# Radiation Dose Chart

This is a chart of the ionizing radiation dose a person can absorb from various sources. The unit for absorbed dose is "sievert" (Sv), and measures the effect a dose of radiation will have on the cells of the body. One sievert (all at once) will make you sick, and too many more will kill you, but we safely absorb small amounts of of natural radiation daily.
Note: The same number of sieverts absorbed in a shorter time will generally cause more damage, but your cumulative long-term dose plays a big role in things like cancer risk.

Sleeping next to someone (0.05 µSv)

Living within 50 miles of a nuclear power plant for a year (0.09 µSv)

Eating one banana (0.1 µSv)

Living within 50 miles of a coal power plant for a year (0.3 µSv)

One arm x-ray (1 µSv)

Using a CRT monitor for a year (1 µSv)

Extra dose from spending one day in an area with higher-than-average natural background radiation, such as the Colorado plateau (1.2 µSv)

Dental or hand x-ray (5 µSv)

Extra dose from one day in an average town near the Fukushima plant (~3.5 µSv as of March 17th, varies quite a bit)

Background dose received by an average person over one normal day (10 µSv)

Airplane flight from New York to LA (40 µSv)

Using a cell phone (0 µSv)—a cell phone's transmitter does not produce ionizing radiation* and does not cause cancer.

* Unless it's a bananaphone.

Chest x-ray (20 µSv)

All the doses in the blue chart combined (~60 µSv)

Living in a stone, brick, or concrete building for a year (70 µSv)

Average total dose from the Three Mile Island accident to someone living within 10 miles (80 µSv)

EPA yearly release limit for a nuclear power plant (250 µSv)

Yearly dose from natural potassium in the body (390 µSv)

EPA yearly limit on radiation exposure to a single member of the public (1 mSv=1,000 µSv)

Maximum external dose from Three Mile Island accident (1 mSv)

Mammogram (3 mSv)

One-day dose (~3.6 mSv) at two sites 50 km NW of Fukushima on 3/16, seen again on 3/17. However, other areas near Fukushima saw barely-elevated doses.

Normal yearly background dose. About 85% is from natural sources. Nearly all of the rest is from medical scans (~3.65 mSv)

EPA yearly release target for a nuclear power plant (30 µSv)

Chest CT scan (5.8 mSv)

Dose from spending an hour on the grounds at the Chernobyl plant in 2010 (6 mSv in one spot, but varies wildly)

Maximum yearly dose permitted for US radiation workers (50 mSv)

■ = (0.05 µSv)

■ = (20 µSv)

■ = (10 mSv)

■ = (1 Sv)

Ten minutes next to the Chernobyl reactor core after explosion and meltdown (50 Sv)

Radiation worker one-year dose limit (50 mSv)

All the doses in the green chart combined (~75 mSv)

Lowest one-year dose clearly linked to increased cancer risk (100 mSv)

Dose causing symptoms of radiation poisoning if received in a short time (400 mSv, but varies)

EPA guidelines for emergency situations, provided to ensure quick decision-making:

Dose limit for emergency workers protecting valuable property (100 mSv)

Dose limit for emergency workers in lifesaving operations (250 mSv)

Severe radiation poisoning, in some cases fatal (2000 mSv, 2 Sv)

Extremely severe radiation poisoning. Survival sometimes possible with prompt treatment (4 Sv)

Fatal dose, even with treatment (8 Sv)

Sources:

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Chart by Randall Munroe, with help from Ellen, Senior Reactor Operator at the Reed Research Reactor, who suggested the idea and provided a lot of the sources. I'm sure I've added in lots of mistakes; it's for general education only. If you're basing radiation safety procedures on an internet PNG image and things go wrong, you have no one to blame but yourself.

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