



PATIENT & CAREGIVER EDUCATION

Radiation Therapy

This information will help you prepare for radiation therapy, including what to expect before, during, and after your treatment. You will also learn about side effects and how to care for yourself during your treatment.

We suggest you read through this resource at least once before you start radiation therapy, and then use it as a reference in the days leading up to your radiation treatments so that you can do all you can to prepare. Bring it with you for your simulation appointment and all future appointments with your radiation oncologist so that you and your healthcare team can refer to it.

About Radiation Therapy

Radiation therapy uses high-energy rays to treat cancer. It works by damaging the cancer cells and making it hard for them to reproduce. Your body then is naturally able to get rid of these damaged cancer cells. Radiation therapy also affects normal cells. However, your normal cells are able to repair themselves in a way that cancer cells cannot.

During external beam radiation, a treatment machine will aim beams of radiation directly to the tumor. The beam passes through your body and destroys cancer cells in its path. You will not see or feel the radiation.

Radiation therapy takes time to work. It takes days or weeks of treatment before cancer cells start to die, and they keep dying for weeks or months after radiation therapy ends.

You can have radiation before, during, or after surgery or chemotherapy.

Your Role on Your Radiation Therapy Team

You will have a team of healthcare providers working together to provide the right care for you. You are a part of that team, and your role includes:

- Arriving on time for all your radiation therapy sessions.
- Asking questions and talking about your concerns. We have included a list of possible questions at the end of this resource.
- Letting someone on your radiation therapy team know when you have side effects.
- Telling your doctor or nurse if you are in pain.
- Caring for yourself at home:
 - Quitting smoking, if you smoke. If you want to quit, call our Tobacco Treatment Program at 212-610-0507.
 - Following your radiation therapy team's instructions to care of your skin.
 - Drinking liquids as instructed by your healthcare team.
 - Eating the foods suggested by your radiation therapy team.
 - Maintaining your weight.

Simulation

Before you begin your treatment, you will have a treatment planning procedure called a simulation. This is done to make sure that:

- Your treatment site is mapped.
- You get the right dose of radiation.
- The amount of radiation that gets to your nearby tissues is as small as possible.

During your simulation, you will have x-rays and your skin will be marked with little tattoo dots. These marks identify the area that will be treated.

Your simulation will take at least an hour, but can be longer depending on the treatment your doctor has planned for you.

Preparing for your simulation

You may need to follow additional instructions to prepare for simulation, depending on what area is being treated. Your nurse will review this with you.

Bowel preparation

Diet instructions

Medications

If you don't need any special preparation, you can eat and drink as you normally would on the day of your simulation.

During your simulation, you will be lying in one position for a long time. If you think you will be uncomfortable lying still, you can take acetaminophen (Tylenol®) or your usual pain medication before your simulation. If you think you may get anxious during your procedure, speak with your doctor about whether medication may be helpful.

Wear comfortable clothes that are easy to take off because you may need to change into a hospital gown. Do not wear jewelry, powders, or lotions.

Day of your simulation

What to expect

A member of your radiation therapy team will check you in. You will be asked to state and spell your full name and birth date many times. This is for your safety. People with the same or similar names may be having care on the same day as you.

You will be greeted by your radiation therapist. He or she will take a photograph of your face. This picture will be used to identify you throughout your treatment.

Your therapist will then explain the simulation to you. If you have not already signed a consent form, your radiation oncologist will review everything with you, and ask for your signature.

During your simulation

For your simulation, you may need to get undressed and change into a gown. You should keep your shoes on. If you wear a head covering, such as a wig, turban, or cap, you may have to remove it. Your therapists will help you lie down on a table and make every effort to ensure your comfort and privacy.

Although the table will have a sheet on it, it is hard and has no cushion. If you have not taken pain medication and think you may need it, tell your therapists before your simulation begins. Also, the room is usually cool. If you feel uncomfortable at any time, let your therapists know.

Throughout your simulation, you will feel the table move into different positions. The lights in the room will be turned on and off and you will see red laser lights on each wall. Your therapists use these laser lights as a guide when they position you on the table. **Do not look directly into the red beam because it may damage your eyes.**

Although your therapists will walk in and out of the room during your simulation, there will always be someone who can see and hear you. You will hear your therapists speaking to each other as they work, and they will explain to you what they are doing. Do not move once your simulation begins, because it may change your position. However, if you are uncomfortable or need help, tell your therapists.

