

## Importance of reducing exposure to radiation in cancer prevention

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Radiation is the emission of energy as electromagnetic waves or moving subatomic particles. Natural radiation is produced by a variety of naturally occurring radioactive elements present in soil, water, air, and the human body. Every day, we are naturally exposed to a small amount of ionising radiation. Radon gas from the earth is often the most common source, however, there are other man-made sources that make up a tiny part of it.

This type of ionising radiation (high energy radiation) can be the cause of cancer if a person is exposed to a lot of it. Radiation can affect our cells and damage our DNA, in some instances this is a useful tool in treating and diagnosing cancer; chest x-rays, computed tomography (CT) scans, positron emission tomography (PET) scans, and radiation therapy can all induce cell damage. The risks of cancer from these medical procedures are very low, and the benefits almost always outweigh the risks.



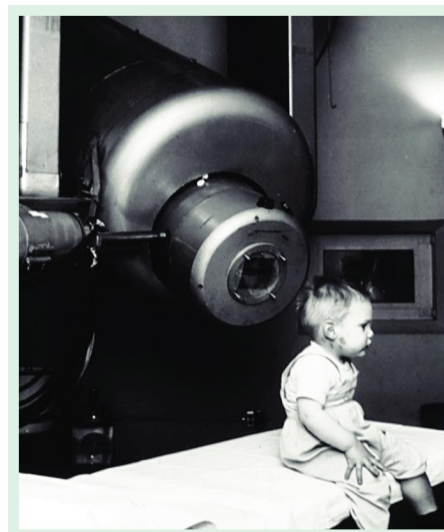
Exposure to radiation is carefully monitored and reviewed, not only on a national level but also locally. There are regulations in place to assist organisations to follow safe and effective practice in protecting their patients and staff to minimise this risk and prevent radiation events from occurring. In the UK, IRMER regulations are followed and across Europe the Euratom Community rules on

radioactive source control are put in place to maintain safety in radiation and every country has a responsibility to monitor levels of radioactivity in air, water, soil, and foodstuffs.

Radiation therapy has come a long way since it was first discovered, new techniques and systems are being utilised and continually developed to improve safety and efficiency within this field. The 1950s saw many advancements in radiotherapy, including the increasing use of megavoltage therapy, the discovery and application of the oxygen effect, the gradual discontinuance of radiotherapy for benign conditions, and the introduction of cancer chemotherapy.

Although it has been some time since a major radiation incident occurred, The World Health Organisation (WHO) suggest three main principles of how to protect ourselves in affected areas: stay in, tune in, and follow instructions.

These still apply in our clinical areas, as we have a responsibility to also protect our



colleagues and our patients. We must ensure we educate patients on the risks of ionising radiation with good clinical evidence and justification, this will allow them to make well-informed choices about their own care and possibly receiving life-saving treatments.

Every treatment carries risk, this is something that is taken into consideration by all clinicians when making decisions on clinical care for their individual patients. Cancer Research UK statistics state that almost 30% of cancer patients received radiation therapy between 2013-2014, whereas some European studies suggest that this number is lower, despite this therapy being indicated for almost 50% of cancer patients.

Radiation is utilised as a tool to damage cancer cells with the aim of preventing them from growing back. Inevitably, surrounding healthy tissues can be affected during this treatment modality which can cause short- and long-term side effects. These are taken into consideration when making clinical decisions, and it is a requirement for every patient to be properly educated and informed of them during the consent process.

We have a duty of care to each other and our patients; stay knowledgeable and understand the risks of ionising radiation so that we can all remain safe.

Useful resources:

<https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation#:~:text=High%2Denergy%20radiation%2C%20such%20as,made%2C%20tested%2C%20or%20used>.

[https://www.who.int/news-room/questions-and-answers/item/radiation-and-health?gclid=CjwKCAjw1YckBhAOEiwA5aN4ARRHLT3W5rgBGmNQiPo8DtUfvf-rCRgwYAI3qExwg6r31QmCjni2RhoCYgUQAvD\\_BwE](https://www.who.int/news-room/questions-and-answers/item/radiation-and-health?gclid=CjwKCAjw1YckBhAOEiwA5aN4ARRHLT3W5rgBGmNQiPo8DtUfvf-rCRgwYAI3qExwg6r31QmCjni2RhoCYgUQAvD_BwE)

<https://www.cancerresearchuk.org/health-professional/cancer-statistics/treatment#heading-Three>

[https://energy.ec.europa.eu/topics/nuclear-energy/radiation-protection\\_en](https://energy.ec.europa.eu/topics/nuclear-energy/radiation-protection_en)

<https://www.legislation.gov.uk/uksi/2017/1322/contents/made>