University Hospitals of Leicester
NHS Trust

Benefits and risks of your child's tests or procedures that use X-rays

Department of Radiology

Information for Parents

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Introduction

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

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

X-rays are used for:

- Ordinary X-rays like 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 child's body.
- They let us see your child's bones, organs or blood vessels.
- They can help find a cause for your child's medical problem. Or, they can rule out a serious problem.
- The results will help us to decide on the care and treatment that your child may need.
- X-rays can also guide doctors during certain medical procedures. In the past some of these procedures would have needed surgery. Some would not have been possible at all.
- Your child cannot see X-rays. They will not feel them during an X-ray test.

What are the risks from X-rays?

The main risk from having X-ray tests 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. We work to keep this risk as small as possible. We train our staff to use the equipment. We test our equipment to make sure it is working in the right way.

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

The risks from X-rays are a little higher for babies and children than they are for adults. This is because children are still growing. They have a long life ahead of them. We take extra care with young patients to keep the amount of X-rays used as low as possible.

About 1 in 2 people (50%) will get cancer at some point in their lifetime. The extra risk from your child having an X-ray is between 1 in 500,000 people (0.0002%) for low dose X-ray tests, and 1 in 500 people (0.2%) 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, and some longer fluoroscopy exams.

We know that it can be worrying when your child needs a test or procedure. If you have any worries or concerns you can ask the person who referred your child for the X-ray test. You can also talk to hospital staff.

Natural background radiation

Many things can affect our risk of getting a cancer. This includes

- our family history
- lifestyle
- age
- the amount of natural background radiation where we live

We are all exposed to natural background radiation every day of our lives. It 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 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 a radiation dose about the same as a few months or a few years of natural background radiation. This includes 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 to my child?

X-ray tests are 'prescribed' by doctors and other specially trained healthcare staff. This is a bit like how a GP prescribes medicines. Only people who have had training can prescribe an X-ray test. This helps to protect your child from having X-rays tests that they do not need.

X-ray tests are prescribed when they are needed to help decide how your child's medical problem should be treated.

Your child will only be prescribed an X-ray test if it is needed and the benefits of having it outweigh the risks. Your child's doctor believes that not having the results of this test will be a higher risk to your child. Specially trained X-ray staff has also looked at this and agree with the doctor.

We make sure that your child's exposure to X-rays is as low as possible.

Radiation risks for an unborn baby

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

If your child is having an X-ray test near their tummy, we may need to ask them about their menstrual periods and if there is any chance that they may be pregnant. We must ask girls age 10 to 15, and all children age 16 and over. We understand that this can be a very sensitive topic.

If your child is pregnant or if there is any chance that they could be pregnant, the doctor looking after them will discuss whether the X-ray test should go ahead:

- **If the test is needed urgently** so your child can have treatment essential for their or their baby's health, the doctor may decide that the benefits from having the test outweigh the risks.
- **If the test is not needed urgently** the doctor may decide to delay it until later in the pregnancy, or until after birth.
- Sometimes there may be different tests which can be done to diagnose your child's illness. The decision on which test is safest to do may depend on how many weeks pregnant they 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 stomach. This means the risks to an unborn baby is much lower.

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

How much more is my child's risk of getting cancer if they 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.

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 below shows the extra lifetime risk of getting a cancer from common children's X-rays tests.

Typical doses for children from common X-rays tests:

Type of X-ray examination	Equivalent time of average natural background radiation	Extra lifetime risk of getting cancer	
CT scan of the chest	A few years	0.15%	Low
CT scan of the head	A few months to a year	0.06%	Low
Chest X-ray	A few days	Less than 0.002%	Negligible
Dental X-ray	A few days	Less than 0.0002%	Negligible

References and more information

- International Atomic Energy Agency (IAEA): What patients need to know, 2020
  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
- World Health Organization (WHO): Communicating radiation risks in paediatric imaging, 2016.
  https://www.who.int/publications/i/item/978924151034

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Previous reference:

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