RADIATION THERAPY
QUESTIONS AND ANSWERS

How does Radiation Therapy Work?

Cancer cells grow and divide more rapidly than many of the normal cells around them. High doses of radiation can kill cells or keep them from growing and dividing, and it has proven to be particularly effective in killing cancer cells and shrinking tumors. Although some normal cells are affected by radiation, most normal cells recover more fully from the effects of radiation than do cancer cells. Receiving external radiation treatments is painless, just like having an X-ray taken.

Does radiation therapy expose people to radioactive substances?

Many people, when they hear the word “radiation,” think immediately of radioactive substances. However, no radioactive substances are involved in the creation of X-rays or electrons by a medical linear accelerator. When a linear accelerator is switched to “on,” radiation is produced and aimed directly at cancer cells. Then, like a flashlight, when the machine is switched off, there is no more radiation – none is “stored” or “transported.”

What kind of radiation is used?

Photons (X-rays) and Electrons are used to deliver radiation. The radiation is generated by a machine called a linear accelerator. This machine stands approximately nine feet tall, is nearly 15 feet long and can be rotated around the patient with great precision. Operationally, microwave energy, similar to that used in a satellite television transmission, is used to accelerate electrons to nearly the speed of light. As they reach maximum speed, they collide with a tungsten target, which in turn releases photons, or x-rays.

Very small beams with varying intensities can be aimed at a tumor from various angles to attack the target in a complete three-dimensional manner.

Varian's SmartBeam IMRT can be delivered with beams the size of a 2.5 x 5 millimeter pixels – the size of a pencil tip – each with varying intensity. The idea is to deliver the lowest dose possible to the healthy surrounding tissue, reducing the chance of causing a radiation side effect, while still delivering the maximum dose to the tumor.

How does a Medical Linear Accelerator work?

As radiation strikes human tissue it produces (largely from naturally occurring water in the body) highly energized ions which are lethal to both normal and malignant cells. While both good and bad cells suffer from radiation, healthy cells can adapt over successive regenerative cycles. Malignant cells do not possess this adaptation mechanism and thus do not survive; this is why patients are scheduled to come into the Welch Cancer Center for daily treatments rather than a single treatment.

What are the side effects of treatment?

Side effects vary from patient to patient. Side effects of radiation are directly related to the area of the body being treated. Most patients do not experience any serious difficulties and most patients will be able to continue with their normal daily activity during their treatment.

Who gives the treatment?

A doctor who has had special training in using radiation to treat disease - - a Radiation Oncologist - - prescribes the type and amount of treatment that best suits a particular patient's needs. The Radiation Oncologist works with the patient's referring physician and also heads a highly trained Health Care Team. This team often includes: 1) a Radiation Physicist who participates in the planning process and ensures that the machines deliver the right dose of radiation, 2) a Dosimetrist, who plans the treatment with the Oncologist and the Physicist, 3) a Radiation Therapist, who sets the patient up for treatment and runs the equipment that delivers the radiation and, 4) a Radiation Oncology Nurse, who provides nursing care and helps patients learn about treatment and how to manage any side effects.

How long is a course of treatment?

Radiation Therapy is usually given five days a week for six to eight weeks. When radiation is used for palliative care, the course of treatment

lasts for two to three weeks. For each radiation therapy session, the patient is in the treatment room for about 15 minutes. These types of schedules, which use small amounts of daily radiation, rather that a few larger doses, help protect normal body tissues in the treatment area. Weekend rest breaks allow normal cells to recover. The total dose of radiation and the number of treatments a patient needs depend on the size and location of the cancer, the type of tumor, the patient's general health, and other factors.

Is radiation therapy expensive?

Treatment of cancer with radiation can be costly. It requires very complex equipment and the services of many health care professionals. The exact cost of your radiation therapy will depend on the type of treatment approach and the number of treatments the patient needs.

In addition to Medicare, most health insurance policies cover charges for radiation therapy including IMRT. If you have any question you should talk with your insurer or the business office at Sheridan County Memorial Hospital about your policy and how expected costs will be paid.