Hull and East Yorkshire Hospitals NHS Trust

Employer's Procedures

Radiology Department

The Ionising Radiation (Medical Exposure) Regulations 2017

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PROCESS FOR MONITORING COMPLIANCE

Radiology Ops Groups and Radiology RMT Committee

REFERENCES

The Ionising Radiation (Medical Exposure) Regulations 2017

1 INTRODUCTION

This document is written to ensure that departmental process conforms with the Ionising Radiation (Medical Exposure) Regulations 2017 (IRMER 2017).

2 PURPOSE

This document ensures the Radiology Department is compliant with regulation 6(1) of the Ionising Radiation (Medical Exposure) Regulations 2017. Regulation 6(1) requires employers to write procedures associated with medical exposures. It is a legal requirement for all IRMER Practitioners and IRMER Operators to follow these procedures.

3 SCOPE

These procedures apply to all staff involved in radiographic (including interventional) medical exposures and associated practical aspects, such as image evaluation. These staff will normally include IRMER Operators such as radiologists, radiographers and assistant practitioners performing medical exposures. It also applies to IRMER Practitioners (Radiologists and Registrars) who justify individual exposures and evaluate images.

4 DUTIES

All IRMER Practitioners and IRMER Operators involved in radiographic (including interventional) medical exposures are legally obliged to follow these procedures.

1. Procedure to identify correctly the individual exposed to ionising radiation

1.1.1 Immediately prior to the start of the planned medical exposure, the Operator must verify the identity of the patient by asking them to state their name, date of birth and address and comparing these against the details on the request card.

1.1.2 For inpatients, the Operator must also check the details on the patient's identity band/wristband against those on the request card and check verbally. Neonates and children under 1 year old have 2 identity bands/wristbands so both must be checked against those on the request card.

1.1.3 For any invasive procedure or any procedure requiring GA / sedation a Radiology Safety Checklist and /or WHO surgical checklist must be undertaken. Individual flow charts per modality clearly outline when and where these should be used.

1.1.4 If there is more than one Operator, such as in CT, it must be clear which Operator is responsible for identifying the patient

1.1.5 If an address is not detailed on an identity band/wristband, then it is acceptable to verify the identity of the patient by checking name, date of birth and hospital number or NHS number against those on the request card.

1.1.6 Verbal communication may prove difficult and unreliable with certain patients and identification may be impossible to establish by the procedures detailed in Paragraphs 1 to 3. In such instances, Paragraphs 5 to 13 must be followed.

1.1.7 For inpatients, it is acceptable to rely on the patient's identity band/wristband alone.

1.1.8 If a patient is unable to speak but can write, this is an acceptable alternative.

1.1.9 Where a patient's first language is not English arrangements must be made for an interpreter to be available. Staff can request an interpreter through the Patient Advice & Liaison Service (PALS). If an interpreter is required for a face to face consultation one week's notice of the date is usually required. However, if the consultation can be undertaken via the telephone Language Line is available for staff to use via the switchboard with PIN numbers allocated to each division. The PALS office can also assist with the provision of sign language interpreters, if required.

1.1.10 For TB patients who cannot speak English, the wristband is the only acceptable method of identification. If the patient presents without a wristband, they must not be exposed and sent back to the TB nurse.

1.1.11 If a patient is not able to identify themselves, and is not wearing an identity band / wristband, a member of the patient's immediate family should be asked to supply name, date of birth and address on behalf of the patient. If this method is used, the identifying person and their relationship to the patient should be recorded on the Radiology Information System (RIS).

1.1.12 If an immediate family member is not available, the name, date of birth and address must be supplied by an escort with personal knowledge of the patient. If this method is used, the identifying person and their professional position or relationship to the patient must be recorded on the RIS.

1.1.13 If an unconscious patient, who cannot be identified, is admitted through the Accident & Emergency Department they will be identified via their 'unique' Emergency Department (ED) admission number. The Radiology Department is responsible for liaising with ED as regards obtaining the patient's true identity and demographic details.

1.1.14 If a patient attends the Radiology Department for a referral from the Sexual Health Clinic and will not divulge their personal details, then the unique identifying number issued by the clinic should be used.

