working with lasers.

## APPENDIX 2: MR SAFETY EXPERT

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The MR Safety Expert will have an advanced knowledge of MRI techniques and an appropriate understanding of the clinical applications of MRI. Ideally they will be a physicist with expertise in MRI. Clinical units should appoint an MR Safety Expert who acts according to recognised standards ie they should normally have Health and Care Professional Council (HCPC) registration or General Medical Council (GMC) specialist registration.

The MR Safety Expert should be contacted to advise in accordance with the national guidelines and in the Policy and Procedures for the Operation of Magnetic Resonance Imaging Units, on the following:

- Site planning for new MRI installations.
- Development of the MRI safety framework and local rules.
- The necessary engineering, scientific and administrative aspects of the safe clinical use of the MR devices.
- Monitoring the effectiveness of local safety procedures,
- Procurement.
- Image Quality Assurance.
- Adverse incident investigation
- Specific patient examinations with complex MR Conditional implants or devices.
- The risks associated with individual procedures and on methods to mitigate these risks.
- Advise on non-routine MR procedures for individual patients and specific patient groups.

### **APPENDIX 3: PURCHASE/LOAN OF POTENTIALLY HAZARDOUS NIR EQUIPMENT**

You must inform the Head of Non-Ionising Radiation at least 2 weeks in advance of the requirement to use the equipment to ensure that adequate safety systems can be put into place. The sooner you provide this information the more likely there is to not be a delay in implementing it.

Details of the equipment including manufacturer, model and any brochures provided by the company.	
Type of NIR risk	
Description of the area in which it will be used e.g the physical location, the design of that location.	
Details of the use of the equipment.	
Loan/New equipment	Loan/New equipment (delete as appropriate)
Supplier contact details	
NHS Indemnity form completed	Y/N/N/A
Area of use	
Contact name and number	
Clinical lead name and number	
Safety supervisor (LPS/MR Responsible person/UV supervisor/other) name and number	
Risk assessment completed? (Provide a copy)	Y/N
Systems of work/local rules in place?	Y/N
Clinical procedures in place?	Y/N
Staff adequately trained?	Y/N
Service contract/evidence of service prior to loan obtained	Y/N
Details of fire safety requirements	
Details of training	
Detail PPE provided.	

I am aware that prior to first use the recommendations of the relevant Safety Advisor should be taken into account, electrical safety testing must be performed and clinical procedures must be approved.

Name:

Designation:

Date:

## APPENDIX 4: EXAMPLES OF NON-IONISING RADIATION SOURCES

SOURCE	EXAMPLE
Static magnetic fields	MRI
Time varying magnetic fields	MRI
Non-coherent artificial optical radiation	Ultraviolet (UV) light sources Photodynamic therapy devices Intense Pulsed Light (IPL) sources Blue light therapy Curing lights Infra-red sources Theatre lights
Laser	<p>Class 1: Safe under reasonably foreseeable conditions of operation and generally exempt from additional control measures.</p> <p>Class 1M: Safe under reasonably foreseeable conditions of operation but may be hazardous if used with magnifying optics (e.g. eye loupes or binoculars).</p> <p>Class 1C: A laser product which is designed explicitly for contact applications to the skin or non-ocular tissue. No additional control measures are required apart from following manufactures instructions for use.</p> <p>Class 2: Laser devices that emit visible radiation and are safe for brief direct exposures. Prolonged staring into the beam may cause eye injury. Natural aversion responses including head movement and blink reflex is assumed to provide adequate protection.</p> <p>Class 2M: Laser devices that emit visible radiation and are safe for brief direct exposures. Prolonged staring into the beam may cause eye injury and injury possible if used with magnifying optics. Natural aversion responses including head movement and blink reflex is assumed to provide adequate protection.</p> <p>Class 3R: Eye injury possible from intentional intra-beam viewing but risk is low for short unintentional exposure because of natural aversion behaviour.</p> <p>Class 3B: Direct exposure may cause serious eye injury. Viewing of diffuse reflections is generally safe, on condition that the eye is no closer than 13 cm from the diffusing surface and the exposure duration is less than 10 s</p> <p>Class 4: Hazardous to the eyes and skin under all conditions. Fire risk.</p>
Radiowaves	MRI Diathermy
Microwaves	Ablation Therapy Sterilisation
Ultrasound	Lithotripsy Physiotherapy