



FOX CHASE CANCER CENTER

RADIATION THERAPY GUIDE FOR PATIENTS

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How To Reach Us

For Questions or Concerns About Your Care

- Call your radiation doctor or the radiation front desk at the location where you are being treated.
 - Main Campus: **215-728-2581**
 - Buckingham: **215-794-2700**
 - East Norriton: **610-275-1517**
- After business hours and on weekends, call one of the numbers above and press 0 for the main operator, or call the hospital main number at **215-728-6900**. Ask for the nursing supervisor.

To Cancel or Change Your Daily Radiation Appointment

- Call your radiation therapist at the number given to you at your first visit.
- Tell your therapist at your next treatment so he/she can change your schedule.
- For last-minute changes, call:
 - Main Campus: **215-728-2581**
 - Buckingham: **215-794-2700**
 - East Norriton: **610-275-1517**

Cover: Eric M. Horwitz, MD, FABS, FASTRO

Non-discrimination notice: It is the policy of Fox Chase Cancer Center and Temple University Hospital that no one shall be excluded from or denied the benefits of or participation in the delivery of quality medical care on the basis of race, ethnicity, religion, sexual orientation, gender, gender identity/expression, disability, age, ancestry, color, national origin, physical ability, level of education, or source of payment.

Randi Cohen, MD, MS

Welcome

Thank you for choosing Fox Chase Cancer Center, home to one of the largest and most dynamic radiation oncology programs in the nation. Our advanced radiation technologies combined with highly skilled doctors, nurses, and radiation therapists makes Fox Chase a top U.S. hospital for radiation treatment.

Fox Chase offers many choices for radiation therapy, including:

- Stereotactic body radiotherapy (SBRT)/CyberKnife
- Intensity-modulated radiotherapy (IMRT)
- Volumetric-modulated radiotherapy (VMAT)
- Brachytherapy
- Image-guided radiation therapy (IGRT)
- 3D conformal radiation

Our team approach to care means our radiation doctors work with all of your specialists to give you a customized radiation treatment plan to treat your cancer. This may include taking part in clinical trials, which can give you access to new, state-of-the-art treatments not yet widely available.

Whether you are already a patient, or you are new to Fox Chase, we know this may be a stressful time for you and your family. This guide is designed to help you get ready for your radiation therapy. Our doctors, nurses, therapists, nurse educators, social workers, and other specially trained staff are committed to giving you excellent care. We can also offer emotional support, advice, and coping strategies when you need them most.



A Cancer Center Designated by the
National Cancer Institute



Comprehensive Cancer Center

Fox Chase Cancer Center holds the highest designation from the National Cancer Institute (NCI) as a Comprehensive Cancer Center. These elite centers are recognized for excellence in cancer treatment, research, prevention and education.

National Comprehensive Cancer Network

Fox Chase Cancer Center is a founding member of the National Comprehensive Cancer Network (NCCN), a not-for-profit alliance of leading cancer centers. NCCN centers are at the forefront of cancer diagnosis, treatment and supportive care, and lead the way in conducting groundbreaking research.

The Joint Commission

Fox Chase Cancer Center is accredited by The Joint Commission. Accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards.



Rebecca M. Shulman, MD

Locations

Fox Chase Cancer Center – Main Campus

333 Cottman Avenue
Philadelphia, PA 19111-2497

888-FOX-CHASE (888-369-2427)

Reception Desk: 215-728-2581

Fox Chase Cancer Center – Buckingham

2365 Heritage Center Drive
Furlong, PA 18925

Reception Desk: 215-794-2700

Fox Chase Cancer Center – East Norriton

(Located on the campus of Suburban Community Hospital)

2701 Dekalb Pike
Norristown, PA 19401

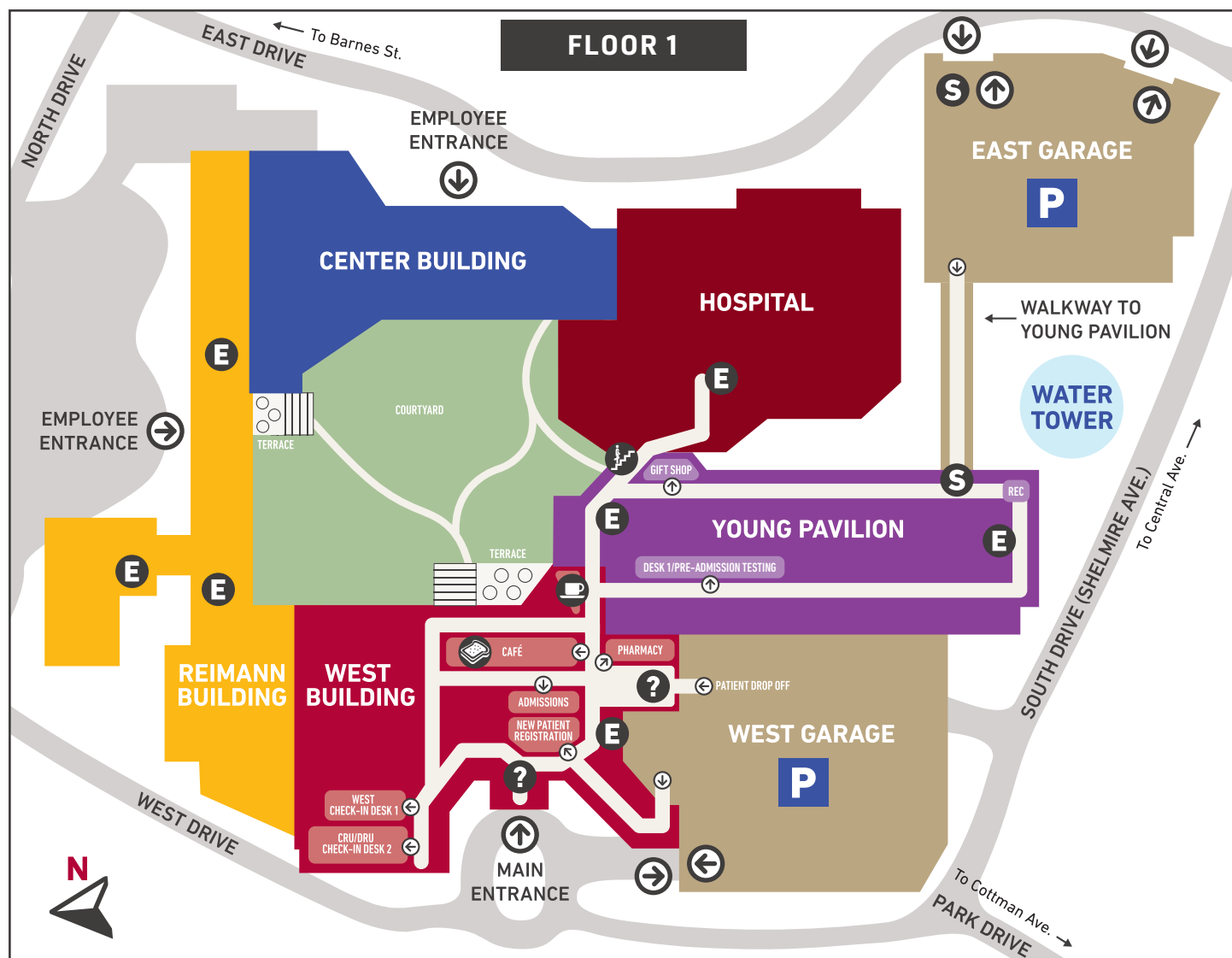
Reception Desk: 610-275-1517

Patients can receive their radiation at Buckingham and East Norriton locations even if they are having chemotherapy and/or surgery at Fox Chase Cancer Center's main campus or an outside hospital.

