



PATIENT & CAREGIVER EDUCATION

Radiation Therapy to Your Lymph Nodes

This information will help you get ready for radiation therapy to your lymph nodes at MSK. It will help you know what to expect before, during, and after your treatment. It will also help you learn about side effects and how to care for yourself during treatment.

Read through this resource before you start radiation therapy. Use it as a reference in the days leading up to your treatments so you can prepare as much as possible. Bring this resource to your simulation appointment and all future appointments with your radiation oncologist. You and your radiation therapy team will refer to it throughout your treatment.

About radiation therapy

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

You will have a type of radiation therapy called external beam radiation. During your treatments, a machine will aim beams of radiation directly at the tumor. The beams will pass through your body and destroy cancer cells in their path. You won't see or feel the radiation.

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

About radiation therapy to your lymph nodes

Many people have radiation therapy to their lymph nodes as part of their treatment for lymphoma.

There are many different groups of lymph nodes in your body (see Figure 1). During your radiation therapy treatments, beams of radiation will be aimed at the group(s) of lymph nodes where the cancer is. Some radiation may also be aimed at your spleen. Your spleen is an organ in your abdomen (belly).

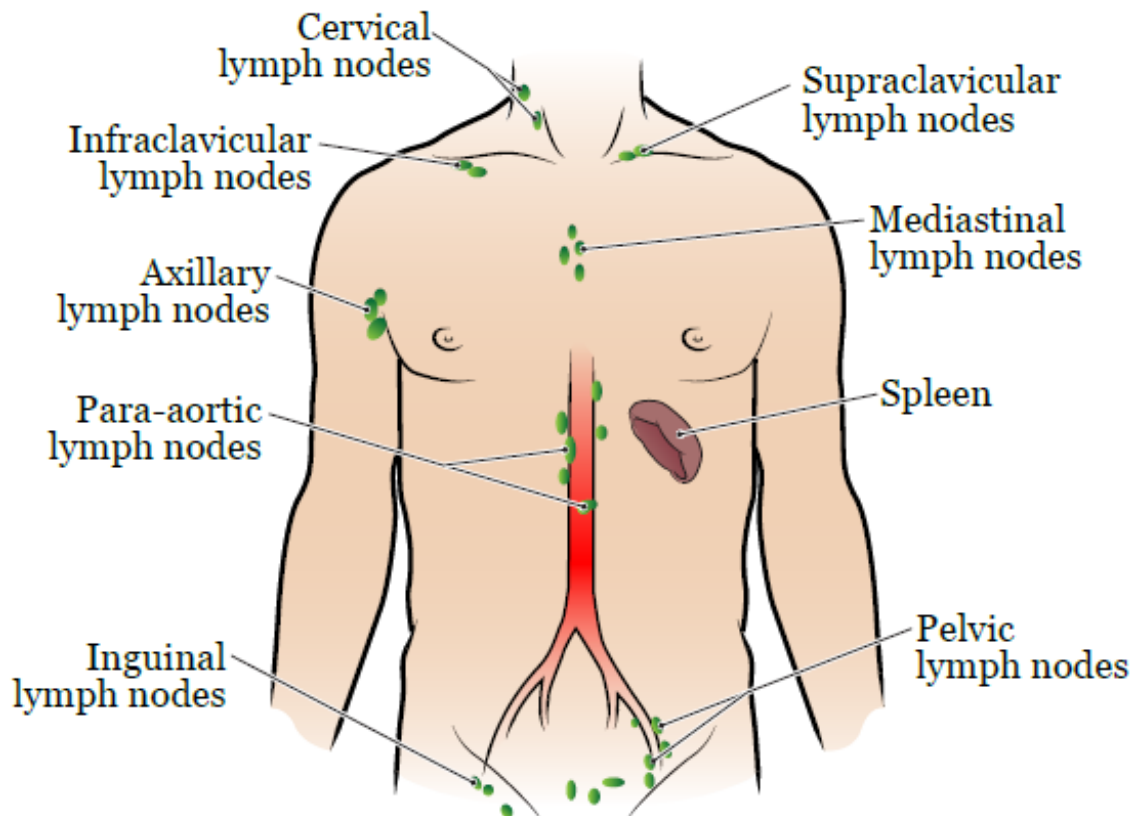


Figure 1. Groups of lymph nodes in your body

Your radiation oncologist or nurse will check off the areas that will be targeted during your radiation therapy.

