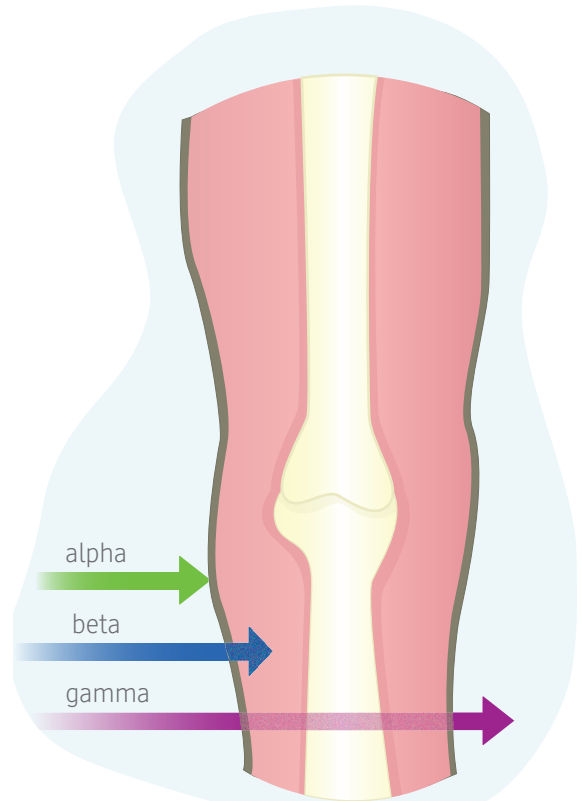
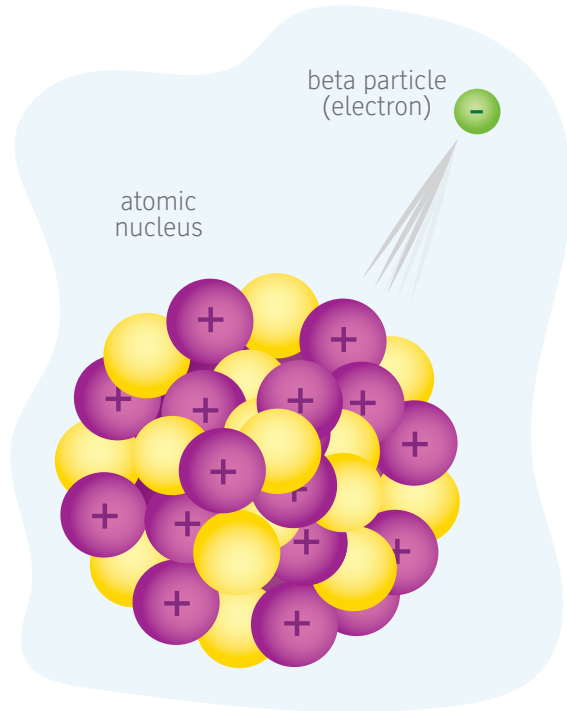


### WHAT IS BETA ( $\beta$ ) RADIATION?

Beta ( $\beta$ ) particles are highly energetic electrons emitted from atomic nuclei during radioactive decay.



Cross section of a human leg, demonstrating the penetration depth of radiation types: alpha radiation is stopped by human skin, beta radiation penetrates into the skin and gamma radiation penetrates the body entirely.

Beta radiation

Some properties of these  $\beta$  particles include:

- The  $\beta$  particle is an electron.
- Compared with the alpha ( $\alpha$ ) particle, a  $\beta$  particle is much lighter – about 7,000 times lighter than the  $\alpha$  particle.
- The  $\beta$  particle is **charged**, but less so than the  $\alpha$  particle – it is therefore less strongly ionising than the  $\alpha$  particle but more so than gamma ( $\gamma$ ) radiation, which is uncharged.
- The  $\beta$  particle interacts with matter but not as strongly as the much heavier  $\alpha$  particle. The  $\beta$  particle can penetrate a few 10 cm of air and can penetrate 1 to 2 cm into living tissue.
- The  $\beta$  particle is easily stopped by a sheet of aluminium.

- $\beta$  radiation cannot make a target radioactive.
- Because the  $\beta$  particle penetrates only skin deep into human tissue, the dose from beta radiation is often referred to as a 'skin dose'.
- The  $\beta$  particle can be emitted from both heavy and light radioactive nuclei. Lighter radioactive nuclei, such as carbon-14 or potassium-40, are usually exclusively  $\beta$  particle emitters.