
X-ray examinations

Summary

- An x-ray examination uses an electrical device to emit (put out) x-rays and digital technology to create two-dimensional pictures of internal body structures.
 - This test is particularly useful in diagnosing conditions or diseases that affect the bones and chest.
 - A conventional x-ray examination is non-invasive, painless and does not require any recovery time.
 - The dose of radiation from an x-ray examination is considered safe – roughly the same as you would receive from the general environment in about one week.
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An x-ray examination creates images of your internal organs or bones to help diagnose conditions or injuries. A special machine emits (puts out) a small amount of ionising radiation. This radiation passes through your body and is captured on a special device to produce the image.

The dose of radiation you will receive depends on the area of your body being examined. Smaller areas such as the hand receive a lesser dose compared to a larger area such as the spine. On average, the dose of radiation is roughly the same as you would receive from the general environment in about one week.

Tell your doctor if you are pregnant or think you may be pregnant. Another type of test may be recommended.

Radiographers and radiologists

The two types of health practitioners involved in x-ray examinations are:

- a radiographer who conducts the examination and is trained to create the best quality images as safely as possible
- a **radiologist** (a medical specialist) who is trained to interpret x-ray images.

How x-rays work

A small amount of ionising radiation is passed through the body. In the past, this went onto a sheet of special film. Nowadays x-ray examinations are more likely to use a device that will capture transmitted x-rays to create an electronic image.

The calcium in bones blocks the passage of radiation, so healthy bones show up as white or grey. On the other hand, radiation passes easily through air spaces, so healthy lungs appear black.

When x-ray examinations are used

This test is very common. About seven million x-ray examinations are made every year in Australia. Some of the many uses include:

- diagnosis of fractures – detection of broken bones is one of the most common uses of this test
- diagnosis of dislocations – an x-ray examination can reveal if the bones of a joint are abnormally positioned
- as a surgical tool – to help the surgeon accurately perform the operation. For example, x-ray images taken during orthopaedic surgery show if the fracture is aligned or if the implanted device (such as an artificial joint) is in position. X-rays may also be used in other surgical procedures for a similar purpose
- diagnosis of bone or joint conditions – for example, some types of cancer, arthritis or osteoporosis
- diagnosis of chest conditions – such as pneumonia, lung cancer, emphysema or heart failure
- detection of foreign objects – for example, metal fragments or swallowed coins.

Medical issues with x-ray examinations

Medical considerations prior to the procedure include:

- Tell your doctor if you are pregnant or think you may be pregnant. Another type of test may be recommended.
- A conventional x-ray examination does not require any special preparation, other than possibly having to change into a hospital gown.
- Some x-ray examinations involve the use of an iodinated contrast agent (a type of dye). This substance helps to improve the detail of the images or to make it possible to see body structures such as the bowel or blood vessels. The hospital x-ray department or private x-ray clinic will give you instructions on how to prepare for the test and what to expect.

X-ray examination procedure

Depending on the part of your body being examined, you may be asked to undress, remove all jewellery and wear a hospital gown. During the basic procedure:

- The radiographer will instruct you in positioning for the x-ray. You may be asked to stand up, lie down or sit down.
- The radiographer will place you between the x-ray machine and the imaging device that captures the x-rays being transmitted through that part of your body.
- The radiographer may shield parts of your body with a lead apron. This is to reduce the risk of unnecessary exposure to radiation.
- The radiographer will need to touch you to position your body correctly for each picture.
- The radiographer operates the controls while each image is taken. To do this, they will stand behind a screen and call instructions to you if necessary.
- You may be asked to hold your breath for a couple of seconds as each picture is taken, so that the breathing movement doesn't blur the images.
- A straightforward conventional x-ray examination, of the hand for example, usually takes a few minutes. Other types of x-ray examination may take longer.

Immediately after an x-ray

After the x-ray you can get dressed (if you changed out of your clothes) and wait for further instructions. A radiologist will interpret the x-ray images. The results are usually sent to your doctor, so you will need to make a follow-up appointment.

Complications from x-ray examinations

An x-ray examination is a painless and non-invasive procedure. You will not be radioactive after the test. The dose of radiation is considered safe – roughly the same as you would receive from the general environment in about one week.

There is a very small (negligible) increase in your risk of developing cancer within 10 years of the x-ray examination (less than 0.01 per cent increase). It is important to try and limit the number of x-rays you get over your life.

Taking care of yourself at home after an x-ray examination

A conventional x-ray examination does not require any recovery time. You can go about your normal business as soon as you leave. If you have had an examination that has used a contrast agent, you will be given specific instructions concerning any after care that may be necessary. This might involve drinking additional water, but the radiographer will advise you.

Treatment will vary depending on the condition under investigation and the results of the x-ray examination.

Alternatives to x-ray examination

Depending on the medical condition, alternatives to x-ray examinations may include:

- **ultrasound** – the use of sound waves to create a picture of internal body structures
- **magnetic resonance imaging (MRI)** – the combination of a magnetic field and radio waves to produce

three-dimensional pictures

- computed tomography scan (**CT scan**) – the use of x-rays and digital computer technology to create three-dimensional pictures
- **bone density testing** – a procedure to determine bone strength. A range of medical procedures is available.

Where to get help

- Your referring **GP (doctor)**
- Radiographer
- **NURSE-ON-CALL** Tel. **1300 60 60 24** – for expert health information and advice 24 hours, 7 days

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