

Occupational Radiation Exposure During Pregnancy



One concern of employees who regularly receive some radiation exposure during their work is the safety of childbearing and the effects of radiation dose to their unborn child. While an employee does not have to stop working during pregnancy, there are radiation dose limits that should be observed to ensure the safety of the fetus. While a worker does not have to declare pregnancy, if pregnancy is declared a fetal radiation monitor will be issued to the employee. The fetal dosimeter may be cancelled at anytime.

Risk from Pre-natal Radiation Exposure

The risk from radiation exposure is dependent upon the amount of exposure. The exposures allowed for declared pregnant workers are small, and the resulting risk is extremely minimal compared to other risks that are always present during a pregnancy.

Fetal Radiation Dose Limits (Occupational)

The dose to an embryo or fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, must not exceed 5 mSv (0.5 rem). This is 10 times less than the whole-body dose for employees who use radiation.

There is no indication from scientific studies that harm to the fetus can result from these levels of prenatal radiation exposure. However, harm has been demonstrated at *much higher* doses. Therefore, caution is wise.

Potential Fetal Radiation Dose Effects

Less than 500 mrem – no observable effects, and no indication of effects later in life.

500-5000 mrem - There are no observable effects on the growth or development of the embryo or 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 has been suggested that factors other than radiation may account for this increase.

Higher Exposures - 5,000 to 50,000 mrem - Fetal exposures in excess of 5,000 mrem are very unlikely because of existing occupational limits for radiation exposure.

Effects to the fetus in this range could include a decrease in IQ or mental retardation, as well as an increase in cancer later in life.

Reducing Potential for Exposure to the Fetus

Avoid handling large amounts (> 1mCi) of liquid radioiodine. The fetal thyroid is extremely sensitive to radiation, and exposure to you will result in fetal exposure.

Avoid extremely long periods of fluoroscopy during work (when possible) and always wear lead protective garments during these procedures.

Declaring Pregnancy

State and Federal regulations allow you to reduce your occupational exposures to below 500-mrem during pregnancy by declaring this in writing to the Radiation Safety Office. 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 occupational limits for non-pregnant workers, the declaration of pregnancy is voluntary. However, once pregnancy is declared, the 500-mrem limit becomes a requirement.

If you are a radiation worker who receives less than 50 mrem whole-body dose in a year, you do not need to declare pregnancy.

If you currently work with radiation but do not have a dosimeter, you may still declare pregnancy and receive a fetal monitor: Call the Radiation Safety Office (206.543.0463) and ask for RSO Form 9, Request for Fetal Dosimeter. The Radiation Safety Office may determine that you are not required to have a fetal dosimeter, but you are still allowed to request and receive one if you wish.

Fetal Dosimeters

Radiation workers who declare pregnancy receive a "fetal dosimeter" in addition to their regular whole body dosimeter and/or TLD ring.

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 lead apron and the regular dosimeter is to be worn outside the lead apron at the collar level. Please pay special attention to not get the two dosimeters confused and switch locations.

Confidential Monitoring

If privacy is desired, contact the RSO at 206.543.0463. We will mail the badge and fetal dosimetry results directly to you instead of to the Area Dosimetry Coordinator, (or arrange a location for pick-up).

You are not required to disclose the declaration of pregnancy to anyone outside of the Radiation Safety Office. 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.

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 doctor. In most cases, the doses are so low that there is no reason for concern.