Parking

Parking is free at our main campus, Buckingham, and East Norriton locations. On the Fox Chase Cancer Center main campus, you may park in the West Garage. You can enter the West Building from Levels 1 and 2 of the West Garage. Patient drop-off areas are found on Level 2 of the West Garage and the circle in front of the West Building.

Fox Chase Cancer Center Campus Map



*Medical Records has moved from the West Building to Friends Hall at Temple University Hospital – Jeanes Campus.

Legend

- | | | | | |
|-----------|-------------|-------------|--|----------|
| Cafeteria | Coffee Cart | Information | Patient Support Services
(information/Security) | Security |
| Café | Elevators | Parking | Public Hallway | Stairs |

Campus Locations

Center Building

Cafeteria	FLOOR 2
PET/CT Scan	FLOOR 1

Hospital

Brungard Surgical	
Family Waiting Suite	FLOOR 3
Diagnostic Imaging	FLOOR 1
Endoscopy	FLOOR 1
Pre-Surgical Waiting Area	FLOOR 2
Rehabilitation/Physical Therapy	FLOOR 3
Speech Therapy	FLOOR 3

West Building

Admissions	FLOOR 1
Clinical Research Unit (CRU) ...	FLOOR 1
Coffee Cart	FLOOR 1
Direct Referral Unit (DRU)	FLOOR 1
Infusion/Port Check-In	FLOOR 1
New Patient Registration	FLOOR 1
Pharmacy	FLOOR 1
Scheduling, West Building	FLOOR 1
Terrace Café	FLOOR 1
West Building Check-In	FLOOR 1

Young Pavilion

ATM	FLOOR 1
Boo's Boutique	FLOOR 1
Karen's Korner Gift Shop	FLOOR 1
Mammography	FLOOR 1
Pre-Admission Testing	FLOOR 1
Pulmonary Lab	FLOOR 1
Radiation	LOWER FLOOR
Resource & Education Center ...	FLOOR 1
Scheduling, Young Pavilion	FLOOR 1
Women's Cancer Center	FLOOR 1
Young Pavilion Desk 1 – 4	FLOOR 1
Young Pavilion Lab	FLOOR 1

Your First Appointment

Please come on time to your first visit. If your radiation appointment is your first visit to Fox Chase Cancer Center, you will find both your registration and appointment time in your new patient appointment letter. For other locations, please go directly to the front desk. We will register you at this time.

What to Bring to Your First Visit

- All health insurance cards, including prescription cards, and a referral form (if your health plan needs a written referral)
 - You should check your health plan to see if you will need a referral for the services you will have at Fox Chase. This includes provider visits, lab service, radiology studies and other services. We must receive your referrals before all visits or treatments.
- Co-payment: Based on your type of insurance, you may need to make a co-pay. If you are unsure if this will be needed, call your health plan's member services department or your Fox Chase nurse navigator.
- Your social security number
- State- or government-issued picture ID, such as a driver's license or passport
- Copy of your advance directive, if you have one
 - An advance directive may be created no matter what your life stage or health. This legal document is also known as a living will. It tells your doctor what health care you would like provided or withheld in case you are not able to tell them yourself as a result of your health status. You should bring a copy of any medical power of attorney you may have as well as this legal document authorizing another person to make healthcare decisions for you.
- Name and address of your primary care doctor and other doctors who should get reports/updates
- Completed **Patient Registration Form**
 - If you prefer, you may fax this form to us at **215-728-5666** at least one working day before your appointment.
- Completed **New Patient Assessment Form**

What to Bring for the Doctor

Please bring these items with you to your first visit if they have not been sent before your visit:

- Your medical records, X-rays, reports of your X-rays, and results of all blood work
- All past radiation records, along with treatment planning
- Pathology slides
 - It is very important to ask for all pathology slides from your biopsy or surgery. To do this, call the doctor who performed your biopsy or surgery. We urge you to have your pathology/cytology slides (glass) sent as soon as possible before your visit.
- Your health history, including a list of your doctors, allergies, and any prescription and over-the-counter medicines you take (include doses and how often you take them)
- Completed **New Patient History Checklist**
- Questions for your doctor



Shelly B. Hayes, MD

Important Note

Before your first visit, your nurse navigator may have already worked with you to collect:

- Copy of your health records
- X-ray CDs and reports
- Pathology slides and reports

Your records are very important to your care. You will need to get your records, unless other plans have been made by your referring doctor. Read our **Patient Records Checklist** for more information.

We will return your pathology slides and original X-rays to the hospital or facility they came from after we have reviewed them. All printed material that you bring with you will be kept at Fox Chase as part of your medical record. We cannot copy records for you. If you wish to keep copies for yourself, please make them before your visit or ask the hospital or facility for extra copies. If you have trouble getting your records, please call **215-728-2570**.

New and Existing Patients

Plan to be at Fox Chase for 2–3 hours on your first visit. Our nursing and physician team will fully evaluate you, talk about your treatment options, and answer any questions you may have. We suggest you bring a family member or friend with you to this visit. It is helpful for another person to hear your doctor's plan for care and offer you support. Your support person can also help make sure all of your questions are fully answered.

Patients with Implanted Devices (such as Pacemaker, Defibrillator, Insulin Pump, etc.)

It is very important that you tell your doctor and nurses if you have any device implanted in your body. Radiation therapy could affect it. If you have an implanted cardiac device, please bring your device ID card to your visit. If your device is in the part of your body that will be treated, we may need to make plans with your cardiologist to remove it. Before treatment, we suggest you have your device checked by your cardiology team to make sure it is working properly.

For questions about your visit, call **215-728-2570**.



Mark A. Hallman, MD, PhD; Eric M. Horwitz, MD, FABS, FASTRO; Thomas J. Galloway, MD; and Joshua E. Meyer, MD, FASTRO

Canceling or Rescheduling Your First Appointment

If you need to cancel or change your appointment, please call us as soon as possible, at least 24 hours before your visit, at 215-728-2570.

