

Document Control

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Introduction

The Ionising Radiation (Medical Exposure) Regulations {IR(ME)R} 2000 were introduced to protect patients against the hazards associated with the use of ionising radiation in medical settings. The updated version in 2017 adds extra legislation to also cover the information provided in relation to the risk and benefit of radiation exposures.

According to IR(ME)R 2017 “wherever practicable, and prior to an exposure taking place, the patient or their representative is provided with adequate information relating to the benefits and risks associated with the radiation dose from exposure”.

Purpose

The Standard Operating Procedure (SOP) has been written to:

- Ensure that patients or their representatives are provided with adequate information relating to the benefits and risks associated with the radiation dose from exposure, prior to the exposure taking place.
- Identify the roles and responsibilities of those involved in providing this information.

Scope

This Standard Operating Procedure (SOP) relates to the following staff groups who may be involved in providing information to patients prior to imaging examinations.

- Radiographers (Operators)
- Radiologists (Practitioners)
- Medical Referrers
- Non-Medical Referrers
- Medical Physics

Location

This Standard Operating Procedure applies to information being provided prior to imaging examinations at the Northern Devon Healthcare Trust.

Equipment

Posters, leaflets and other display equipment.

All Radiology imaging equipment on the above sites including General and A+E x-ray units, AMX Mobile imaging machines, Dental imaging equipment, Mobile Image Intensifiers, Interventional fluoroscopy equipment, CT and DEXA.

Procedure

14.1. Referrers

The risks and benefits of having the radiation exposure should always be discussed with the Patient, in the first instance, by the Referrer prior to submitting a referral for imaging.

This should include how the imaging will allow them to be able to make a diagnosis or monitor the progress of the patient's treatment, and how the benefits from having the X-ray, and making the right diagnosis or providing the correct treatment, outweigh the very low risk involved with the X-ray itself.

It should be emphasised that the risk of cancer induction is extremely low and an indication of approximate average UK background equivalent radiation time given; for example a chest X-ray should be described as being equivalent to a few days of average UK background radiation, and a CT Chest, Abdomen and Pelvis equivalent to approximately 4 years average UK background radiation (UK Background equivalent radiation times are shown in Appendix D).

14.2. The Radiology Department

In the Radiology department information on the risks and benefits of having a radiation exposure (see appendix) will be clearly displayed;

In the waiting room by:

- Posters
- Laminated booklets

In the X-ray room by:

- Posters
- Comforters and Carers consent forms

14.3. Operators and Practitioners

Operators and Practitioners will also be able to provide information on the risk and benefit of having x-rays to the patient or their representative or carer.

The Operator will make a short statement to the patient following the confirmation of identification and checking of expected examination, and prior to the exposure taking place.

For General x-ray this will be: **“The x-ray that you are having today involves a small dose of radiation, are you happy to proceed?”** An approximate UK background radiation equivalent time should be given. These are shown in Appendix D.

For CT and other higher dose examinations this will be: **“The examination that you are having today involves a dose of radiation, are you happy to proceed?”** An approximate UK background radiation equivalent time should be given. These are shown in Appendix D.

If the patient does not feel they have been given sufficient information, or have further questions relating to their diagnosis or treatment, then they may refuse to have their x-ray and go back to discuss this with their Doctor or the Healthcare Professional who has referred them.

14.4. Comforters and Carers

Information for comforters and carers about radiation dose is also provided on the ‘comforters and carers consent form’. <G:\Radiology Clinical Governance\IRMER\Comforters and Carers\General Information for Comforters and Carers Supporting Patients Consent Forms.docx>

References

- Ionising (Medical Exposures) Regulations 2000. Statutory Instruments 2000 No 1059 – <http://www.opsi.gov.uk/si/si2000/20001059.htm>
- IRMER – Ionising Radiation (Medical Exposures) Amendment Regulations 2006
http://www.opsi.gov.uk/si/si2006/uksi_20062523_en.pdf
- [Ionising Radiation \(Medical Exposure\) Regulations 2017. Statutory Instruments 2017.](#)

Associated Documentation

Northern Devon Healthcare NHS Trust Policies for:

- Northern Devon Healthcare NHS Trust Radiation Policy

Appendix

- A. Poster for display in radiology
- B. Booklet for display in waiting room.
- C. Comforters and Carers consent form
- D. UK Average Background Radiation Equivalent Times for Radiological Exams

Appendix A

Your X-ray and you

Your doctor or healthcare practitioner have referred you for an X-ray so that they are able to make a diagnosis or monitor the progress of your treatment. You should discuss with them how the information the X-ray will give will help with your diagnosis or treatment.

It is really important that the benefits from having the X-ray and making the right diagnosis or providing the correct treatment outweigh the very low risk involved with the X-ray itself.





