

University of Maryland doctors treat first breast cancer patients with GammaPod radiotherapy

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Radiation oncologists at the University of Maryland Marlene and Stewart Greenebaum Comprehensive Cancer Center (UMGCCC) are now treating patients with the GammaPod, a new FDA-cleared radiation therapy for early-stage breast cancer. The UMGCCC is the first site to treat patients with this first-of-its-kind system, which was invented by University of Maryland School of Medicine (UMSOM) scientists and physicians. This is the only external-beam radiation delivery system specifically designed to treat breast cancer.

"With this new technology, we are able to significantly shorten the length of [radiation](#) treatment for early breast cancer—from up to six weeks, to only a matter of days," says Elizabeth M. Nichols, MD, an assistant professor of radiation oncology and clinical director of the Department of Radiation Oncology at UMSOM.

"Not only is this approach more convenient for patients, but it can also potentially reduce side effects, such as skin reactions, which can result from traditional [radiation therapy](#)," says Dr. Nichols, who treats patients at UMGCCC. "We expect that GammaPod's highly focused radiation will also help to improve cosmetic outcomes for our patients."

Granted 510(k) clearance by the U.S. Food and Drug Administration (FDA) in December 2017, the GammaPod stereotactic radiation therapy system delivers a high dose of radiation to a specific area in the breast,

sparing nearby healthy tissue and major organs such as the heart and lungs.

Typically, patients with early-stage breast cancer have surgery to remove a tumor, followed by three to six weeks of standard radiation therapy to the whole breast to help kill residual cancer cells and prevent recurrence. Stereotactic radiation therapy is most commonly used to treat brain cancer and cancers in other parts of the body; the GammaPod enables this high-precision technology to be used for breast cancer, to target part of the breast.

"GammaPod allows us to optimize the use of stereotactic radiosurgery to treat breast cancer," says co-inventor William F. Regine, MD, FACR, FACRO, the Isadore & Fannie Schneider Foxman Endowed Chair and professor of radiation oncology at UMSOM and chief of radiation oncology at UMGCCC.

Patients with early-stage cancer who are eligible to receive "partial breast irradiation" with the GammaPod will receive five days of treatment to the tumor site after surgery in a noninvasive fashion. These are primarily women with small tumors whose cancer has not spread to the lymph nodes.

The GammaPod can also be used to provide a single "boost" treatment to women with breast cancer of any stage, including more advanced cancers, instead of four to five treatments, thereby shortening the overall duration of radiation therapy. This treatment would be in addition to standard radiation therapy to the whole breast.

UMGCCC doctors also expect to soon begin treating early-stage patients with the GammaPod before surgery, to gauge the machine's effectiveness in reducing the size of a tumor or destroying the cancer altogether.

"The promise and hope of the GammaPod is that we will be able to change the paradigm for treating early-stage breast cancer by identifying patients who can be treated with radiation alone, potentially eliminating the need for surgery," says Dr. Nichols, who is leading a research consortium with other sites that will have the GammaPod system within the year.

"Increasingly, the focus is on developing strategies to reduce treatment for low-risk breast [cancer](#) patients, and the GammaPod is in line with these efforts," she says.

Patients who are treated with the GammaPod will be enrolled in clinical trials so that investigators can collect data to evaluate the new treatment system. Additional studies are planned.

"We envision that one day we'll be able to neutralize a tumor with a high dose of focused radiation instead of removing it with a scalpel," says inventor Cedric X. Yu, DSc, FAAPM, the Carl Mansfield, MD Professor in Radiation Oncology at UMSOM and the founder and chief executive officer of Xcision Medical Systems, LLC. "This approach would spare [patients](#) the negative side effects of surgery and prolonged radiation treatments, significantly improving their quality of life."

In developing the system, Dr. Yu sought to create a noninvasive alternative to brachytherapy, a common type of partial breast irradiation in which doctors insert radioactive sources through catheters, or tubes, into the breast to deliver high-dose radiation to the area where the tumor was removed.

The GammaPod system targets a tumor with thousands of precisely focused beams of radiation from 25 rotating sources. A patient is treated lying on her stomach with her breast immobilized by a patented vacuum-assisted cup. The couch moves during treatment as radiation "paints" the

tumor. Treatments take five minutes to 40 minutes, depending on the therapy plan.

The machine gets its name from the type of radiation (gamma rays) and the pod-like shape of the machine.

"We are incredibly proud that after more than a decade of research and development, this novel radiation therapy system invented by two of our faculty members will now help shorten [treatment](#) times for women with early-stage [breast cancer](#)," says UMSOM Dean E. Albert Reece, MD, Ph.D., MBA, University Executive Vice President for Medical Affairs and the John Z. and Akiko K. Bowers Distinguished Professor. "I congratulate Dr. Regine and Dr. Yu on this tremendous achievement."

Provided by University of Maryland

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