

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:

UK Average Background Radiation Equivalent Times for Radiological Examinations

Radiography

A few days:

Dental (intraoral and OPG) (1day)

Chest (2 days)

Limbs and Joints (Except hips) (1 day)

A few weeks:

Hip (2 weeks)

A few months:

Abdomen (2 months)

Pelvis (2 months)

Lumbar spine (3 months)

Thoracic spine (2 months)

CT

A few months:

Head (6 months)

High resolution chest (5months)

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)

Cervical 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)

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:

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