

Metrology

Measurement in Sport



Dosimetry

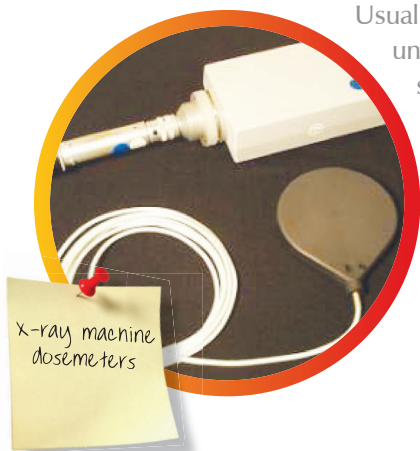
Bodies are machines, and athlete's bodies are machines that are trained and tested to the limit – so they often need to be checked for damage. X-rays allow us to see inside the body to check its structures, but, in their passage through flesh and bone, X-rays cause damage of many kinds. So, it is important to ensure that X-ray machines are powerful enough to produce clear images, but not so powerful that the health risk is unnecessarily high.

Did you know? A space shuttle astronaut on a one-week mission receives about the same dose of radiation as an average person does in three years.

When X-rays pass through air some of the atoms are stripped of outer electrons and become ions. The amount of this ionisation is a measure of the intensity of the X-ray beam. To check the output of an X-ray machine a probe called a dosimeter measures the amount of ionisation produced.

Usually, the dosimeters are sent to a laboratory to undergo these tests. Every year or so, the laboratories send their own equipment to their National Measurement institute to be checked.

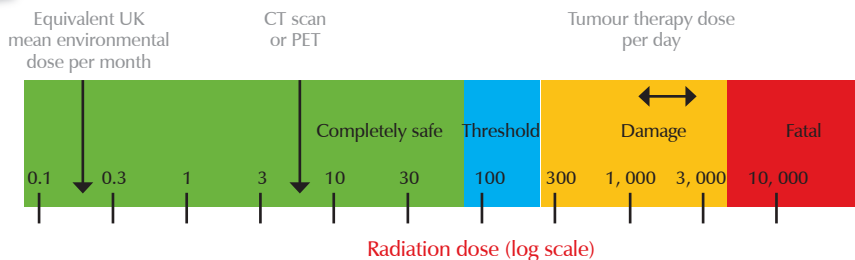
The SI unit of radiation dose is the sievert, equivalent to one joule of energy per kilogram of matter. The following chart shows the effects of different doses in millisieverts (thousandths of a sievert). A single diagnostic X-ray is about 0.01 to 0.1 millisieverts.



X-ray machine dosimeters



The first ever X-ray image, produced in 1896



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