About X-rays and radiation

We all receive radiation, known as 'background radiation', every day. Mankind has successfully adapted to it over millions of years. The background radiation is due to natural causes from cosmic rays reaching the earth from space, from certain rocks (which may be contained in building materials), from travel (particularly air flight), from the food we eat and from naturally occurring radon gas (particularly widespread in granite areas of the country such as Devon and Cornwall).

In any one year our exposure will vary according to where we've lived, where we may have flown to and what we may have eaten.

In perspective

Every X-ray we have gives us a small additional dose of radiation; the level of dose varies with different types of X-ray examinations.

Examinations such as chest X-rays and X-rays of limbs have doses that are relatively low and equivalent to less than 3 months background radiation and so carries a very low risk to you.

CT scans have doses that are a slightly higher and can be equivalent to 1 to 5 years background radiation depending on what area is being scanned.

All X-ray doses are kept as low as reasonably practicable to ensure that images of a high diagnostic quality are obtained without exceeding accepted dose levels.

Pregnancy

A baby in the womb can be particularly sensitive to the radiation of an X-ray or CT scan.

If you are, or think you may be, pregnant, please tell the radiographer before you have an X-ray.

Age

The risks from x-rays are a little higher for children than for adults and much lower for older people. Extra care is taken with young patients to keep their X-ray exposure to a minimum.

Consent

Please feel free to ask your doctor or the radiographer if you have any further questions.

You can refuse to have the X-ray if you do not feel you have sufficient information.

Appendix B

How Safe Is Your X-ray?



Your X-ray and you

Your doctor or healthcare practitioner have referred you for an X-ray so that they are able to make a diagnosis or monitor the progress of your treatment.

You should discuss with them how the information the X-ray gives them will help with your diagnosis or treatment.



It is really important that the benefits from having the X-ray and making the right diagnosis or providing the correct treatment outweigh the very low risk involved with the X-ray itself.

There are strict regulations and legal requirements that govern all X-ray exposures (Ionising Radiation (Medical Exposures) Regulations (IR(ME)R) 2017) .

The radiographer must be able to justify the exposure to radiation that you will receive during your x-ray examination before you are able to have the requested x-ray examination; this is usually done from the

information that your doctor, or healthcare practitioner, has provided on the x-ray form.

Sometimes it is not justified, from the information given, that you have an exposure to radiation, and it might be that a different test is more appropriate that does not involve radiation; in this case the radiographer will discuss this with you and speak to your doctor or healthcare practitioner.

About X-rays and radiation

X-rays

X-rays are a type of radiation that can pass through the body. In healthcare this type of radiation is used to provide images to help to diagnose illness or monitor medical conditions; you cannot see X-rays and you will not feel them during an X-ray examination.



The X-ray exposure itself takes a fraction of a second and so a very small amount of radiation is needed. As the X-rays pass through the body, the energy from X-rays is absorbed at different rates by different parts of the body. A detector or plate on the other side of the body picks up the X-rays after they've passed through and turns them into an image.

More than one X-ray from different angles may be necessary to provide as much information as possible; particularly when looking for broken bones.

Radiation

We all receive radiation, known as 'background radiation' every day, although mankind has successfully adapted to it over millions of years; this background radiation is due to natural causes from:

- cosmic rays reaching the earth from space
- from certain rocks (which may be contained in building materials)
- from travel (particularly air flight)
- from naturally occurring radon gas (particularly widespread in granite areas of the country such as Devon, Cornwall & Dartmoor).

In any one year our exposure will vary according to where we've lived, where we may have flown to and what we may have eaten.

In perspective

Every X-ray we have gives us a small additional dose of radiation; the level of dose varies with different types of X-ray examinations. Generally the amount of radiation you will receive during your X-ray examination is the equivalent of between a few days and a few years of exposure to natural 'background radiation' that you would receive from the environment.

Examinations such as Chest X-rays, X-rays of Limbs and Dental X-rays have doses that are relatively low and equivalent to less than 3 months background radiation and so carry a very low risk to you.



CT scans have doses that are a slightly higher and can be equivalent to 1 to 5 years background radiation depending on what area of the body is being scanned.

All X-ray doses are kept as low as reasonably practicable to ensure that images of a high diagnostic quality are obtained without exceeding accepted dose levels.

Every exposure to X-rays carries a risk of causing cancer many years or decades later; however this risk is thought to be very small; a general x-ray of your chest, limbs or teeth has a less than 1 in 1,000,000 chance of causing cancer (NHS Choices, 2015).

More information on the typical doses received, equivalent periods of natural background radiation and lifetime fatal cancer risks from diagnostic medical exposures can be found on the NHS Choices website: <https://www.gov.uk/government/publications/medical-radiation-patient-doses/patient-dose-information-guidance>

Age

The risks from x-rays are a little higher for children than they are for adults; this is because children are still developing and growing and have a long life ahead of them.

Extra care is taken with young patients to keep their X-ray exposure to a minimum.