Billing for Your Radiation Services

Fox Chase will send two bills to your insurance company—one for the doctor's services and one for the hospital-based services (Fox Chase Cancer Center). After your insurance pays, you may get two bills from us. These show your out-of-pocket costs, such as copays, co-insurance, and deductibles.

Also, you may notice radiation services billed during a time you were not here in the department. This is standard. Your radiation plan is developed behind the scenes by a medical physicist and dosimetrist. It is based on information gathered from your simulation and your doctor. Several things are billed as part of this process, including treatment planning, calculations and, often, treatment devices. During treatment, your radiation chart is reviewed by a physicist once every five treatments and may happen over a weekend. Your radiation doctor will see you once every five treatments to make sure you are adjusting to the radiation as expected and do not have any adverse effects.

Based on your insurance company, the hospital will get an authorization for all expenses at the time your simulation is scheduled. In order for this process to run smoothly, please make sure we have your most current insurance information. If your information changes, please tell the front desk.

Insurance

Fox Chase Cancer Center accepts many health plans. Please visit FoxChase.org/insurance-financial-information to make sure that we accept your plan. You should also call your insurance company to go over your benefits and patient liability. Patient liability is what you might have to pay out-of-pocket. This includes deductibles, co-pays, co-insurance and any care and services not covered by your health plan.

Your Radiation Therapy Team

Radiation therapy calls for a comprehensive approach. Our team combines knowledge and expertise to decide the right treatment options for your care. Our goal is to develop and provide a treatment program that maximizes the chance of curing your cancer while giving the smallest dose of radiation to normal organs. We aim to maintain your quality of life and preserve your normal organ function.

Whether radiation therapy is being used alone or along with other types of treatment, we work with your care providers so you get the most thorough, personalized care possible. During your care, you may meet some or all of the following staff:

- **Radiation oncologists** are doctors who specialize in treating your cancer with radiation therapies, lead the team, and manage your treatment.
- **Radiation oncology nursing team** monitors your condition and cares for you during and after your radiation treatment.
- **Radiation oncology residents** are doctors training to be a radiation oncologist and work closely with your radiation oncologist and nurse to take care of you.
- **Radiation therapists** are licensed professionals who set up and deliver your daily radiation treatment and help to monitor your progress over the course of your treatment.
- **Radiation nurse practitioners and physician assistants** may take part in your care during follow-up visits after radiation is complete.
- **Medical physicists** maintain and monitor the treatment equipment, oversee the quality of treatments being given, and help in the planning of some of the most advanced treatments that we perform.
- **Radiation dosimetrists** work with the radiation oncologist and medical physicist to calculate the safest, most effective treatment plan for you.
- **Radiation oncology social workers and other support staff** make sure your medical and personal needs are met during and after treatment.

Fox Chase's in-house team of cardiologists, pulmonologists and internists may work with your oncologist to manage any pre-existing or new medical conditions that may arise during your course of care. Our supportive oncology and palliative care team helps manage any pain from your cancer or treatment. They also offer support in the areas of wellness; psychosocial counseling; and treatment planning before, during, and after your cancer treatment.

What is Radiation Therapy?

CBCT (cone-beam computed tomography)-based adaptive radiation therapy is a new radiation treatment offered at Fox Chase that uses the Ethos™ therapy system—a state-of-the-art linear accelerator (linac) that includes CBCT imaging technology and artificial intelligence-based software to power the adaptive treatment process. With it, clinicians make daily adjustments to the treatment plan, ensuring that the optimal radiation dose hits the tumor while minimizing damage to the healthy tissue and organs. Anyone who is a candidate for stereotactic body radiation therapy and some IMRT could opt for adaptive radiation therapy.

Radiation therapy for cancer uses high-energy beams to kill cancer cells. It may be given alone, before or after surgery, or along with chemotherapy or hormonal therapy. Types of radiation therapy include:

- External Beam
- Brachytherapy (Internal)
- Total Body

External Beam Radiation Therapy

External Beam Radiation Therapy delivers the radiation from a machine outside the body called a linear accelerator. Intensity-modulated radiation therapy (IMRT) and volumetric-modulated arc therapy (VMAT) are the most advanced techniques for this treatment available. Fox Chase doctors pioneered the state-of-the-art treatments we have today, including IMRT and brachytherapy.

Adaptive Radiation Therapy is an advanced form of external beam radiation that allows your treatment plan to be updated each day. The Radiation Oncology team at Fox Chase uses Cone-Beam CT (CBCT) imaging to check the size and position of the tumor and nearby organs before each treatment. If anything has changed, the plan can be adjusted right away. These changes may be small or large, but they help the doctor aim the radiation more precisely at the cancer. This approach also helps protect healthy tissue and may reduce side effects.

Intensity-Modulated Radiation Therapy (IMRT) is an advanced form of three-dimensional (3D) conformal radiation therapy. During IMRT, the radiation dose is aimed at the tumor (target) with great precision. IMRT is able to give high doses of radiation to the cancer while cutting down on the dose to the normal tissue around it. This reduces side effects. The use of CT and MRI scans during treatment simulation allows us to create a complex 3D treatment plan using many radiation beams focusing on a cancer. This complexity is needed when treating prostate cancer because the prostate is next to the bladder and rectum. These organs are sensitive to the effects of radiation.

IMRT directs hundreds of tiny radiation beams from many different angles. At each of these angles, the intensity of the radiation is varied or modulated, and the shape of the beam is changed to match the shape of the tumor. These adjustments enable the prescribed amount of radiation to be delivered to each part of the tumor while limiting exposure to healthy tissue. 3D conformal radiation therapy was developed at Fox Chase Cancer Center, which was first in the region to use IMRT. Fox Chase has one of the most significant and long-standing experiences with IMRT and VMAT in the country.

Volumetric-Modulated Arc Therapy (VMAT) is an advanced form of IMRT that delivers a precisely sculpted 3D dose distribution via a 360-degree rotation of the treatment machine around the patient. In addition to sparing more normal tissue than other techniques, it can also offer reduced treatment delivery time compared to standard IMRT treatment.

Short Course External Radiation Therapy (Hypofractionation)

In some cases, a short course of radiation may be used in your care. Known as stereotactic body radiotherapy (SBRT), this treatment uses a higher-than-normal daily dose of radiation, which is usually given in 1–2 weeks instead of 1–2 months.



Stephanie E. Weiss, MD, FASTRO

SBRT is used to treat some types of lung and prostate cancers. This treatment is also used, in some cases, to treat cancer that has spread to the bones or brain. When short course radiation is used in the brain, it is usually called stereotactic radiosurgery (SRS). If it is right for you, your radiation doctor will talk about the methods and timing of this treatment with you at your visit.

Image-Guided Radiation Therapy (IGRT)

The delivery of radiation to the tumor or target area calls for precise aiming. Often, a daily X-ray or brief CT scan will be used to make sure that the treatment beams are on target. The radiation oncology team is careful to make sure that radiation is delivered to the right area while doing the best they can to spare nearby organs and tissues.