- ☐ The lymph nodes in your neck (cervical lymph nodes)
- ☐ The lymph nodes above your collar bone (supraclavicular lymph nodes)
- ☐ The lymph nodes below your collar bone (infraclavicular lymph nodes)
- ☐ The lymph nodes in the middle of your chest (mediastinal lymph nodes)

- ☐ The lymph nodes in your armpit (axillary lymph nodes)
- ☐ The lymph nodes in your abdomen (para-aortic lymph nodes)
- ☐ Your spleen
- ☐ The lymph nodes in your pelvis (pelvic lymph nodes)
- ☐ The lymph nodes in your groin (inguinal lymph nodes)

Your role on your radiation therapy team

Your radiation therapy care team will work together to care for you. You're a part of that team, and your role includes:

- Getting to your appointments on time.
- Asking questions and talking about your concerns.
- Telling someone on your care team when you have symptoms related to your treatment.
- Telling someone on your care team if you're in pain.
- Caring for yourself at home by:
 - Quitting smoking if you smoke. MSK has specialists who can help you quit smoking. For more information about our [Tobacco Treatment Program](#), call 212-610-0507.
 - Caring for your skin based on your care team's instructions
 - Drinking liquids based on your care team's instructions.
 - Eating the foods your care team suggests.
 - Staying around the same weight.

Simulation

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

- Your treatment area is mapped out.
- You get the right dose of radiation.

- The radiation dose to nearby tissue is as small as possible.

During your simulation, you will have imaging scans and your skin may be marked with little tattoo dots. These marks help your team make sure you're in the correct position for your radiation treatments.

Your simulation appointment will take about 4 hours.

Preparing for 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, ask your doctor if medication may be helpful.
- Wear comfortable clothes that are easy to take off. You will need to change into a hospital gown.
- Don't wear jewelry, powder, or lotion.
- If your dentist made a mouth guard for you, bring it to your simulation.

To help pass the time during your simulation, your radiation therapists can play music for you.

You may need to follow additional instructions to prepare for your simulation. If you do, your nurse will give you more information.

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

For people having a positron emission tomography-computed tomography (PET-CT) scan

- Starting 6 hours before your simulation appointment time, don't eat or drink anything except water. This includes gum, hard candy, cough drops, and mints. If you eat or drink anything except water, your PET-CT

scan may need to be rescheduled.

- You may get intravenous (IV) contrast (dye) during your PET-CT scan. If you're allergic to IV contrast, tell your nurse. They will give you special instructions.

Take devices off your skin

You may wear certain devices on your skin. Before your simulation or treatment, device makers recommend you take off your:

- Continuous glucose monitor (CGM)
- Insulin pump

If you use one of these, ask your radiation oncologist if you need to take it off. If you do, make sure to bring an extra device to put on after your simulation or treatment.

You may not be sure how to manage your glucose while your device is off. If so, before your appointment, talk with the healthcare provider who manages your diabetes care.

Day of your simulation

Once you arrive

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 a similar name may be having care on the same day.

Your radiation therapist will greet you. They will take a photograph of your face. This picture will be used to identify you throughout your treatment.

Your radiation therapist will then explain what to expect during your simulation. If you haven't already signed a consent form, your radiation oncologist will review everything with you and ask for your signature.

During your simulation

You will need to change into a hospital gown for your simulation. You should keep your shoes on. If you wear a head covering (such as a wig, turban, or cap), you may need to remove it.

After you change, your radiation therapists will bring you to the simulation room and help you lie down on the table. They will do everything they can to make sure you're comfortable and have privacy.

The table will have a sheet on it, but it's hard and has no cushion. Also, the room is usually cool. If you feel uncomfortable at any time, tell your radiation therapists. If you haven't taken pain medication and think you may need it, tell your radiation therapists before your simulation starts.

Once your simulation starts, don't move. Moving may change your position. However, if you're uncomfortable or need help, tell your radiation therapists.

During 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 radiation therapists will use these laser lights as a guide to help position you on the table. Don't look directly into the laser lights, because they may damage your eyes.

There will be an intercom (microphone and speaker) and a camera inside the simulation room. Your radiation therapists will walk in and out of the room during your simulation, but there will always be someone who can see and hear you. You will hear your radiation therapists talking to each other as they work, and they will talk to you to explain what they're doing.

Positioning

Your position will depend on the which group(s) of lymph nodes are being treated. Your radiation therapists will help you get into the correct position.

Your radiation therapists will also make an immobilization device for you to use. The immobilization device will help you stay in the correct position. You will use it during your simulation and each of your treatments.

