

Radiation therapy is a type of treatment that involves exposing.

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Radiation therapy, often known as radiotherapy and abbreviated as RT, RTx, or XRT, is a type of cancer treatment that uses ionising radiation to regulate or destroy malignant cells. It is typically given via a linear accelerator. Radiation therapy may be curative for a variety of cancers that are limited to one part of the body. It may also be used as adjuvant therapy following surgery to remove a primary malignant tumour to prevent tumour recurrence (for example, early stages of breast cancer). Radiation therapy has been utilised before, during, and after chemotherapy in patients with tumours that are sensitive to it. Radiation oncology is a subspecialty of oncology that deals with radiotherapy. A radiation oncologist is a doctor who specialises in this field.

Because of its capacity to limit cell proliferation, radiation therapy is routinely used to treat malignant tumours. Ionizing radiation causes cellular death by destroying the DNA of malignant tissue. Shaped radiation beams are focused from many angles of exposure to intersect at the tumour, producing a considerably bigger absorbed dose there than in the surrounding healthy tissue, sparing normal tissues (such as skin or organs, which must pass through radiation to treat the tumour). Aside from the tumour, the radiation fields may also encompass the draining lymph nodes if they are clinically or radiologically involved with the tumour, or if subclinical malignant dissemination is suspected. To account for uncertainties in daily set-up and internal tumour mobility, a margin of normal tissue around the tumour must be included. Internal movement (for example, respiration and bladder filling) and movement of external skin markings relative to the tumour site can generate these problems.

Radiation oncology is a medical speciality that deals with the administration of radiation, as opposed to radiology, which deals with the use of radiation in medical imaging and diagnosis. A radiation oncologist may prescribe radiation with the goal of curing the cancer ("curative") or as adjuvant therapy. It can also be used as a palliative treatment (when a cure isn't possible but local illness control or symptomatic relief is the goal) or as a therapeutic treatment (when a cure isn't possible but local disease control or symptomatic relief is the goal) (where the therapy has survival benefit and can be curative). Radiation therapy is frequently used with surgery, chemotherapy, hormone therapy, immunotherapy, or a combination of the four. The majority of common cancer types can be treated in some form with radiation treatment.

The kind, location, and stage of the tumour, as well as the patient's overall condition, will determine the treatment intent (curative, adjuvant, neoadjuvant therapeutic, or palliative). TBI (total body irradiation) is a type of radiation therapy that is used

to help the body prepare for a bone marrow transplant. Another type of radiation therapy that limits exposure to healthy tissue during procedures to treat malignancies of the breast, prostate, and other organs is brachytherapy, in which a radioactive source is inserted inside or close to the area requiring treatment. Trigeminal neuralgia, auditory neuromas, severe thyroid eye disease, pterygium, pigmented villonodular synovitis, and the prevention of keloid scar formation, vascular restenosis, and heterotopic ossification are among the non-malignant disorders for which radiation therapy is used. Concerns regarding the risk of radiation-induced malignancies limit the use of radiation therapy in non-malignant illnesses.

Side effects

Radiation therapy is painless in and of itself. Many low-dose palliative treatments (for example, radiation therapy to bony metastases) have little or no adverse effects, while oedema compressing nerves in the treated area can produce a short-term pain flare-up in the days following treatment. Higher doses can result in a variety of side effects during therapy (acute side effects), months or years after treatment (long-term side effects), or after re-treatment (re-treatment side effects) (cumulative side effects). The organs that receive radiation, the treatment itself (kind of radiation, dose, fractionation, concurrent chemotherapy), and the patient all influence the nature, intensity, and duration of side effects.

The majority of side effects are predicted and predictable. Radiation's side effects are often limited to the part of the patient's body that is being treated. Higher doses of head and neck radiation, for example, have been linked to cardiovascular problems, thyroid malfunction, and pituitary axis dysfunction. Modern radiation therapy tries to minimise adverse effects while also assisting patients in understanding and dealing with those that are unavoidable.

Fatigue and skin irritation, similar to a mild to moderate sunburn, are the most common adverse effects observed. Fatigue usually appears in the middle of a treatment course and can continue for weeks after it is completed. The inflamed skin will recover, but it will not be as supple as it once was.

Side effects that occur suddenly

Vomiting and nausea

This is not a common side effect of radiation therapy, and it is only associated with radiation therapy to the stomach or abdomen (which typically react a few hours after treatment) or radiation therapy to certain nausea-producing structures in the head during treatment of certain head and neck tumours, most commonly the vestibules of the inner ears. Some patients

vomit during radiotherapy, or even in anticipation of it, as with any unpleasant treatment, but this is a psychological response. Antiemetics can be used to treat nausea for any reason.

Surface damage to epithelial cells

Radiation therapy can cause damage to epithelial surfaces. This could include the skin, oral mucosa, pharynx, intestinal mucosa, and ureter, depending on the location being treated. The rate at which damage occurs and is repaired is determined by the turnover rate of epithelial cells. Several weeks into treatment, the skin usually becomes pink and painful. The skin may break down and the reaction may become more severe during the treatment and for up to one week after the conclusion of radiation therapy. Although the moist desquamation is unpleasant, it normally heals quickly. In regions with natural creases in the skin, such as beneath the female breast, behind the ear, and in the crotch, skin reactions are more severe.

Sores in the mouth, throat, and stomach

Temporary pain and ulceration in the mouth and throat are frequent when the head and neck area is treated. If the condition is severe, the patient may require painkillers as well as nutritional support/food supplements. If the oesophagus is treated directly or, more typically, if it receives a dosage of collateral radiation during lung cancer treatment, it can become painful. Collateral radiation can cause gastric, stomach, or duodenal ulcers while

treating liver cancers and metastases. Non-targeted delivery (reflux) of the radioactive agents being infused is a typical cause of collateral radiation. There are methods, procedures, and equipment available to reduce the likelihood of this type of negative side effect.

Uncomfortable stomach

The lower bowel can be treated directly with radiation (for rectal or anal cancer) or it can be exposed to other pelvic structures through radiation therapy (prostate, bladder, female genital tract). Soreness, diarrhoea, and nausea are common symptoms. Nutritional therapies may be able to aid with radiotherapy-induced diarrhoea. Changes in dietary fat, fibre, and lactose during radiotherapy were observed to lessen diarrhoea at the conclusion of treatment in persons who had pelvic radiotherapy as part of anticancer treatment for a primary pelvic cancer.

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