

# Diagnostic nuclear medicine/ PET examinations during pregnancy & breastfeeding

## Consent form

[ Affix patient label ]



**I-MED Radiology  
Network**

Comprehensive care. Uncompromising quality.

Your referring doctor has recommended that you have a diagnostic nuclear medicine/PET examination during pregnancy/breastfeeding. They have considered whether it is the most appropriate examination (including alternative imaging modalities that do not use ionising radiations) and have concluded that the benefits of the examination to your clinical management outweigh any risks associated with the use of ionising radiation. It is however important that you are aware of these risks and that you consent to continue with your examination. To help you in your understanding, a summary of these risks is described below. If you would like more information, please ask I-MED staff or alternatively additional information can be found at the end of this document.

### Radiation risk of diagnostic nuclear medicine/PET examinations during pregnancy

Before discussing the nature of any risks to the fetus from a Nuclear Medicine/PET examination, it is important to consider the radiation exposure from such an examination in the context of natural background radiation. Background radiation is always present and provides each of us with a continuous, small radiation dose. Sources of background radiation in our environment are cosmic rays from the universe, naturally occurring radioactive substances in the food and water we eat and drink, the air we breathe, in the ground, in building materials and so on. In Australia, every year, everyone receives background radiation that is equivalent to the radiation dose from 50–100 chest X-rays. In fact, during an entire 40-week pregnancy the radiation exposure received by the fetus from background sources alone can be calculated to be approximately 0.8 mSv. This is quite normal and unavoidable. It is against this that any risks to the fetus from medical examinations using ionising radiations should be considered.

Diagnostic Nuclear Medicine and PET uses small amounts of a radioactive material (radiopharmaceutical), which is normally injected into a patient's vein, but can be given through the mouth or inhaled. The radiopharmaceutical will then be distributed throughout the body, some organs will however collect a higher concentration of the radiopharmaceutical than others.

As part of your Nuclear Medicine/PET examination you may also receive a CT scan (which use X-Rays). This scan is identical to the CT scans used in other medical imaging examinations, however the radiation dose received is often much lower. The radiation used in both Nuclear Medicine and CT scans is known as ionizing radiation, some of which is absorbed by the body. It is very important to realise that most diagnostic Nuclear Medicine/PET examinations expose the fetus to such low levels of radiation that they are not a cause for concern. However, it is good practice if possible, to avoid examinations that directly expose the uterus or abdomen to radiation if a woman could be or is pregnant. As with all medical imaging, any minor risk to mother and fetus from the small amount of radiation should be outweighed against the benefit of the test or procedure.

The potential risk to the unborn fetus from ionising radiation used in Nuclear Medicine/PET (e.g. X-rays, Radiopharmaceuticals) is generally dependent on:

- the particular radiopharmaceutical used (this determines which organs will receive the greatest dose)
- the part of the mother's body exposed to the CT scan (if applicable)
- the stage of pregnancy
- the total radiation dose received

There are two main types of risk when a fetus is exposed to ionising radiation:

#### 1. Short-term risk

Because the fetus is rapidly growing and developing, short-term risks are different for a fetus compared with a child or adult. Our current understanding indicates that short term risks such as death, slowing of normal growth, abnormal growth (resulting in deformities) and being intellectually or emotionally underdeveloped, would not be expected to occur in an embryo or fetus that had been exposed to less than 100 mGy of radiation.

**The fetal doses associated with NM/PET and CT scanning are normally significantly below 100mGy. I-MED clinical staff can explain to you the estimated dose to your unborn child for your specific examination(s).**

#### 2. Long-term risk

Long term risks include the theoretical risk of cancer sometime after birth (as a child or adult) and the risk of hereditary diseases occurring in the descendants of someone who was exposed to radiation as a fetus. The risk of heritable effects from fetal irradiation is very low, being much lower than the risk of radiation induced cancer. Approximately 1 in every 500 children will naturally develop cancer during childhood, without ever being exposed to radiation as a fetus. After exposure to radiation, the risk of cancer induction is considered to be uniform throughout pregnancy after the first 3-4 weeks of gestation (5-6 weeks from LMP). The risk during these first few weeks will be very small (and probably much smaller than if the exposure had occurred later in pregnancy).

*Please turn over to continue*

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For examinations that give the least amount of radiation to the fetus the estimated potential additional risk for the fetus is approximately less than 1 in 1,000,000. For higher fetal dose examinations, the additional risk can be up to 1 in 100. If a higher dose examination is needed, because the risk of not doing the test is very significant for the mother or the fetus, then this is appropriate. If a woman has one of the higher dose tests before she knows she is pregnant, the increased risk to the fetus is still considered to be small. This would not be a reason on its own to consider pregnancy termination, because of fears about cancer risks for the baby or child.

It is understandable for patients that have had exposure to medical ionising radiation when they are pregnant or who have found out they are pregnant soon after an examination that they are worried about whether this will affect their fetus. If you have any concerns at all regarding exposure to medical ionising radiation, please discuss this with I-MED clinical staff.

I-MED clinical staff will have explained the estimated risk to the fetus for your specific examination(s).

### Radiation risk of nuclear medicine/PET examinations during breastfeeding

When a radiopharmaceutical (radioactive injection) is given as part of a Nuclear Medicine/PET examination, it spreads throughout the body. Some organs will collect a higher concentration of the radiopharmaceutical than others, but it will be distributed throughout the body. Some radiopharmaceuticals can enter the breast milk of nursing mothers and be consumed by the infant exposing them to a small radiation dose.

To avoid unnecessary exposure of the infant to the radiopharmaceutical, it may be necessary to suspend breastfeeding and restrict close contact for a short period of time after the nuclear medicine procedure. The length of this period of time will depend on the type and amount of radiopharmaceutical used. **If this is required, I-MED clinical staff will inform you of any restrictions you need to take.**

#### Patient consent

I have read and fully understand the risks and restrictions involved in having a Nuclear Medicine/PET examination using ionising radiation when breastfeeding or caring for an infant/child. I have been informed of any necessary restrictions on close contact and/or breastfeeding. I hereby give consent to have a nuclear medicine/PET examination performed.

\_\_\_\_\_  
Signature of patient or guardian giving consent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and Signature of technologist performing the exam

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name and Signature of radiologist/doctor in charge

\_\_\_\_\_  
Date

#### Interpreter's statement

I have provided a sight translation in \_\_\_\_\_ (state the language) of the patient consent form. I also have assisted the patient/parent and/or guardian with any verbal and written information given by the medical imaging professionals..

\_\_\_\_\_  
Interpreter's full name

\_\_\_\_\_  
Interpreter's signature

\_\_\_\_\_  
Date

#### Acknowledgements:

Much of the content regarding ionising radiation risks during pregnancy has been adapted from Wallace A & Hayton A (2017) Radiation Risk of Medical Imaging During Pregnancy. <https://www.insideradiology.com.au/radiation-risk-preg/>

More information can be found at:

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)

International Atomic Energy Agency (IAEA)