To help pass the time, your therapists can play music for you. You may bring a CD of your own from home, if you wish.

Positioning

Depending on the area of your body that is being treated, you may lie on your stomach or on your back. Your arms may be raised above your head or at your sides.

We may need to make a mold of your body to help you stay in the same position. Making the mold takes about 15 minutes and will happen during your simulation. If you need a mold, you will lie in it during the simulation and every day of your treatment. This helps us make sure that you are lying in the correct position.

X-ray images

While you are lying in your position, you will get x-rays of the area to be treated. These may be done on an x-ray machine called a simulator or on a computed tomography (CT) scan machine (see Figure 1). These scans are used only to map your treatment. They are not used for diagnosis or to find tumors. If you need other imaging, your nurse will explain this to you.

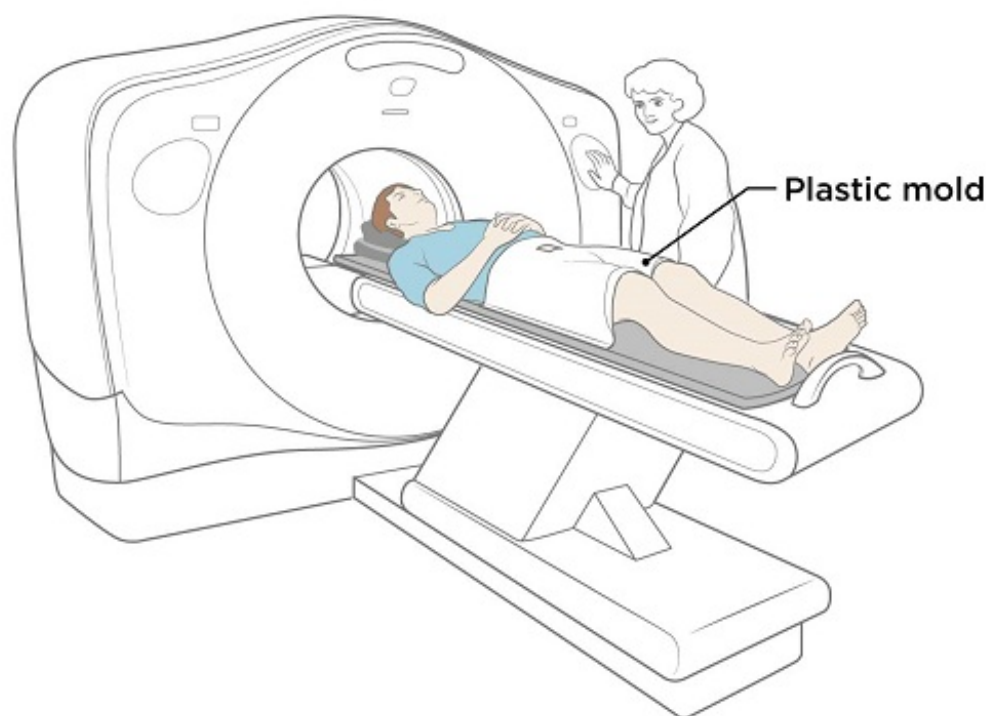


Figure 1. Computed Tomography (CT) scan machine

It will take about 45 minutes to get your x-rays. During the scan, you will hear

the machine turn on and off. Even if the noise seems loud, your therapists will be able to hear you if you speak with them.

Skin markings (tattoos)

Your therapists will draw on your skin in the area being treated with a felt marker. You may need permanent skin markings called tattoos. Your therapists will use a sterile needle and a drop of ink to make the tattoo. The sensation of getting one feels like a pinprick. The tattoo marks are no bigger than the head of a pin. The felt marking can be washed off after your simulation. **The tattoos are permanent and will not wash off.** If you are concerned about receiving tattoos as part of your radiation treatment, talk with your doctor.

After the tattoos are made, your therapists will take several photographs of you in your simulation position. The photographs and tattoo marks will be used to position you correctly on the table each day of your treatment.

After Your Simulation

At the end of your simulation, we will give you an appointment for your set-up procedure. This is the final appointment before your treatment begins.

Scheduling your treatment

Radiation treatments may be given Monday through Friday. For some people, the treatment is given in just one day. For other people the treatment is given over a number of weeks. Your treatment will be given for about _____ days/weeks.

