Radiation Therapy
Cancer treatment requires a team effort. The Radiation Oncology team may include radiation oncology doctors, registered nurses, radiation therapists, medical assistants, and other certified health care professionals. These teams help plan and administer radiation therapy and care for patients undergoing radiation treatment.

We provide patients with information concerning their cancer and treatment. We will provide an environment that allows you to explore your cancer diagnosis and treatment options. Our goal is to minimize the negative impact of the disease and its treatment on the quality of patients’ lives. Our team manages patients’ treatment side effects. We also coordinate care with the inpatient hospital services if an admission to the hospital is needed. A radiation oncology doctor directs and supervises patients’ radiation treatment. Our clinic staff is available daily if questions or concerns arise at any time during the course of treatment. Our goal is to assist you with medical, nutritional, social, or spiritual needs.

The Department of Radiation Oncology is located on the first floor, on the east side of the Anschutz Cancer Pavilion on the Anschutz Medical Campus (formerly Fitzsimons). We are open for patient services Monday through Friday, 7 a.m. to 5 p.m. Outside of these hours, there is always a doctor on call.
**WHAT IS RADIATION THERAPY?**

Radiation beams consist of energy waves or streams of particles. Some radiation beams are used to see inside the body and find disease, such as CT scan or a chest x-ray. These beams have a much lower energy than that used with radiation therapy. Radiation therapy uses high-energy beams to treat cancer and other illnesses. It can come from special machines or from radioactive substances. These high-energy beams are aimed at tumors or areas of the body where there is disease. Other names for radiation therapy are: radiotherapy, radiation oncology, X-ray therapy, cobalt therapy, electron beam therapy, or irradiation.

The total radiation dose given is usually divided into daily treatments. The dose and number of treatments depends on many things such as:

- The type and location of the tumor.
- Whether anti-cancer drugs (chemotherapy) are given at the same time.
- How the tumor responds to radiation.
- The side effects that arise during treatment.
How Does Radiation Therapy Work?

Radiation therapy can kill cells or change their ability to divide and grow. Although radiation damages both cancer cells and normal cells, normal cells recover more often from the effects of radiation. The goal of radiation therapy is to damage as many cancer cells as possible, while limiting harm to nearby healthy tissue. The radiation oncology doctor carefully plans your treatment to limit the amount of normal tissue being treated.

What Are the Benefits of Radiation Therapy?

Radiation therapy is an effective way to treat many kinds of cancer in almost any part of the body. Half of all people with cancer are treated with radiation as part of their cancer treatment. Sometimes doctors use radiation before surgery to shrink a tumor. After surgery, it may be used to stop the growth of any cancer cells that remain. For some patients, it is the only treatment needed. Thousands of people are free of cancer after having radiation treatments alone or in combination with surgery, chemotherapy, and biological therapy.

Even when curing the cancer is not possible, radiation therapy can often relieve symptoms. Many patients find the quality of their lives improved when it is used to shrink tumors and reduce pressure, bleeding, pain, or other symptoms. (Radiation therapy is also used to treat some non-cancer conditions.)
WHAT ARE THE RISKS INVOLVED WITH RADIATION THERAPY?

As with many other treatments for disease, there are risks for patients who are receiving radiation therapy. The radiation doctor will not advise radiation treatments unless he or she believes that the benefits (such as control of disease or relief of symptoms) are greater than the likely risks of treatment. One thing to remember is that radiation is a local treatment for cancer. Other than fatigue, side effects relate to the area of the body being treated. Fatigue may develop with any type of radiation treatment. Before treatment starts the doctor will go through the risks and benefits in detail and give the patient and family time to ask questions.

HOW IS RADIATION THERAPY GIVEN?

Radiation therapy can be in either of two forms: external or internal. Some patients will be treated with both forms. Most cancer patients receiving radiation therapy have the external type. It is usually given during outpatient visits to a hospital or treatment center. In external therapy, a machine directs the high-energy beams at your tumor. Some normal tissue near it may also need be included.
Most treatment machines produce different levels of high-energy beams. The doctor selects the most appropriate beams according to the location of the tumor. There are many things that are done to make sure that the treatment is given safely and accurately. The treatment machine is checked daily by a specially trained person (physicist) to make sure that it is running correctly. In addition, x-ray films called “port films” or “block checks” are taken at least weekly to be sure the treatment continues to be correct.

Internal radiation therapy is called “brachytherapy”. This therapy uses radioactive substances, or seeds. These are placed directly into a tumor or inserted into a body cavity near the tumor or remaining tumor cells, using needles, tubes, wires, or small radioactive seeds. The placing of the radioactive source is sometimes called an “implant”. Sometimes after a tumor has been removed by surgery, these radiation sources are put into the area around the incision to kill any tumor cells that may remain.

Another type of internal radiation therapy uses unsealed radioactive sources or liquids. This source is taken by mouth, put into body cavities, or injected directly into the body. During this type of treatment, the patient may need to stay in the hospital for several days.
WHAT HAPPENS AFTER THE FIRST MEETING WITH THE RADIATION DOCTOR?

There are usually three visits to the Radiation Oncology Department before treatment begins. The first appointment is a meeting with the radiation oncology doctor. It usually takes about an hour and a half. The doctor reviews the patient’s medical history (records, scans and films) and performs a physical examination. The doctor talks about the purpose and goals of treatment and answers questions.

The next appointment is a simulation or treatment planning session. It usually takes about one hour. The patient has a series of CT scans and measurements taken. Markers such as metal balls or wires may be placed on or in the body. These help to accurately target the site of treatment. See the teaching sheet Simulation for more detailed information.

The skin over the area of the body to be treated may need permanent tattoos. A clean, small needle is dipped in black India ink and placed just below the skin. The tattooing feels like a needle prick. Usually only 3-4 small pricks are needed. Devices may be used to help keep the head or body correctly positioned during treatment.
These devices include masks, cradles, and blocks.

After your simulation, the doctor works with a staff member called a “dosimetrist” to design the treatment plan. The planning process is quite complex, and involves selecting the correct beam sizes, angles, and energies. Custom-shaped blocks of special metal may be created to shield the normal tissues from the radiation.

About one week later there is a third appointment called a “block check”. This appointment takes place on the treatment machine. This is to make sure that all the plans are accurate before the real treatment begins. After this has been completed treatment usually begins at the next appointment. Commonly, treatments are every day, Monday through Friday, except holidays. Therapy may last anywhere from 1 day to 7 weeks.

Patients will have weekly appointments with their radiation doctor and nurse. At this time the doctor will check to see if the patient is tolerating the treatment as expected. At the same time, patients may discuss any of their concerns or questions.
WHAT IS TREATMENT LIKE?

• It is necessary to lie on the treatment machine table in the same position as in the planning session.

• It is important to lie as still as possible during the treatment and breathe normally.

• Harmless beams of laser light will be used to help correctly position the body before each treatment.

• The patient will be alone in the treatment room when the beam is on, but can talk with the therapist. The therapists can always hear and see the patient during treatment. They monitor the patient at all times by a video screen and intercom system.

• The machine used for treatment is a little noisy and very large. The machine moves around the patient to aim the beam at the tumor from different angles. During the treatment the patient will not see, feel, or hear the radiation beam. However, the machine makes clicking noises as the patient receives the treatment.

• Patients may bring in a favorite CD to listen to during treatment.

• After treatment patients can go back to their daily routines.

Patients may visit or call Radiation Oncology at the Anschutz Cancer Pavilion (phone number 720-848-0100).