PRINT-New OSF Cancer Institute will advance specialized treatment

In the past decade, breakthrough treatments for cancer have emerged requiring a personalized approach. The new OSF HealthCare Cancer Institute on the campus of OSF HealthCare Saint Francis Medical Center in Peoria, Illinois, will offer access to a variety of treatments under one roof when it welcomes its first patients next month.

A lesser discussed treatment that will be available is brachytherapy or implant radiation. Unlike external beam radiation, this treatment is delivered from inside the tumor and can provide more intense doses of radiation at the tumor site. Brachytherapy is most commonly used to treat cancers of the female pelvis, prostate, breast, eye and skin.

James McGee, MD, radiation oncologist at OSF HealthCare Saint Francis Medical Center has sub-specialized in brachytherapy. It is the most targeted radiation treatment type and preserves healthy tissue.

"Placing a radiation source directly into the patient's tumor allows for many advantages. In this way, the radiation is not going through normal tissues and has much less normal tissue effect. At the same time, it creates the need to be very individualized and very creative."

The radiation is given with high dose delivery rates usually with a very small radiation source in a cable moving through an applicator or even a series of needles to the core of the malignancy. The devices are called temporary implants that are removed after the dose is delivered. Brachytherapy implants may be short-term (temporary) or long-lasting (permanent). The result is a higher cure rate for certain cancers than with external beam radiation alone says Dr. McGee.

"In current era of more sophisticated brachytherapy, cure rates are rising 20% higher than they were, and the complication rates have dropped by at least 20%. The control rate is higher because we are able to safely deliver a higher dose. And we've learned that we have to give a much higher dose effect if we are going to really truly cure these cancers."

The OSF Cancer Institute will have a state-of-the-art brachytherapy surgical suite, fitted with a GE CT scanner on rails, specifically designed for the space. It will allow patients to stay under anesthesia during CT-guided applicator or implant insertion. A new MRI scanner is located directly outside the suite, creating efficient transfer for the patient, when MRI imaging will help, improving their overall experience.

Better preparation through 3D models

Dr. McGee sits in front of a 3D model made for a woman who had cervical cancer. It was developed using translucent silicone molding and graphite material to represent tumor growth. He explains that because of the need for precision application of the radioactive material, OSF HealthCare enlisted engineers at Jump Trading Simulation & Education Center to create patient-specific models for complex cancer cases.

"We've actually been taking MRI scans from patients and in preparation for their treatment and we've created models that represent their normal anatomy and the anatomy of their cancer. Usually this is after initial treatment with chemotherapy radiation, probably for about five weeks."

The use of brachytherapy reduces recovery time and side effects, and is often a shorter, more cost-effective treatment than traditional external beam radiation. There are many types of brachytherapy.

These can be categorized by the duration of the dose delivery - high dose rate, low dose rate, and permanent. They are also categorized by the technique used such as interstitial (in between cells of cancerous tissue), intracavity and surface application.

Dr. McGee looks forward to being able to enhance brachytherapy procedures by having the operating room, imaging, and treatment delivery system integrated in the same space at the OSF Cancer Institute.