Brachytherapy (Internal Radiation Therapy)

Brachytherapy is a form of internal radiation therapy in which the radiation is placed directly into the cancer. It involves either implanting radioactive material into the cancer (low-dose rate [LDR] implant) or placing an applicator or needles into the cancer and having a single radiation source go through the applicator/needles for a short period of time. The radiation source and applicator are then taken out (temporary high-dose rate [HDR] implant).

- **Low-Dose Rate (LDR) Permanent Implants**

After the radiation source is put in place, the catheter is removed. The implants always stay in your body, but the radiation gets weaker each day. As time goes on, almost all radiation goes away. When it is first put in place, you may need to limit your time around other people. Be extra careful not to spend time with children or pregnant women.

- **High-Dose Rate (HDR) Temporary Implants**

The radiation source is left in place for as little as 10–20 minutes at a time and then taken out. You may have treatment twice a day for 2–5 days or once a week for 2–5 weeks. The schedule depends on your type of cancer. During the course of treatment, your catheter or applicator may stay in place, or it may be put in place before each treatment. You may be in the hospital during this time, or you may make daily trips to the hospital to have the radiation source put in place. As with LDR implants, your doctor will take the catheter or applicator out once you are done with treatment.

Total Body Irradiation (TBI)

TBI is used to treat patients with leukemia, lymphoma and multiple myeloma who will be receiving a stem cell transplant. TBI targets the entire body. In addition to destroying cancer cells, it suppresses the immune system, thereby destroying diseased bone marrow cells. TBI helps reduce the chance of transplant rejection. It is given either in a single fraction or four-day series of radiation twice a day.



Thomas J. Galloway, MD

Getting Ready for Radiation Therapy

A lot of planning goes into your radiation therapy even before you get your first treatment. Planning includes the following steps:

1. You will have a treatment planning session where your radiation oncologist finds the area to be treated by using a CT simulator. This is called a simulation because the patient position and beam aiming “simulates” the positioning used for daily treatment. You will not get radiation during simulation.

Sometimes an MRI simulation will also be performed. This gives your care team the information they need to plan your treatment. It is done on a piece of equipment called a linear accelerator or “linac.” The CT and MRI simulators produce diagnostic-quality images to verify the position of the area to be treated. Your doctor or nurse may give you special instructions for simulation.
2. Your skin will be marked with small dots, or tattoos, to identify the area of radiation and to make sure the therapists can treat you accurately each day. If needed, custom devices will be made for you during the simulation step to help you stay in the precise position every day of treatment.
3. Your team of doctors will make a treatment plan using information gathered during the simulation phase. This process could take up to 1–2 weeks.
4. You will return to Fox Chase for a setup or “trial run” using the treatment machine. You will be placed on the machine in your simulation position, and special X-rays (called electronic portal images) will be taken to show the path of the X-ray beams.
5. On most days, images will be taken to make sure you are in the proper position so that your radiation treatment will be given as accurately as possible. There are multiple ways to guide radiation, including electronic portal images, CT images, and information from implanted markers. These daily images will be compared with the plans made by your treatment planning team.
6. Once the planning process is complete, your treatment will begin.

Radiation Treatment

When you get to the Radiation Oncology Department, you must check in at the front desk. We will place a white bracelet around your wrist and direct you to a waiting room. At this point, you are officially checked in.

While having treatment, you will see your radiation doctor for an exam once per week on the same day each week. This is called your "on-treatment visit" day. **Please allow at least one hour for your on-treatment visit day.** After you have your daily radiation on your on-treatment day, you will check in at the nurses' desk (next to the waiting room) to see your radiation doctor.

On-treatment clinic times most often run from 7am to 5pm. Please check the radiation oncology schedule for the day you will be seen by your radiation doctor. We will let you know about any schedule changes. Once you are given a time slot, you will stay in that slot for your daily treatment. Please note that our daily schedule is tightly booked. If you have a conflict, we will do our best to meet your change requests.

Because radiation treatment is complex, it sometimes takes longer than we expect to complete a treatment. Please plan on being here for one hour, although we will most often complete your treatment sooner. **If we are running behind schedule, we will tell you while you are in the waiting room. If you are waiting longer than 15 minutes and have not yet been taken for treatment or received an update, please let us know at the nurses' desk.**

We suggest that you do not miss any scheduled treatment days. If you miss a treatment because of a holiday or an emergency, we will add that day(s) to the end of your schedule. **You must complete the entire number of treatments prescribed by your radiation doctor for maximum benefit.**

Patients Getting Chemotherapy and Radiation

We understand how hard it can be to schedule different treatments, tests, or visits in a single day. Some chemotherapy treatments take many hours and sometimes the doctor will want your chemotherapy to be before your radiation treatment as part of your treatment plan. If you are getting radiation and chemotherapy at the same time, scheduling your chemotherapy in the morning is best so that there is enough time for you to get each treatment. This may cause you to arrive early or late for your radiation appointment, but that is okay. You may come down to the radiation department after your chemotherapy, and we will start your treatment as soon as we can.

Visitors

The health and safety of our patients and staff is our top priority. As a result of the COVID-19 pandemic, we continue to make changes to our regular visitor policy. For the most up-to-date information, please visit **[FoxChase.org/visitor-information](https://www.foxchase.org/visitor-information)** or call **888-FOX-CHASE (888-369-2427)**.

Treatment Schedule

Radiation therapy is given Monday through Friday. Treatments are not given on Saturdays or Sundays except in urgent situations. We are closed on these holidays:

- New Year's Day
- Memorial Day
- Juneteenth
- Fourth of July
- Labor Day
- Thanksgiving Day
- Christmas Day

Vacations/Maintenance Scheduling

Fox Chase is committed to making sure your treatment plan runs as smoothly as possible. Please schedule any vacations at least one week after you have finished your entire course of treatment. While Fox Chase engineers perform regular preventative maintenance on our machines, we sometimes have mechanical issues. This may cause your treatment to be canceled for a day, causing the day missed to be added to the end of your treatment schedule. We will let you know in advance if this happens. Please give us a number where you can be reached in case of a mechanical delay.

What Happens During an External Beam Treatment Session?

- On your first day of treatment, your radiation therapy team will explain the daily process for treatment.
- We may ask you to change into a hospital gown.
- You will go to the treatment room to receive radiation and lie on a table in your simulation position. The therapist will help you get into the correct position using your skin marks and body mold or face mask. You may see colored lights pointed at your skin marks. These lights are harmless and help the therapist position you for treatment.
- You will need to stay very still so the radiation goes to the exact same place each time.
- The therapist will leave the room to control the radiation machine just before your treatment begins. He/she will watch you on a TV screen and can talk to you through a speaker.
- Your therapist can help you find ways to be comfortable during treatment. He/she will offer to play music of your choice to help you relax. Please tell your therapist if you feel sick or uncomfortable. He/she can stop the radiation machine at any time. You will not be able to feel, hear, see, or smell the radiation.

