

RADIATION SAFETY UPDATE

Radiation incidents — IR(ME)R

IR(ME)R is aimed at protecting patients.

The Ionising Radiation (Medical Exposure) Regulations NI 2018, known as IR(ME)R, aim to protect people against the dangers from exposure to ionising radiation in healthcare settings

What is a radiation incident?

A radiation incident is an event where a person undergoing a Medical Exposure covered by IR(ME)R (NI) 2018 was or potentially could have been (near miss) exposed accidentally or unintentionally, or was exposed to a radiation level that significantly deviates from accepted and justified clinical practice.

Radiation Incidents include:

- Near miss exposure events
- Exposure events that are not notifiable to RQIA
- Exposure events that are notifiable to RQIA

The Regulation and Quality Improvement Authority (RQIA) is the independent body responsible for monitoring, inspecting and enforcement of IR(ME)R.

Why should radiation incidents be reported?

IR(ME)R NI 2018 increases the emphasis on patient safety. Imaging services, BHSCCT is committed to providing and safeguarding the highest standards of care for service users, staff and visitors. The service and Trust recognizes that adverse incidents will occur and that it is important to identify causes to ensure lessons are learned to reduce the likelihood of reoccurrence.

When is a radiation exposure event notifiable to RQIA?

- Accidental exposure: when an individual has received an exposure when no exposure of any kind was intended, that is, if the wrong patient was exposed to radiation, for example if wrong ID sticker on a paper referral.
- Unintended exposure: when an exposure was intended but when the exposure they received was significantly greater or different to that intended, for example, if the patient was referred for the wrong examination and the incorrect examination was undertaken

RQIA and other IR(ME)R regulatory bodies have issued guidance on significant, adverse, unintended exposure (SAUE) in June 2019.

Reporting Process for IR(ME)R radiation incidents at BHSCCT

A responsive and effective radiation incident reporting and analysis system has been revised and implemented. The "Policy and procedure for the reporting and the investigation of IR(ME)R related incidents in areas using X-rays for diagnostic and interventional procedures" has been available from the Hub since July 2019 and is applicable to all areas involving radiation (excluding Radiotherapy and Nuclear Medicine).

Imaging service's Radiation incident governance group meets weekly to review, analyse and monitor all imaging service's radiation incidents. In addition it ensures notifiable incidents are reported in line with SAUE guidance and detailed investigation reports are submitted to RQIA within the 12 week timeframe.



"place the quality and safety of patient care above all other aims for the NHS."

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Did you know?

The BHSCCT MPE (Medical Physics Expert) is Dr Adam Workman.

The MPE provides advice and guidance on the radiation safety of individuals undergoing medical exposures for example, whether a radiation incident is notifiable to RQIA and providing subsequent radiation dose reports.

Responsibilities in Patient Pathway

The safe and accurate delivery of diagnostic clinical imaging services is the responsibility of all staff involved in the clinical imaging patient pathway.

All IR(ME)R duty-holders must be vigilant and follow procedures and safe practices such as multi-point checks at all stages in the patient's pathway.

Entitled

The **REFERRER** must be entitled in line with BHSCT Employer's Procedures.
The **PRACTITIONER** must be entitled in line with BHSCT Employer's Procedures.
The **OPERATOR** must be entitled in line with BHSCT Employer's Procedures.

Referral

REFERRER:

- Correctly identifies the patient, verifies pregnancy status (and breast feeding where applicable)
- Check previous medical history including relevant imaging (including duplicate requests)
- Assesses patient to ensure it is physically possible for the patient to undergo the examination
- Confirms patient understands and consents to the examination and understands when/how they will receive the appointment/urgent examination.
- Provides patient with information relating to the benefit and risk of the ionising radiation examination (in line with IR(ME)R NI 2018).
- Checks referral guidelines (iRefer or local guidelines) to confirm appropriate examination requested.
- Considers alternative to non-ionising radiation
- Supplies adequate, relevant clinical information on the request as required and includes previous imaging.
- Confirms correct body part / laterality and checks correct imaging modality selected
- Confirms unique identifier (signature/electronic signature/correct user login)
- Ensures correct timing of the examination is clearly identified
- Provides mandatory information including the referring consultant and referral source on the imaging request form/referral, any special needs/interpreter/disabilities
 - **PAUSES AND CHECKS** the referral is for the **RIGHT PATIENT, RIGHT TEST, RIGHT TIME**
 - Completes and sends request
 - **Cancels procedure or exam if no longer required.**
- Referrer provides patient with information relating to the benefit and risk of the ionising radiation examination (in line with IR(ME)R NI 2018).

