

# Radiation and Medical Imaging

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## What is radiation?

Radiation is best described as energy moving through space, and it can take many forms, including visible light, x-rays, gamma-rays, microwaves, and radio waves. Radiologists use low dose radiation in the form of x-rays to create images of different parts of your body. High doses of radiation can also be used to treat certain types of cancer.

## Where does radiation come from?

Radiation is all around us. The two main sources of ionizing radiation are from natural background radiation and medical exposure (CT scans and x-rays). Natural background radiation comes from the Sun (cosmic radiation), the Earth (mostly Radon gas), and from naturally radioactive substances in our body. Natural background radiation exposure accounts for an average of 3.1 mSv/yr with variations depending on where you live. The average radiation exposure to individuals in the US is 6.2 mSv/yr which includes natural background and medical imaging.

## What are x-rays?

X-rays are a type of radiation used in medical imaging much like a camera uses visible light to create an image. X-rays pass through the body and create an image on film based on how many x-rays get absorbed and how many pass through. These films are commonly referred to as “x-rays,” but x-rays are actually the type of radiation that is used to produce the image. Studies that use x-rays include plain films, fluoroscopy, and computed tomography (CT scans).

## Understanding Risk

It is important to realize that in a properly performed individual exam, the potential health benefits almost always outweigh the potential risks of radiation exposure. Great effort has been made throughout the medical community to ensure patient safety while providing quality diagnostic images. However, there is data to suggest that high doses of radiation increase your future risk of cancer. The data is compiled from high dose exposures including survivors of atomic bombs and radiation spills. There is no proof that the low doses of radiation used with common x-rays or CT scans cause cancer, but we know enough to use this technology carefully and only when needed.

## Typical Radiation Doses

Exam	Dose (mSv)
Dental x-rays	0.01
Airline Flight	0.02
Mammogram	0.4
Chest x-ray	0.10
Natural Background	3.1 / year
Average US Exposure	6.2 / year
Chest CT	7.0
Abdominal CT	8.0

## Quick Tips

- Benefits of study usually outweigh potential risks.
- Don't get any study you don't need.
- Keep a history of your studies to avoid unnecessary repeat exams.



Promoting responsible imaging through patient and provider education

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