Imaging scans

You will have imaging scans while you're in your treatment position. These may be done on a CT machine called a simulator or on a PET/CT scan machine. The scans will be used only to map your treatment area. They aren't used for diagnosis or to find tumors.

- If you're having a PET/CT scan, your nurse may place an intravenous (IV) line in one of your veins. The IV line will be used to give you contrast (dye) before the scan. This helps your team get clear images of the area to be treated.
- If you're having a CT scan, you may need to hold your breath during the scan. Your radiation therapists will tell you how and when to do it.

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

The imaging scans will take about 45 minutes.

Skin markings (tattoos)

While you're lying in your treatment position, your radiation therapists will draw on your skin with a felt marker. You can wash off the felt markings after your simulation.

You may also need permanent skin markings called tattoos. The tattoo marks are no bigger than the head of a pin. Your radiation therapists will use a sterile needle and a drop of ink to make each tattoo. Getting them will feel like a pinprick. **The tattoos are permanent and won't wash off.** If you're concerned about having tattoos as part of your radiation treatment, talk with your radiation oncologist.

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

After your simulation

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

Scheduling your treatment

Radiation treatments are given daily, Monday through Friday, for about _____ weeks.

You must come in every day you're scheduled for treatment. Your radiation therapy may not work as well if you skip or miss treatments. If you need to miss a treatment for any reason, call your radiation oncologist's office to tell your team. If you need to change your schedule for any reason, speak with the scheduler or call your doctor's office.

Planning your treatment

During the time between your simulation and your set-up procedure, your radiation oncologist will work with a team to plan your treatment. They will use the images taken during your simulation to plan the angles and shapes of your radiation beams. They will also determine the dose of radiation that you will receive. These details are carefully planned and checked. This takes between 5 days and 2 weeks.

Set-up procedure

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

When you arrive for your set-up procedure, you will be shown to the dressing room and asked to change into a hospital gown.

Your radiation therapists will bring you to the room where you will receive your treatment each day. They will position you on the table. You will lie

exactly as you did on the day of your simulation.

Special x-rays called beam films will be taken to make sure your position and the area being treated are correct. Beam films may also be taken before some of your other treatments. They aren't 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

For each of your treatments, check in at the reception desk and have a seat in the waiting room. When your radiation therapists are ready for you, you will be shown to the dressing room and asked to change into a hospital gown. Keep your shoes on during your treatment.

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

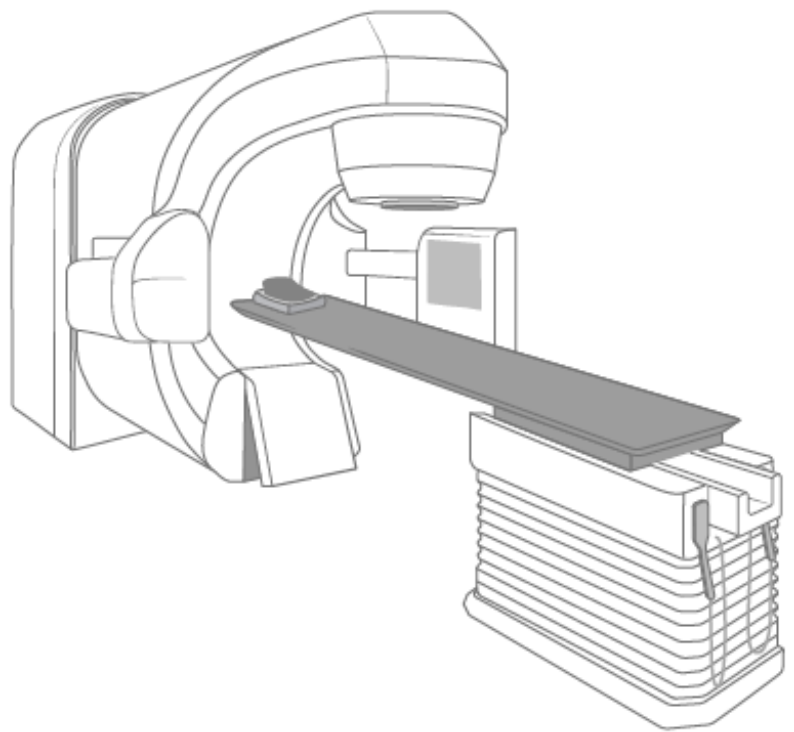


Figure 2. The treatment table

Once you're positioned correctly, your radiation therapists will leave the room, close the door, and start your treatment. You won't 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 about 30 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.

