Radiation Therapy for Pain Relief

Radiation therapy is a type of cancer treatment that directs high-energy radiation at cancer cells, destroying the cells' ability to divide and grow. There are two ways to deliver radiation therapy: external beam therapy (EBT) (https://www.radiologyinfo.org/en/info/ebt) and brachytherapy (https://www.radiologyinfo.org/en/info/brachy) . A machine may direct an x-ray beam at the cancer (external beam), or the doctor may place a radioactive source inside the body either temporarily or permanently (brachytherapy).

Physicians also use radiation therapy to relieve pain and alleviate the symptoms caused by cancer. This palliative radiation is suitable for certain types of cancer, including:

- pain caused by cancer in a bone
- spinal cord or nerve compression
- symptoms associated with cancer in the brain
- shrinking a tumor to relieve pressure

Overview

Large tumors can press on nerves, bones, and organs and grow into tissue nearby, causing pain. Your physician may recommend palliative radiation therapy to treat these painful tumors.

The team of professionals involved in palliative radiation therapy treatment includes:

- Radiation oncologists (physicians)
- Radiation therapists
- Radiation oncology nurses
- Medical physicists
- Dosimetrists
- Social workers
- Dietitians
- Palliative care physicians (can have training in medicine, medical oncology, radiation oncology, anesthesiology, or surgery)

What is radiation therapy for pain relief?

Radiation therapy is the use of high-energy radiation to treat cancer. Palliative radiation therapy uses the same radiation at a lower dose to alleviate the symptoms and pain caused by certain types of cancer.

Radiation therapy directs high-energy radiation at cancer cells, damaging their DNA and disabling their ability to reproduce. The body naturally gets rid of the damaged cells.

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Palliative radiation therapy shrinks tumors, easing the pressure on body parts nearby. Physicians use radiation therapy to:

- shrink tumors in the brain that create swelling and pressure inside the skull
- relieve pressure from tumors on airways, blood vessels, nerves, and other tubular structures in the body (like the intestines)
- stop cancers from bleeding.

Bone Pain

Cancer in the bones weakens the bone, increasing fracture risk. The cancer can start in the bone or move to the bone from somewhere else. Palliative radiation shrinks cancer in the bone, relieving pressure and pain and slowly letting the bone heal itself. Radiation therapy does not "melt" bones. Radiation therapy directed at cancer in the bone can make walking and movement less painful and help healthy bone tissue to regrow.

Spinal Cord

Cancer in the spine can put pressure on the nerves of the spinal cord. This compression can cause pain, leg weakness, or loss of bladder or bowel control. Palliative radiation therapy helps prevent and treat these symptoms. Radiation can be delivered before or after spine surgery to treat spinal cord compression. Cancer can also grow inside the spinal canal around the spine itself. Radiation therapy can help treat this as well; surgery is rarely used in these cases.

How is radiation therapy used for pain relief?

A radiation oncologist may use EBT or brachytherapy for pain relief. The planning and delivery of palliative radiation therapy is similar to the process used for treating cancer. One significant difference is the radiation dose, which is usually lower for palliative radiation therapy.

For EBT, the radiation source is outside the patient's body. A radiation treatment machine can be a linear accelerator that accelerates electrons to produce x-rays or can have a radioactive piece of metal that aims gamma rays to specific parts of the body.

Brachytherapy places a radioactive source inside the body. Needles, seeds, wires, or catheters containing a radioactive source are implanted directly into or near a tumor. The radioactive source may remain inside the body temporarily or permanently. *See the Radiation Therapy (https://www.radiologyinfo.org/en/info/intro_onco) page for more information.*

Radiation Therapy Process

Palliative external beam radiation therapy begins with a planning session. You will first undergo a CT simulation scan; this CT scan is very similar to diagnostic CT scans you may have had before. The radiation therapist may place permanent or temporary marks on your skin to help position you for radiation treatments.

If your head or neck are being treated, the radiation therapists may form a special mask around your head to keep your head very still for each treatment.

The radiation plan is developed and checked by dosimetrists, medical physicists, and radiation oncologists. The plan also undergoes quality and safety checks. Specially trained radiation therapists deliver the treatment.

You may need one or several weeks of treatments to relieve your pain.

Side Effects

Your treatment team will explain the potential side effects of palliative radiation therapy. These side effects depend on the area of your body treated. Your doctor can prescribe pain and anti-nausea medications. Most side effects go away 4-6 weeks following

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treatment. Side effects can include:

- fatigue
- nausea, vomiting, and diarrhea
- pain while swallowing
- a temporary pain flare before pain starts to improve
- a little dry skin or redness in the treatment area

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