What Happens During a High-Dose Rate (HDR) Brachytherapy Radiation Treatment Session?

- The number and length of treatments you will have depends on your disease site and treatment plan. Your doctor will talk about this with you during your first visit.
- For some treatments you will need to have sedation or anesthesia. You may have an IV started and have a catheter placed to empty urine from your bladder.
- Most brachytherapy is put in place through a tube attached to a larger device, called an applicator. Your doctor will place the applicator into your body before you begin treatment. With some types of brachytherapy, once the applicator is in place, you may need to have a CT scan and/or an MRI before every treatment.
- Once these steps are complete, your care team will take you to the treatment room. The physicist will attach tubes connecting the applicator to the radiation source machine. The staff will then leave the room, but they will be able to see and hear you through a camera and talk to you through a speaker.
- The physicist and doctor will control the radiation source and deliver the radiation through tubes attached to the applicator. You will not feel, hear, see or smell the radiation. The radiation source will be kept in place for a prescribed amount of time (5–20 minutes) and will then be withdrawn into the radiation source machine.
- You will not be radioactive at the end of treatment. In most cases, you will be discharged right away or after a short recovery period. If you had sedation, then a family member or friend will have to drive you home.

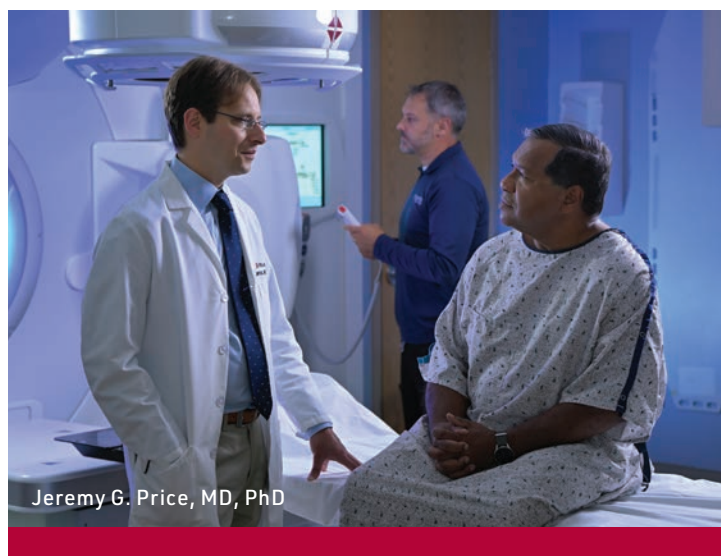
Side Effects and How to Manage Them

Your radiation doctors plan treatments very carefully to lessen side effects. While some patients have little or no side effects from radiation therapy, others feel some discomfort. Side effects are usually short-term and can be treated. No matter what type of therapy you receive, our doctors and nurses are skilled in helping to manage side effects.

Side effects most often start by the second or third week of treatment. They can last up to several weeks after your final radiation treatment. Many people who get radiation have some fatigue and skin reactions. Not all symptoms pertain to every patient and are specific to the area being treated. Side effects from radiation mostly affect the area which is being treated. Based on the area of your body being treated, you may also have some:

- Hair loss
- Appetite changes
- Mouth and throat changes
- Trouble swallowing
- Swelling
- Coughing
- Diarrhea
- Nausea and vomiting
- Urinary and bladder changes
- Sexual changes

Most side effects go away within 1–2 months after you have finished radiation therapy.



Fatigue

You may feel more tired than normal during treatment. The cancer itself or radiation therapy may be the cause. Your body is working hard to heal itself. To help with fatigue:

- Go for a short walk, ride a bike, or do yoga. If you were physically active before starting radiation treatment, try to keep up your current exercise routine, or adjust it as you start to feel fatigue. Research shows that most people feel better when they get some exercise each day.
- Plan tasks for times when you have the most energy. Finish only what you can and let others help you with the rest.
- Plan time to rest. Take short naps or breaks between activities.
- Relax before bed so you can sleep better. Read or listen to soothing music. Try to get a good night's sleep.
- Keep track of how you feel each day. Keeping a record will help you plan how to best use your time. Share your record with your nurse. Let your doctor or nurse know if you notice changes in your energy level, such as whether you have lots of energy or feel tired.
- Try eating 5–6 small meals each day rather than three large ones. Eat foods that are easy to fix, such as canned soups, frozen meals, yogurt, and cottage cheese. Drink plenty of fluids (about eight cups of water or juice) each day.
- Talk with your doctor or nurse. He/she can suggest treatments for problems that may be causing your fatigue, such as anemia (a problem in which the number of red blood cells is below normal), depression, or trouble sleeping.

Skin Reactions

Radiation can affect healthy skin cells in the treatment area. When people get radiation almost every day, their skin cells may not have enough time to recover between treatments. Skin changes can happen any place on the body that gets radiation. Reactions are like mild sunburn. Some common skin changes you may have include dryness, redness, itching, peeling, sores, ulcers, and swelling. Your skin may darken in that spot. Most skin changes heal and fade within a few weeks of stopping treatment.

Caring for Your Skin

- When you shower/bathe, do not scrub the treatment area. Only use mild soaps (like Dove) that are free of harsh chemicals or fragrances. Dry yourself with a soft towel by patting, not rubbing, your skin. Be careful not to wash off the ink markings needed for radiation therapy.
- Apply moisturizing lotion to your skin. Ask a member of your care team which lotion to use. **Do not put lotion on the treatment area before treatment.** Wait until after you have been treated and apply as you like. Check with your doctor or nurse before using:
 - Bubble bath
 - Cornstarch
 - Cream
 - Deodorant
 - Hair removers
 - Makeup
 - Oil
 - Ointment
 - Perfume
 - Powder
 - Soap
 - Sunscreen
- Avoid sun on the treated area. Ask your care team about using sunscreen.
- Protect your skin from heat or cold. Do not use tanning beds, hot tubs, saunas, hot pads and ice packs.
- Wear soft, loose clothing to avoid rubbing irritated skin.
- Do not shave in the area being treated unless your doctor says it is okay.
- Do not use tape or adhesive bandages on the treatment area.
- For anal skin irritation, clean the area with unscented baby wipes or water from a spray bottle and avoid excessive wiping.
- Talk with your care team if you have any problems or questions about your skin.

Hair Loss

Hair loss from radiation therapy happens only on the part of your body being treated. This is not the same as hair loss from chemotherapy, which happens all over your body. You may start losing hair in your treatment area 2–3 weeks after your first radiation therapy session. It takes about one week for all hair in your treatment area to fall out. Your hair may grow back in the months after treatment is over. Sometimes, however, the dose of radiation is so high that your hair may never grow back. Once your hair starts to re-grow, it may not look or feel as it did before. It may be thinner or curly instead of straight, or it may be darker or lighter in color.