1.1.15 If a patient is anaesthetised the Operator must obtain the patients identification from their identity band/wristband and verify this with the Anaesthetist.

1.2 Procedure if details do not match those on the request

1.2.1 If the address is incorrect, the patient should be asked for previous addresses as this may be due to moving house. Details must be amended on both the RIS and the Hospital Information System.

1.2.2 If any details are still incorrect, the Referrer should, where possible, be contacted. They must ensure that the patient is the correct patient, change the identification details on the request card to correct the errors and initial the changes made before the investigation can proceed.

1.2.3 If the Referrer is not available, their secretary, or another member of their team, should be contacted to obtain the correct details. The correct details should be written on the request card and initialled by the member of staff who obtained them.

2. Procedure to identify individuals entitled to act as IRMER referrer, IRMER practitioner or IRMER operator within a specified scope or practice

In most circumstances the referrer must supply the IRMER practitioner with:

- Sufficient medical data (such as previous diagnostic information, medical records and clinical indications) relevant to the medical exposure to enable the IRMER practitioner to justify the exposure, or an IRMER operator to authorise the exposure under justification guidelines written by the IRMER practitioner

- If applicable, information on the patient's menstrual status.

- Referrals can be electronic or hand written. The referral source and the referrers name must be clearly indicated.

Verbal referrals: Theatre procedures
In circumstances where a written request is unavailable the referrer must be present with the operator during the radiographic procedure. In this situation, the referrer is physically identifying the patient and as such the operator may authorise the exposure.

Verbal referrals: Acute referrals in interventional procedures
In certain circumstances the referrer will verbally request the procedure directly with the radiologist. The radiologist will always justify and authorise subsequent exposures.

<u>Individuals entitled to act as IRMER Referrers</u>:

All referrals must be in line with referral protocols/guidelines.

MEDICAL STAFF	
Referrer	**Medical Exposure**
Consultants	All medical exposures
Specified Associate Specialist / Staff Grade Associate Specialist / Staff Grade Registrar	Plain Radiography Specified GI Fluoroscopic Exposures Image Intensifier CT Scanning Angiography and interventional
Senior House Officer House Officer	Plain Radiography GI Fluoroscopic Exposures CT Scanning Angiography and interventional
General Practitioner	Plain Radiography Specified GI Fluoroscopic Exposures CT Scanning

NON-MEDICAL STAFF		
Referrer	**Medical Exposure**	**Protocol**
Radiographers Specified Nurse Practitioners Specified Allied Health Professionals	Range of examinations for specified indications	As per appropriate protocol
Dentists	Extra Oral Radiography	

Individuals entitled to act as IRMER Practitioners:

The legal responsibility for justification always remains with the IRMER practitioner. However, authorising that the exposure has been justified is a separate function, the responsibility for which can rest with the IRMER practitioner or a suitably qualified operator (i.e. Registered Radiographer) who may authorise under justification guidelines produced by the relevant healthcare professional.

The person responsible for authorisation may be someone other than the operator who subsequently carries out the exposure. For example, a senior radiographer may authorise but another radiographer may make the exposures. The method of authorisation should be stipulated by a signature on the request card and by the naming the radiographer in the relevant field in the Radiology Information System (RIS) (see below for specific authorisation methods).

IRMER Practitioner	**Medical Exposure**
Consultant Radiologists	Plain Radiography All Fluoroscopy (inc; angiography/interventional) CT scanning
Radiology Registrars who have successfully completed the relevant FRCR radiation safety & physics module	Plain Radiography All Fluoroscopy (inc; angiography/interventional) CT scanning
Consultants (e.g. Cardiologists) who have received appropriate IR(ME)R training and are authorised by the Radiology Department	Exposures relevant to speciality and training.