You will be alone in the room during your treatment, but your radiation therapists will be able to see you on a monitor and hear you through an intercom at all times. They will make sure you're comfortable during your treatment.

Breathe normally during your treatment, but don't move. However, if you're uncomfortable or need help, tell your radiation therapists. They can turn off the machine and come in to see you at any time, if needed.

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

Weekly visits during your treatment

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

If you need to speak with your radiation oncologist or radiation nurse between these weekly visits, call your radiation oncologist's office. You can also ask the support staff or your radiation therapists to contact your radiation oncologist or nurse when you come in for treatment.

Vitamins and dietary supplements

Many people ask about taking vitamins during treatment. If you want to take a multivitamin, you can. Don't take more than the recommended daily allowance of any vitamin. Don't take any other vitamins or any supplements without talking to your doctor. This includes both nutritional and herbal supplements.

Side effects of treatment

You may have side effects from radiation therapy. The type and how severe they are depends on many things. These include the dose of radiation, the number of treatments, and your overall health.

You may start to notice side effects about 2 weeks after you start treatment. They may get worse during treatment, but they will slowly get better over several weeks after you finish treatment. Some side effects may take longer to go away. Follow the guidelines in this section to help manage your side effects during and after treatment.

Below are the most common side effects of radiation therapy to your lymph nodes. You may have all, some, or none of these. Your nurse will talk with you about the side effects you're most likely to have.

Skin and hair reactions

During radiation therapy, the skin and hair in the treatment area may change. This is normal.

- After 2 to 3 weeks, your skin may become pink or tanned. Later in your treatment, your skin may become bright red or very dark.
- Your skin may feel dry, itchy, and look flaky.
- You may have a rash, especially in areas where your skin has been exposed to the sun. If this happens, tell your doctor or nurse. A rash can also be a sign of infection.
- Skin in sensitive areas may blister, open, and peel. If this happens, tell your doctor or nurse.
- You may lose some or all of the hair in the treatment area. The hair will usually grow back 3 to 6 months after you finish treatment.

Your skin will gradually heal after you finish treatment, but this often takes 3 to 4 weeks. Sometimes, skin reactions get worse during the week after you finish treatment. If this happens, call your doctor or nurse.

Your nurse will teach you how to care for your skin. They will apply special dressings (bandages) or creams, if needed. Your doctor may stop your treatment until your skin heals.

Follow the guidelines below to care for your skin. Keep following them until your skin gets better. **These guidelines refer only to the skin in the**

treatment area.

Keep your skin clean

- Bathe or shower every day. Use 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 the skin in the treatment area. Don't use a washcloth, scrubbing cloth, or brush.
- If you received tattoo marks before your treatment, they're permanent and won't wash off. You may get other markings during treatment, such as an outline of your treatment area with a felt-tipped marker. You can remove these markings with mineral oil when your radiation therapists say it's okay.
- Don't use alcohol or alcohol pads on the skin in the treatment area.

Moisturize your skin often

Start using a moisturizer when you start treatment. This can help minimize skin reactions. You can use an over-the-counter (not prescription) moisturizer.

- Use a moisturizer that doesn't have any fragrances or lanolin. Your nurse may suggest a moisturizer for you to use.
- Don't use more than 1 moisturizer at a time, unless your nurse tells you to use more.
- Apply the moisturizer 2 times each day.

Avoid irritating your skin

- If your skin is itchy, don't scratch it. Apply moisturizer. Ask your nurse for recommendations on how to relieve the itching. They may give you a prescription for medication to treat itchy skin.
- Wear loose-fitting cotton clothing and undergarments over the treatment area. Avoid underwire bras or tight clothing that will rub against your skin.

- Use only the moisturizers, creams, or lotions that you have discussed with your radiation oncologist or nurse.
- Don't use makeup, perfume, powder, or aftershave on the skin in the treatment area.
- Don't use deodorant if your skin is open, cracked, or irritated. You can use deodorant on intact skin in the treatment area. Stop using it if your skin becomes irritated.
- Don't shave in the treatment area. If you must shave, use only an electric razor. Stop if your skin becomes irritated.
- Don't put tape on the treatment area.
- Don't let the skin in the treatment area come into contact with extreme hot or cold temperatures. This includes hot tubs, water bottles, heating pads, and ice packs.
- If you don't have any skin reactions, you can swim in a chlorinated pool. Shower right after you get out of the pool to rinse off the chlorine.
- Avoid tanning or burning your skin. If you're going to be in the sun:
 - Use a PABA-free sunblock with an SPF of 30 or higher.
 - Wear loose-fitting clothing that covers as much of the skin in the treatment area as possible.

