

Ionising Radiation During Pregnancy

Adult and Child/Young Person | Informed consent: patient information

A copy of this patient information sheet should be given to the patient or substitute decision-maker or parent/legal guardian/other person* of a child or young person to read carefully and allow time to ask any questions about the procedure. The patient information sheet should be included in the patient's medical record.

In this information sheet, the word 'you' means the patient unless a substitute decision-maker, parent, legal guardian or other person is providing consent on behalf of the patient, in which case the word 'you' means the substitute decision-maker, parent, legal guardian or other person when used in the context of the person providing consent to the procedure.

Uncertainty around pregnancy status

If there is uncertainty around your pregnancy status, a urine or blood test may need to be performed with your consent. If your pregnancy status cannot be confirmed the Medical Imaging staff will obtain further advice and consult with a radiologist (doctor).



1. What is ionising radiation during pregnancy and how will it help me?

Radiation is a general term for energy that can travel through the environment. Radiation we come across in our daily lives includes visible light, ultraviolet light (which can cause sunburn), microwaves and radio waves. A radiation dose is measured in Millisieverts (mSv).

Ionising radiation is higher energy radiation that can interact with the material it is travelling through, for example the human body. Background ionising radiation comes from the sun, soil, buildings, food, water, the air we breathe and even our own bodies. This natural background radiation surrounds us every day. Ionising radiation has two very different uses in medicine:

1. **Radiation therapy** – high levels of radiation are used to kill cancer cells, for example, breast cancer.
2. **Medical imaging** – low levels of radiation are used to capture images of structures and processes inside the body to help diagnose, monitor and treat patients.

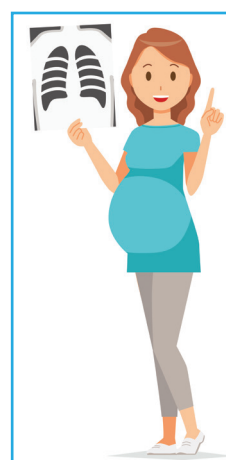


Image: A pregnant person holding an x-ray.
ID: 1045744639.
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What are the different types of medical imaging procedures that use ionising radiation?

Medical imaging procedures are used to create the images of the inside of the body and include:

- **X-ray:** x-ray procedures use x-rays and produce a very low amount of radiation.
- **OPG (Orthopantomogram):** uses x-rays, and a low amount of radiation, to take images of the teeth and jaw.
- **CT (Computed Tomography):** uses a series of x-rays, and a low amount of radiation, taken from different angles around the patient to create a series of images (slices) through the body. CT scans use higher amounts of radiation than a standard x-ray. If you require more information a *Computed Tomography (CT) Scan During Pregnancy* patient information sheet can be provided to you.
- **Fluoroscopy:** uses a series of x-rays to create moving images of the inside of the body. The amount of radiation in these procedures is variable and is very low or similar to a CT scan.



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- **Nuclear medicine and PET (Positron Emission Tomography):** use a radioactive tracer (source of radiation which can be injected, swallowed or inhaled) to create images of the biochemical function of an organ or tissue. Total radiation is similar to CT, however, unlike CT, the radiation is delivered inside the body. This means your body will be a source of radiation for a short amount of time. The amount of time depends on the type of scan and radioisotope used. Staff will advise of any precautions that need to be taken after the scan.
- **Mammography:** uses x-rays to image breast tissue. The radiation dose is similar to x-rays.
- **BMD (Bone Mineral Densitometry):** uses very low energy x-rays to determine bone composition. BMD uses lower levels of radiation than a standard x-ray.

Magnetic Resonance Imaging (MRI) and Ultrasound (US) are also used in medical imaging but do not use ionising radiation.

What is the radiation exposure from medical imaging?

The radiation exposure from imaging procedures can be compared with the amount of natural background radiation we all receive, just by living in Australia¹.

The following table shows the radiation exposure and equivalent background radiation time associated with common imaging techniques, as well as everyday items/events associated with radiation exposure. For example, when having a chest x-ray you should receive the same amount of radiation that you would usually receive in 4 days from natural background radiation.

Event	Radiation exposure (measured in mSv)	Equivalent natural background radiation time
Eating a Brazil nut (30 grams)	0.001	5 hours
Having a dental x-ray	0.01	2 days
Having a chest x-ray	0.02	4 days
Taking a 20 hour plane flight	0.1	22 days
Living in Australia for a year (natural background radiation)	1.7	1 year
Having a CT scan of the abdomen	10	6 years

Radiation and pregnancy

It is important to tell Medical Imaging department staff how many weeks pregnant you are, as the risk varies depending on the stage of pregnancy, procedure and body part. An unborn baby is more sensitive to medical radiation than adults. However, risks from medical imaging procedures are still very low.

Medical imaging where the radiation does not pass through an unborn baby (for example, x-ray of a hand or leg) does not pose a risk to the unborn baby as the radiation exposure is very low. Medical imaging where the radiation does pass directly through an unborn baby (for example, x-ray of your pelvis or abdomen) carries a small radiation risk. Non-urgent medical imaging procedures that directly expose the unborn baby should be delayed until after giving birth. However, there may be good reasons to perform medical imaging to enable the best care for you, which in turn benefits the unborn baby. If the procedure is required, the risk to you from not having the procedure can be greater than the risk or the possible harm to the unborn baby.

