Benefits and risks of tests and procedures that use X-rays

Department of Radiology

Information for Patients

Last reviewed: June 2025
Next review: June 2028
Leaflet number: 36 Version: 6

This leaflet tells you about the benefits and risks of having tests or procedures that use X-rays.

What is an X-ray?

X-rays are a type of high energy (ionising) radiation used to see the inside of your body.

They are many types of tests and procedures that use X-rays. These include:

- **Ordinary X-rays**. These are the ones you have at the dentist or to look for broken bones.
- **CT scans**. They take pictures of inside you from all angles around your body.
- **Special screening procedures and treatments**. They take pictures and videos of the inside of your body. This is called fluoroscopy.

What are the benefits of using X-rays?

The benefits of doing X-ray tests and procedures are:

- They are a quick way to find out what is happening inside your body.
- They let us to see your bones, organs or blood vessels.
- They can help find a cause for your medical problem. Or, they can rule out a serious problem.
- The results will help us to decide on the care and treatment that you may need.
- Doctors and other specially trained staff can use X-rays as guides during certain medical procedures. In the past some of these procedures would have needed surgery. Some would not have been possible at all.
- You cannot see X-rays. You will not feel them during an X-ray test.

What are the risks from X-rays?

The main risk is a slightly higher risk of getting a cancer in the future. This risk is thought to be very small, if there is any risk at all. By training our staff and looking after equipment, we work to keep this risk as small as possible.

We make sure that the amount (dose) of X-rays used is as low as possible. This keeps the risk to you as low as possible.

In the general population about 1 in 2 people (50%) will get cancer at some point in their lifetime. The extra risk from having an X-ray is between 1 in 1,000,000 people (0.0001%) for low dose X-ray tests, and 1 in 1000 people (0.1%) for higher dose X-ray tests .

Examples of low dose tests include X-rays of the chest, arms and legs.

Examples of higher dose tests include CT scans of the chest or tummy (abdomen), and some longer fluoroscopy exams.

If you have any worries or concerns you can ask the person who referred you for the X-ray test, or you can talk to hospital staff.

Natural background radiation

Many things can affect our risk of getting a cancer. This includes our family history, our lifestyle, age and the amount of natural background radiation where we live.

We are all exposed to natural background radiation every day of our lives. This comes from the ground and building materials around us, the food we eat, and even from outer space.

Each X-ray test gives us a small extra ‘dose’ on top of this natural background radiation. We can compare the radiation dose from different X-ray tests with the amount of natural background radiation:

- **Low dose X-ray tests** give you a radiation dose about the same as only a **few days** of natural background radiation. This includes X-rays of the teeth, chest and limbs.
- **Higher dose X-ray tests** give you a radiation dose about the same as a few months or a few years of natural background radiation. This includes longer tests that take many X-ray pictures or videos. This includes some longer fluoroscopy tests and CT scans.

These tests are only a small part of our lifetime dose from natural background radiation.

Do the benefits of an X-ray test outweigh the risks?

X-ray tests are ‘prescribed’ by doctors and other specially trained healthcare staff. This is like how a GP prescribes medicines. This means that only people who have had training can prescribe an X-ray test. This helps to protect you from having X-rays you do not need.

You may have an X-ray test prescribed when it is needed help to help decide how your medical problem should be treated.

You will only be prescribed an X-ray test if the benefits of having it outweigh the risks of having the test. This means that the risks to you from not having the X-ray test are greater than the risks of

having the test. Specially trained X-ray staff also check that this is the right test for you before it goes ahead.

If your medical problem can be diagnosed and treated without an X-ray, then there may be no benefit in having it. The staff member prescribing the X-ray test will think about this.

Radiation risks for an unborn baby

The risks from radiation are slightly higher for an unborn baby. Because of this we need to be very careful about using X-rays during pregnancy, or when a patient may be pregnant.

If you are having an X-ray test near the tummy, the person taking the X-ray may need to ask you about your menstrual periods and if there is any chance that you may be pregnant.

If you are pregnant or if there is any chance that you could be pregnant, the doctor looking after you will talk to you to decide if you should have the X-ray test or not:

- **If the test is needed urgently** so you can have treatment essential for your health or the health of your baby. The doctor may advise that the benefits from having the test outweigh the risks.
- **If the test is not needed urgently** the doctor may suggest delaying it until later in your pregnancy, or until after you have given birth.
- Sometimes there may be different tests which can be done to diagnose your illness. The decision on which test is safest to do may depend on how many weeks pregnant you are.

For X-ray tests away from the tummy, such as of the head, chest, arms and lower legs the X-rays do not go near the tummy. This means the risk to an unborn baby is much lower.

The X-ray test may go ahead if the health benefit to you clearly outweighs the small radiation risk to your baby. This will only happen after your doctor has talked to you about any other options.

How much more is my risk of getting cancer if I have an X-ray test?