You must come in every day that you are scheduled for your treatment. Treatment may not be as effective if you skip or miss appointments. If you need additional time due to unforeseen circumstances, your radiation oncologist will tell you. If you for some reason you can't come in for treatment, you must call your radiation oncologist's office to let your team know. If you need to change your schedule for any reason, speak with your radiation therapist.

Treatment planning

During the time between your simulation and start of treatment, your radiation oncologist will work with a team to plan your treatment. They will use your simulation x-rays and CT scan to plan the angles and shapes of your radiation

beams. The details are carefully planned and checked. This takes between 5 days and 2 weeks.

Vitamins and dietary supplements

Many people ask about taking vitamins during treatment. You may take a daily multivitamin, if you wish. Do not take more than the recommended daily allowance of any vitamin. Do not take any other vitamins or any supplements without talking to your doctor. This includes both nutritional and herbal supplements.

Set-up Procedure

Before your first treatment, you will be scheduled for a set-up procedure. This generally takes about 1 hour. If pain medication was helpful during simulation, you may want to take it before this procedure.

When you come for your set-up procedure, you will be shown to the dressing room and asked to change into a gown. Your therapists will bring you to the room where you will receive your treatment each day. They will position you on the treatment table. You will lie exactly as you were lying day of your simulation.

Special x-rays called beam films will be taken to make sure that your position and the area being treated are correct. The beam films will be repeated throughout your treatment. They are not used to see how your tumor responds to the treatment.

Depending on your treatment plan, you may start treatment on the same day as your set up procedure or 1 to 2 days later.

During Your Treatment

After you check in at the reception desk, have a seat in the waiting room. When your radiation therapists are ready for you, they will tell you to change into a gown. You should keep your shoes on during the treatment.

Your radiation therapists will bring you into the treatment room and help you lie on the table (see Figure 2). You will be positioned exactly how you were lying during your set-up procedure.

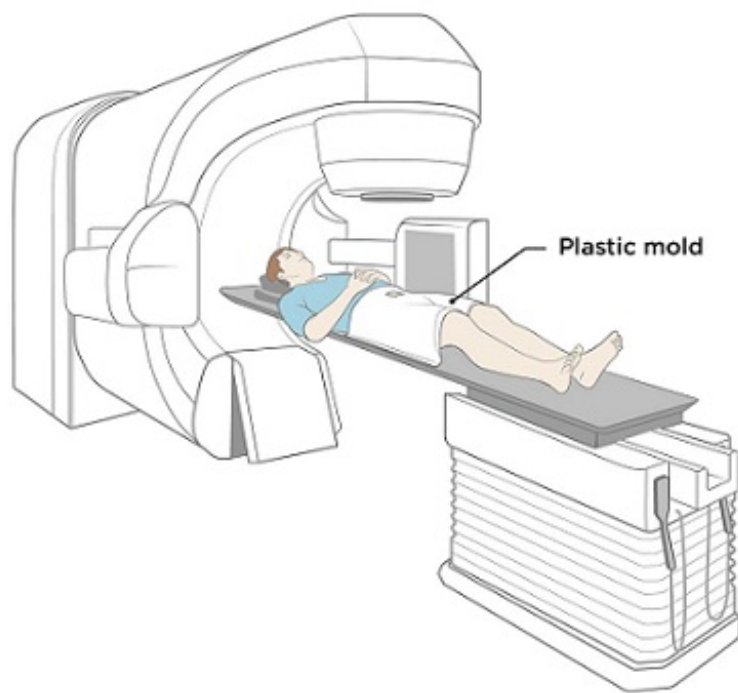


Figure 2. During your treatment

Once you are positioned correctly, your therapists will leave the room, close the door, and begin your treatment. You will not see or feel the radiation, but you may hear the machine as it moves around you and is turned on and off. You will be in the treatment room for 15 to 45 minutes, depending on your treatment plan. Most of this time will be spent putting you in the correct position. The actual treatment only takes a few minutes.

Although you will be alone during the treatment, your therapists will see you on a monitor and hear you through an intercom at all times. Your radiation therapist will make sure that you are comfortable during the treatment. Breathe normally during the treatment, but do not move. However, if you are uncomfortable or need help, speak to your therapists. They can turn off the machine and come in to see you at any time, if necessary.

Neither you, nor your clothes will become radioactive during or after treatment. It is safe for you to be around other people.