Justification

IRMER PRACTITIONER (Radiologist or Radiographer):

- Confirms referrer ID (and referrer is entitled)
- Correctly identifies patient, match patient data on referral with RIS
- Checks previous medical history including all relevant imaging
- Enquires whether patient is pregnant or breastfeeding if relevant
- Evaluates the clinical information supplied by the referrer and considers any appropriate alternative procedure not involving ionising radiation
- Balances risk v benefit of medical exposure and confirm decision
- Justifies the medical exposure or notifies referrer if exposure cannot be justified
- Assigns modality and protocol, include any specific requirements for the individual exposure
- Assigns urgency, clarify timing of procedure
- Authorises the medical exposure (this step can be undertaken by Authorising operators who refer to Authorisation guidelines as applicable) by adding a physical or electronic signature to the request to demonstrate justification has occurred

Following justification and authorisation the patient is appointed according to priority level

Exposure

OPERATOR (if entitled to do so):

- Confirms identity of Referrer (checks they are entitled)
- Confirms justification of the exposure and identity of entitled IRMER Practitioner OR compares referral with authorisation guidelines and authorises request (if entitled to do so)
- Checks previous medical imaging for the patient, confirms timing of the examination is appropriate
- Confirms modality is correct, checks blood results as required for IV injections / interventional procedures
- Confirms patient identity, previous medical history and relevant imaging with patient
- Explains procedure and confirms patient understands, and confirms no contraindications to examination
- Confirms consent and records where appropriate, confirms correct body region / laterality
- Confirms patient weight/height when appropriate
- Positions patient
- Confirms correct product, date, volume, flow rate, concentration, activity (where appropriate), and route of administration for any contrast agent or radiopharmaceutical associated with exposure
- Selects appropriate examination protocol and equipment settings
- Performs optimisation adjustments with due regard to patient age, sex, pregnancy status, BMI and dose constraints
- **PAUSES & CHECKS BEFORE EXPOSURE / ADMINISTRATION**

Post Exposure

OPERATOR

- Completes exposure, checks image quality and confirm no further imaging is required, completes post processing.
- Attends to the aftercare needs of the patient including appropriate information regarding results.
- Sends images to image archive system and confirms complete arrival of images before proceeding with next patient.
- Records exposure factors, completes clerical duties with regard to all documentation associated with the examination

OPERATOR (clinical evaluation)

- Documents a clinical evaluation in line with local procedures

REFERRER

- Where applicable: makes and records clinical evaluation in line with local procedures. Ensures clinical evaluation is used in the decision to manage patient. Considers need for further imaging. Discusses findings with patient.

BHSCT Imaging Services

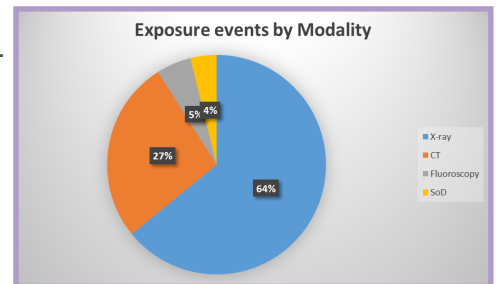
IR(ME)R Radiation Incidents 2019-20

290 radiation incidents were reported and logged on the services radiation incident log January 2019-May 20.

156 were near miss radiation incidents, whilst 134 incidents involved patient exposures.

26 radiation incidents were classified as notifiable to RQIA by the MPE. Of the 26 notifiable incidents 16 of these related to referrers, 7 to operators and 3 by equipment errors/faults.

Summary of Exposure incidents: 50 exposure events were reported by X-ray Radiographers, 21 by CT services, 4 from fluoroscopy and 3 from School of Dentistry.



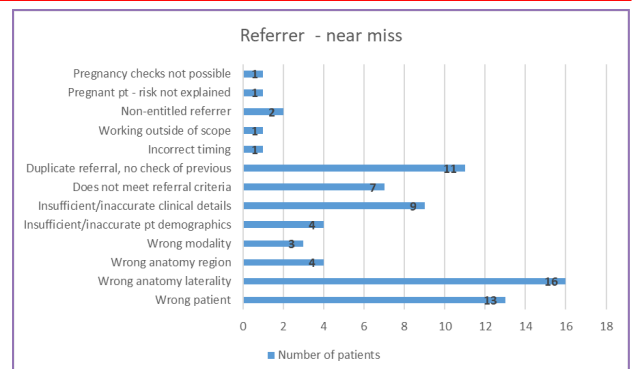
Summary of Exposure incidents notifiable to RQIA: 7 occurred in CT, 13 in X-ray, 2 in fluoro, 1 in IR and 2 in nuclear medicine. The causes of the incident relate primarily to duty holders (referrers and operators) whilst 3 notifiable incidents were caused by equipment errors/faults.

Referrer errors accounted for 64% of notifiable incidents and related to wrong patient being referred for imaging, patient referred for wrong test, duplicate referral and other. Trend analysis highlighted several occurrences of same incidents caused by referrer error which led to reporting to RQIA under SAUE guidance, for example, inaccurate clinical details on requests for post operative imaging of the knee which led to incorrect modality undertaking exposure.

Operator error relating to failure to check previous imaging accounted for a number of notifiable errors on different sites.

Operator error accounted for more than 50% of non-notifiable radiation incidents for example incorrect laterality exposed, wrong set up, inadequate supervision and other.

Summary of Near Miss Radiation incidents: Review of 102 of the near miss radiation incidents has identified the main causes of near miss radiation incident lies with referrers who are responsible for 71.5% (73 of 102) near miss radiation incidents. This correlates with findings reported by CQC (Dec 2019).



