TEST

X-ray

An X-ray uses a small amount of radiation to create images inside your body.

WHAT IT MEASURES
How strongly body tissues absorb X-rays

SAMPLE
None

FASTING NEEDED?
Usually no; some contrast examinations require fasting

HOW LONG IT TAKES
Usually 5 to 30 minutes

RESULTS IN
Same day to several days; varies by imaging service

USED FOR
Diagnosis, screening, procedure guidance, and monitoring

MAIN LIMITATION
Overlapping tissues can hide small or subtle abnormalities

Overview

An X-ray is an imaging test that uses a controlled amount of ionising radiation to create pictures of structures inside your body. Ionising radiation has enough energy to pass through tissue.

Different tissues absorb X-rays differently. Bone absorbs more and usually appears white. Air absorbs little and appears dark. Fat, muscle, organs, and fluid appear in shades of grey.

A standard X-ray creates a flat, two-dimensional image. More than one view may be needed because body structures can overlap. An X-ray is different from a CT scan, which uses multiple X-ray measurements to create detailed cross-sectional images.

X-rays are commonly used to examine bones, joints, the chest, teeth, and some abdominal problems. Mammography is a specialised type of X-ray used for breast screening and assessment. Some examinations use a contrast material to make particular organs or blood vessels easier to see.

Why the test is ordered

An X-ray may be ordered when its images could help explain symptoms, assess an injury, or guide care. Common reasons include:

An X-ray cannot answer every medical question. Ultrasound, CT, MRI, or another test may be more useful when detailed views of soft tissues, blood vessels, nerves, or internal organs are needed.

- Looking for a broken or dislocated bone
- Checking the lungs and heart outline on a chest X-ray
- Examining joint alignment or changes in bone
- Checking the position of a medical device, tube, or implant
- Looking for some causes of abdominal pain or blockage
- Monitoring healing after a fracture or procedure
- Screening in specialised settings, such as mammography or dental imaging

Who should have the test

You may be offered an X-ray if a healthcare professional thinks it is likely to provide useful information. The decision considers the body area, your symptoms or injury, previous test results, and whether another type of imaging would be better.

Children can have X-rays when needed. Imaging teams adjust the equipment and exposed area to the child's size and the clinical question.

Tell the imaging team if you are pregnant, might be pregnant, or have recently missed a period. This does not automatically mean the test must be cancelled. The team can consider whether the examination should continue, be changed, or be delayed.

Routine X-rays are not usually repeated without a reason. Bringing details of previous imaging may prevent unnecessary repeat pictures and help the radiologist compare changes over time.

How to prepare

Most plain X-rays need little preparation. You can usually eat, drink, and take your regular medicines as normal. Follow the instructions from the imaging service because contrast examinations may require fasting or other preparation.

Wear comfortable clothing that is easy to remove. You may need to change into a gown. Metal objects can cover important areas on the image, so you may be asked to remove jewellery, glasses, hearing aids, belts, underwired clothing, or removable dental items.

Tell the team before the examination if you:

Do not stop prescribed medicines unless your own care team or the imaging service has specifically told you to do so.

- Are pregnant or could be pregnant
- Have difficulty standing, lying flat, or holding a position
- Have had surgery or an implant in the area
- Recently had a contrast examination
- Need support because of pain, disability, or anxiety

What happens during the test

A radiographer, a healthcare professional trained in medical imaging, positions the relevant part of your body between the X-ray machine and an image detector. Depending on the examination, you may stand, sit, or lie on a table.

The radiographer may place supports around you or ask you to move into several positions. For some chest or abdominal images, you will be asked to take a deep breath and hold it briefly. Staying still helps prevent blurring.

The radiographer operates the equipment from behind a protective screen or from a short distance away. Taking each picture usually lasts less than a second. You will not feel the X-rays, although holding an injured body part in position may be uncomfortable.

The images are checked before you leave. Extra pictures may be taken if the first images are unclear or another angle is needed. This does not necessarily mean that anything abnormal was found.

Understanding your results

A radiologist, a doctor trained to interpret medical images, usually reviews the X-ray and sends a report to the professional who requested it. In some settings, another appropriately trained clinician may report the image.

The report describes what can be seen and may compare the findings with older images. It

may state that no abnormality is visible, describe a finding, or recommend another test when the X-ray does not fully answer the question.

X-rays do not have a universal numerical reference range. Interpretation varies by imaging service, age, sex, pregnancy status, medicines, previous surgery, and clinical context. A finding may be expected after an operation but unexpected in someone without that history.

