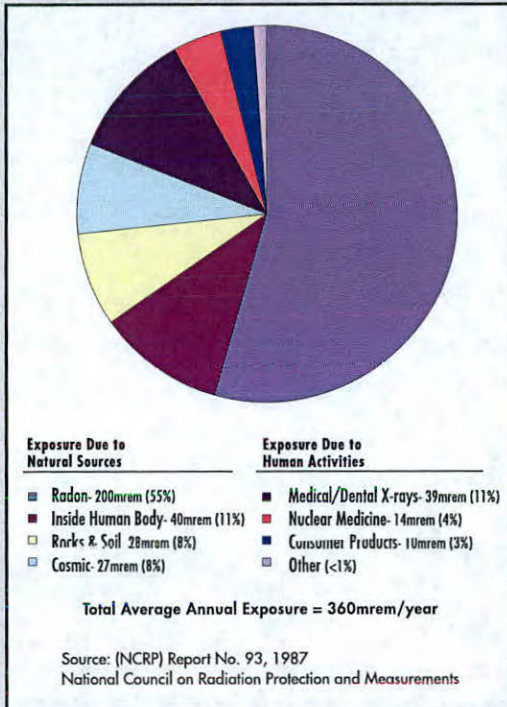


# RADIATION BASICS



U.S. Army Corps of Engineers  
St. Louis District



## What is Radiation?

Radiation is all around us, all the time, everywhere. It is energy that travels in the form of unseen waves or particles.

**Depending on how much energy it has, radiation can be:**

- Non-ionizing (low energy) such as visible light and microwaves, or
- Ionizing (high energy) such as x-ray machines.

**Ionizing radiation may be one of three types.**

- Alpha particles can travel approximately one to two inches in air and can be blocked by a sheet of paper.
- Beta particles can travel 6-10 feet in air, but can be blocked by a few millimeters of substance (i.e. clothing, glass, plastic, aluminum.)
- Gamma rays can travel the farthest but may be stopped with lead or concrete.

## How are we exposed to radiation?

The average American receives 300 millirem of radiation every year from natural sources. An additional 60 millirem per year is received from man-made sources, like x-rays.

Source of Exposure	Amount of Exposure
Average Cigarette Smoker (1 pack/day)	1300 mrem/year
Nuclear Medicine Examination of Brain	650 mrem/exam
Nuclear Medicine Examination of the Thyroid	509 mrem/exam
Upper Gastrointestinal Tract Series	245 mrem/exam
Nuclear Medicine Examination of the Lungs	150 mrem/exam
CT Scan of the Head and Body	110 mrem/exam
Dental X-ray	6 mrem/x-ray
Foods Grown with Phosphate Fertilizers	5 mrem/year
Highway and Road Construction Materials	4 mrem/year
Gas Mantles for Camping Lantern	2 mrem/year
Cross Country Airline Trip	1.5 mrem/year
Domestic Water Supply	1 to 6 mrem/year
Television Receivers	1 mrem/year
Eating Pound of Brazil Nuts	0.5 mrem/year
Sleeping with Spouse (or significant other)	0.1 mrem/year

**AR-273**