

Basic facts:

Not all imaging exams use radiation. MRI and ultrasound do not. They have no risk of causing cancer.

- Coloradans are exposed to natural background radiation each year. This is from the altitude and makeup of rocks and soil in the area.
- There is no evidence that low doses (below 100 mSv) of radiation cause cancer in adults.
- 2 out of 10 Americans die from cancer where the cause of the cancer is not known. If we assume that even small amounts of radiation can cause cancer, a chest CT scan would not significantly increase a patient's lifetime risk of dying from cancer.
- It takes 10 to 15 years from the time of radiation exposure for most types of cancer to develop.
- Because of the long delay between exposure and the growth of cancer, a patient's age plays a major role in his or her individual risk of developing cancer from radiation exposure.
- For significant clinical conditions, the risk of not having a diagnostic imaging study far exceeds the potential risk linked with the study.



Leaders in radiation safety.

University of Colorado Hospital has full-time radiation safety specialists, imaging technologists, physicists and radiologists. The most current information and technology is used to ensure your safety and to give the best health care to you and your family.

What can I do to lessen my radiation dose?

Being informed is always important. Before having an imaging exam, be sure to ask your doctor:

- Why do I need this?
- How will this improve my health care?
- Are there other tests that don't use radiation?

If you have questions about radiation safety at the University of Colorado Hospital, please talk about your concerns with your doctor. Or, you may call our radiation safety officer at 720.848.6549.

Resources for more information:

- radiologyinfo.org
- imagewisely.org

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Radiation Exposure from Diagnostic Imaging Exams for Adults



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Imaging exams can provide valuable information to your doctor. If you don't have an imaging exam that is recommended by your doctor, you may not get an accurate diagnosis. Your condition may not be treated in a timely and effective manner. There is a risk tied to not having a medically-necessary imaging exam.

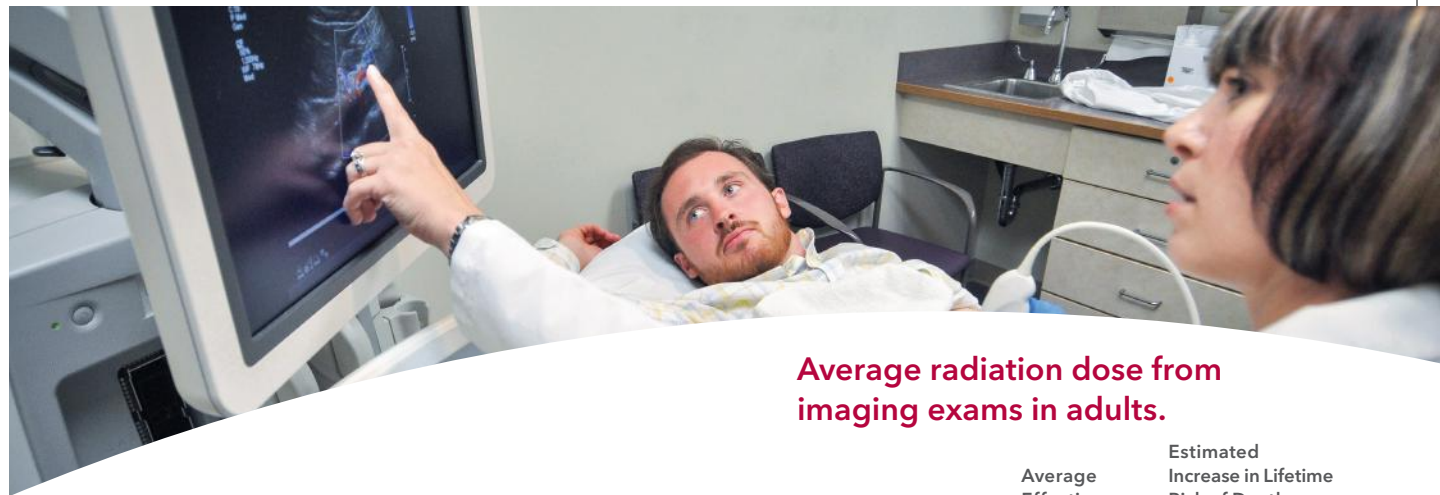
Radiation risk.

Recent media reports have stressed the risk of radiation in diagnostic imaging procedures, including X-ray, nuclear medicine and computerized tomography (CT). UCHHealth University of Colorado Hospital has put together some information to help patients stay informed and involved in their health care.

X-ray, nuclear medicine, and CT scans are commonly used procedures that apply the benefits of radiation. The exact risk linked with these low levels of radiation is not known. However, it is thought that the risk of developing cancer from these exams is either very low or nonexistent.

There is no evidence that radiation from diagnostic imaging exams causes cancer in adults. However, to be cautious, the medical community uses the risk linked with higher levels of radiation and uses a related risk for lower doses. For example, if a dose of 1000 mSv has been shown to increase the risk of developing cancer by 4%, it is assumed that a dose of 10 mSv increases the risk of developing cancer by 0.04%, or 1 in 2500.

The following has been gathered by several national and international groups that study the effects of exposure to radiation.



Your radiation dose.

The values in the table show an average effective dose for various imaging exams in adults. They are based on data from between 1990 and 2007. Modern imaging exams produce an even smaller dose. The exact dose you get during your exam will depend on the specific needs of your exam. It also depends on your body size and frame.

Average annual effective dose from natural background radiation.

United States	3.1 mSv
State of Colorado	4.0 mSv
Less than 1 in 1,000,000	Negligible
1 in 1,000,000 to 1 in 100,000	Minimal
1 in 100,000 to 1 in 10,000	Very low
1 in 10,000 to 1 in 1,000	Low
1 in 1,000 to 1 in 500	Moderate
1 in 500 to 1 in 100	High
Lifetime chance of death from:	
Lightning strike	1 in 100,000
Bicycle accident	1 in 10,000
Drowning	1 in 1,000
Motor vehicle accident	1 in 100
Cancer (natural causes)	1 in 5

Average radiation dose from imaging exams in adults.

Exam	Average Effective Dose	Estimated Increase in Lifetime Risk of Death from Cancer*
General X-ray		
Chest X-ray	0.02 mSv	1 in 1.2 million
Abdomen, hip, or pelvis X-ray	0.7 mSv	1 in 35,000
CT		
Head CT	2 mSv	1 in 12,000
Chest CT	7 mSv	1 in 3,500
Abdomen CT	8 mSv	1 in 3,000
Mammography		
Mammogram (both breasts)	0.48 mSv	1 in 125,000
DEXA		
Bone density scan	0.001 mSv	1 in 24 million
Interventional Procedures		
Head & neck angiography	5 mSv	1 in 5,000
Coronary angioplasty, stent placement, or RF ablation	15 mSv	1 in 1,600
Nuclear Medicine		
Thyroid scan	1.9 mSv to 4.8 mSv	1 in 13,000 to 1 in 5,000
Bone scan	6.3 mSv	1 in 4,000
PET	14.1 mSv	1 in 1,700
Cardiac scan	9.4 to 1.4 mSv	1 in 2,600 to 1 in 2,100

* These risk estimates are based on the effects of very high amounts of radiation and likely overestimate the actual risk of an imaging exam causing a fatal cancer. There is no evidence that doses below 100 mSv increase your risk of developing cancer.