



Queen Victoria Hospital  
NHS Foundation Trust

# Xray and CT Scan



## About X-rays and radiation



### X-rays and CT scans

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

### X-ray, CT scans and your body

X-rays and CT scans are useful diagnostic tools that have been around for many years. The amount of radiation you receive from x-ray is just a fraction of what would have been used 40/50 years ago. CT radiation doses have also greatly reduced since use of the early scanners used in the 1980s.

Your doctor has referred you for an X-ray or CT scan so that they can make a diagnosis or monitor the progress of your treatment/healing.

If you have queries as to why the doctor/healthcare practitioner has referred you for an X-ray, you should discuss with them the reasons for having the X-ray and how it will help them.

**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 inform your doctor or healthcare practitioner.

## X-ray

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.



## CT scan (CAT Scan)

A CT scan may take around 30 seconds to scan from your neck to the bottom of your pelvis. The x-rays pass through the body as you move through the scanner. The x-ray machine spins inside the equipment housing and as the weakened x-rays exit your body they are picked up by a row of detectors and converted into thousands of images which can be reconstructed to view your body from many angles, including the ability to reconstruct as 3D images.



## How safe is my x-ray?

We all receive background radiation every day and our bodies have successfully adapted to it over millions of years. This background radiation is due to natural sources, such as:

- cosmic rays reaching the earth from space
- travel (particularly air flight)
- certain rocks (which may be contained in building materials, e.g. granite)
- Naturally occurring radon gas (particularly widespread in areas such as Devon, Cornwall & Dartmoor)
- Food (brazil nuts, bananas)

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.

## 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.

If you accompany a child you will be required to wear some lead protection. Pregnant women are unable to act as a comforter or carer.

## 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 any examination using 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, 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.

## In perspective

Every X-ray we have gives us a small additional dose of radiation; the level of dose varies with the 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 are equivalent to less than 3 months background radiation and so they carry a very low risk to you.

CT scans have doses that are 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 acceptable 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; some CT scans have a risk of causing cancer of 1 in 10,000 but a general x-ray of your chest, limbs or teeth has a less than 1 in 1,000,000 chance of causing cancer (www.gov.uk, 2008).

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

## References:

NHS Choices (2015)

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

Patient Dose information: guidance (2008)

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

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