

Unveiling the power of radiation therapy in the fight against cancer.

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Description

Radiation therapy, also known as radiotherapy, is a cornerstone in the comprehensive treatment of cancer. This vital medical intervention uses high-energy radiation to target and eradicate cancer cells, offering hope and relief to countless individuals diagnosed with various forms of cancer. This article aims to provide a detailed overview of radiation therapy, covering its mechanism, types, delivery methods, side effects, and its indispensable role in modern cancer treatment.

Mechanism of radiation therapy

Radiation therapy employs ionizing radiation to damage the DNA within cancer cells, disrupting their ability to divide and grow. This process can lead to cell death or render the cells unable to proliferate further. Remarkably, radiation therapy is a localized treatment, meaning it predominantly impacts the targeted area, minimizing harm to surrounding healthy tissues.

Types of radiation therapy

There are two primary types of radiation therapy:

External Beam Radiation Therapy (EBRT): This involves directing radiation from an external machine towards the cancer-affected area. It is the most common form of radiation therapy.

Internal Radiation Therapy (Brachytherapy): This entails placing a radiation-emitting source directly into or near the cancerous site. The radiation source can be temporary or permanent, providing a concentrated dose of radiation to the tumor.

Delivery methods of radiation therapy

Radiation therapy can be delivered through several techniques:

Intensity-Modulated Radiation Therapy (IMRT): IMRT customizes the intensity of the radiation beams, allowing for precise dose delivery while sparing nearby healthy tissues.

Stereotactic Radiosurgery (SRS): SRS delivers a high dose of radiation to a small and precise target in a single session.

Proton therapy: This form of therapy uses protons instead of X-rays to treat cancer, enabling more precise targeting and reduced radiation exposure to surrounding tissues.

Image-Guided Radiation Therapy (IGRT): IGRT uses imaging techniques to guide the radiation therapy in real-time, enhancing accuracy during treatment.

Side effects of radiation therapy

While radiation therapy is highly effective in treating cancer, it can cause side effects due to its impact on both cancerous and healthy cells. Common side effects may include:

Fatigue: Patients often experience tiredness and a lack of energy during and after radiation treatment.

Skin changes: The skin in the treated area may become red, dry, or irritated, resembling a sun-burn.

Nausea and digestive issues: Radiation to the abdomen can cause nausea, vomiting, or diarrhea.

Hair loss: Depending on the area treated, hair loss may occur, but it is usually localized to the treated region.

Long-term effects: Radiation therapy may have long-term effects, such as damage to organs near the treatment area or an increased risk of secondary cancers.

Conclusion

Radiation therapy stands as a pillar of modern cancer treatment, showcasing its prowess in combatting cancer and improving the quality of life for patients. Advances in technology and treatment planning continue to refine radiation therapy, enhancing its precision and reducing its side effects. The future holds immense promise, with on-going research and innovation aiming to further optimize radiation therapy, solidifying its role in the ever-evolving landscape of cancer treatment.

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