Fatigue

Fatigue is 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 will gradually go away after your treatment is done, but it can last for several months.

There are many reasons you may develop fatigue during treatment, including:

- The effects of radiation on your body.

- Traveling to and from your treatments.
- Not having enough restful sleep at night.
- Not eating enough protein and calories.
- Having pain or other symptoms.
- Feeling anxious or depressed.
- Side effects of certain medications.

You may find that your fatigue is worse at certain times of the day.

Ways to manage fatigue

- If you're working and are feeling well, keep doing so. However, working less may help you have more energy.
- Plan your daily activities. Think about the things you need to do or that are most important to you. Do these activities when you have the most energy.
- Plan time to rest or take short (10 to 15 minute) naps during the day, especially when you feel more tired. When you nap, try to sleep for less than 1 hour at a time.
- Try to sleep for 8 or more hours every night. This may be more sleep than you needed before you started radiation therapy.
 - Being active during the day can help you sleep better at night. For example, if you're able to exercise, you can go for a walk, do yoga, or ride a bike.
 - Relaxing before you go to bed can also help you sleep better at night. For example, you can read a book, work on a jigsaw puzzle, listen to music, or do calming hobbies.
 - You may also find it helpful to go to sleep earlier at night and get up later in the morning.
- Ask family and friends to help you with things like shopping, cooking, and cleaning. Ask your insurance company if they cover home care services.

- You may have more energy if you exercise. Ask your doctor if you can do light exercise, such as walking, stretching, or yoga.
- Eat foods and drink liquids that are high in protein and calories. For information about eating during your treatment, read the resource *Eating Well During Your Cancer Treatment* (www.mskcc.org/pe/eating_cancer_treatment).
- Ask your radiation oncologist or nurse for help managing any other side effects you have. Pain, nausea, diarrhea, trouble sleeping, or feeling depressed or anxious can increase your fatigue.

Changes to your blood cell counts

Bone marrow is the substance inside your bones that makes blood cells. You have 3 kinds of blood cells:

- White blood cells that fight off infection.
- Platelets that help your blood clot when you injure yourself.
- Red blood cells that carry the oxygen you need for energy.

A blood cell count is a measurement of how many blood cells you have. If there are large areas of bone marrow in the treatment area, you may have lowered blood cell counts. Chemotherapy may also lower your blood cell count.

About once a week during your treatment, you will have a blood test called a CBC (complete blood count) to keep track of your blood cell counts. If your blood counts get too low, your radiation oncologist may decide to stop your treatments until they return to higher levels. They may also give you an injection to help raise your white blood cell count, if needed. We will tell you what precautions to take if your blood counts get too low.

Call your doctor or nurse right away if you have:

- A temperature of 100.5 °F (38 °C) or higher
- Shaking chills

- Flu-like symptoms
- Bleeding

These things can mean that you have an infection.

Appetite loss

Your appetite may decrease while you're receiving treatment. However, your body needs protein and calories. They help repair the the normal cells injured from radiation. Also, if you use a mold during your treatments, it may not fit correctly if your weight changes. Try not to lose weight during your treatment.

- Be selective about what you eat to be sure you increase your calories and protein. We will give you the resource *Eating Well During Your Cancer Treatment* (www.mskcc.org/pe/eating_cancer_treatment). It contains many suggestions. Try the foods that are recommended.
- Try to eat small meals often throughout the day.
- If you never seem to feel hungry, set up a schedule to make sure you eat regularly. For example, set a schedule to eat every 2 hours.
- Eat your meals in a calm place. Take your time eating. Eat with family or friends whenever you can.
- Choose foods with different colors and textures to make your meals more appealing.
- Bring snacks and drinks to your treatment appointments. You can have while while you're waiting or while you're coming to and from your appointments.
- Drink liquid nutritional supplements if you're not eating enough food. There are many products available, and they come in many flavors. Ask your doctor or nurse which product is best for you.

Sexual health

You may have concerns about how cancer and your treatment may 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. They're titled *Sex and the Adult Male with Cancer* and *Sex and the Adult Female 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

Cancer diagnosis and treatment can be very stressful and overwhelming. You may feel:

- Anxious or nervous
- Depressed
- Numb
- Afraid
- Helpless
- Uncertain
- Alone
- Frustrated
- Worried
- Angry

You might also worry about telling your employer you have cancer or about paying your medical bills. You may worry about how your family

relationships may change, or that the cancer will come back. You may worry about how cancer treatment will affect your body, or if you will still be sexually attractive.

