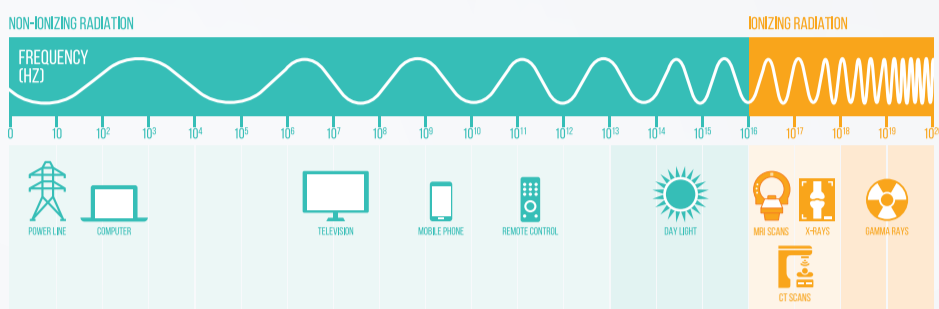


WHAT IS MEDICAL IMAGING AND RADIATION THERAPY?

What is radiation?

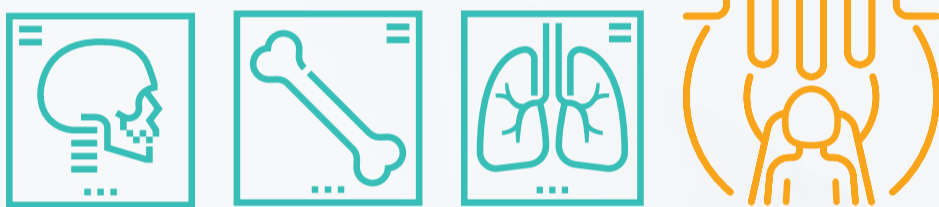
Radiation is energy travelling as waves or particles. Ionising radiation has enough energy to change the chemical composition of matter. Non-ionising radiation has less energy but can still excite molecules and atoms causing them to vibrate faster.



What is medical imaging and radiation therapy?

Medical imaging (radiography) is the science of using radiation to provide images of tissues, organs, bones, and vessels.

Radiation therapy uses the information from diagnostic images for the treatment of abnormal tissues utilising high energy radiation.



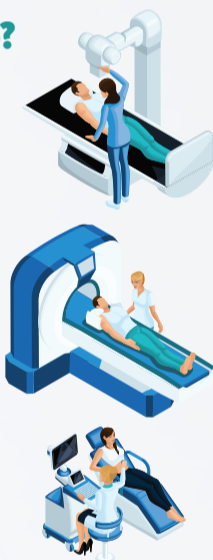
What do medical radiation professionals do?

Radiographers are health professionals who image patients in order to help diagnose the patient's medical condition.

Radiation therapists calculate the radiation plan and operate the equipment to administer doses of radiation to treat cancerous growths in patients. Radiation Therapy can also assist in pain relief for cancer patients.

Nuclear medicine technologists prepare and give patients radiopharmaceuticals to help image the body and help diagnose the patient's medical condition.

Sonographers use high-frequency sound waves to produce dynamic visual images of organs, tissues or blood flow that assist doctors to diagnose, monitor and treat your illness or assess the health of your baby if you are pregnant.



How do you become a medical radiation professional?

You must complete an undergraduate Bachelor of Medical Radiation Science and specialise in radiation therapy, radiography or nuclear medicine technology. Entry to the course can also be via a Masters program which are two years in length.

How many medical radiation professionals are there in Australia?

There are 18,976 Medical Radiation Practitioners in Australia - Statistics from MRPBA June 2025

18,976

MRP's IN AUS



What technologies and procedures are used in the medical radiation profession?



Radiography

Produces X-rays to detect bone fractures, find foreign objects and show the relationship between bone and soft tissue.



CT scan

Computed tomography scans obtain "slices" of anatomy so physicians can view what's happening inside organs.



MRI scan

Magnetic resonance creates detailed images of anatomy by exposing atoms in the body to a strong magnetic field.



Nuclear medicine

Radiopharmaceuticals injected into the body emit gamma rays that provide functional information about organs, tissues and bone.



Radiation therapy treatment

Procedures of targeted doses of radiation to the patient's body to treat cancer or other diseases.



Sonography

Commonly referred to as ultrasound, uses sound waves to obtain images of organs and tissues.



Cardiac-interventional radiography

Procedures targeted for diagnosis and treatment of cardiac diseases and abnormalities.



Vascular-interventional radiography

Procedures specifically targeted for catheter placement and the diagnosis and treatment of vascular diseases.



Mammography

Produces images of breast tissue to diagnose and rule out breast disease.



Quality management

Monitors the quality of processes and systems to ensure optimal treatment delivery and patient safety.



Bone densitometry

Measures bone mineral density to diagnose and rule out osteoporosis.



Radiation therapy planning

Radiation dose is planned and calculated to deliver maximum dose to abnormal tissue whilst protecting healthy organs and tissues.

What measures are in place to ensure safe levels of radiation dosage?

Concrete walls – for high risk areas eg: radiation therapy. Concrete shielding walls reduce the intensity of radiation depending on the thickness and density of the concrete structure. With a higher density material, the radiation is reduced faster.

Lead lining in walls – for medium risk applications eg: nuclear medicine, radiography. Radiation protection walls are used to guard people against the harmful effects of exposure to radiation. Lead has proven to be one of the most effective and to provide the best protection in proportion to the amount of material used.

Lead aprons – for low risk radiation. Lead or lead equivalent shielding for X-rays is an effective way to reduce radiation exposure.

All medical radiation professionals work towards the dosage aims **ALARA** (As Low As Reasonably Achievable). Time, distance and shielding is an integral part to help prevent unnecessary exposure as well as overexposure.



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