Individuals entitled to act as IRMER operators:
Individuals entitled to act as IRMER operators are those personnel who have had theoretical training stipulated by IRMER Schedule 3, and practical training on the X-ray equipment they operate; they must be from one of the following staff groups:

Operator	**Medical Exposure**	**Conditions**
Radiologists & Registrars	Fluoroscopy, Angiography & Interventional	
Main X-ray Radiographers	Plain Radiography, Fluoroscopy, Image Intensifier, Angiography & Interventional	
Specified Barium Enema / GI Radiographers	Barium Enema and specified GI procedures	Working to schemes of work and who have received appropriate training
Specified CT Radiographers	CT scanning	
Assistant Practitioners	Plain Radiography, Fluoroscopy, Image Intensifier, Angiography & Interventional	Working to schemes of work and who have received adequate training
Clinical Imaging Support Workers (CISW)	Plain Radiography, Fluoroscopy, Image Intensifier,	Working in a support role NOT operating X-ray machines (note: CISW do not require theoretical training stipulated by IRMER Schedule 2 but do require training under the Ionising Radiation Regulation 1999 (IRR regulation 14))
Medical Physics staff	Any equipment if appropriately trained	
Radiation Physics staff	Any equipment if appropriately trained	

Duties of Operators:
The operator is any person who carries out a practical aspect of the medical exposure. The primary responsibility of the operator is to optimise the exposure. The operator must ensure that the patient is correctly identified, that the exposure has been justified, and for female patients, status regarding their menstrual cycle is the same as that recorded on the request card. The operator may then authorise the procedure. In accordance with Radiology Requesting Protocol 44, the original referrer (or radiologist) should be consulted where there is any doubt as to the appropriateness of any request, unless the operator is permitted to carry out the exposure in accordance with the relevant annex of HEYH Radiology Requesting Protocol 44.
Any additional information required to facilitate a retrospective estimation of the effective dose to the patient should be recorded. To undertake new techniques, and use new equipment, operators must be adequately trained, and this training must be documented.

Methods of authorisation:

General Radiography
The method of authorisation is carried out by naming the examining radiographer in the relevant field in the RIS.

Computed Tomography (CT)
In-patients: Identification of the radiologist/registrar who justified the exposure is carried out by naming them in the relevant field in the RIS
The method of authorisation is carried out by naming the scanning radiographer in the relevant field in the RIS. This also demonstrates who identified the patient prior to the scan
Out-patients: The method of authorisation is carried out by naming the scanning radiographer in the relevant field in the RIS. This also demonstrates who identified the patient prior to the scan

CT Brachytherapy patients
For Brachytherapy procedures, all concomitant CT exposures are justified and authorised by the clinical oncologist prior to treatment.
Radiographers may carry out the exposure without a specific written request from Oncology provided that the patient has had the relevant brachytherapy applicators inserted.

Interventional Radiology, Screening Room 5 HRI, Screening Rooms 1 & 2 CHH and all mobile screening (HRI & CHH Theatres)
The method of authorisation is carried out by naming the operating radiographer in the relevant field in the RIS.

3. Procedure to be observed in the case of non-medical imaging exposures

3.1 Non-medical imaging exposures are those undertaken for insurance, administrative or legal purposes (such as suspected drug smugglers) where there is not expected to be any direct health benefit for the patient. In these cases, the IRMER Practitioner will take any non-medical benefits to the patient into account when justifying the procedure, and will take particular account of the risks in relation to those benefits.

3.2 Non-medical imaging exposures will only be undertaken with the consent of the patient (in the case of chest radiography for emigration purposes, the patient's signature on the relevant forms will be taken to imply consent). In all other cases, the request will be vetted by the appropriate radiologist (acting as IRMER Practitioner). Consent to the procedure will be sought before proceeding, if this has not already been obtained by the referrer (e.g. the Customs and Excise authorities in the case of suspected drug smugglers).

3.3 Any additional projections or investigations, which may be required as a result of the initial investigation, must be medically justified.

4. Procedure for making enquiries of individuals of childbearing age to establish whether the individual is or may be pregnant

4.1 In all individuals of reproductive capacity, the clinician requesting the examination should consider the possibility of pregnancy. National guidelines[1] acknowledge that there is no risk to the conceptus following irradiation during the first 10 days of the menstrual cycle. However, in the interval between 10 days and the date at which the next menstrual cycle is due there is a small risk for high dose procedures such as pelvic or abdominal CT and barium enemas.