It's normal and OK to worry about all these things. All these kinds of feelings are normal when you or someone you love has a serious illness. We're 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. For example, you can talk with your spouse or partner, close friend, or family member. You can also talk with a chaplain (spiritual advisor), nurse, social worker, or psychologist.

Join a support group. Meeting other people with cancer will give you a chance to talk about your feelings and learn from others. You can learn how other people cope with their cancer and treatment and be reminded you are not alone.

We know that all cancer diagnoses and people with cancer are not the same. We offer support groups for people who share similar diagnoses or identities. For example, you can join a support group for people with breast cancer or for LGBTQ+ people with cancer. To learn about MSK's support groups, visit www.msk.org/vp. You can also talk with your radiation oncologist, nurse, or social worker.

Try relaxation and meditation. These kinds of activities can help you feel relaxed and calm. You might try thinking of yourself in a favorite place. While you do, breathe slowly. Pay attention to each breath or listen to soothing music or sounds. For some people, praying is another way of meditation. Visit www.msk.org/meditations to find guided meditations led by our Integrative Medicine providers.

Exercise. Many people find that light movement, such as walking, biking,

yoga, or water aerobics, helps them feel better. Talk with your healthcare provider about types of exercise you can do.

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

Site-specific side effects

You may also have side effects related to the area being treated. Your nurse will mark the site-specific side effects that you may have.

□ Changes to your mouth and throat

Your treatments may cause changes in your mouth and throat. You may have:

- Mouth sores
- Mouth pain
- Throat sores
- Throat pain
- Pain when you swallow
- Trouble swallowing
- Thicker saliva than usual
- Dry mouth
- Taste changes

Follow the guidelines below to help manage these side effects.

- Brush your teeth after you eat and before you go to bed. Use a soft-bristle toothbrush and the toothpaste your dentist recommended or a mild toothpaste that has fluoride.
- If you have dentures, a bridge, or a dental prosthesis, take it out and

clean it each time you clean your mouth. Leave it out while you sleep. If your mouth becomes irritated, keep it out of your mouth as much as you can.

- If you currently floss your teeth, keep flossing once a day before you go to bed. If you haven't flossed in the past, don't start during your treatment.
- Rinse your mouth every 4 to 6 hours, or more often for comfort. Use 1 of the following liquids:
 - One quart (4 cups) of water mixed with 1 teaspoon of salt and 1 teaspoon of baking soda
 - One quart of water mixed with 1 teaspoon of salt
 - One quart of water mixed with 1 teaspoon of baking soda
 - Water
 - A mouthwash with no alcohol or sugar

To rinse, swish and gargle the liquid for 15 to 30 seconds, then spit it out.

- Use a lip moisturizer after you care for your mouth. Don't apply it 4 hours before your treatment.

If your mouth is dry, try the suggestions below.

- Use a mouth moisturizer.
- Take sips of water or other liquids (such as coconut water, almond milk, Gatorade®, and broth) often during the day. It may be helpful to carry a bottle of water.
- Use an aerosol pump spray bottle filled with water to moisten your mouth.
- Use a humidifier, especially at night. Be sure to change the water in the humidifier and clean it as directed.
- Avoid using air conditioners.

If you start having trouble swallowing or pain when you swallow, tell your doctor or nurse. They can prescribe medication to make you more comfortable.

As side effects develop, your doctor may ask you to see your nurse every day. Your nurse will look at your mouth and spray your mouth, if needed.

☐ **Changes inside your nose**

You may have changes inside your nose, such as dryness, stuffiness, occasional minor nosebleeds, or all 3. To help manage these side effects, keep the inside of your nose moist. You can do this using saline nose spray, a humidifier, or both.

☐ **Ear pain**

You may have ear pain from the swelling caused by your treatments. If you do, tell your doctor or nurse. Ear pain can also be a sign of infection.

Don't try to clean or clear out your ears. Don't use cotton swabs (Q-tips®) inside your ears.

☐ **Voice changes (hoarseness)**

You may have hoarseness from the swelling caused by your treatments. Your voice may be more breathy, strained, rough, or high or low pitched. To help manage voice changes:

- Rest your voice as much as you can.
- Don't whisper. This can cause strain on your vocal cords.
- Use a humidifier.
- Gargle with one of the liquids listed in the "Changes to your mouth and throat" section.

