Internal radiation gets better results for cancer patients

If we could only recognize the value of a daily dose of low level radiation for general health.

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A "short-distance treatment" for cancer recently took another big leap at Washington University.

After seeing a fivefold jump in patients the past decade, doctors here have created the Brachytherapy and micro-RT Treatment Center to further develop this increasingly popular alternative.

"Brachytherapy" literally means short-distance treatment. It involves applying radiation to tumors by using internally-placed radiation sources rather than the usual external radiation beam.

The technique can achieve higher and more accurately targeted doses of radiation, which can more selectively destroy growing cancer cells. Last year, Washington University doctors treated 1,500 patients with the technique, five times more than they did in the mid-1990s.

"Brachytherapy has become the mainstay of therapy for gynecological cancers," said Dr. Perry Grigsby, a professor of radiation oncology who has been named the new center's director.

"And, part of our growth has come through patient referrals for these treatments. As advances have been made in the equipment, smaller hospitals haven't had the patient base to upgrade to the more expensive technology. So, they began sending many patients to us."

Also adding to the growth has been the expansion of brachytherapy to other types of tumors. The use of brachytherapy for breast cancer has grown as studies have shown good results for very early stage tumors.

These patients receive two brachytherapy treatments a day for five days rather than the more typical once-a-day external beam treatments for six to seven weeks.

Many brachytherapy procedures use catheters -- or small, hollow tubes -- to deliver tiny pellets of radioactive iridium directly to the tumor site.

Computers control the time each pellet spends in the tumor -- a matter of minutes -- to deliver a precise, uniform dose of strong radiation throughout the cancer. The pellets are then drawn back into their storage chamber, leaving the patient free of any residual radiation.

But that's just one method. Grigsby and his team also work with Dr. J. William Harbour, an associate professor of ophthalmology, to treat ocular melanoma with brachytherapy by using cup-shaped devices to destroy the tumor while saving the patient's eye.

"We count ingested and injected radioisotopes as brachytherapy, too," Grigsby said. "The School of Medicine has built a tremendous service center for thyroid cancer. Most of

those patients will receive radioactive iodine as a post-surgery treatment, and we do that here in radiation oncology, which has again added to our patient base."

The center also administers other radioisotopes intravenously for lymphomas, liver metastases and brain tumors.

Because of increasing demand, the center will purchase two new brachytherapy systems and enlarge its current physical space.

The facility will house a newly developed device called a micro-RT, which was recently patented by Grigsby and colleague Daniel Low, an associate professor of radiation oncology.

This device enables researchers to irradiate tiny tumors in lab animals without exposing the rest of the animal to radiation. It enables scientists to study the effect of radiation treatment on individual tumors in experimental animals to improve human treatments.

Now, Grigsby is studying ways to use PET scans -- positron emission tomography -- to fine-tune brachytherapy in gynecological cancer treatment.

"In a recent study, we showed that using PET scans lets us better control placement of the brachytherapy catheters and determine tumor response over the course of treatment," Grigsby said.

"In most cervical cancer patients, PET scans show us that the tumor shrinks in an orderly way, allowing us to lower the radiation dose to cause fewer complications and side effects. If we don't see the expected shrinkage, we change our treatment plan to get a better result."