Radiation Therapy for Breast Cancer

Overview

Thanks to advances in science and medicine, cancer care has evolved throughout the past decade, giving patients with breast cancer several options when it comes to their treatment. Radiation therapy — the use of high-energy X-rays to shrink tumors and kill cancer cells — is one of the most successful ways to eliminate cancer and return patients to their everyday lives. For most breast cancer patients, their treatment plans include radiation therapy.

The radiation oncologists at the world-renowned University of Maryland Marlene and Stewart Greenebaum Comprehensive Cancer Center (UMGCCC) provide breast cancer patients with advanced radiation therapies and support, treating affected areas while minimizing radiation to healthy tissues. As experts at a National Cancer Institute (NCI)-designated comprehensive cancer center, they also participate in and have access to the latest research in radiation oncology.

This guide will help you understand more about how radiation therapies work, treatment options, what to expect during treatment, support services, clinical trials guiding the future of radiation oncology and the multi-disciplinary team who will lead you through recovery.

To schedule a Radiation Oncology appointment please call 410-328-6080
For more information visit us online at umgccc.org/radonc
HOW RADIATION THERAPY WORKS
Radiation therapy is aimed at delivering radiation to cancer cells while sparing as much healthy tissue as possible. Some healthy cells can be damaged during radiation treatment. However, the healthy cells can usually repair this damage while the cancer cells cannot. This is why radiation therapy is usually given over the course of several weeks instead of all at once. When small doses of radiation are given daily, healthy cells have the chance to recover while the cancer cells are killed off.

Most patients receive radiation as part of a cancer treatment plan that also includes treatments such as surgery and chemotherapy. Occasionally radiation therapy is done before cancer surgery to shrink the tumor. However, with breast cancer, it is most common to receive radiation therapy after completely healing from surgery.

Radiation kills microscopic cells that might remain after surgery. It is used in hopes of preventing breast cancer from returning (recurring) in the breast, chest wall, or surrounding lymph nodes above or below the collarbone.

TREATMENT OPTIONS
External Beam Radiation
Most commonly, patients with breast cancer receive external beam radiation therapy. This is radiation that is delivered to the tumor site from a machine outside the body.

Usually, external beam radiation is given to a patient five days a week for 3 to 7 weeks. A CT scan is often used to plan a patient’s radiation treatment. The image produced by the scan is one of the tools used to place patients in the right position before each treatment begins. During treatment, small amounts of radiation are delivered to the breast or chest wall, and, if necessary, the lymph nodes that drain the breast. By giving small amounts of radiation daily instead of a large dose at once, healthy cells are given a chance to recover while the cancerous cells are destroyed.

Several different technology options are available for our radiation oncologists to precisely deliver radiation therapy. The more precisely radiation therapy can be delivered to the tumor site, the more healthy cells are protected from radiation, which can mean that patients have fewer side effects.

Image-guided Radiation Therapy (IGRT)
The goal of radiation treatment is to focus radiation on the cancer cells and as little radiation as possible on the healthy cells. IGRT helps the treatment team do that. Real-time images show precisely where the tumor, tumor bed, or at-risk lymph node regions are located. This allows radiation to be delivered more accurately to the targeted area.

At UMGCCC, our radiation oncologists use AlignRT® surface guided radiation therapy (SGRT) to ensure patients are positioned correctly prior to treatment. This technology works without the need for skin markers or extra radiation. It also allows the radiation therapist to know when a patient has moved before or during treatment, so he or she can be repositioned.

Intensity-modulated Radiation Therapy (IMRT)
IMRT sends radiation beams of different intensities to the tumor site from the directions that spare as much healthy tissue as possible. Our radiation oncologists and physicists helped perfect IMRT technology by developing Direct Aperture Optimization. This feature of the TrueBeam allows for the radiation beams to be filtered through an opening that changes as the radiation passes through the tumor. Because the opening changes shape to match the area that needs radiation, a higher dose of radiation can be used.

Anatomy of an External Beam Radiation System
(aka Linear Accelerator or LINAC)
Protecting the Hearts of Patients with Breast Cancer

Keeping still during treatment is an important part of radiation therapy. However, breast tumors usually move when patients breathe. Because AlignRT helps the therapist stop the radiation beam when the tumor moves out of the treatment zone, this technology provides greater accuracy for breast cancer treatment. The technology also allows for deep inspiration breath hold, which moves the heart away from the area receiving radiation. The result is that the heart is better protected during breast cancer treatment.

We are the only cancer center in the region to offer AlignRT. Other technologies unique to UMGCCC that help protect internal organs include proton therapy and thermal therapy.

RapidArc®
Some of UMGCCC’s linear accelerators feature RapidArc, a form of IMRT that delivers radiation from 360 degrees. This technology allows a three-dimensional radiation dose to be conformed to the tumor without the need for the linear accelerator to make repeated stops and starts. This means that treatment times are up to eight times faster — or as little as two minutes each day. Shorter treatment times make it easier for patients to remain as still as possible during therapy.