As demonstrated the most common referrer errors relate to wrong laterality, wrong patient and duplicate referral which have also been included in the exposure radiation events. Additional investigation is required to examine the circumstances which result in referrer error.

There are a number of exposure events recorded whereby referrer error (e.g. wrong patient, wrong anatomy laterality, failure to check previous imaging, failure to cancel duplicate referrals) have resulted in patients receiving an unnecessary dose of radiation and, on occasions, the need to report to the regulator.

Referrers are requested to Pause & Check when completing requests for medical exposures

Operators are required to Pause & Check before all medical exposure

Actions: Local actions taken, for example, communication with referrers, review of processes, and training. Escalation of referrer errors to Radiation Safety Committee and relevant sub-committee (DRNM).

Additional investigation ongoing to examine the circumstances for repeated types of error and to consider if a review of working practices is required to see if any environmental factors/human factors/staffing factors exist which have contributed to radiation incidents.

Learning from the CQC

The Care Quality Commission (CQC) annual IR(ME)R report identifiedreferrer error (incorrect patient referrals, insufficient /inaccurate referral information, failure to cancel a request, duplicate referrals/no check of previous) as being the most common causes of radiation incident notifications under SAUE guidance in diagnostic imaging.

There has been a decrease in number of notifications reported to CQC in 2019/20 however the impact and challenges of COVID is recognised and the subsequent stress in the workforces in addition to staffing issues. The benefit of the Clinical Imaging board's coding taxonomy was outlined by CQC. Imaging services has adopted this taxonomy and will develop further in 2020/21.



IRR17—Radiation incidents

What is IRR17?

IRR17 [Ionising Radiations Regulations (Northern Ireland) 2017] sets out a framework to ensure occupational exposures and exposures of members of the public are kept as low as reasonably practicable. The main aim of the Regulations Regulations is to establish a framework for the protection of workers and the general public against the dangers arising from work with ionising radiation. An Approved Code of Practice and a set of Guidance Notes are available to assist in the interpretation of the regulations (<https://www.hse.gov.uk/pubns/priced/l121.pdf>). The Health and Safety Executive for Northern Ireland (HSENI) enforces the regulations.

If you work with ionising radiation you have a legal duty to protect yourself and others from all hazards arising from your work. In particular, you must not expose yourself or others to ionising radiation to an extent greater than is reasonably necessary for the purposes of your work, and you must exercise reasonable care while carrying out such work. For this reason you must become familiar with the Local Rules.

IRR related incidents reported across BHSCT in 2019 and to date in 2020 include: a) staff members in theatres failing to apply lead personal protective equipment which has been provided for them by the Employer, b) new lead protective equipment not fit for use—this was identified on receipt and testing prior to being put into use by imaging services.

IRR - Responsibility of all employees

All employees must comply with regulation 35 of IRR17, which states that every employee who is engaged in work with ionising radiation shall make full and proper use of any Personal and Protective Equipment (PPE) that is provided by their employer (including dose monitoring devices).

Employees should only undertake work with ionising and non-ionising radiations or associated with medical exposures, within the scope of their practice and according to the relevant procedures.

It is important for employees who work in areas involving radiation to have radiation awareness training at regular intervals.

Have you read your local rules? Do you know who to contact in the event of a radiation incident? Do you know who your Radiation Protection Supervisor (RPS) is? Have you read the BHSCT radiation safety policy? Do you know what radiation PPE is available to you? Have you had radiation awareness training recently?



LOCAL RULES
for the
DIAGNOSTIC USE OF X-RAYS
Within the
Belfast Health and Social Care Trust
Including
Belfast City Hospital
Mater Infirmorum Hospital
Musgrave Park Hospital
Royal Belfast Hospital for Sick Children
Royal Hospital Site
as required by the
Ionising Radiations Regulations (Northern Ireland) 2017

The Local Rules outline the key instructions to enter and work safely in the areas where ionising radiation is used (Controlled Areas). They outline that that all staff members remaining in a Controlled Area during exposures must wear any lead PPE and personal dosimeters provided by the Employer.

Local Rules are a legal document under IRR(NI)17 and non-compliance may be interpreted as a breach of the Regulations that could lead to formal disciplinary proceedings.

The enforcing authority could also take legal proceedings against those who persistently do not comply under IRR(NI)17 and the Health and Safety at Work Order. Staff members are reminded of these responsibilities. IRR17 compliance issues presentation by HSE (similar to CQC reports) is available from:

<https://webcommunities.hse.gov.uk/connect.ti/radiationcom/view?objectId=690693&exp=e1>

A General Radiation Awareness Sheet is attached.

Did you know?

The BHSCT RPA (Radiation Protection Advisor) is Dr Phil Orr. The RPA provides advice on compliance with IRR17 and is available for advice on all aspects of radiation safety of workers or members of the public.

References

Department of Health. *The Ionising Radiation (Medical Exposure) Regulations (Northern Ireland) 2018*. London: The Stationary Office, 2018
Care Quality Commission (2018). *IR(ME)R annual report 2019-20*. Newcastle upon Tyne.