

If you are about to have such an examination and are a woman of childbearing age, the radiographer or radiologist (see definitions on the last page) will ask you if there is any chance of your being pregnant.

If this is a possibility, your case will be discussed with the doctors looking after you to decide whether or not to recommend postponing the investigation. There will be occasions when diagnosing and treating your illness is essential for your health and your unborn child. When this health benefit clearly outweighs the small radiation risks, the X-ray or scan may go ahead after discussing all the options with you.

Important points to remember

- In Radiology Departments, every effort is made to keep radiation doses low
- The radiation doses from X-ray examinations are small in relation to those we receive from natural background radiation, ranging from the equivalent of a few days worth to a few years.
- The health risks from these doses are very small in relation to the underlying risks of cancer, but are not entirely negligible for some procedures such as fluoroscopy
- You should make your doctor aware of any other recent X-rays or scans you may have had, in case they make further examinations unnecessary.
- The risks are much lower for older people and a little higher for children and unborn babies, so extra care is taken with young or pregnant patients. If you are concerned about the possible risks from an investigation using radiation, you should ask your doctor whether the examination is really necessary. If it is, then the risk to your health from not having the examination is likely to be very much greater than that from the radiation itself.

To put radiation exposure levels into perspective, the following table lists the common X-ray examinations and the equivalent period of background radiation that gives approximately the same radiation dose.

X-Ray Examination	Equivalent Period of Background Radiation
Chest	A few days
Dental	
Arms and legs	
Hands and feet	
Skull	A few weeks
Head	
Neck	
Breast	A few months to a year
Hip	
Spine	
Abdomen	
Pelvis	
CT of Head	
Kidneys and bladder – IVP	A few years
Stomach – barium meal	
Colon – barium enema	
CT Chest	
CT Abdomen	

Based on an information leaflet for patients prepared by NRPB together with the College of Radiographers, the Royal College of Radiologists and the Royal College of General Practitioners

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St. John's Hospital
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Radiation



Information Leaflet

**For
Patients,
Relatives
and Visitors**

Are x-rays safe?

Patients are sometimes concerned about the possible harmful effects of x-rays. This leaflet will explain the risks and put them into perspective. X-rays are only used if the benefit to the patient outweighs the small risk involved.

What are the different types of X-ray?

Radiography

This is the familiar X-ray which most of us will have at some time during our lives, usually for looking at broken bones or at the chest or teeth. A machine directs a beam of X-rays through the part of your body that is being examined and on to a special film. A picture is produced on the film of the structures the X-rays have passed through in your body. Simple X-rays such as these involve extremely low amounts of radiation.

Fluoroscopy

This is sometimes called 'screening'. After passing through your body, the X-ray beam is viewed by a special camera which produces a moving picture on a TV screen. The radiologist or radiographer performing the examination can take snapshots of any important findings, or record and store the whole thing.

Fluoroscopy is often used to look at the gut. For example, in a 'barium meal' you will be asked to swallow a drink of barium, which is shown up well by X-rays, to give moving pictures of your stomach and intestine. Fluoroscopic examinations usually involve higher radiation doses than simple radiography.

What are the benefits of having an x-ray?

Using X-rays for diagnosis can bring very real benefits to patients. The overriding concern of your doctor and the hospital radiology department is to ensure that when X-rays are used, the benefits from making the right diagnosis, and consequently giving you the appropriate treatment, outweigh any small risk involved. If treatment decisions depend on the findings,

then the risk to your health from not having the examination is likely to be much greater than that from the radiation itself.

Is it possible to avoid radiation completely?

We are all exposed to natural background radiation every day of our lives. This comes from the ground and building materials around us, the air we breathe, the food we eat and even from outer space (cosmic rays). In most of Ireland, the largest contribution is from radon gas which seeps out of the ground and accumulates in our houses.

Each medical X-ray gives us a small additional dose on top of this natural background radiation. The level of dose varies with the type of examination, ranging from the equivalent of a few days of natural background radiation to a few years.

Is there some other way to make the diagnosis?

Before deciding to send you for this X-ray examination, your doctor will have considered the other types of tests available. X-rays are used when they are judged to be the most suitable method of assisting diagnosis.

Are X-rays dangerous?

You will be glad to know that the radiation doses used for X-ray examinations are many thousands of times too low to produce immediate harmful effects, such as skin burns or radiation sickness. The only effect on the patient that is known to be possible at these low doses is a very slight increase in the chance of cancer occurring many years or even decades after the exposure.

Why should I accept any risk?

Just about everything we do in our daily lives carries some level of risk. We tend to regard activities as being "safe" when the risk of some thing unpleasant happening falls below a certain level. The benefits from any X-ray examination or isotope scan should usually outweigh the small radiation risks.

It should be remembered that the higher dose examinations are normally used to diagnose more serious conditions when a greater benefit to the patient is to be expected.

Make sure your doctor is aware of previous X-ray examinations or scans you have had, in case they make additional examinations unnecessary.

Are the risks the same for everyone?

As you get older you are more likely to need an X-ray examination. Fortunately radiation risks for older people tend to be lower than for others. This is because there is less time for a radiation-induced cancer to develop, so the chances of it happening are greatly reduced.

Children, however, with most of their life still ahead of them, may be at twice the risk of middle-aged people from the same X-ray examination. This is why particular attention is paid to ensuring that there is a clear medical benefit for every child who is X-rayed. The radiation dose is also kept as low as possible without detracting from the information the examination can provide.

A baby in the womb may also be more sensitive to radiation than an adult, so we are particularly careful about X-rays during pregnancy. There is no problem with something like an X-ray of the hand or the chest because the radiation does not go anywhere near the baby.

However, special precautions are required for examinations where the womb is in, or near, the beam of radiation, or for isotope scans where the radioactive material could reach the baby through the mother's circulating blood.

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