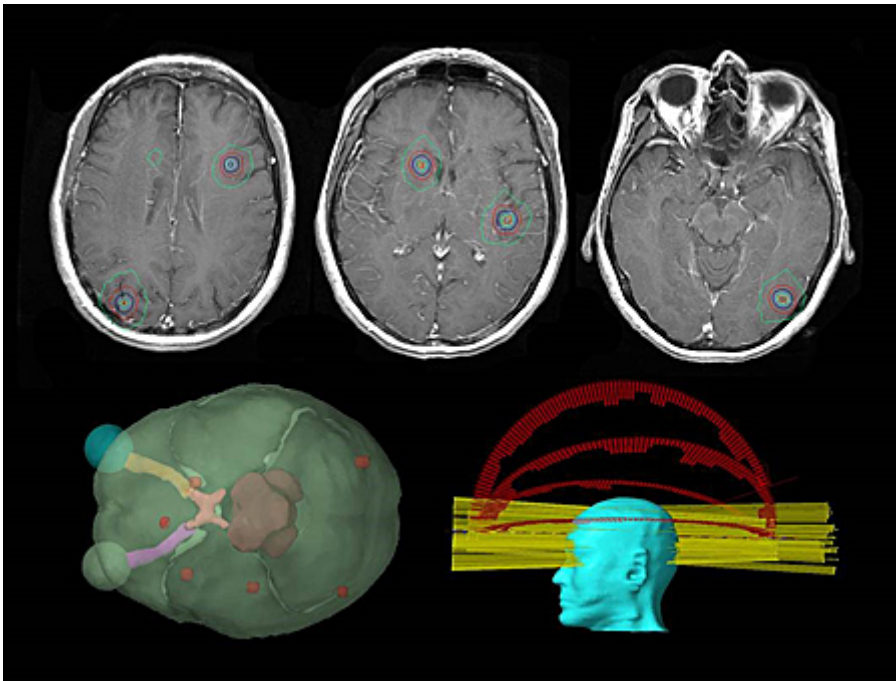


Sometimes Radiation is a Good Thing

By Yadira Galindo | July 01, 2016

Radiation therapy won't result in web-slinging superpowers, but the effects can be a powerful treatment tool to treat patients undergoing cancer treatment.

Utilizing high-energy radiation technologies that include X-rays, gamma rays and charged particles, this type of treatment shouldn't be taken lightly. A team of highly trained radiation oncologists, dosimetrists and physicists prescribe and design a treatment plan intended to shrink tumors and kill cancer cells.



For a breast cancer patient with six metastatic brain tumors, physicians and researchers at Moores Cancer Center employed a technology called frameless stereotactic radiosurgery to treat all six metastases simultaneously with minimal irradiation of surrounding brain tissue. Top row: Post-contrast MRI images of brain show tumors with overlay of radiation dosage (colored lines). Bottom left: 3D rendering of brain, brainstem, globes and optic pathway with the six brain lesions. Bottom right: 3D rendering of patient's head with volumetric arc therapy (arcs in red).

According to the National Cancer Institute at the National Institutes of Health, half of all patients with cancer receive some type of radiation therapy. Cancers of the breast, brain, lung, gynecologic, prostate, head and neck, leukemia and lymphoma are most likely to need this treatment. For some people, radiation therapy is intended to treat cancer by eliminating tumors, but for others, it is used as palliative treatment to relieve symptoms or pain caused by the disease.

The treatment itself is painless and odorless, said [Catheryn Yashar, MD](#), medical director of

the UC San Diego Health radiation oncology clinic in La Jolla. During initial consultations, Yashar explains to patients that the experience is similar to undergoing a chest X-ray or computed tomography (CT) scan before discussing risks, benefits and other issues.

“It’s important for patients to be involved in the decision-making of their health, so we discuss the goal of treatment; is it meant to be curative or to ease pain?” said Yashar. “We then discuss what type of radiation is best for their individual case and what areas we do and don’t want to radiate. Depending on the complexity, the final plan can take a few hours to days or even weeks because precision is key.”

