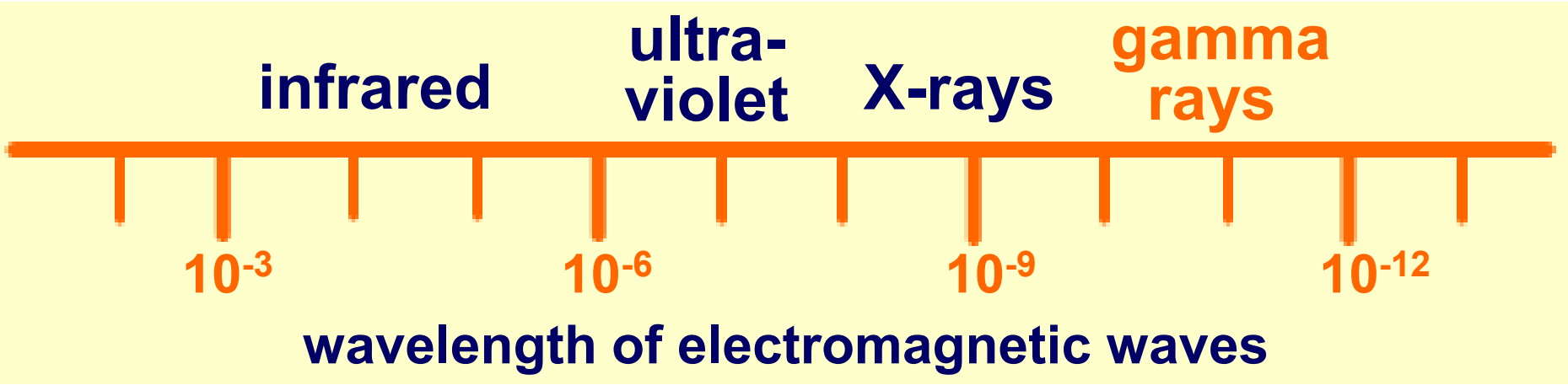
Gamma Rays

What are gamma rays?

Gamma rays are emitted by certain radioactive materials and have many uses in medicine.

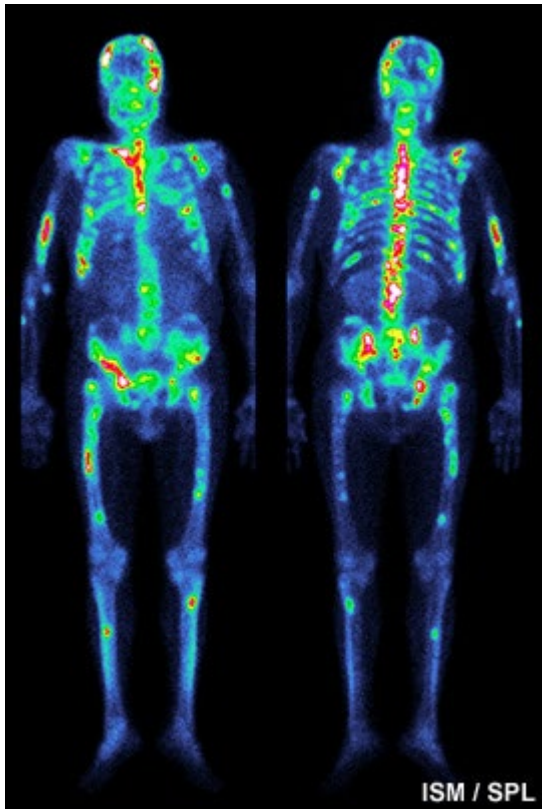
Gamma rays are the highest-energy form of electromagnetic radiation and are beside X-rays in the electromagnetic spectrum.



Gamma rays have wavelengths between 0.001 and 0.1 nm (less than the size of an atom), which makes them the form of electromagnetic radiation with the shortest wavelengths.

What are gamma rays used for?

- **Medical imaging**
  A gamma scan is obtained by injecting a radioactive tracer, which concentrates in the area of the body being investigated. Gamma rays emitted from this area are detected by a gamma camera.



- **Sterilizing**
  Gamma rays are used to sterilize medical equipment because they are highly penetrating and kill all living cells.

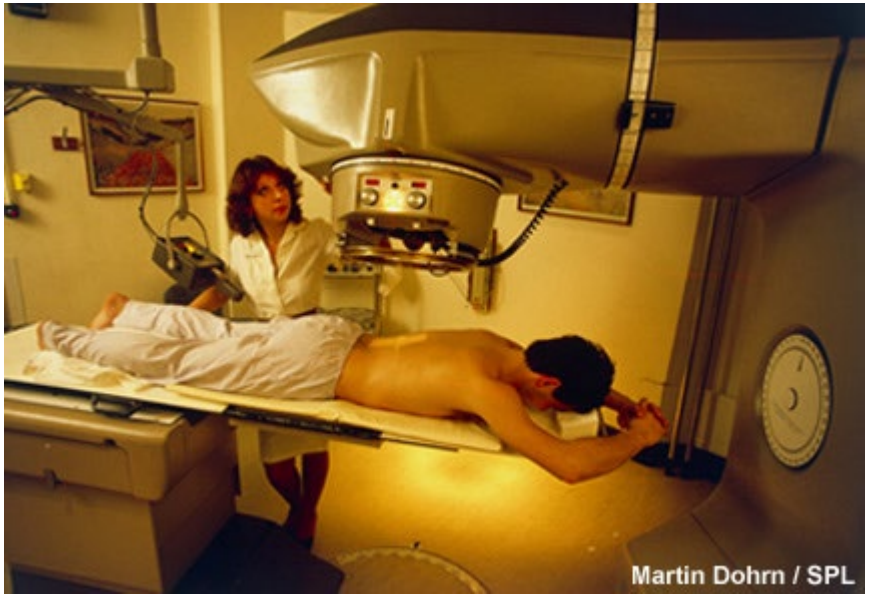
- **Industrial imaging**
  Gamma rays are even more penetrating than X-rays and can pass through denser materials. They can be used to examine metal castings and welded structures.

Gamma rays to treat cancer

Radiotherapy is the use of high-energy ionizing radiation, such as gamma rays, to kill cancer cells.

The radiation dose may come from a radioactive source in a machine outside the body, which directs a beam of radiation at the cancer cells.

Healthy cells can also be affected by the radiation applied to the body.



Steps to reduce the effects on healthy tissue include:

- **splitting the radiation dose** into a number of treatments;
- **rotating the beam** of radiation so that healthy cells receive a lower dose than the cancer cells.

Gamma rays – missing words activity

What are the missing words about gamma rays?

1a. Gamma rays have the [?] wavelengths in the electromagnetic spectrum.

1b. This means that they are the [?] energy form of electromagnetic radiation.

2. Gamma rays are produced by [?].

3a. Gamma rays are dangerous to living cells because they [?] them.

3b. This is because the gamma rays damage the [?] in cells.

solve