



We live in a radioactive world

Radiation is a part of our natural environment and always has been. In fact, the natural radioactivity in our environment is just about the same today as it was at the beginning of the Neolithic Age, more than 10,000 years ago.

Where does this radiation come from?

The sun brings us visible light as well as infrared and ultra-violet radiation. In addition, the fusion process that powers the sun produces gamma rays and, during solar flares, even emits X-rays.

Earth's crust contains radioactive elements. Uranium, thorium, and potassium are naturally found in the crust. As these elements decay, they become other elements, such as radon, that are found in soil, water and air all over the world.

Your own body is radioactive because of the foods you eat, the water you drink and the air you breathe. For example, bananas are a rich source of potassium that your body needs to regulate fluids and muscle contractions as well as send nerve signals. That same potassium makes bananas slightly radioactive.

Radiation comes from outer space, too. Cosmic radiation includes radiation from the sun, as well as deep space events, like a super massive galaxy exploding. Flying and living at higher elevations your exposure to cosmic radiation.

We are also exposed to man-made radiation

Because we can measure and control radiation, we can use its properties in applications that improve our lives. Radiation helps makes our food safer; it improves the quality of tools, gauges, and machines; it detects smoke in our homes; it powers space travel; and it offers one of the cleanest ways of generating electricity. You may be surprised to learn nuclear power production accounts for less than 0.1% of background radiation, while radioactive gases from the soil are responsible for 37 percent.

For most people, though, the biggest source of radiation exposure—nearly 50 percent—is from medical imaging and nuclear medicine. Radiation is used to diagnose, treat, and research a wide variety of conditions and illnesses. Cancer treatment is just one of the many examples of how radiation improves healthcare. X-rays, CT-scans, and mammograms are other familiar applications. New uses and treatments are being discovered and researched every day.

So, how much radiation are you exposed to in a year?

How much radiation you are exposed to depends very much on where you live and how you live your life. Use this calculator to estimate your personal annual dose.

Radiation & you

We live in a radioactive world - humans always have. Radiation is part of our natural environment. We are exposed to radiation from materials in the earth, from naturally-occurring radon in the air, from outer space, and from inside our own bodies as a result of the food and water we consume. This radiation is measured in units called millirems (mrems). The average dose per person from all sources is about 620 mrems per year. It's not uncommon, though, for any of us to receive less or more in a given year. Standards allow exposure to as much as 5,000 mrems a year for those who work with and around radioactive material.¹



askanything@ans.org
ans.org



Radiation & you

Estimate Your Personal Annual Radiation Dose

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Factors	Common Sources of Radiation	Your Annual Dose (mrems)
Where You Live	Cosmic Radiation (from outer space) Exposure depends on your elevation (how much air is above you to block radiation). Amounts are listed in mrem (per year). At sea level.. 26 mrem 2-3000 ft 35 mrem 6-7000 ft 66 mrem 0-1000 ft 28 3-4000 ft 41 7-8000 ft 79 1-2000 ft 31 4-5000 ft 47 8-9000 ft 96 5-6000 ft 52 <small>(Elevation of cities (in feet): Atlanta 1050; Chicago 595; Dallas 435; Denver 5280; Las Vegas 2000; Minneapolis 815; Pittsburg 1200; St.Louis 455; Salt lake City 4400; Spokane 1890.)</small>	_____ mrem
	Terrestrial (from the ground) If you live in a state that borders the Gulf or Atlantic Coasts add 15 mrem	_____ mrem
	If you live in the Colorado Plateau area add 75 mrem	_____ mrem
	If you live anywhere else in the continental US add 35 mrem	_____ mrem
	House Construction If you live in a stone, adobe, brick or concrete building..... add 7 mrem	_____ mrem
	Power Plants If you live within 50 miles of a nuclear power plant add 0.01 mrem	_____ mrem
	If you live within 50 miles of a coal-fired power plant add 0.03 mrem	_____ mrem
Food, Water, Air	Internal Radiation ² From food (Carbon-14 and Potassium-40) & from water (radon dissolved in water)	40 mrem
	From air (radon)	200 mrem
How You Live	Jet Plane Travel.....0.5 mrem per hour in the air	_____ mrem
	If you have porcelain crowns or false teeth ³0.07 mrem	_____ mrem
	If you go past luggage x-ray inspection at airport.....0.002 mrem	_____ mrem
	If you view a TV or computer screen which uses CRT technology ⁴ 1 mrem	_____ mrem
	If you smoke 1/2 pack of cigarettes every day of the yearadd 18 mrem	_____ mrem
	If you have a smoke detector0.008 mrem	_____ mrem
Medical Tests	Medical Diagnostic Tests – Number of millirems per procedure ⁵ X-Rays: Chest 10 mrem, Mammography 40, Skull 10, Cervical Spine 20, Lumbar Spine 150, Upper GI 600, Abdomen (kidney/bladder) 70, Barium Enema 800, Pelvis 60, Hip 20, Dental Bitewing/Image 0.5, Extremity (hand/foot) 0.1	_____ mrem
	CT Scans: Head 200 mrem, Chest 700, Abdomen 800, Pelvis 600, Extremity 10, Angiography (heart) 1200, Angiography (head) 1000, Spine 600, Whole Body 1275, Cardiac 300	_____ mrem
Your Estimated Annual Radiation Dose		_____ mrem



Sources

1. <http://www.nrc.gov/about-nrc/radiation/health-effects/info.html>
2. Average values.
3. Some of the radiation sources listed in this chart result in an exposure to only part of the body. For example, false teeth or crowns result in a radiation dose to the mouth. The annual dose numbers given here represent the "effective dose" to the whole body.
4. The value is less than 1, but adding a value of 1 would be reasonable.
5. Exposures for medical tests vary depending upon equipment and the patient. The doses listed are an average for an actual exposure.

Primary sources for this information are National Council on Radiation Protection and Measurements Reports: #92 Public Radiation Exposure from Nuclear Power Generation in the United States (1987); #93 Ionizing Radiation Exposure of the Population of the United States (1987); #94 Exposure of the Population in the United States and Canada from Natural Background Radiation (1987); #95 Radiation Exposure of the U.S. Population from Consumer Products and Miscellaneous Sources (1987); #100 Exposure of the U.S. Population from Diagnostic Medical Radiation (1989); and #160 Ionizing Radiation Exposure of the Population of the United States (2009).