Before Hair Loss

- Decide whether to cut your hair or shave your head before you lose your hair. If you decide to shave your head, the best time to do so would be before starting radiation treatment. This is so we do not have to remake your mask if the fit changes.

If you plan to buy a wig, do so while you still have hair. The best time to select a wig is before or soon after radiation therapy begins. This way, your wig will match the color and style of your own hair. Choose a wig that feels comfortable and does not hurt your scalp. Ask your doctor or nurse about Boo's Boutique, found on the first floor of Fox Chase. Boo's Boutique specializes in helping patients make decisions about wigs.

Caring for Your Hair

- Gently wash your hair using a mild shampoo, such as a baby shampoo. Use a soft towel to dry your hair by patting and not rubbing.
- Do not use items that can hurt your scalp, such as:
 - Straightening or curling irons
 - Brush rollers or curlers
 - Electric hair dryers
 - Hair bands and clips
 - Hair sprays
 - Hair dyes
- Do not use products to perm or relax your hair or hair weaves and extensions.
- Do not use harsh products, like gel, mousse, oil, grease, or pomade during treatment.

After Hair Loss

- Protect your scalp, which may feel tender after hair loss. When outdoors, protect against cold and sunburn by covering your head with a hat, turban, scarf, or wig.

Appetite Changes

Your body uses extra energy to heal during radiation therapy. It is important to eat enough calories and protein and drink adequate fluids to maintain your strength and weight during this time. You may notice changes in your eating habits. You may lose your appetite, food may taste different, or you may find it hard to eat. Think of healthy eating as part of your treatment. Talk to your care team if you are having eating issues. You may be referred to a nutritionist, a professional who specializes in food planning.

Try these tips:

- Eat slowly.
- Eat more food during the times you are feeling better.
- Eat small meals throughout the day instead of a few big meals.
- Ask others to eat with you. This can make meal times more pleasant.
- Drink plenty of water and other fluids.
- Check with your doctor before taking vitamins (especially in high doses), herbal remedies, or other supplements.
- Have easy-to-make foods on hand for when your energy level is low.
- Get plenty of protein and calories. These help your body to heal, keep your muscles from weakening, and provide fuel.

Some common high-protein foods include:

Supplements/Shakes	Serving Size	Protein per Serving (grams)
Boost®	8 ounces	14
Boost® Breeze	8 ounces	9
Boost® Plus	8 ounces	14
Carnation® Breakfast (regular or sugar-free)	made with 1 cup of milk	13
Ensure® Plus	8 ounces	13
Glucerna® Shake	8 ounces	10
McDonalds® milkshake	small	11
Burger King® milkshake	small	10
Dairy Queen Blizzard®	small	9-11
Wendy's® Frosty	small	8

Food	Serving Size	Protein per Serving (grams)
Soybeans	½ cup	14
Veggie or soy patty	1	11
Greek yogurt	½ cup	9-12
Chicken breast	1 ounce	9
Pork tenderloin	1 ounce	9
Pumpkin seeds	1 ounce	9
Lentils	½ cup	9
Milk (any type)	1 cup	8
Beef	1 ounce	8
Egg substitute	¼ cup	7.5
Cottage cheese	¼ cup	7
Tuna packed in water	1 ounce	7
Canned beans (kidney, cannellini, garbanzo)	½ cup	6-7
Peanuts	1 ounce	6-7
Fish	1 ounce	6-7
Egg	1	6-7
Sunflower seeds	1 ounce	6
Lunch meats	1 ounce	5-6
Tofu, firm	¼ cup	5
Peanut butter	1 tablespoon	4

Mouth and Throat Changes

Your Mouth

Radiation therapy to the head and neck can cause mouth changes. Radiation not only kills cancer cells but can also harm healthy cells in the glands that make saliva and the moist lining of your mouth. You may have:

- Mouth sores
- Tooth decay
- Jaw stiffness
- Infection to gums/teeth/tongue
- Dry mouth
- Loss/change in taste
- Thickened saliva

Some problems, like mouth sores, may go away after treatment ends. Others, such as taste changes, may last for months or even years. Some problems, such as dry mouth, may get better but never go away.

Mouth Care

- Visit your dentist before starting radiation to finish any dental work and make sure your mouth is as healthy as possible.
- Keep your mouth moist by drinking water, sucking ice chips, chewing sugar-free gum, or sucking sugar-free hard candies. Your doctor may also suggest that you use a saliva substitute or prescribe medicine to help increase saliva.
- Check your mouth each day to spot problems as soon as they start. Look for mouth sores, white patches, or areas of irritation.
- Keep your mouth, teeth, gums, and tongue clean.
 - Brush with an extra-soft toothbrush after every meal and at bedtime.
 - Use fluoride toothpaste. Your doctor may prescribe special fluoride gel.
 - Floss gently daily. If your gums bleed or hurt, stay away from those areas.
 - Rinse your mouth every 1–2 hours with a salt and baking soda rinse. Mix 1/4 teaspoon baking soda and 1/8 teaspoon salt in one cup of warm water.
 - If you have dentures, make sure they fit well, and clean them by soaking or brushing them each day.
- Exercise your jaw muscles three times a day by opening and closing your mouth 20 times as far as you can without pain.
- Let your doctor know if your mouth hurts. Your doctor may need to prescribe medicine to help control mouth pain.

Your Throat

Radiation therapy to the neck or chest can cause the lining of your throat to become swollen and sore. Your risk for throat changes depends on how much radiation you are getting, whether you are also having chemotherapy, and whether you use tobacco and alcohol while getting radiation therapy. You may notice throat changes in 2–3 weeks after starting radiation. These will likely get better 4–6 weeks after you have finished treatment.





Jessica Karen Wong, MD, MEng

Nutrition During Head, Neck, or Chest Radiation

- Be careful of what you eat when your mouth is sore. Choose foods that are easy to chew/swallow, such as foods that are soft, moist, or wet. Sip liquids with meals.
- Choose foods/drinks high in calories and protein. (See the list under “Appetite Changes” on page 16.) When it hurts to swallow, you may eat less and lose weight. It is important to maintain your weight during radiation therapy.
- Eat small meals and snacks 5–6 times a day, instead of three large meals each day.
- Avoid sharp or crunchy foods, food/drinks high in sugar and acidity, hot or spicy foods, and alcohol and tobacco products.
- Sit upright and bend your head slightly forward when eating. Do not lie down or recline for at least 30 minutes after eating.
- Talk to your care team if you are having difficulty swallowing or experience choking and coughing while eating.

Coughing

Coughing, often a symptom of your disease, may be caused by cancer treatment, especially radiation to the chest.

- Medicine may be prescribed depending on the severity of your cough.
- Stay hydrated by drinking 6–8 glasses* of water per day.
- Use a humidifier to help a dry cough.
- Do not smoke, as smoking can worsen a cough.

