

Benefits and risks of radiation

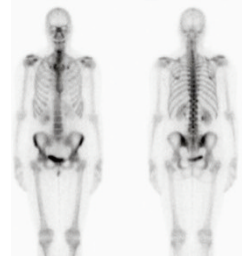
Information for Clinical Imaging patients



Who is this leaflet for?

Your doctor or healthcare practitioner has referred you for a test involving ionising radiation eg X-rays to help them make a diagnosis or monitor your treatment. There are strict laws that govern X-ray exposures, namely the Ionising Radiation (Medical Exposures) Regulations. Your doctor will have considered the benefits of having the X-ray and any associated risks to you when requesting the test. These should have been discussed with you.

Examinations which use radiation include X-rays, CT scans, fluoroscopy examinations and nuclear medicine imaging.



What is radiation?

Radiation involves the passage of high energy waves and particles through space, the atmosphere, buildings and people.

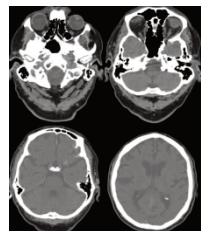
We are continuously exposed to 'background' radiation through:

- cosmic rays reaching the earth from space
- rocks and soil that end up in our buildings and the food we eat
- travel (particularly air flight)
- exposure to radon gas (granite contains uranium which decays and produces radon gas. There is a lot of granite in Cornwall).



There is nothing we can do about background radiation.

It is the ability of radiation to pass through the human body that is used to make images in medical X-rays and CT scans. You cannot see or feel them but they have the potential to break chemical bonds in our body tissues.



Why do I need this test?

The radiographer or imaging practitioner that performs the test must decide whether the radiation you receive is in your best interests. If it cannot be justified from the information your doctor has provided your test may be postponed or cancelled (for example it may be that an alternative test with fewer or no X-rays is available). If this is the case it will be discussed with you and your doctor or healthcare practitioner.

What are the risks of radiation?

Any X-ray exposes us to a small amount of radiation – the amount or 'dose' varies with the examination. Every exposure carries a small risk of causing cancer many years or even decades later.

How much radiation will I receive?

Generally speaking the dose you receive is equivalent to something between a few days to a few years of background radiation.

All doses are kept as low as possible whilst ensuring that the images obtained are of diagnostic quality.

Some examples of typical doses received are given in the table below.

Imaging procedure	Dose (mSv)	Equivalent period of natural background radiation in Cornwall	Lifetime additional risk of fatal cancer per examination
Limbs & joints(except hip)	< 0.01	0.5 days	1 in a few million
Dental (panoramic)	0.01	0.5 days	1 in 2 million
Chest X-ray	0.02	1 day	1 in a million
Spine X-ray	1.3	2 months	1 in 15,000
CT scan of the head	2	4 months	1 in 10,000
Barium meal	3	5 months	1 in 6,700
Nuclear Medicine Bone Scan	4	7 months	1 in 5,000
CT chest, abdomen & pelvis	10	1.3 years	1 in 2,000

What are the risks for children?

The risks to children are a little higher than for adults because their tissues are more sensitive and they have a longer life ahead of them. Extreme care is taken to keep their doses as small as possible.

Consent

Before you have your imaging procedure or scan you will be asked the following question:

'The examination that you are having today involves a dose of radiation, are you happy to proceed?'

What if I am pregnant?

Unborn babies are also very sensitive to radiation. If you are of childbearing age you will need to complete a declaration of pregnancy status prior to certain X-ray examinations.

If you are, or think you may be, pregnant, please tell the radiographer or imaging assistant practitioner before you have an X-ray.

Can I bring someone with me?

It is sometimes necessary for a relative or carer to be present during an X-ray examination, either to hold or reassure a patient. The relative / carer will receive a small radiation dose during the examination. Radiographers and imaging assistant practitioners are trained at keeping such doses to a minimum.

If you are required to act as comforter or carer, you will be asked to sign a declaration that you consent to be present during the examination. If you are of childbearing age you will also be asked to declare that you are not pregnant.

Any questions?

We are here to answer your questions as best we can. Please feel free to ask us about your examination.

Tel: 01872 252285

www.royalcornwall.nhs.uk/services/clinical-imaging

Further information

More information about national radiation guidelines is available from the following Government websites:

Public Health England - Ionising Radiation and You

www.phe-protectionservices.org.uk/radiationandyou/

Patient dose information guidance (2008) with lifetime additional cancer risk

www.gov.uk/government/publications/medical-radiation-patient-doses/patient-dose-information-guidance

Ionising Radiation (Medical Exposures) Regulations 2017

www.legislation.gov.uk/uksi/2017/1322/pdfs/uksi_20171322_en.pdf

If you would like this leaflet in large print, braille, audio version or in another language, please contact the General Office on 01872 252690

