

## Radiation Therapy Types and Applications

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### DESCRIPTION

Radiation therapy, or radiotherapy, is a form of cancer treatment that uses high radiation doses to kill cancer cells and reduce the tumor growth. Very few levels of radiation are used in x-rays to see inside the body, just like when taking x-rays for teeth or broken bones. Different types of cancer can be treated with radiotherapy also it can be used in combination with other cancer curatives includes chemotherapy and/or surgery.

### Types of radiotherapy

There are two types of radiotherapy that uses to treat cancer

- External Beam Radiation
- Internal Beam Radiation

**External beam radiation:** External beam radiation is the most popular and reliable technique of cancer radiation therapy. The word "external" indicates that the source of the energy beams is a device outside of the body. A medical professional carefully targets the rays on the cancerous area of the body. External beam radiation is also known to as teletherapy.

Types of external-beam radiation therapy

**Three-dimensional conformal radiation therapy (3D-CRT):** During this sort of radiation therapy, precise 3-dimensional images of the malignancy are obtained using computed tomography (CT) or magnetic resonance imaging (MRI) scans. The medical personnel directs the ray using these images. The medical personnel can safely provide enhanced radiation dosages using this technique while avoiding damage to healthy tissue. This reduces the risk of side effects.

**Intensity modulated radiation therapy (IMRT):** The radiation therapy in issue is more challenging. With IMRT, variations in radiation dosage are possible. Instead of using the same intensity for each ray as in a standard 3D-CRT, each ray is different in intensity. IMRT more effectively targets the tumour while avoiding healthy tissue when compared to standard 3D-CRT.

**Proton beam therapy:** In this method, protons are used in place of x-rays. A proton is a positively charged particle. Protons have

the power to kill cancer cells at high energies. To the targeted tumour, protons deliver an exact dose of radiation therapy. Compared to x-ray beams, proton therapy produces very less radiation outside the tumour. This reduces damage to the local tissue. The relatively new medical treatment of proton therapy requires specialized equipment. Only specific cancer types are currently treated with it.

**Image-guided radiation therapy (IGRT):** Imaging is used in IGRT during radiation therapy. Images are compared to those taken before to the start of treatment and while it is being administered. This helps physicians to directly place the radiation.

**Stereotactic radiation therapy (SRT):** With this therapy, a small tumour area receives a strong, precise dosage. The Case needs to be relatively. SRT is constantly administered in a single session or in a maximum of ten sessions. More than one SRT training may be required for some people.

**Internal radiation therapy:** Internal radiation therapy exposes cancer cells to radiation inside your body. Small tumours in the head, neck, breast, cervix, uterus, or prostate can be treated with it. People can get internal radiation from a liquid or solid source.

In brachytherapy, a solid radioactive source, or "seed," is implanted within or next to a tumour. It releases radiation to a small area to eliminate cancer cells. Some implants prolong the release of low dosages (weeks). Others might produce advanced doses for a shorter time (minutes). Temporary implants are occasionally used in brachytherapy. Others stay in body permanently. They eventually stop releasing radiation.

Systemic remedy uses liquid radioactive material to circulate through your bloodstream to find and kill cancer cells. A few types are ingested. Radionuclide treatment is one of the curatives (radio immunotherapy). During radio immunotherapy, a radioactive protein recognizes certain cancer cells, attaches to them, and also radiates the cancer cells to death.

### Applications

- It is used to treat malignant tumours as the main form of therapy.

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- Moreover, it is utilized in combination with hormone therapy, chemotherapy, and surgery.
- The majority of the iodine in the blood is absorbed by the thyroid gland. I-131 can therefore be used to kill thyroid tissue and thyroid cancer with just few side effects on the rest of the body.
- To treat malignant excess fluid in these cavities, radioactive phosphorus can be injected into the abdominal cavity or the linings of the lungs.
- Monoclonal antibodies that have been radio-labeled attach just to the intended target, delivering radiation to the site. Moreover, some non-Hodgkin lymphomas are treated with it.