Diarrhea

Radiation therapy to the pelvis, stomach, and abdomen may cause diarrhea. People get diarrhea because radiation can irritate healthy cells lining the inside of the bowel. These areas are sensitive to the amount of radiation needed to treat cancer.

- Stay hydrated. Drink 8–12 cups* of clear liquids daily. Water is preferred; avoid liquids high in sugar. Severe diarrhea can cause dehydration, which may become serious and require intravenous fluids. Our team will monitor you closely for dehydration.
- Eat small meals and snacks rather than three large meals.
- Eat foods high in salts, such as sodium and potassium. Your body can lose these salts when you have diarrhea, and it is important to replace them. Try bananas, oranges, peaches, and apricot nectar, as well as boiled or mashed potatoes.
- Avoid:
 - Alcohol
 - Milk and dairy foods
 - Spicy foods
 - Foods or drinks with caffeine
 - Foods or drinks that cause gas
 - Foods high in fiber
 - Fried or greasy foods

**Consult with your clinician, as this may not apply in all situations.*

- Eat low-fiber foods. High-fiber foods can worsen diarrhea. **See the chart to the right for some low-fiber foods.**
- Take care of your rectal area. Your doctor or nurse may suggest an ointment to help with discomfort. Instead of toilet paper, use a baby wipe or squirt water from a spray bottle to clean yourself after bowel movements. Ask your nurse about sitz baths.
- Talk with your care team if you are having diarrhea. They may suggest taking a medication, such as Immodium, to help.

Nausea and Vomiting

Nausea and vomiting can occur after radiation therapy to the stomach, small intestine, colon or parts of the brain. Your risk for nausea and vomiting depends on how much radiation you are getting, how much of your body is in the treatment area, and whether you are also having chemotherapy.

To prevent nausea and vomiting:

- Eat and drink bland, easy-to-digest foods and drinks that do not upset your stomach, such as toast, gelatin, and apple juice.
- You may feel less nausea if you relax before each radiation therapy treatment.
- Learn the best time for you to eat and drink. Try a light snack, such as crackers and apple juice, 1–2 hours before radiation therapy. Or, you may feel better if you have treatment on an empty stomach.
- Eat small meals and snacks. Eat slowly and do not rush.
- Have foods and drinks that are at room temperature (not too hot or cold).
- Talk with your doctor or nurse. He/she may suggest a special diet or prescribe medicine to help prevent nausea.
- Ask your doctor or nurse about acupuncture, which may help relieve nausea and vomiting caused by cancer treatment. Acupuncture, a type of complementary and alternative medicine, involves inserting thin needles through the skin at specific points on the body.

Food Types	Low-Fiber Food Suggestions
Drinks	Coffee, tea, carbonated drinks, milk (if tolerated), strained juices (except prune)
Bread	White bread and toast, white rolls, crackers, muffins, pancakes, waffles
Cereal	Cream of wheat, cream of rice, any cold cereal made from rice or corn
Meat or substitute	Any ground meat; well cooked, tender beef, pork, ham, lamb, chicken, turkey or seafood; eggs, cheese, creamy peanut butter
Vegetables	All well-cooked vegetables without seeds (except peas, corn and lima beans); lettuce, if tolerated
Fruits	Applesauce, ripe bananas, melons, all canned fruit (except pineapple and grapes); no dried fruit
Dairy	Milk, cheese, cottage cheese, yogurt
Desserts	Plain cakes and cookies, pie made with allowed fruits, plain sherbet, water ice, Jello®, custard, ice cream (without berries), ice pops, plain hard candy, marshmallows, frozen yogurt
Condiments/fats	Margarine, butter, gravies, bacon fat, vegetable oils, salad dressings; bouillon, broth or cream soups made with allowed ingredients; jelly, ketchup, vinegar



Sameera Kumar, MD

Urinary and Bladder Changes

Radiation therapy to the pelvis can cause urinary and bladder problems by irritating the healthy cells of the bladder wall and urinary tract. These changes may start 3–5 weeks after radiation therapy begins. Most problems go away 2–8 weeks after treatment is over. You may experience:

- Burning or pain when you begin to urinate or after you urinate
- Trouble starting to urinate
- Trouble emptying your bladder completely
- Frequent, urgent need to urinate
- Inability to control the flow of urine from your bladder
- Waking frequently to urinate
- Blood in your urine
- Bladder spasms, which are like painful muscle cramps

Ways to manage include:

- Drink lots of fluids. Aim for 6–8 cups* of fluids each day, or enough that your urine is clear to light yellow in color.
- Avoid coffee, black tea, alcohol, spices, and all tobacco products.
- Talk with your doctor or nurse if you think you have urinary or bladder problems. You may need to provide a urine sample to check for infection.
- Talk with your doctor or nurse if you have incontinence. He/she may refer you to a physical therapist to assess your problem. The therapist may recommend exercises to help you improve your bladder control.
- Your doctor may prescribe medications to help you urinate, reduce burning or pain, and ease bladder spasms.

**Consult with your clinician, as this may not apply in all situations.*

Sexual Changes

Sexual and fertility changes can happen when people have radiation therapy to the pelvic area. For women, this includes radiation to the vagina, uterus, or ovaries. For men, this includes radiation to the testicles or prostate. In men and women, changes may be seen with rectal or bladder treatment. Scar tissue from radiation therapy can cause many sexual side effects. Other problems, such as fatigue, pain, anxiety, or depression, can also affect your interest in having sex. Some sexual and fertility changes you may experience include:

Women

- Pain during sex
- Vaginal stenosis (narrowing)
- Infertility
- Vaginal itching and dryness
- Symptoms of menopause

Men

- Impotence (inability to keep erection)
- Inability to get a woman pregnant because of fewer or less effective sperm

It is important to be open and honest with your spouse or partner about your feelings and concerns, and how you prefer to be intimate while you are having radiation therapy. Some things to keep in mind:

- If you don't feel like having sex, then explore other ways to be close, such as hugging, cuddling, and talking.
- Radiation therapy to the pelvis can cause permanent infertility. If you plan to have children, talk to your doctor.
- If you want to have sex, and your medical team has let you know it is okay, then go ahead. Using a water-based lubricant may be helpful. Use birth control throughout radiation treatment.
- For women, your doctor may encourage you to use a vaginal dilator to decrease narrowing of the vagina.

Fox Chase Cancer Center offers a Women's Menopausal and Sexual Health Program and Men's Sexual Health Program and Erectile Dysfunction Clinic to support patients as they adjust to changes during and after cancer treatment. For more information about these programs, please call **888-FOX-CHASE (888-369-2427)**.



How Radiation Therapy Will Affect Your Daily Life

Can I Still Work?