□ **Difficulty eating and drinking**

Many side effects of radiation therapy can make it hard to eat and drink. This can cause weight loss, fatigue, and dehydration.

If your weight changes, the immobilization device used during your treatment may not fit correctly. This can make it harder to stay in the correct position for your treatments. Follow the guidelines below to help keep your weight from changing.

Change what you eat and drink based on your side effects **If you have pain or soreness in your mouth or throat or have trouble swallowing:**

- Eat soft, moist, bland foods. Take small bites and chew the food well.
- Use sauces and gravies to soften foods.
- Blend or purée your foods to change the texture.
- Avoid things that may irritate your mouth and throat, such as:
 - Very hot foods and liquids
 - Dry, hard, and coarse foods (such as chips, pretzels, crackers, and raw vegetables)
 - Spices (such as pepper, chili, horseradish, hot sauce, and curry)
 - Acidic or citrus foods and juices (such as orange, grapefruit, lemon, lime, pineapple, and tomato)
 - Alcohol
 - Tobacco

If your mouth is dry:

- Rinse your mouth before eating.
- Use gravies and sauces to prepare your food.
- Drink liquids while eating dry foods (such as rice or bread).

If you have appetite loss:

- Eat small, frequent meals throughout the day. If you never seem to feel hungry, set up a schedule to make sure you eat regularly.
- Choose foods and drinks that are high in calories and protein. Avoid foods and drinks that are filling but don't have many calories or protein.
- Eat your meals in a calm place. Take your time while eating. Eat with family or friends whenever possible.
- Bring snacks and drinks to your treatments. You can have them while you're waiting or while you're coming to and from your appointments each day.

If you have nausea:

- Tell your doctor or nurse. They may prescribe medication to help.
- Eat foods that are less likely to upset your stomach, such as:
 - Foods at room temperature or cooler.
 - Liquids that are cooled or chilled.
 - Dry, starchy foods (such as toast, soda crackers, melba toast, dry cereal, pretzels, and angel food cake).
 - Yogurt, sherbet, and clear liquids (such as apple juice, Jell-O®, and ginger ale).
 - Cold chicken or turkey, baked or broiled, with the skin removed.
 - Soft fruits and vegetables.
- Avoid foods and liquids that may make nausea worse, such as:
 - Hot foods with strong odors (smells).
 - Spicy, fatty, greasy, and fried foods.
 - Very sweet foods.
 - Acidic or citrus foods and juices (such as orange, grapefruit, pineapple, and tomato).

- Alcohol.

Get enough nutrition during your treatment

- Eat a well-balanced diet that's high in calories and protein. This will help you maintain your weight and feel better during treatment. Your dietitian will work with you to help you choose the best foods and liquids.
- Use liquid nutritional supplements. There are many different products and flavors you can try. Talk with your doctor, nurse, or dietitian about which one is best for you.
- If you want, you can take a daily multivitamin.
 - Read the multivitamin's label. Don't take more than the recommended daily amount of any vitamins or minerals.
 - Don't take any other dietary supplements (such as vitamins and herbal supplements) without talking with your doctor.

For information about eating during treatment, read the resource *Eating Well During Your Cancer Treatment*

(www.mskcc.org/pe/eating_cancer_treatment) or *Eating Guide for Puréed Food and Mechanical Soft Food Diets*

(www.mskcc.org/pe/pureed_mechanical_soft_diets).

For information about getting enough nutrition before, during, and after radiation therapy to the head and neck, watch the video *Nutrition Before and During Treatment for Head and Neck Cancer*

(www.mskcc.org/pe/hnnutrition_before_radiation).

□ Diarrhea

You may notice changes in your bowel movements during your treatment. These may include having more bowel movements and softer stools than usual. You may also develop diarrhea. These side effects can start during the first few weeks of your treatment and last until 2 to 4 weeks after you finish treatment.

Below are guidelines to help you manage diarrhea and other changes in

your bowel movements. Follow these guidelines until your bowel movements return to normal.

- Eat foods that are low in fiber, low in fat, and lactose-free. Your nurse will give you the resource , which has information about what foods to eat. When your bowel movements return to your normal pattern, you can slowly start adding foods from your usual diet.
- Try to drink 8 to 12 cups (2 to 3 quarts) of liquids throughout the day. This will help replace the water and salts you lose in your bowel movements.
 - Choose drinks such as Gatorade®, juices, and nectars. It's best to dilute them (add a little bit of water) first so they're not too strong. Non-fat soup broth and Pedialyte® are also good choices.
 - Limit drinks with caffeine (such as coffee, tea, and colas), because they can make you more dehydrated.
- Eat bananas and potatoes without the skin. They help replace important salts you may lose when you have diarrhea.
- Avoid any food or drink that makes your symptoms worse.
- Take medication for diarrhea, such as loperamide (Imodium®). You can buy it a pharmacy without a prescription. Your doctor may prescribe other medications.