Terms such as "opacity," "shadow," or "lesion" describe how an area looks. They do not, by themselves, provide a diagnosis. Your result needs to be considered alongside your symptoms, examination, and other tests.

What affects the results

An image can be limited even when the equipment and procedure work correctly. Important factors include:

Most medicines, meals, coffee, and ordinary exercise do not affect a plain X-ray. Pregnancy usually affects the decision about how and whether to perform the test rather than making the image inaccurate.

Previous images can improve interpretation. Without them, a stable old finding may appear new, or a small change may be harder to recognise.

- Movement: Breathing or moving during the exposure can blur fine detail
- Positioning: Pain or limited movement may prevent the best viewing angle
- Overlapping anatomy: Ribs, bowel, organs, or other bones may hide a finding
- Body size: Thicker tissue can reduce image detail
- Metal or clothing: Jewellery, fasteners, implants, or objects in pockets can cover anatomy
- Timing: Some fractures, infections, and other conditions are not visible early
- Too few views: A finding hidden on one view may appear from another angle
- Recent contrast: Barium or other contrast material from a recent test may obscure an area

Accuracy and limitations

Accuracy depends heavily on the body part and the question being asked. There is no single accuracy figure for all X-rays.

X-rays are particularly useful for many fractures and for showing differences between air,

bone, and denser tissue. However, a normal image does not rule out every problem. Small or early fractures, early chest infections, cartilage injuries, ligament damage, and subtle soft-tissue changes may not be visible.

X-rays can also show a shadow that looks abnormal even when there is no disease. Overlapping tissues, skin folds, old injuries, external objects, or normal anatomical differences can create this appearance. Another view or a different test may clarify the result.

CT may be better for complex fractures or detailed views inside the chest or abdomen. MRI often provides more detail for the brain, spinal cord, joints, ligaments, and other soft tissues. Ultrasound can assess many organs without ionising radiation. The best test depends on the clinical question.

Risks and complications

A plain X-ray is painless and does not place radiation inside your body. The radiation exposure is generally low, but the amount differs by body area, number of images, and type of examination. Repeated or higher-dose exposures carry more cumulative risk than a single low-dose image.

Tell the imaging team if you could be pregnant so they can minimise exposure and consider alternatives where appropriate.

Most plain X-rays do not use contrast material. If contrast is required, the risks depend on whether it is swallowed, given into a vein, or introduced another way. The imaging service should explain the specific risks and any preparation before that procedure.

What happens next

You can usually return to normal activities immediately after a plain X-ray. If contrast or a sedative was used, follow the instructions given by the imaging team.

For routine examinations, the report is sent to the professional who requested the test. Results may be available the same day, but reporting can take several days depending on urgency and the imaging service. Arrange the follow-up method you were given rather than assuming that no news means a normal result.

If an X-ray shows a finding needing prompt attention, the imaging team may contact the requesting service directly. Further imaging, treatment, or a repeat X-ray after a set interval may be recommended.

Do not wait for a routine report if you develop severe breathing difficulty, heavy or worsening chest pain, loss of consciousness, uncontrolled bleeding, or a limb that becomes cold, blue, numb, or severely swollen after an injury. Seek urgent or emergency care according to local services.

Common questions

Can I drink coffee before an X-ray?

Usually, yes. Coffee does not affect most plain X-rays. Check your appointment instructions if the examination uses contrast or involves the digestive system.

Does the time of day matter?

Usually not. X-ray appearance does not normally change in a meaningful way between morning and evening. Appointment timing may matter if fasting or bowel preparation is required.

Can I exercise beforehand?

Ordinary exercise does not usually affect an X-ray. If exercise worsens an injury or makes it harder to hold the required position, avoid it before the appointment.

Can I have an X-ray while pregnant?

An X-ray may still be appropriate when the expected benefit is important. Tell the team before imaging so they can assess the body area, urgency, radiation exposure, and possible alternatives.

Do I need to take off my clothes?

Only clothing covering the area or containing metal may need to be removed. You may be given a gown, and staff should provide privacy while you change.

Can I drive home afterwards?

Yes, after most plain X-rays. Driving restrictions may apply if you received a sedative or if your injury itself makes driving unsafe.

Sources

- US Food and Drug Administration - Medical X-ray Imaging
- NHS - X-ray

- RadiologyInfo.org, American College of Radiology and Radiological Society of North America - Bone X-ray
- RadiologyInfo.org, American College of Radiology and Radiological Society of North America - Radiation Dose in X-ray and CT Exams
- International Atomic Energy Agency - Radiation Protection of Patients: X-rays