

Occupational Radiation Exposure During Pregnancy



Ionizing radiation is produced by x-ray machines, radioactive materials, and radiation therapy machines. There is potential for the embryo or fetus to be exposed during procedures such as fluoroscopy, radiation therapy, or working with sealed or unsealed radioactive materials. If desired, a radiation worker who is pregnant may declare their pregnancy in writing to take advantage of voluntary limits for dose to the embryo/fetus.

Risk from Prenatal Exposure

The risk from radiation exposure to a fetus is dependent upon the amount of radiation dose received by the fetus, and the time frame during the pregnancy in which the dose was received. The dose allowed for declared pregnant workers is small, and the resulting risk is minimal compared to other risks that are always present during a pregnancy.

Confidential counseling on the risks of prenatal exposure is available upon request. Please [contact Radiation Safety](#) to schedule an appointment.

Declaring Pregnancy

If you are a radiation worker and are pregnant, State and Federal regulations allow you to reduce your occupational exposures to below 500 mrem during pregnancy by declaring the pregnancy in writing to Radiation Safety. The 500 mrem voluntary gestational limit is 10% of the normal occupational limit for radiation workers. Because the risk is believed to be small, even at the 5,000 mrem level for nonpregnant workers, the declaration of pregnancy is voluntary. After the pregnancy is declared, the 500 mrem limit becomes a requirement. The pregnant worker may withdraw the pregnancy declaration at any time.

If you currently work with radiation but do not have a dosimeter, you may still declare your pregnancy and receive a fetal dosimeter by [contacting Radiation Safety](#).

Fetal Dosimeters

Radiation workers who declare their pregnancy receive a “fetal dosimeter” in addition to their regular dosimeters.

The fetal dosimeter is worn at the waist level. If a lead apron is worn (as for workers using fluoroscopic x-ray equipment), the fetal dosimeter is to be worn under the apron near the fetus, and the regular dosimeter is to be worn outside the apron at the collar level. Please pay special attention to ensure that the dosimeters are worn at the correct locations and are not switched.



Confidential Monitoring

If privacy of your pregnancy is desired, [contact Radiation Safety](#). The fetal dosimeter and dose results will be sent directly to you instead of to the Series Coordinator, (or arrange a location for pick-up).

You are not required to disclose the pregnancy to anyone outside of Radiation Safety. However, if your job duties or schedule must be modified in order to comply with the 500-mrem limit, then your department and your Human Resources representative must be included in this process.

Fetal Radiation Dose Limits

The total occupational dose to the fetus of a declared pregnant worker must **not exceed 500 mrem** (5 mSv). This is 10 times less than the whole-body dose for occupational radiation workers.

There is no indication from scientific studies that harm to the fetus can result from these levels of prenatal radiation exposure.

Medical X-rays and Nuclear Medicine Procedures

The occupational limits for declared pregnant workers do not apply to medical procedures when you are the patient. Your dosimeter(s) should not be worn if you receive a medical procedure that involves diagnostic x-rays or any nuclear medicine procedures.

If you received a medical exam involving radiation while you were unaware that you were pregnant, you should discuss this with your medical provider. In most cases, the doses are low enough that there is no reason for concern.



Reducing Potential Exposure to the Fetus

Avoid handling large amounts (>1 mCi) of liquid unbound (NaI) radioiodine while pregnant. The fetal thyroid tissue is extremely sensitive to radiation.

Avoid long periods of fluoroscopy while pregnant (when possible) and always wear leaded protective garments during these procedures. Lead protective garments attenuate 95-99% of scattered radiation, so it is not necessary (nor advised) to wear multiple layers of lead aprons, vests, or thyroid shields, even while pregnant. Some departments may have “pregnancy lead” which is a larger size to accommodate a thicker mid-section, but does not provide increased shielding.

Fetal Effects at High Radiation Doses

The effects of radiation exposure on the fetus are dependent upon the magnitude of the radiation exposure.

Prenatal exposure up to 500 mrem (the voluntary fetal dose limit)

No observable effects, and no indication of effects later in life. Less than 500 mrem is generally considered “safe”.

Prenatal exposures between 500 and 5000 mrem (up to the occupational dose limits)

There are no observable effects on the growth or development of the fetus in this dose range. Exposure to radiation has not been associated with birth defects, miscarriages or other abnormalities for fetal exposures at these levels.

There may be an increased risk of cancer later in life for those exposed prenatally to radiation at these levels (500 to 5,000 mrem), but it is possible that factors other than radiation may account for this increase in cancer risk.

Very High Exposures: 5,000 to 50,000 mrem

Fetal exposures in this range are very unlikely because of existing occupational limits for radiation exposure.

Effects to the fetus in this range could include a decrease in intelligence, mental retardation, cancer, and other issues later in life.

Questions

If you have questions or would like more information regarding the risks of radiation exposure while pregnant, please contact Radiation Safety.

206.543.0463

radsaf@uw.edu