- Some people are able to work full-time during radiation therapy. Others can work only part-time or not at all. How much you are able to work depends on how you feel. Ask your doctor or nurse what to expect from your treatment.
- You are likely to feel well enough to work when you first start your radiation treatments. As time passes, do not be surprised if you feel more tired, have less energy, or feel weak. Once you have finished treatment, it may take a few weeks or months to feel better.
- You may need to talk to your employer about adjusting your schedule, reducing the number of hours you work, or working from home (if you can).

Should I Exercise?

Ask your doctor about exercise. It may help you sleep better and control some side effects. Exercise is also good for your body and sense of well-being.

- Exercise during those times of day when you have the most energy.
- Even small amounts of exercise can help. Instead of jogging, try walking or a stationary bike.
- If you are unable to walk, you can lift 3–5 lb. weights in a chair, and do leg lifts or stretching exercises.
- If you do not know where to start, ask your care team.

Will Treatment Make Me Radioactive?

- External radiation therapy will not make you radioactive. You don't have to worry about being physically close to family and friends.
- Internal radiation therapy means that radioactive material is put into your body. In some instances, you will have to take certain precautions for a short time. Your care team will tell you what you need to do to keep others around you safe.

How Can I Cope With My Feelings During Radiation Therapy?

Living with cancer and undergoing treatment can be stressful. It is normal to feel anxious, depressed, afraid, angry, frustrated, helpless, or alone at some point during radiation therapy.

- Many people find it helpful to talk with others who are going through the same process. To meet others, think about joining a support group. These groups meet in-person and online.
- Try relaxation or meditation exercises. Some people find prayer helpful.
- Exercise can boost your mood. Try activities like walking, biking, yoga, or water aerobics.
- Speak with your nurse or doctor about consulting with social services or pastoral care. Our experienced, compassionate team is here to help you cope.

Late Effects of Radiation

Radiation therapy can cause health problems that may not show up for months or years after treatment has ended. Late effects are specific to the part of your body that was treated and the doses of radiation you received. Your doctor will talk with you about late effects when discussing your follow-up care.



Penny R. Anderson, MD

Survivorship Care

At Fox Chase Cancer Center, we believe that in cancer, the survivorship experience begins at the time of diagnosis and continues throughout the patient’s life.

Our comprehensive Survivorship Program, which begins after treatment is over, helps address the ongoing physical, mental, emotional, social and financial effects of cancer so you can achieve the best possible health and work toward your new normal.



We do this by offering specialized medical and preventive care, genetic counseling and testing, psychiatric services, nutritional support, health and wellness education, and many other resources to ensure your best post-treatment health and quality of life. We include your family members, friends and caregivers as part of your survivorship experience, and our goal is to provide whatever you and your loved ones need to thrive after cancer.

Resources and Support Services

We believe treatment of the whole patient is crucial. Fox Chase offers a wide range of information and support services to address all of your needs—physical, spiritual, and emotional. **For a complete listing, please refer to the Fox Chase Cancer Center Guide for New Patients or visit [FoxChase.org/services](https://www.foxchase.org/services).**

Telehealth Options At Fox Chase

As an alternative to an in-person appointment, Fox Chase is offering telehealth video and phone appointments for eligible patients. Whether you are a new or existing patient, a member of your care team will contact you before your first or next appointment if you are eligible for a telehealth visit. We treat telehealth appointments as we would an in-person appointment. To learn more, please visit **[FoxChase.org/telehealth](https://www.foxchase.org/telehealth)**.



Left to right: Abigail T. Berman, MD, MSCE; Sangeeta K. Tyerech, MD; Hilario Yankey, MD, MBA

Important Things to Remember

I did the following to get ready for my radiation therapy:

- ☐ I let my doctor and nurse know if I have any implanted devices.
- ☐ All of my questions were answered.

I will do the following in preparation for the day of my radiation therapy:

- ☐ I have an implanted cardiac device. I have my identification card for my device.
- ☐ I have a copy of my living will and/or power of attorney.
- ☐ I let my nurse know if a family member or friend will be joining me in the exam room on my on-treatment day.
- ☐ I did not apply lotion to the area of my body being treated with radiation therapy.
- ☐ I took off any jewelry (including **wedding rings**, religious medals and body piercings) and other valuables.

I will do the following after my radiation therapy:

- ☐ I scheduled a follow-up visit.

Important Phone Numbers

FOX CHASE INFORMATION LINE.....888-FOX-CHASE (888-369-2427)

Admissions	215-728-2635
Billing (Hospital and Physician Bills) and Insurance.....	888-378-0357
Cancel or Reschedule First Appointment.....	215-728-2570
Care Connect	215-728-3536
Clinical Trials	215-214-1515
Compliance/HIPAA Privacy Hotline	800-910-6721
Diagnostic Imaging (Radiology)	215-728-3879
Endoscopy, Minor Procedure, Bronchoscopy (EMB) Suite	215-214-1460
Financial Counseling/Assistance Programs	215-728-2678
Lost and Found (Security).....	215-214-1601
Medical Records Department.....	215-728-2640
Nurse Phone Triage	215-728-4300
<i>Medical questions, Monday-Friday (Speak to a registered nurse.)</i>	
Nutrition Counseling	215-728-2600
Operator	215-728-6900
Outpatient Pharmacy	215-728-3178
Pain and Palliative Care Program	215-728-3544
Pastoral Care	215-728-2944
Patient Advocacy Line	215-728-3063
Patient Records.....	215-728-2570
Physical Medicine and Rehabilitation Department	215-728-2592
Pre-Admission Testing	215-728-2566
Psycho-Oncology and Psychosocial Support Programs	215-214-3940
Radiation Appointments and Scheduling.....	215-728-2581
Radiation Front Desk.....	215-728-2581
Resource and Education Center (REC)	215-214-1618
Respiratory Care	215-728-3515
Risk Assessment Program/Genetic Testing.....	877-627-9684
Social Work Services Department/Support Groups.....	215-728-2668
Speech Pathology Department	215-728-2592
Symptom and Medication Questions:	215-728-4300
Main Campus	215-728-2581
Buckingham.....	215-794-2700
East Norriton	610-275-1517
After-Hours Phone Line for Symptom and Medication Questions	215-728-6900
<i>Urgent medical issues and questions after hours, weekends and holidays</i>	

You will be asked if you prefer that your health care be provided in a language other than English. If so, we will arrange for an interpreter for you or other appropriate means to enhance your communication with us.

Le preguntarán si prefiere que se le brinde atención médica en un idioma distinto del inglés. En dicho caso, tomaremos las medidas necesarias para proporcionarle un intérprete u otro medio que resulte adecuado para mejorar nuestra comunicación con usted.

Вас спросят, хотели ли бы вы получать медицинское обслуживание не на английском языке. Если это так, мы пригласим для вас переводчика или найдем другие способы улучшить общение с вами.

我们会问您，是否希望我们以英语之外的其他语言提供医疗服务。如果您回答是，我们会为您安排口译员或其他适当方式，以便强化您与我们的交流。

