

RSNA Statement on Safety of the Developing Fetus in Medical Imaging During Pregnancy
Updated: 5/25/2022

The Radiological Society of North America (RSNA) is committed to excellence in patient care through education and research.

- Medical imaging has improved the quality of healthcare and made it safer by providing less invasive methods for diagnosis and treatment. A pregnant patient and her fetus may require imaging for many different reasons that may or may not be related to the pregnancy. Imaging remains an essential tool to provide the best possible maternal and fetal care.
- Women who are pregnant or think they could be pregnant should always disclose this information to the radiologist, technologist and/or their ordering physician prior to any type of imaging test. The radiologist, in conjunction with the patient and the ordering physician, will balance the benefit of the intended examination against any potential harm to the woman or fetus before performing any imaging test.
- Magnetic resonance imaging (MRI) and ultrasound (sonography) are types of imaging which do not use ionizing radiation and are regarded as safe to the fetus in normal clinical usage, i.e., $\leq 3T$ MRI and without prolonged use of color/power Doppler in the first trimester.
- When considered essential, certain imaging examinations may require administration of an intravenous contrast material or radioisotope, in which case the risks versus benefits should be carefully considered.
- Imaging exams that use ionizing radiation include X-rays, computed tomography (CT scans), fluoroscopy and nuclear medicine.
 - Although the risk of radiation exposure during pregnancy is a common concern, a missed or delayed diagnosis may pose a greater threat to both the woman and her fetus than any hazard associated with ionizing radiation.
 - Radiologic procedures outside the abdomen and pelvis will not pose a significant risk to the developing fetus when standard precautions are taken. For example, a mammography examination would result in a fetal dose that is equivalent to a few extra days of environmental background radiation that any fetus or future child will be naturally exposed to prenatally or postnatally.
 - For an examination where the developing fetus is in the field of view, there is no evidence that a procedure using routine parameters (<50 mGy) at any time during pregnancy will result in spontaneous miscarriage or developmental abnormalities, as stated by the [American College of Obstetricians and Gynecologists](#).
 - According to the International Commission on Radiological Protection (ICRP), radiation has been shown to increase the risk for some types of cancer in both adults and children. Throughout most of pregnancy, the fetus is assumed to be at about the same risk for carcinogenic effects as a child may be postnatally. The actual risk of cancer induction after radiation exposure where the fetus is in the field of view (for example a CT scan of the pelvis) is unknown but thought to be very low. The likelihood the future child will

remain healthy with no adverse radiation effects is only slightly different from that of any other child who has not had such exposure prenatally.

- If an unusually complex procedure with high levels of radiation has occurred, or if a woman has a medical condition that has required multiple exposures throughout her pregnancy, then a medical physicist should be consulted to calculate the total dose to the fetus and any associated potential risks.
 - A termination of pregnancy is rarely indicated on the basis of fetal exposure to ionizing radiation from properly supervised medical imaging during pregnancy in all but exceptional cases.
 - Conservative clinical management is the best way to minimize radiation risk in utero. If the proposed benefit outweighs the risk, and the decision is made to proceed with imaging using ionizing radiation, then radiation dose reduction methods should be implemented using the principle of As Low As Reasonably Achievable (ALARA). This is the principle that all imaging with ionization radiation should be performed using the least dose possible to obtain diagnostic quality images.
 - In April 2019, the American Association of Physicists in Medicine (AAPM) published a statement recommending that patient fetal shielding during X-ray based diagnostic imaging should be discontinued as routine practice. RSNA supports the [AAPM Position Statement on the Use of Patient Gonadal and Fetal Shielding](#).
- More information for patients is available at RadiologyInfo.org.

RSNA is a strong advocate for quality, safety, equity and strict adherence to appropriateness criteria in medical imaging and radiation oncology. Through its peer-reviewed journals, education programs and annual scientific assembly, RSNA continually informs radiologists, medical physicists, radiation oncologists and other radiology professionals of the latest technologies and research developments designed to optimize dose and improve patient safety.