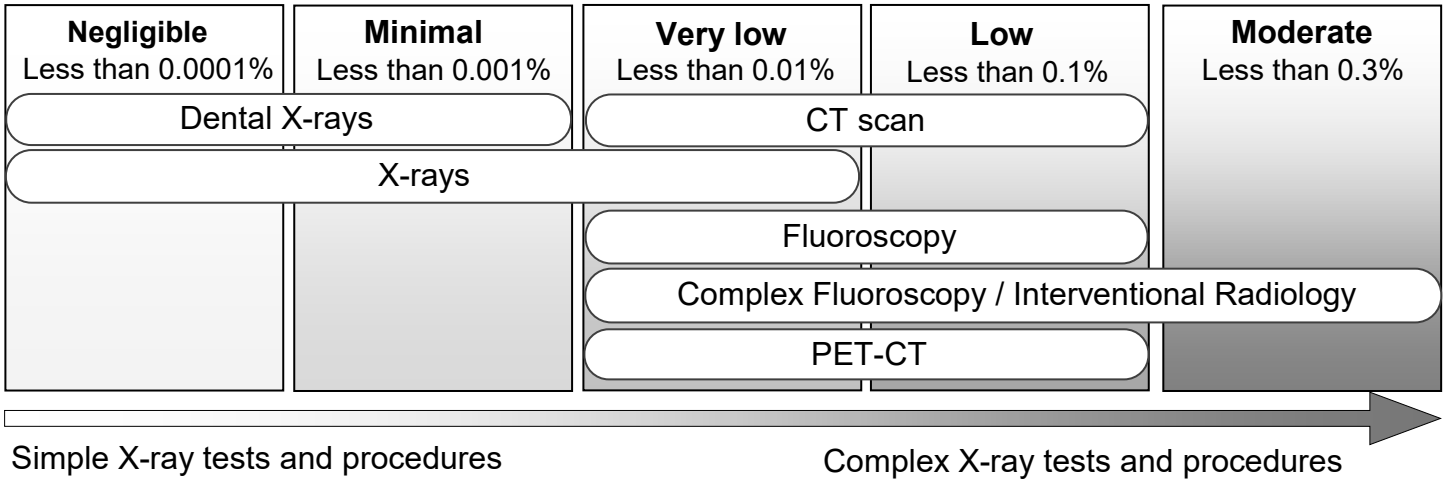
The most common X-ray tests are those of the teeth, chest and limbs. These give very small doses of radiation.

More complex X-ray treatments (fluoroscopy) or CT scans take lots of X-ray pictures. These tests give higher doses but often give more information.

In the general population, around 1 in 2 people will get cancer at some point in their lifetime. This means our risk of getting a cancer is about 50%.

The table on the next page shows the estimated increased lifetime risk of getting cancer from common X-ray tests or procedures.

Additional risk of getting cancer from common diagnostic X-rays:



Type of X-ray examination	Equivalent time of average natural background radiation	Extra lifetime risk of getting cancer	
CT scan of the body	A few years	0.1%	Low
CT scan of the head	A few months to a year	0.01%	Very Low
Lumbar spine X-ray	A few months to a year	0.01%	Very low
Abdomen X-ray	A few months to a year	0.01%	Very low
Pelvis X-ray	A few months	0.001%	Minimal
Chest X-ray	A few days	Less than 0.001%	Minimal
Arms or legs X-ray	A few days	Less than 0.0001%	Negligible
Hands and feet X-ray	Less than a day	Less than 0.0001%	Negligible

References and more information

- International Atomic Energy Agency (IAEA) - What patients need to know: https://www.iaea.org/resources/rpop/patients-and-public/x-rays
- UKHSA - Medical Imaging: What you need to know, 2022: https://www.gov.uk/government/publications/medical-imaging-what-you-need-to-know/medical-imaging-what-you-need-to-know--2
- Cancer Research UK— Cancer statistics for the UK https://www.cancerresearchuk.org/health-professional/cancer-statistics-for-the-uk

اگر آپ کو یہ معلومات کسی اور زبان میں درکار ہیں، تو براہِ کرم مندرجہ ذیل نمبر پر ٹیلی فون کریں۔
على هذه المعلومات بلغةٍ أخرى، الرجاء الاتصال على رقم الهاتف الذي يظهر في الأسفل
જો તમને અન્ય ભાષામાં આ માહિતી જોઈતી હોય, તો નીચે આપેલ નંબર પર કૃપા કરી ટેલિફોન કરો

ਜੇ ਤੁਸੀਂ ਇਹ ਜਾਣਕਾਰੀ ਕਿਸੇ ਹੋਰ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੁੰਦੇ ਹੋ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਹੇਠਾਂ ਦਿੱਤੇ ਗਏ ਨੰਬਰ 'ਤੇ ਟੈਲੀਫੋਨ ਕਰੋ।
Aby uzyskać informacje w innym języku, proszę zadzwonić pod podany niżej numer telefonu

Previous reference:

If you would like this information in another language or format such as EasyRead or Braille, please telephone 0116 250 2959 or email equality@uhl-tr.nhs.uk

LEICESTER'S RESEARCH

Leicester's Hospitals is a research active trust so you may find research happening on your ward or in your clinic. To find out about the benefits of research and become involved yourself, speak to your clinician or nurse, call 0116 258 8351 or visit www.leicestersresearch.nhs.uk/patient-and-public-involvement