Depending on which area of the body is being scanned and the estimated radiation dose to the unborn baby, you may be asked to sign a consent form for this procedure. In requesting this procedure, your doctor has determined that the risks of not having the radiation exposure outweigh the risks to you and your unborn baby. Your doctor/clinician should give you personalised information about the risk to you and your unborn baby².



2. What are the risks?

There are risks and possible complications associated with the procedure which can occur with all patients – these are set out below. There may also be additional risks and possible complications specific to your condition and circumstances which the doctor/clinician will discuss with you. If you have any further concerns, please ensure that you raise them with the doctor/clinician.

Risks of radiation

The risks of radiation exposure from this procedure need to be compared to the risks of your condition not being treated. Exposure to radiation may cause a slight increase in the risk of cancer to you over your lifetime. However, the potential risk is small compared to the expected benefit of this procedure¹.

Risks of radiation to an unborn baby

There is a very small increase in the risk of your unborn baby developing a childhood cancer if the radiation does pass directly through to the unborn baby (for example abdomen x-ray). If the radiation does not pass directly through to the unborn baby there is a very small change in risk.

The following table shows the natural chance of an unborn baby not developing cancer by the age of 18, as well as the chance, if a pregnant person has a CT scan (over the abdomen and any other body part), when a baby is in utero.

Event	Chance of unborn baby NOT developing cancer by the age of 18 years
No CT scan	99.8%
CT scan of any body part (except abdomen)	99.8%
CT scan of abdomen	99.6%

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Ionising radiation in our everyday environment
www.arpansa.gov.au

What are the risks of not having ionising radiation during pregnancy?

There may be adverse consequences for your health if you choose not to have the proposed procedure. Please discuss these with the referring doctor/clinician.



3. Are there alternatives?

Depending on what the doctor/clinician hope to diagnose, MRI or ultrasound may be a suitable and safe alternative. The number of weeks of your pregnancy may also affect the suitability of these alternatives.

Making the decision to have a procedure requires you to understand the options available. Please discuss any alternative procedure options with your doctor/clinician.



4. What should I expect after the procedure?

Your healthcare team will talk to you about what to expect after your procedure and upon discharge from hospital.



5. Who will be performing the procedure?

Radiographers, doctors, nuclear medicine technologists, sonographers, nurses, and medical imaging assistants make up the medical imaging team. All or some of these professionals may be involved in your procedure.

A doctor/clinician other than the consultant/specialist may assist with/conduct the clinically appropriate procedure. This could include a doctor/clinician undergoing further training, however all trainees are supervised according to relevant professional guidelines.

If you have any concerns about which doctor/clinician will be performing the procedure, please discuss this with the doctor/clinician.

For the purpose of undertaking professional training in this teaching hospital, a clinical student(s) may observe medical examination(s) or procedure(s) and may also, subject to your consent, assist with/conduct an examination or procedure on you.

You are under no obligation to consent to an examination(s) or a procedure(s) being undertaken by a clinical student(s) for training purposes. If you choose not to consent, it will not adversely affect your access, outcome or rights to medical treatment in any way.

For more information on student care, please visit www.health.qld.gov.au/consent/students.



6. Where can I find support or more information?

Hospital care: before, during and after is available on the Queensland Health website www.qld.gov.au/health/services/hospital-care/before-after where you can read about your healthcare rights.

Further information about informed consent can be found on the Informed Consent website www.health.qld.gov.au/consent. Additional statewide consent forms and patient information sheets are also available here.

Staff are available to support patients' cultural and spiritual needs. If you would like cultural or spiritual support, please discuss this with your doctor/clinician.

Queensland Health recognises that First Nations People's culture must be considered in the patient's clinical care to ensure their holistic health and individual needs are met.



7. Questions

Please ask the doctor/clinician if you do not understand any aspect of this patient information sheet or if you have any questions about your proposed procedure.

If you have further questions prior to your appointment, please contact the Medical Imaging department via the main switchboard of the facility where your procedure is booked.



8. Contact us

In an emergency, call Triple Zero (000).

If it is not an emergency, but you have concerns, contact 13 HEALTH (13 43 25 84), 24 hours a day, 7 days a week.

References:

1. Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). Ionising radiation in our everyday environment, 2021. Available from www.arpansa.gov.au
2. The Royal Australian and New Zealand College of Radiologists®, Diagnostic Radiology and Pregnancy V2.0 Position Statement, 2017, and ARPANSA, Code for Radiation Protection in Medical Exposure Radiation Protection Series C-5. Available from: www.arpansa.gov.au/regulation-and-licensing/regulatory-publications/radiation-protection-series/codes-and-standards/rpsc-5

* Formal arrangements, such as parenting/custody orders, adoption, or other formally recognised carer/guardianship arrangements. Refer to the Queensland Health 'Guide to Informed Decision-making in Health Care' and local policy and procedures.