Weekly visits during treatment

Your radiation oncologist and radiation nurse will see you each week to talk with you about any concerns, ask about any side effects you may be having, and answer your questions. This visit will be before or after your treatments each _____ . You should plan on being at your appointment about 1

extra hour on those days.

If you need to speak with your radiation oncologist or radiation nurse any time between your weekly visits, ask the support staff or your therapists to contact them when you come in for treatment.

Side Effects

Some people develop side effects from radiation therapy. Which side effects and how severe they are depend on many factors, such as the area being treated, the dose of radiation, the number of treatments, and your overall health. The side effects may be worse if you are also getting chemotherapy. Below are the most common side effects of radiation therapy. You may have all, some, or none of these.

Skin and hair reactions

During radiation therapy, your skin and hair in the area being treated may change. This is normal. After 2 to 3 weeks, your skin may become pink or tanned. It may even become bright red or very dark later on.

Your skin may feel dry and itchy, and may look flaky during treatment. Sometimes, the skin in sensitive areas may blister, open, and peel. If this happens, tell your doctor or nurse.

You may also notice a rash, especially in any area where you have had previous sun exposure. Although this may be a side effect of treatment, a rash could also be a sign of infection. If you develop a rash at any time during your treatment, tell your doctor or nurse.

Your nurse may apply special dressings or creams and teach you how to care for your skin. Your doctor may stop your treatment until your skin heals. This skin reaction sometimes becomes more severe during the week after treatment is done. If this happens, call your doctor or nurse. Your skin will gradually heal after your treatment is completed, but this often takes 3 to 4 weeks.

You may lose some or all of the hair in the area being treated. Your hair will usually grow back 3 to 6 months after your treatment is completed.

Below are guidelines to help you care for your skin during treatment. Follow

these guidelines until your skin gets better. **These guidelines refer only to the skin in the area being treated with radiation.**

Keep your skin clean

- Bathe or shower daily using warm water and a mild unscented soap, such as Neutrogena®, Dove®, baby soap, Basis®, or Cetaphil®. Rinse your skin well and pat it dry with a soft towel.
- When washing, be gentle with your skin in the area being treated. Do not use a washcloth, a scrubbing cloth, or brush.
- If you received tattoo marks before your treatment, they are permanent and won't wash off. You may get other markings during treatment such as an outline of your treatment area with a purple felt-tipped marker. You can remove these markings with mineral oil when your therapists say it's okay.
- **Do not use alcohol or alcohol pads on your skin in the area being treated.**

Moisturize your skin often

- Start using a moisturizer when you begin treatment. This can help to minimize any skin reaction. You can use over-the-counter moisturizers. When choosing a moisturizer pick one that does not have any fragrances or lanolin. There are a number of products that are good to use, and your nurse may suggest one of these to you. Use only one at a time unless your nurse tells you to use more.
- If you are using a moisturizer, apply it 2 times a day.

Avoid irritating your skin in the area being treated

- Wear loose-fitting cotton clothing in the area being treated. Do not wear tight clothing that will rub against your skin.
- Use only the moisturizers, creams, or lotions that are recommended by your doctor or nurse.
- Don't use makeup, perfumes, powders, or aftershave in the area being treated.
- Don't use deodorant if your skin is open, cracked, or irritated. You can use

deodorant on intact skin in the area being treated. Stop using it if your skin becomes irritated.

- If your skin is itchy, do not scratch it. Apply moisturizer. Ask your nurse for recommendations on how to relieve the itching.
- Don't shave in the area that is being treated. If you must shave, use only an electric razor. Stop if your skin becomes irritated.
- Don't put tape on your treated skin.
- Don't let your treated skin come into contact with extreme hot or cold temperatures. This includes hot tubs, water bottles, heating pads, and ice packs.
- If you have no skin reactions during your treatment, you can swim in a chlorinated pool. However, be sure to rinse off the chlorine right after getting out of the pool.
- Avoid tanning or burning your skin during treatment and for the rest of your life. If you are going to be in the sun, use a PABA-free sunblock with an SPF of 30 or higher. Also, wear loose-fitting clothing that covers you as much as possible.

Fatigue

Fatigue is a feeling of feeling tired or weak, not wanting to do things, not being able to concentrate, or feeling slowed down. You may develop fatigue after 2 to 3 weeks of treatment, and it can range from mild to severe. Fatigue may last 6 weeks to 12 months after your treatment ends.

