Cancer, Radiation Treatment

Radiation therapy uses ionizing beams for killing cancer cells and shrinking tumors. Radiation damages both cancer cells and normal cells, but normal cells have the DNA to repair themselves. Cancer cells **do not** have DNA to repair themselves and therefore, are killed off by the radiation, and the body disposes of them. The goal of therapy is to kill as many cancer cells without causing harm to healthy cells near the cancer. Radiation therapy may also be used to reduce pain (*palliative therapy*).

RADIATION IS USED FOR DIFFERENT REASONS

- As the primary or only treatment for the cancer.
- Used before surgery to shrink a tumor.
- Used after surgery to stop the growth of any remaining cancer cells.
- Used in combination with other treatments to kill cancer cells.
- Used in advanced cancer patients to help with symptoms of the cancer.

RADIATION THERAPY MAY BE EXTERNAL OR INTERNAL

- **External beam radiation** is used most often. It is given on an outpatient basis. This means you do not have to be hospitalized. The energy (source of radiation) used in external radiation therapy may come from X-rays or gamma rays. Although they are produced in different ways, both use packets of energy (*photons*). Lower energy beams can be used to destroy cancer cells on the surface of the body. Higher energy beams are used to treat cancer deep within the body. Compared with some other types of radiation, x-rays can deliver radiation to a fairly large area.
- **Internal radiation** is called brachytherapy. There is a lose dose rate (LDR) where permanent seeds are implanted into the patient, usually used for GYN or Prostate cancer. This procedure is an inpatient procedure. High dose rate brachytherapy (HDR) is another type of radiation, which is an outpatient procedure. Needles are inserted into the patient, and the radiation travels through these needles to deliver the dose prescribed. This procedure is mainly used for prostate and breast cancers. Both of these types use a live source of radiation.

Radiation therapy may be used to treat almost all types of tumors. It is also used to treat leukemia and lymphoma. There are a few that are more radio resistant and may not respond to radiation alone. These are cancers of the blood-forming cells and lymphatic system.

For some types of cancer, radiation may be given to areas that do not have evidence of cancer. This is done to prevent cancer cells from growing in the area receiving the radiation. This technique is called *prophylactic radiation therapy*.

RISKS

Side effects of radiation therapy depend on which part of your body is exposed to radiation and how much radiation is used. Most people are affected by fatigue, which is the most common side effect.

Everybody deals with radiation differently. You cannot predict what the side effects will be. They do not occur right away, and it can take 2-3 weeks to develop side effects. Most side effects are temporary and can be controlled. Once the treatment is complete, the side effects do not stop right away. It can take up to 3-4 weeks to regain your energy or for the redness to go away. Your body does heal from the radiation.
Some common side effects are:

- Difficulty swallowing, coughing (head and neck cancers and lung cancers).
- Feeling sick to your stomach (*nauseous*), vomiting and/or diarrhea (abdominal area or pelvis being treated).
- Bladder problems, frequent urination and/or sexual dysfunction (bladder, kidney, prostate cancer).
- Hair loss (brain tumors).

BEFORE THE TREATMENT BEGINS

There will be a planning simulation usually in the radiation department using a CT planning scan. Your radiation oncologist will plan exactly where the radiation will be delivered. The treatment fields will be planned just for you in order to treat you the best way possible. They also make a plan to avoid critical structures in the body. You may also be given a dye (*contrast*) during this CT planning scan or an MRI.

- You will be positioned how you will be everyday for your treatment. The goal is to have a position that can be reproduced daily.
- Usually, temporary marks will be placed on your body to give the therapists a place to shift from once the plan is complete. Then, tattoos are usually put on you in order for you to line up in the same way each day. These tattoos are permanent, but are the size of a freckle.

DURING THE RADIATION TREATMENTS

- You will lie perfectly still on a table in the position determined for treatment, while the linear accelerator moves around you.
- This machine delivers the radiation in exact doses from many possible angles.
- Treatments are usually spread out over several weeks. This is to allow your healthy cells to recover between sessions. Usually, treatments are spread out between 5-6 weeks, but this is determined by your radiation oncologist.
- There is no pain during this treatment. You will not feel the radiation being delivered. The treatment takes about 15-20 minutes, including setup time.

AFTER THE TREATMENTS

- You will have tests and follow-up appointments. They are usually 6 weeks to 6 months after radiation to see if the treatment helped reduce pain or eliminate the cancer cells.

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