AlignRT® with Deep Inspiration Breath Hold
UMGCCC radiation oncologists often use AlignRT with Deep Inspiration Breath Hold when treating patients with left-sided breast cancer. The heart moves away from the chest wall when patients take a deep breath. This is the ideal time to deliver radiation because the heart will be protected. AlignRT allows radiation therapists to know when patients are in this optimal position. They can also stop the radiation beam when the patient breathes, so radiation does not reach the heart.

Proton Therapy
Most often, external beam radiation uses X-rays, or photon radiation. However, several UMGCCC radiation oncologists now treat patients with proton therapy. This modality is available through an affiliation with the Maryland Proton Treatment Center in the UM BioPark near the University of Maryland Medical Center.

Unique to the region, proton therapy is another advanced radiation technology that stops at the site of the tumor. The healthy tissue beyond the tumor does not receive any radiation. Proton therapy can be beneficial to some patients with breast cancer. It is especially useful for patients with cancers near the heart.

Thermal Therapy
For patients who have been treated for breast cancer only to have cancer return in the chest wall, thermal therapy may be an option. Thermal therapy, aka hyperthermia, is used in combination with radiation, chemotherapy or both of these therapies.

Thermal therapy involves heating tumor cells to between 104°F and 113°F for about an hour either before or after cancer treatment. Heat can be applied either externally (external thermal therapy) or directly to the tumor site (interstitial thermal therapy). Heating the tumor kills cancer cells, makes them more susceptible to treatment and promotes circulation, which helps healthy tissue.

Side effects from thermal therapy are minimal — mild skin redness and blistering are common with external thermal therapy. However, the benefits can be great. Thermal therapy is another offering at UMGCCC that is unique to the region.

Partial Breast Irradiation
When used to treat breast cancer, radiation is most often delivered to the entire breast. Higher radiation doses are focused on the areas most affected by the cancer. This is currently the standard treatment for most patients.

However, doctors are studying newer treatment approaches that deliver radiation to only part of the breast. This is called partial breast irradiation. These approaches spare as much healthy breast tissue as possible. At UMGCCC, radiation oncologists use SAVI® (strut assisted volume implant), or a small tube through which high dose rate radiation is delivered to a patient’s lumpectomy site. Treatments are given twice per day for five days.

For the right patients, partial breast irradiation can sometimes reduce side effects caused by treatment and have the added convenience of shortening the course of treatment to just one week.
Shortened Radiation Schedules
The standard length of treatment for women receiving whole breast radiation is typically 5 to 7 weeks. However, a new approach called hypofractionated radiation therapy involves speeding up treatment so that the same radiation dose usually given over 5 to 7 weeks is delivered in just 3 weeks.

Follow-up studies with patients over a 10-year period have shown that both the standard and hypofractionated treatment schedules are equally safe. They are also both equally effective at preventing cancer from coming back. Hypofractionated radiation therapy can be more convenient for patients because it shortens their treatment. You and your doctor can discuss which approach is ideal for you.

WHAT HAPPENS DURING TREATMENT
Determining Your Ideal Treatment Plan
Before you begin radiation treatment, you will meet with your radiation oncologist to discuss your treatment options. UMGCCC offers a wide range of treatment technologies, and you and your radiation oncologist will decide which approach is right for you.

Your radiation oncologist will then work with a dosimetrist and radiation physicist to decide how to best deliver your radiation therapy so that healthy tissues are protected as much as possible. They will also determine how much radiation needs to be focused on the tumor cells and the number of daily treatments you will need.

The Simulation Session for Accurate Radiation Delivery
Once your radiation treatment plan has been created, you will come in for a planning session called a simulation. The simulation usually takes between one to two hours. The team will determine the exact area of your breast or chest wall that will receive radiation treatment. You will also have a CT scan, possibly with 4-dimensional software, to show how your breast moves when you breathe. This will help plan how radiation will be delivered so that the tumor cells receive the full dose of radiation while minimizing exposure to your healthy tissue.

Your chest will be marked with tiny ink dots. These marks will help the radiation therapist start the process of lining you up for treatment each day. It will be important to keep these marks on throughout your course of treatment.

Length of Treatment
Your course of radiation treatment will take somewhere between 3 and 7 weeks. The average radiation treatment regimen for patients with breast cancer is somewhere between 5 and 6½ weeks.

Receiving Treatment
One to two weeks after the simulation, your treatment will begin. Daily treatments are given on an outpatient basis. This means that you will not be admitted to the hospital, and you will be free to go about your day after each treatment session.

