Liver Cancer: Radiation Therapy

What is radiation therapy?

Radiation therapy uses high-energy beams of X-rays or particles to kill cancer cells.

When might radiation therapy be used?

Surgery is a more common treatment for liver cancer. But radiation therapy can also be used to target liver cancers. Radiation might be used if:

- All the cancer in the liver can't safely be removed with surgery
- There are many tumors in the liver
- You can't have surgery because of other health problems
- The cancer has spread beyond your liver to other parts of your body, like your brain or bones
- You have pain caused by a large liver tumor. Or you have a large tumor that's pressing on major blood vessels.

To plan your entire treatment strategy, you'll talk with a team of cancer specialists. This might include a surgeon, radiation oncologist, and medical oncologist.

How is radiation therapy given?

You can get radiation therapy for liver cancer in two main ways. They are external radiation and radioembolization.

External radiation

The radiation comes from a large machine outside your body. The machine aims invisible beams (X-rays or other types of radiation) through your skin to the tumor(s). Radiation affects the tumor as well as some normal liver cells, which are sensitive to radiation. This means there can be side effects. Newer forms of radiation therapy can better focus the radiation precisely at the tumor. Damage is then limited to normal tissues. An example is stereotactic body radiation therapy. This is also called radiosurgery.

A healthcare provider who specializes in giving external radiation to treat cancer is called a radiation oncologist. This healthcare provider works with you to figure out the kind of radiation you need. This healthcare provider also figures out the dose and how long you need the therapy.

You can usually get external radiation therapy as an outpatient in a hospital or a clinic. Some types of external radiation are given 5 days a week for several weeks. Stereotactic radiosurgery might be done with fewer treatments. This method uses a higher radiation dose (often in about 5 to 10 treatments).

Radioembolization

For this method, radioactive material (often on tiny beads) is put right into the cancer. The beads help stop the blood supply feeding the tumor. They also carry a high dose of radiation right to the cancer cells.

A healthcare provider called an interventional radiologist puts a long, thin, flexible tube (catheter) into an artery in your groin. X-rays are used to thread the catheter up into the big artery in your liver (hepatic artery). Then the healthcare provider pushes tiny radioactive beads through the catheter and into the artery. Blood flow carries the beads into the liver near tumors. They get stuck in the small arteries there. The beads give off small amounts of radiation that travel only a short distance. The radioactive beads destroy the blood vessels that feed

the tumor, killing it. They also send radiation directly to the tumor. Though the beads remain in the liver permanently, they eventually lose their radiation potential over time. They do not cause harm to you.

Preparing for external radiation

You will have a session called simulation before your first radiation treatment. This visit is needed to find out exactly where on your body the radiation beam needs to be aimed. It may take up to 2 hours.

Imaging tests, like CT scans, MRI scans, or ultrasound, may be done to help healthcare providers know where the tumor is and where to aim the radiation. Then you'll lie still on a table while a radiation therapist uses a machine to define your treatment field. The field is the exact area on your skin where the radiation will be aimed. Sometimes it's called a treatment port. The therapist may mark your skin with tiny dots of semipermanent ink or tattoos. This is done so that the radiation will be aimed at the exact same place each time. Body molds might be made to put you in the same position every time and help keep you from moving during treatment. Occasionally, the therapist doing the scan may place a belt on you with a camera placed at the end of the table. This is in order to track your breathing cycle since the liver tends to move as you breathe. The scan will capture your entire breathing cycle, so your tumor is always in the treatment field during the treatment.

Sometimes, before planning radiosurgery, a tiny metal marker will be put into the cancer to allow the radiation machine to track the movement. This can be done by an interventional radiologist using a CT-scan. It's an outpatient procedure.

On the days you get radiation

You'll lie on a table while the machine moves over you on the days you get radiation treatment. You may have to wear a hospital gown. Treatment is a lot like getting an X-ray, but it takes longer. It can take about 15 to 30 minutes to complete. But the radiation treatment itself only takes a few minutes. Much of the time is spent getting you ready. You should plan on being there for about an hour.

At the start of the treatment session, a radiation therapist may put blocks or special shields on you. This will protect parts of your body from being exposed to radiation. Or, the machine itself may have blocks in its head that will serve the same purpose as the shields that would have been placed on you. The therapist then lines up the machine so that radiation is directed to the spot that was marked during the simulation. You may see lights on the machine lined up with the marks on your skin. When you're ready, the therapist leaves the room and turns the machine on. You may hear whirring or clicking noises, like the sounds of a vacuum cleaner, while the machine moves around you and the radiation is given. During the session, you will be able to talk with the therapist over an intercom, and the therapist can see you. You can't feel radiation and the machine will not touch you. Treatment doesn't hurt. And you won't be radioactive afterward.

What to expect after radiation therapy

You may have some side effects from this treatment because radiation affects normal cells as well as cancer cells. Some people have few or no side effects. If you do have them, your healthcare provider may change the dose or how often you get the treatments. Or the healthcare provider may stop treatment until the side effects are cleared up. Be sure to tell your healthcare provider about any side effects you have.

Side effect of radiation therapy

Side effects may not start until you're a few weeks into treatment. Sometimes they don't start until treatment is almost finished. These are some of the more common short-term side effects:

- Diarrhea
- Nausea and vomiting
- Loss of appetite
- Tiredness that doesn't get better with rest (fatigue)
- Skin over the treatment field gets red, irritated, blisters, peels, or changes color (This reaction can be like a bad sunburn.)

The liver is very sensitive to radiation. If a large part of your liver is treated, you may get radiation hepatitis. This can cause yellowing of your skin and eyes (jaundice) and other problems.

Some of these side effects can be controlled with medicine. Some may be helped with diet. Talk with your healthcare provider or nurse about how to deal with them, when to report them, and how to know when they become serious. Usually, these side effects go away over time after you stop getting treatment.