Side effects and damage to healthy tissue is minimized by targeting the radiation dose to the cancer and avoiding normal tissues as much as possible. Imaging tests are incorporated to help the team pinpoint precisely the location and shape of a tumor and target that area.

Along with other factors, such as how deep radiation must travel into the body, the patient’s general health and medical history and other types of cancer treatments that might be needed, the team then applies this information to choose between radiation delivered outside of the body by a machine (external-beam radiation therapy) and internal treatment (brachytherapy) that places radioactive material inside the cancer. The majority of people are treated with photon therapy, a type of external radiation, but today proton therapy is also available.

(Photon therapy uses photons or particles of light; proton therapy uses protons, which are subatomic particles. Generally speaking, they have similar biological effects on tumor tissues, but possess different advantages and disadvantages.)

Once a therapy plan is finalized and the patient arrives for treatment, the patient meets the radiation therapist whose job it is to deliver the treatment exactly as prescribed. Sara Galbraith, a radiation therapist at Moores Cancer Center at UC San Diego Health, said patients will often have questions about doses and the machines that deliver radiation. She walks them through the process and answers any questions before walking out of the room to initiate treatment.

To reduce exposure to themselves, radiation therapists leave the room but monitor patients from behind a wall using monitors, microphones and speakers to see, hear and interact with them. Each patient reacts differently to this process; some do well while others tear up or become anxious and require a pause in the treatment. That’s when Galbraith transitions from providing clinical expertise to offering moral support.

“When I see tears, I stop the clinical aspects of the appointment to find out what the patient needs. Sometimes it’s just a hug,” said Galbraith. “We get on their level to make sure they’re comfortable enough to be left alone in the room or we leave a family member with them or one of us stays to hold their hand. We read each patient to ensure that their needs are met.”

Patients may need radiation only once or require multiple visits. Each dose can last between 1 to 10 minutes, possibly up to 20 minutes for special cases. Normally, after the first treatment, apprehension subsides, but Galbraith and the other therapists continue to build relationships with

their patients at each visit by making them smile or playing the person's favorite music in the treatment room.

Galbraith has bowed her head when a patient asks for a moment of prayer and stopped to listen to a patient who expressed grief knowing there would be no further treatment options.

"I feel that we're here to help them whether they are here for a treatment or to have more time with their family and friends," said Galbraith. "We try to make it easier by making their visits light. We enjoy having a connection with our patients. We're here to help them."

Nurses and social workers also play an important role in supporting patients by answering questions or helping to arrange transportation and other needs. They also offer tips in how to cope with possible side effects. Not everyone will experience them and those that do will have different side effects depending on type of therapy and location. For patients receiving radiation to the abdominal area, nausea may be a problem, said Yashar. When treating the brain, patients may have headaches or swelling.

"To reduce side effects, patients should get plenty of rest, try to eat normally to reduce weight loss and they should check in with their physician, nurse or therapist if experiencing side effects," said Yashar. "Side effects usually get better after a few days or weeks but some can be permanent. The goal is to treat patients with no side effects when possible, but that's a lofty goal, and unfortunately, not always possible."

One common question Yashar receives regarding side effects is, will the patient be radioactive? The answer: Rarely. According to Yashar, 98 percent of patients will walk out of a treatment room and it's over. However, for someone with thyroid cancer who is prescribed an oral radioactive iodine therapy, the person can be radioactive and is given special instructions to reduce exposing others. Men with prostate cancer who are treated with seed radiation — an internal therapy that places pellets of radioactive material in the prostate — can continue as normal. However, Yashar cautions that having children sit on the laps of these patients isn't advised so specific instructions are issued to these men.

Radiation therapy has evolved over the years. Today, pregnant women can be treated under special circumstances, but waiting for birth is still preferred when possible. Alternatively, finding another treatment option would be advised before radiation therapy. With more precise technology and better ways to protect healthy tissue, a patient with a recurrent disease can have the same area treated a second time.

"In radiation oncology, a team of professionals treats a patient. Physicians can't, and don't, do it by themselves," said Yashar. "Our goal is the same as that of the person who walks in our door seeking help. We want to improve the quality of life of our patient and help to treat the cancer if at all possible."

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