

Radiation needs a more prominent role in the fight against cancer

By Mack Roach III

Much of the research conducted in oncology and on cancer is being funded by governmental agencies, such as the United States National Institutes of Health's National Cancer Institute, and pharmaceutical and biotechnology companies. A lot of this research is centered around the development of new chemotherapy drugs. Chemotherapy is generally cancer-site specific in its application, such as cisplatin for head, neck and lung cancer, and various forms of hormonal therapy for prostate cancer, and temozolomide for brain tumours. Radiation, on the other hand, can treat most solid tumours.

Radiotherapy possesses the greatest spectrum of activity against the widest variety of cancers. It has been used to treat cancer for more than 100 years and has proven to be extremely cost effective. This is because once radiation equipment is purchased, it can essentially generate as much radiation as needed, with the primary costs being only electricity and maintenance. This in turn means the more the machine is used, the more cost-effective the treatment per patient. Unlike specific medications that are used up by each patient and cannot be reused, the radiation beam can be used over and over again. In addition, radiotherapy can be used as an alternative to surgery, particularly when the latter would have a profoundly negative impact on quality of life, as can be the case with, for example, laryngeal cancer and anal cancer. The wide spectrum of activity, ability to generate an ongoing supply of treatments and the long-life expectancy of radiation machines of more than ten years explains why radiation therapy as a modality is so cost effective.

Complementing radiation medicine's therapeutic versatility, nuclear medicine

facilitates the detection of very small deposits of cancer cells, which allows for better staging of cancer and targeting of a tumour. These attributes of radiation and nuclear medicine make them essential components for ensuring quality cancer care. A number of international organizations, such as the IAEA and the World Health Organization, have come to play a critical role in facilitating the adoption of these modalities into the global standard oncological portfolio, which, in turn, is also helping patients in developing countries get access to effective treatment that can increase life expectancy and save lives.

Future treatment options using radiation

Numerous studies both in animals and people have shown the potential for radiation to stimulate the immune system in unique and targeted ways. In addition, new and exciting data suggest that there is great potential for further extremely promising advances in 'nuances' to the conventional application of radiation that are actively being investigated. These 'nuanced' approaches, such as 'flash', microbeam and mini-beam, and particle radiation, may very well result in less toxic, much less expensive and more effective treatment for cancer patients and may have a profound impact on cancer care worldwide, particularly in developing countries.

Though already highly cost effective and critical to the cure of our most common cancers now, I predict that the role of radiation and nuclear medicine is likely to continue to expand. The use of these modalities points to an extremely optimistic future, and their 'invisible' nature and effectiveness at a distance may make them the closest thing to 'magic' we will see in my lifetime!



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