The risks from X-rays are much lower for older people.

Pregnancy

A baby in the womb can be particularly sensitive to the radiation of an X-ray or CT scan.

If you are, or think you may be, pregnant, please tell the radiographer before you have an X-ray.

Consent

Please feel free to ask your doctor or the radiographer if you have any further questions.

If you do not feel you have been given sufficient information then you may refuse to have your x-ray and go back to discuss this with your Doctor or the Healthcare Professional who has referred you.

References:

NHS Choices (2015)

<https://www.nhs.uk/conditions/x-ray/>

NHS Choices information on typical effective doses, equivalent periods of natural background radiation and lifetime fatal cancer risks from diagnostic medical exposures

<https://www.gov.uk/government/publications/medical-radiation-patient-doses/patient-dose-information-guidance>

Ionising Radiation (Medical Exposures) Regulations 2017. Statutory Instruments 2017 No 1322

http://www.legislation.gov.uk/ukxi/2017/1322/pdfs/ukxi_20171322_en.pdf

Appendix C

General Information for Carers and Comforters

It is sometimes necessary for a carer or comforter to be present during an x-ray examination, either to hold or to reassure the patient. This may be a relative, friend or a member of staff. All carers and comforters present during the examination will receive a small dose of radiation; the radiographer will be able to reassure you about the risks and are trained and experienced in keeping this dose to a minimum.

We all receive radiation, known as 'background radiation' every day, although mankind has successfully adapted to it over millions of years; this background radiation is due to natural causes from: cosmic rays reaching the earth from space, from certain rocks (which may be contained in building materials), from travel (particularly air flight) and from naturally occurring radon gas (particularly widespread in granite areas of the country such as Cornwall & Dartmoor). Provided that you follow the instructions of the radiographer the amount of radiation you will receive whilst supporting the patient throughout their examination will normally be less than two days of background radiation.

You will be provided with lead protective clothing during the examination to ensure your safety; the radiographer will assist you in this to ensure you are adequately protected prior to the examination. Please ask the radiographer if you have any further questions or concerns prior to the start of the examination.

If you are or it is possible that you may be pregnant it is not advisable to be present during an x-ray examination. Please tell the radiographer and someone else will need to support the patient.

If you are to act as a comforter or carer we need your permission to proceed with the examination; you will be asked to sign this form prior to the examination giving informed consent to do so. This form will be kept securely on file in the radiology department so that continued radiation dose can be monitored in the event of a carer/comforter or staff member supporting patients for multiple examinations.

Carer, Comforter or Staff Member Supporting the Patient.

Exam Date: _____

I have read and understood the general information for comforters and carers and give my consent to be present and assist during the x-ray examination. There is no possibility that I may be pregnant.

Patient Hospital No: _____ Patient Name: _____ Date of Birth: _____

±

Carer/ Comforter/Holder's Signature: _____ **Printed Name:** _____

±

Relationship to Patient: Or Designation of Staff Member: _____

±

Radiographer Carrying out X-ray Examination

Radiographer Signature: _____ Printed Name: _____

±

Examination: _____ DAP Reading: _____ Or Exposure factors:

Lead Protective Clothing Provided: Lead Apron Thyroid Shield Gloves

Appendix D

UK Average Background Radiation Equivalent Times for Radiological Exams

RADIOGRAPHY

A few days:

- Dental (intraoral and OPG) (1 day)
- Chest (2 days)
- Limbs and Joints (except hips) (1 day)
- C-spine (4 days)

A few weeks:

- Hip (2 weeks)

A few months:

- Abdomen (2 months)
- Pelvis (2 months)
- L-spine (3 months)
- T-spine (2 months)

CT

A few months:

- Head (6 months)
- High resolution chest (5 months)

A few years:

- Chest (2 years)
- Chest and abdomen (3 years)
- Chest, abdomen and pelvis (4 years)
- Abdomen (2 years)
- Abdomen and pelvis (3 years)
- Pulmonary Angiography (2 years)
- C-spine (1 year)
- KUB (2 years)
- Virtual colonoscopy (4 years)



FLUOROSCOPY

A few weeks:

Orthopaedic pinning (3 weeks)

A few months:

HSG (2 months)

Fluoroscopy guided injection (2 months)

T-tube Cholangiography (5 months)

Facet joint injection (2 months)

T-tube cholangiography (5 months)

About a year:

Barium (or water soluble) swallow (7 months)

Barium (or water soluble) enema (10 months)

Barium meal (9 months)

Nephrostomy / Nephrostography (13 months)

Sinography (9 months)

ERCP (1 year)

Femoral angiography (1 year)

DXA (about 2 days)

References

1. Ionising Radiation Exposure of the UK Population: 2010 Review, PHE, 2016
2. HPA-CRCE-012 Frequency and Collective Dose for Medical and Dental X-ray Examinations in the UK 2008, HPA, 2010