4.2 If a foetus has been inadvertently exposed, the Radiation Protection Adviser (RPA) should be informed. He can then provide a dose and risk estimate.

4.3 At diagnostic dose levels, the only adverse effect of radiation on the conceptus is an increased risk of cancer induction. Dose levels are too low to induce death or malformations. Therefore, invasive foetal diagnostic procedures or termination of the pregnancy are not justified.

4.4 The accompanying flow diagram indicates the general procedure to be followed. Where necessary local rules will provide specific requirements for particular work areas.

4.5 The senior radiographer and/or Radiation Protection Supervisor (RPS) is responsible for ensuring that all staff are familiar with the correct procedure, and that normal good radiographic practice is carried out to ensure that radiation doses are kept as low as reasonably achievable.

4.6 In order to ensure that the examination is carried out within 28 days of the last menstrual period (LMP) patients should be asked by the Operator who will expose the patient, *"Are you or may you be pregnant?"* or *"Is your last menstrual period overdue?"*

4.7 Where a patient's first language is not English arrangements must be made for an interpreter to be available. Staff can request an interpreter through the Patient Advice & Liaison Service (PALS). If an interpreter is required for a face to face consultation one week's notice of the date is usually required. However, if the consultation can be undertaken via the telephone Language Line is available for staff to use via the switchboard with PIN numbers allocated to each division. The PALS office can also assist with the provision of sign language interpreters, if required.

4.8 For an unconscious patient, who cannot state whether they are pregnant or not, the procedure is to confirm with the clinician/radiologist that the clinical risk outweighs the risk from the exposure. The name of the clinician/radiologist is recorded on the RIS.

4.9 Advisory notices should be prominently displayed in X-ray departments.

4.10 X-ray request forms should have a space to allow for insertion of the LMP by the referring clinician.

4.11 The patient must be asked *"Are you or may you be pregnant?"* If the patient is unsure, the examining operator (e.g. radiographer) must check the dates of LMP, especially if there is a long delay between request and exposure.

4.12 If the operator does not obtain satisfactory assurance the request should be referred back to the requesting clinician or department, or to a radiologist.

4.13 This advice may be ignored in the following cases:-

- Individuals who have been on the contraceptive pill/implant/injection for three months or more, or have an IUD fitted.

[1] Protection of Pregnant Patients during Diagnostic Medical Exposures to Ionising Radiation RCE 9, HPA, 2009 [http://www.hpa.org.uk/Publications/Radiation/DocumentsOfTheHPA/RCE09ProtectionPregnantPatientsduringDiagnosticRCE9/],

- Individuals who have been sterilised.
- Nuns.
- Individuals who are outside the age range of 12 - 50 or are post menopausal.

Is patient a female of reproductive age?

NO ➘ Proceed with examination

YES ↓

Will primary beam irradiate the pelvic area, or does the procedure involve radioisotopes?

↗ NO

YES ↓

Can the patient exclude the possibility of pregnancy?

YES ➔ Record result in the RIS and proceed with examination

NO ↓

Is menstrual period overdue? ("28 day rule")

YES ➔ Review justification for procedure. If proceeding, keep fetal dose to minimum.

NO ↓

Is it a high dose procedure?[2]

YES ↓

NO ➘

Will examination take place in first 10 days of menstrual cycle? ("10 day rule")

YES ➔ Record result in the RIS and proceed with examination

NO ↓

If patient were pregnant, could examination wait until after delivery?

YES ➔ Re-book patient for first 10 days of next cycle.

NO ➘

Record result in the RIS & proceed with examination [3]

[2] Fetal dose of tens of milligray. e.g. abdominal CT, pelvic CT, barium enema, (see www.hullrad.org.uk)

[3] The risk to fetus in first month of pregnancy is less than that in later months.