There are a lot of reasons why you may develop fatigue during treatment, including:

- The effects of radiation on your body.
- Traveling to and from treatment.
- Not having enough restful sleep at night.
- Not eating enough protein and calories.
- Having pain or other symptoms.
- Feeling anxious or depressed.

- Certain medications.

You may find that your fatigue is worse at certain times of the day. Below are suggestions to help you manage your fatigue.

Ways to manage fatigue

- If you are working and are feeling well, continue to do so. However, working less may help increase your energy.
- Plan your daily activities. Pick those things that are necessary and most important to you and do them when you have the most energy. For example, you may go to work but not do housework, or watch your children's sports event but not go out to dinner.
- Plan time to rest or take short naps (10 to 15 minutes) during the day, especially when you feel more tired. If you do nap, try to sleep for less than 1 hour at a time.
- Try to sleep at least 8 hours every night. This may be more sleep than you needed before you started radiation therapy. You may also find it helpful to go to sleep earlier at night and get up later in the morning. One way to sleep better at night is to be active during the day. For example, if you are able to exercise, you could go for a walk, do yoga, or ride a bike. Another way to sleep better at night is to relax before going to bed. You might read a book, work on a jigsaw puzzle, listen to music, or do calming hobbies.
- Ask family and friends to help you with things like shopping, cooking, and cleaning. Check with your insurance company to see if they cover home care services.
- Some people have more energy when they exercise. Ask your doctor if you can do light exercise, such as walking, stretching, or yoga.
- Eat foods that are high in protein and calories. Ask your nurse for the resource *Eating Well During and After Your Cancer Treatment* (www.mskcc.org/pe/eating_cancer_treatment).
- Other symptoms, such as pain, nausea, diarrhea, difficulty sleeping, or feeling depressed or anxious, can increase your fatigue. Ask your doctor or nurse for help with any other symptoms you may have.

Other side effects

Some people may experience other side effects. Your radiation oncologist or nurse will discuss these with you.

Sexual health

You might have concerns about how cancer and your treatment can affect your sexuality. You aren't radioactive. You can't pass radiation to anyone else, so it's safe to be in close contact with other people.

You can be sexually active during radiation treatment, unless your radiation oncologist gives you other instructions. However, if you or your partner are able to have children, you must use birth control (contraception) to prevent pregnancy during your treatment.

The American Cancer Society has resources about sexual health issues during cancer treatment. The one for men is called *Sex and the Man with Cancer*. The one for women is called *Sex and the Woman with Cancer*. You can search for them at www.cancer.org or call 800-227-2345 for a copy.

MSK also has sexual health programs to help you address the impact of your disease and treatment on your sexual health. You can meet with a specialist before, during, or after your treatment.

- **Female Sexual Medicine & Women's Health Program:** For more information or to make an appointment, call 646-888-5076.
- **Male Sexual & Reproductive Medicine Program:** For more information or to make an appointment, call 646-888-6024.

Emotional health

The diagnosis and treatment of cancer can be a very stressful and overwhelming event. You may feel:

<ul style="list-style-type: none">• Anxious• Afraid• Alone• Ambivalent	<ul style="list-style-type: none">• Angry• Depressed• Helpless• Frustrated	<ul style="list-style-type: none">• Nervous• Numb• Worried
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All these kinds of feelings are expected, if you or someone you love has a serious illness. You may also worry about telling your employer that you have cancer or about paying your medical bills. You may worry about how your family relationships may change, about the effect of cancer treatment in your body, or if you will continue to be sexually attractive. You may worry that the cancer will come back. We are here to support you.

Ways to cope with your feelings

- Talk with others. When people try to protect each other by hiding their feelings, they can feel very alone. Talking can help the people around you know what you're thinking. It might help to talk about your feelings with someone you trust. You may choose your spouse or partner, a close friend, family member, chaplain, nurse, social worker, or psychologist. You may also find it helpful to talk to someone who is going through radiation therapy, or a cancer survivor or caregiver who has been through a similar treatment. Through our Patient-to-Patient Support Program, you have a chance to speak with former patients and caregivers. To learn more about this service, please call 212-639-5007.
- Join a support group. Meeting other people with cancer will give you a chance to talk about your feelings and listening to other people who have same concerns. You will learn how others cope with their cancer and treatment. Your doctor, nurse, or social worker can tell you about the support groups you might be interested in.
- Try relaxation and meditation. You might try thinking of yourself in a favorite place while breathing slowly while paying attention to each breath or listening to a soothing music or sound. For some people, praying is another way of meditation. These kinds of activities can help you feel relaxed

and calm.