During your course of treatment, each day you will usually spend about 30 to 40 minutes with Radiation Oncology. The actual time you will be treated with radiation each day will be about 5 to 15 minutes.
POSSIBLE TREATMENT SIDE EFFECTS
When healthy tissue is exposed to radiation, side effects may occur. The good news is that today there are several different ways doctors can more precisely deliver radiation therapy so side effects are reduced.

The most common side effect experienced by patients treated with radiation for breast cancer is reddish, flaky skin, similar to a sunburn, near the treatment area. This skin may be tender to the touch.

You can help manage these side effects by following these simple skin care tips:

- Moisturize your skin with an ointment (such as Aquaphor) at the beginning of your treatment, before side effects appear and after each treatment session.
- Keep your treatment area completely away from the sun.
- Wearing loose-fitting, cotton clothing to prevent your clothes from chafing the treatment area.
- These side effects will gradually disappear after you are done with treatment. However, the skin in your treatment area will always be more sensitive to the sun than before. You will want to always wear a sunblock of at least SPF 30 — a good idea for all of your skin!

PATIENT SUPPORT
Radiation Oncology at the University of Maryland Medical Center recognizes each patient’s treatment and experience with breast cancer is different. Our free concierge program helps meet those individual needs while enhancing a patient’s care and experience with our department. Services offered by Radiation Oncology include:

- Pre-coordination of appointments
- Free valet parking during each visit
- A personal escort from the hospital’s front door to the doctor’s office or treatment area
- Assistance with transportation, lodging and food needs
- Regular communication with patients’ primary care providers

PATIENT EXPERIENCE
The University of Maryland Department of Radiation Oncology scores high in patient satisfaction, with 19 out of 20 patients stating they would recommend the center to friends and family for cancer care. According to patient satisfaction surveys from July 2015 to June 2016, patients also gave high marks for the courtesy, friendliness and concern of nurses and technicians, placing Radiation Oncology at University of Maryland Medical Center in the top 15 percent of outpatient units at academic hospitals nationwide.
**CLINICAL TRIALS**
The medical community is always looking for new and better ways to treat diseases such as cancer. When a promising, new therapy is ready to be tried for patients, it is tested through a clinical trial.

Clinical trials give patients access to new and potentially better therapies, often years before they are available elsewhere. For example, our doctors are currently offering a trial for patients with early stage, localized breast cancer. In this trial, a radiation therapy system invented at the University of Maryland is being tested to see if it can perform as well as a linear accelerator. The new system is believed to be safer for patients and also shortens overall treatment time. The clinical trial will show if it is a better option for some patients.

Not all cancer treatment centers provide access to clinical trials. As part of an academic institution, UMGCCC has a strong clinical trial research program, and seeks to give as many options as possible to patients who wish to participate in a clinical trial.

Visit [UMGCCC.org/clinicaltrials](http://UMGCCC.org/clinicaltrials) for more information about clinical trials, including frequently asked questions (FAQs). Our website also has a full listing of the current trials available at UMGCCC for breast cancer.

**WHY SHOULD YOU CHOOSE UNIVERSITY OF MARYLAND MEDICAL CENTER?**
All radiation oncologists at UMGCCC who treat patients with breast cancer are board certified in radiation oncology. They are highly experienced in using radiation therapy in an optimal way to treat cancers of the breast and take special precautions when using radiation to treat cancers near the heart and lungs. They are also backed by one of the top academic medical centers in the country, the University of Maryland Medical Center.

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**MEET THE TEAM**

**Radiation Oncologists Who Specialize in Treating Breast Cancer**

Steven J. Feigenberg, MD  
Professor of Radiation Oncology; Director of Clinical Research

Special Interests: Early stage breast cancers, locally advanced breast cancer, proton therapy for breast cancer  
Medical Degree: Hahnemann University School of Medicine  
Residency: University of Florida, Gainesville

Elizabeth M. Nichols, MD  
Assistant Professor of Radiation Oncology; Clinical Director

Special Interests: Proton therapy for breast cancer, locally advanced breast cancer, early stage breast cancers  
Medical Degree: University of Maryland School of Medicine  
Residency: University of Maryland Medical Center

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**Radiation Oncologists Who Offer Specialized Therapies for Breast Cancer**

Shahed N. Badiyan, MD  
Assistant Professor of Radiation Oncology

Special Interests: Proton therapy for breast cancer  
Medical Degree: University of Texas Southwestern School of Medicine  
Residency: Mallinckrodt Institute of Radiology, Washington University

Zeljko Vujaskovic, MD, PhD  
Professor of Radiation Oncology

Special Interests: External thermal therapy (hyperthermia) for breast cancer; therapeutic interventions to prevent, mitigate, or treat radiation injury  
Medical Degree: University of Zagreb (Croatia)  
Residency: Medical Center Karlovac (Croatia)  
PhD: Colorado State University  
Specialty Training in Radiation Oncology: Duke University Medical Center

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For an appointment with one of our radiation oncologists, call 410-328-6080.