5. Procedure to ensure that quality assurance programmes in respect of written procedures, written protocols and equipment are followed

5.1 All procedures and protocols must be subjected to periodic audit to ensure that they are current, effective and appropriate. Any necessary improvements or amendments should be identified

5.2 All radiation safety procedures/protocols will be reviewed every 2 - 3 years. Ratification will be done through Ops Group and/or Radiology RMT Committee, where appropriate

5.3 Audits should be undertaken periodically. The RPA will audit the radiology department not less than every three years to assess compliance with IRR17 and IRMER. HEY radiology management will audit the department for general 'radiographic' compliance on a more frequent basis.

5.4 Staff must report any instance when they are aware procedures and protocols are not being followed and are not working as expected.

5.5 A written log (electronic logs are permitted) must be kept of all reported incidents of procedural breakdown.

5.6 Written records of audits must be kept to demonstrate the quality assurance procedures being followed. A report to the Radiology Management Team should be submitted if there are persistent problems.

5.7 The Radiology department must implement a user quality assurance (QA) programme in conjunction with Medical Physics. This must include checks on all X-ray equipment including digital systems, as per the requirements of IPEM Report 91 (typical frequency of tests 1 – 3 monthly).

5.8 Medical Physics will test all relevant equipment as per the requirements of IPEM Report 91 (typical frequency of tests once per year).

6. Procedure for the assessment of patient dose

It is the responsibility of the operator to ensure that patient dose is documented after every exposure. The dose area product (DAP) for general and screening procedures, screening time for screening procedures and dose length product (DLP) for CT must be recorded in the RIS after the patient examination. Although not essential, the tube potential (kVp), tube current-time product (mAs) and focus to detector distance (FDD) should also be entered.

To identify multiple and abnormal exposures (i.e. large/obese patients), the 'Film Type' drop down list in the RIS must be used.

7. Procedure for the use of diagnostic reference levels (DRLs)

7.1 The RPA will act as the IRMER Medical Physics Expert (MPE) with regard to Diagnostic Reference Levels (DRLs).

7.2 DRLs for standard procedures will be recommended by the RPA and will be based on local dose audits, i.e. local DRLs will be established where these are consistently lower than national and/or European DRLs. The RPA will recommend new DRLs when necessary.

7.3 Where healthcare professionals believe that different DRLs are inappropriate, this should be discussed with the RPA, clinical lead, RPS and departmental manager. Any deviations agreed should be documented, with the reasons for the change. A copy should be given to the RPA.

7.4 The local DRL documentation must be approved by radiology management through a relevant committee (Ops Group and/or RMT)

7.5 National and local DRLs "*are not expected to be exceeded for standard procedures when good and normal practice, regarding diagnostic and technical performance, is applied*." This will be checked using periodic patient dose assessments (*or "dose survey*") of a representative group of patients. If the mean and/or median survey dose consistently exceeds the DRL the RPS should investigate the reason for this and in conjunction with RPA initiate an appropriate corrective action where appropriate.

7.6 Records of all survey results and investigations should be kept by the RPS.

7.7 The Radiation Physics Department will manage annual patient dose surveys. These should be performed for each X-ray unit for all standard radio-diagnostic examination performed. Normally this will be achieved by a member of the Radiation Physics Department collecting the appropriate data from the RIS. However, should a 'manual-paper' exercise be required, the following points will apply:

- **7.7.1** The frequency of surveys will be determined by the RPS or departmental manager, in consultation with the RPA. The frequency should not be less than three yearly.
- **7.7.2** Patient dose surveys should include at least ten patients, but preferably twenty.
- **7.7.3** Patients should be selected who individually weigh between 60 kg (9 st 6 lb) and 80 kg (12 st 8 lb). For less frequent examinations the range may be extended from 50 kg (7 st 12 lb) to 90 kg (14 st 2 lb). For greater than 20 patients in a survey, weight may not be required.
- **7.7.4** The assessed patient dose will then be compared to the national or local diagnostic reference level.

7.8 For dental exposures, the DRL for intra-oral examinations is the dose measured at the spacer (Patient Indicator Device) end. For panoramic examinations the DRL is taken as the Dose Area Product (DAP) in $mGy.cm^2$, at the beam receiving slot, for a full rotation. These are measured routinely as part of the regular routine radiation protection surveys. Values higher than the recommended DRLs are highlighted.