- **Exercise.** Many people find that light activity like walking, biking, yoga, or water aerobics helps them feel better. Talk with your doctor or nurse about types of exercise you can do.

We all have our own way of dealing with difficult situations. Generally, we use whatever has worked for us in the past. However, sometimes this is not enough. We encourage you to speak with your doctor, nurse, or social worker about your concerns.

After Your Treatment

Please be sure to keep your follow-up appointments with your radiation oncologist. He or she will evaluate your response to treatment. You may have blood tests, x-rays, and scans during these visits. Before coming, write down your questions and concerns. Bring this and a list of all your medications with you. You can also call your doctor or nurse at any time after your treatment is completed, or in between follow-up visits, if you have any questions or concerns.

Contact Information

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at the numbers listed below.

Radiation oncologist: _____

Phone number: _____

Radiation nurse: _____

Phone number: _____

After 5:00 PM, during the weekend, and on holidays, call _____ and ask for the radiation oncologist on call. If there's no number listed, or you're not sure, call 212-639-2000.

Resources

Many of the resources listed in this guide can be found on the Internet. If you don't have a computer or if you don't know how to use the Internet, check with your local public library or community center.

MSK support services

Counseling Center

646-888-0200

Many people find that counseling helps them. We provide counseling for individuals, couples, families, and groups, as well as medications to help if you feel anxious or depressed.

Female Sexual Medicine & Women's Health Program

646-888-5076

This program helps female patients who are dealing with cancer-related sexual health challenges, including premature menopause and fertility issues.

Integrative Medicine Service

646-888-0800

MSK's Integrative Medicine Service offers patients many services to complement traditional medical care. These include music therapy, mind/body therapies, dance and movement therapy, yoga, and touch therapy.

Male Sexual & Reproductive Medicine Program

646-888-6024

This program helps male patients who are dealing with cancer-related sexual health challenges, including erectile dysfunction.

Nutrition Services

212-639-7312

MSK's Nutrition Service offers nutritional counseling with one of our certified dietitians. Your dietitian will review your current eating habits and give advice on what to eat during and after treatment.

Patient and Caregiver Support Program

212-639-5007

You might find it comforting to talk with a cancer survivor or caregiver who has been through a similar treatment. Through our Patient and Caregiver Support Program, we're able to offer you a chance to talk with former patients and caregivers.

Resources for Life After Cancer (RLAC) Program

646-888-8106

At MSK, care doesn't end after active treatment. The RLAC Program is for patients and their families who have finished treatment. This program has many services, including seminars, workshops, support groups, counseling on life after treatment, and help with insurance and employment issues.

Tobacco Treatment Program

212-610-0507

If you want to quit smoking, MSK has specialists who can help. Call for more information.

External resources

American Cancer Society (ACS)

www.cancer.org

800-ACS-2345 (800-227-2345)

Offers a variety of information and services, including Hope Lodge, a free place for patients and caregivers to stay during cancer treatment.

American Society for Therapeutic Radiology and Oncology

www.rtanswers.org

800-962-7876

A group of radiation oncology professionals that specializes in treating patients with radiation therapy. Provides detailed information on treating cancer with radiation and contact information for radiation oncologists in your area.

CancerCare

www.cancer.org

800-813-HOPE (800-813-4673)

275 Seventh Avenue (Between West 25th & 26th Streets)

New York, NY 10001

Provides counseling, support groups, educational workshops, publications, and financial assistance.

Cancer Support Community

www.cancersupportcommunity.org

Provides support and education to people affected by cancer.

National Cancer Institute (NCI) Cancer Information Service

www.cancer.gov

800-4-CANCER (800-422-6237)

Provides education and support to people with cancer and their families.

Publications are available online and in print.

Questions To Ask Your Doctor or Nurse

We recommend that you write the questions to ask during your visit with your doctor or nurse. Write down the answers during your appointment so that you can review them again later.

Examples of questions to ask

What kind of radiation therapy will I get?

How many treatments will I get?

What side effects should I expect during radiation therapy?

Will these side effects go away after radiation therapy is finished?

What kind of late side effects should I expect after radiation treatment?

For more resources, visit www.mskcc.org/pe to search our virtual library.

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