7.9 Currently, there is only limited guidance on DRLs for children. The situation will be kept under review by the RPA. Dose surveys (e.g. DAP or kV & mAs) should be undertaken in order to establish local DRLs.

7.10 Up-to-date national DRLs can be found on Gov.uk website: www.gov.uk/government/publications/diagnostic-radiology-national-diagnostic-reference-levels-ndrls

8. Procedure for the establishment of dose constraints and other matters for biomedical and research exposures

8.1 This procedure aims to cover all requirements for medical research exposures required by IRMER. It is the responsibility of the local Principal Investigator to ensure the latest NRES (National Research Ethics Service) guidelines are followed. They will identify a suitable IRMER Practitioner who will liaise with an appropriate local MPE.

8.2 All research programmes must have approval from the relevant Ethics Committee (EC) before commencing.

8.3 Each research project involving exposure to individuals for whom no direct benefit is expected from the exposure the IRMER practitioner will approve a dose constraint on the advice of a suitable MPE. This dose constraint must not be exceeded.

8.4 Each research project involving exposure to individuals for whom a direct benefit is expected from the exposure the IRMER practitioner will approve a target level of dose on the advice of a suitable MPE. This target level of dose should be set at a level which it is anticipated will not be exceeded, but may be exceeded if the clinical benefit of additional exposure outweighs the radiation detriment.

8.5 All volunteers must be screened to ensure suitability. Pregnant women and children should not normally be accepted as volunteers unless the project concerns their population group specifically. Adults who lack the capacity to consent must be excluded as volunteers.

8.6 The risks of the exposure must be communicated to the volunteers by the research proposer or team member and confirmed by the operator.

8.7 The IRMER Practitioner who authorises a research exposure must:

a) Satisfy themselves that the subjects participate voluntarily
b) Ensure that the subjects are informed in advance about the risks of exposure
c) Where no direct medical benefit for the individual is expected from the exposure, ensure that the employer's dose constraint is adhered to
d) Where there is a direct benefit, plan a target for the dose to an individual volunteer.

8.8 Just as for standard medical radiation exposures, there should be a record of the exposure factors, to enable an estimate of the effective dose to the individual and to ensure compliance with the dose constraint.

8.9 In the event that the research is part of a multi-centre trial being led by a Chief Investigator from another centre, the local IRMER Practitioner is responsible for reviewing the trial protocol and main REC application and confirm in writing to the local Principal Investigator and R&D office that the local site can adhere to the protocol, local patients are covered by the main REC (Ethical) submission and any additional exposure is justified having regard to IRMER. Similarly the local MPE is responsible for reviewing the trial protocol and main REC application to confirm to the local Principal Investigator that the estimated ranges of doses made by the Lead MPE for the research are reasonable. A local dose constraint or target dose should be established and this should be in line with the total research protocol dose estimated in the main REC application; concerns must be addressed with the Lead MPE for the research.

8.10 For local trials or studies which are not part of multi-centre research programmes, the procedure outlined above should be followed, where the local principal investigator and MPE have the additional responsibilities of the Chief Investigator and Lead MPE respectively.

9. Procedure for carrying out and recording of an evaluation for each medical exposure including, where appropriate, factors relevant to patient dose

General Radiology

The majority of images will be evaluated by a radiologist or reporting radiographer in the Radiology Department and a report entered on the RIS.

In specific circumstances images may be evaluated by specialist member of the medical staff of the department that requested the radiograph. These circumstances are subject to a written agreement between the clinical leads of the radiology department and the clinical department concerned. This agreement is reviewed at a 3 yearly interval. The outcome of this evaluation will be recorded in the patient notes.

CT

All CT images will be evaluated by a Radiologist, reporting radiographer or imaging cardiologist. The outcome of the evaluation will be entered in the RIS. A paper copy may be filed in the patient's case notes.

Interventional, Screening and Theatre Procedures

At the conclusion of the procedure, a summary will be written in the patient's case notes (when available) and a report will be entered on the RIS

10. Procedure to ensure that the probability and magnitude of accidental or unintended doses to patients from radiological practices are reduced so far as reasonably practicable

10.1 All staff are adequately trained and qualified. Appropriate training takes place when new equipment is installed and records to this affect are completed. New staff undergo a period of induction.

10.2 Regular preventative maintenance and repairs are undertaken on each item of equipment involved in the imaging process

10.3 Handover procedures are in place.

10.4 Quality control procedures are in place, implemented and monitored.

10.5 It is the responsibility of all staff to identify equipment faults or procedural breakdowns which could lead to an accidental or unintended dose to a patient. These occurrences should be reported to their line manager to resolve. Lessons learnt will take place via staff meetings

10.6 Clinical audit as per regulation 8 of IRMER is carried out annually for each area Radiology. Records of this are kept.

10.6.1 The following general approach is always taken:

10.6.2 Patient identity checked, prior to any radiation exposure, by the operator.

10.6.3 All equipment subject to regular preventative maintenance – to manufacturers and / or RPA advice.

10.6.4 Equipment quality assurance programme in place as outlined in IPEM 91 and advised by the RPA.

10.6.5 Equipment faults logged and reported to the Superintendent / Senior Radiographer.

10.6.6 Equipment with known faults likely to cause patient overexposure must be taken out of use until repair by a service engineer. Written confirmation must be obtained that the unit is safe for clinical use. Alterations affecting patient dose must be checked by the Radiation Physics Department and certified fit for clinical use.

10.6.7 All staff must undertake manufacturers or suitable in-house training before operating equipment for clinical use.

10.6.8 All incidents must be reported using the DATIX system, with correct investigation and follow up procedures. Any suspected patient exposures ‘much greater than intended’ must be reported to the RPA who will then decide whether the incident needs reporting to the HSE, CQC or EA as appropriate.

10.6.9 Incident investigation reports must be reviewed and appropriate action taken to minimise the risk of recurrence.

10.6.10 When exposing patients to ionising radiation the most appropriate equipment available must be selected and operated in accordance with manufacturers’ tolerances and Trust procedures.

11. Adequate information for the patient

It is a requirement under IR(ME)R to provide wherever practicable, prior to an exposure taking place, the individual or their representative information relating to the benefits and risks associated with the radiation dose from the exposure. Emergency Department, mobile examinations and theatre procedures are generally deemed not practicable.

The information will be given to the patient by poster/leaflet or verbally as appropriate to situation and modality.

12. Unintended and accidental exposures

In the event of an accidental exposure, the department must complete the radiation incident form in available on 'Pattie' or the Radiation Physics website (www.hullrad.org.uk) and send it to the RPA/MPE. An investigation will then be undertaken in collaboration with the department to determine the circumstances, and to perform and estimate of the dose received. If the incident is deemed to be 'clinically significant', the patient, referrer and practitioner must be informed of the occurrence and the outcome of the analysis. If deemed to be an 'exposure significantly greater than is generally considered to be proportionate in the circumstances' the department will need report the incident to the enforcing authority.

13. Dose constraints and guidance for the exposure of carers and comforters

Carers and Comforters (C&C) are individuals who knowingly and willingly incur an exposure to ionising radiation by helping, other than as part of their occupation, in the support and comfort of the individual undergoing the exposure. An appropriate dose constraint for C&C is 0.3 mSv per year.

Justification & Authorisation of exposure:

Only IRMER Practitioners can justify exposures to C&Cs, but the operator is entitled to authorise an exposure of a C&C in the following circumstances:

- The C&C is required to comfort/reassure the patient during the exposure
- The patient will not have their x-ray taken unless C&C is present
- Safety & support – ie holding a child in the correct position

Where a C&C is to be present, the operator must inform them of the risk and benefit of the exposure by verbal instruction prior to the examination, and be assured that the C&C is knowingly and willingly incurring the exposure. Verbal instruction must include ensuring they remain outside the primary beam, stand as far back from the patient as possible and wear appropriate PPE. There must be a comment made in the RIS (or other electronic system) that names the C&C and that they had knowingly and willingly been exposed.