☐ Cough or shortness of breath

You may develop a cough or shortness of breath anytime during or after your treatment. Call your doctor or nurse if you develop these symptoms or if they get worse.

Below are suggestions to help you feel more comfortable if you have a cough or shortness of breath.

- Don't smoke. Smoking irritates the lining of your airway and causes more coughing. If you'd like help to stop smoking, your nurse can refer you to our Tobacco Treatment Program. You can also reach the program by calling 212-610-0507.

- Use 1 or 2 pillows to prop up your upper body while you sleep.
- Use a humidifier while you sleep. Be sure to change the water and clean the humidifier often. Follow the manufacturer's instructions.
- Fatigue may make your shortness of breath worse. Follow the suggestions in the "Fatigue" section to help minimize your fatigue.
- Use cough medication as directed by your doctor.

Late side effects

You may have some side effects many months or years after you finish treatment. The exact side effects you may have depends on the area that was treated. Your nurse will mark the long-term side effects that you may have. They will also give you more information after you finish treatment.

- ☐ Changes in your thyroid hormone levels.
- ☐ A tingling feeling down your arms and legs when you bend your neck forward. This is called Lhermitte's Syndrome. It will go away on its own.
- ☐ Shingles. People who get shingles usually get it within 1 to 2 years after treatment.
- ☐ Radiation injury to your heart and the blood vessels in your heart. This is rare.
- ☐ Lung inflammation. This is called radiation pneumonitis. People who get radiation pneumonitis usually get it 1 to 3 months after finishing treatment.
- ☐ Changes in fertility and hormone production.
 - If your ovaries are in the treatment area, they may be affected. How they're affected and when they start to be affected depends on your specific treatment plan. You may be able to have an operation to move your ovaries out of the treatment area. If this is an option for you, your clinical team will give you more information.
 - If your testes are in the treatment area, they may be affected as soon as you start treatment.

- If you want to have children in the future, tell your clinical team.

After your treatment

Be sure to keep your follow-up appointments with your radiation oncologist. During these appointments, your radiation oncologist will evaluate your response to treatment. You may have blood tests, x-rays, and scans during these visits.

Before each follow-up appointment, write down your questions and concerns. Bring this and a list of all your medications to your appointment. If you're running low on any medication you need, tell your radiation oncologist before you run out. You can also call your radiation oncologist or nurse at any time if you have any questions or concerns.

When to contact your radiation oncologist or nurse

Contact your radiation oncologist or radiation nurse if you have:

- A fever of 100.4 °F (38 °C) or higher.
- Chills.
- Painful, peeling, blistering, moist, or weepy skin.
- Discomfort in the treated area.
- Any new or unusual symptoms.

Contact information

If you have questions or concerns, talk with a member of your radiation therapy team. You can reach them Monday through Friday from 9 a.m. to 5 p.m. at these numbers.

Radiation oncologist: _____

Phone number: _____

Radiation nurse: _____

Phone number: _____

After 5 p.m., during the weekend, and on holidays, call 212-639-2000.
Ask for the radiation oncologist on call.

Resources

MSK support services

Counseling Center

www.msk.org/counseling

646-888-0200

Many people find that counseling helps them. Our counseling center offers counseling for individuals, couples, families, and groups. We can also prescribe medications to help if you feel anxious or depressed. To make an appointment, ask your healthcare provider for a referral or call the number above.

Female Sexual Medicine & Women's Health Program

646-888-5076

Cancer and cancer treatments can affect your sexual health, fertility, or both. Our [Female Sexual Medicine & Women's Health Program](#) can help with sexual health problems, such as premature menopause or fertility issues. We can help before, during, or after your treatment. Call for more information or to make an appointment.

Integrative Medicine Service

www.msk.org/integrativemedicine

Our Integrative Medicine Service offers many services to complement (go along with) traditional medical care, including music therapy, mind/body therapies, dance and movement therapy, yoga, and touch therapy. To schedule an appointment for these services, call 646-449-1010.

You can also schedule a consultation with a healthcare provider in the Integrative Medicine Service. They will work with you to come up with a plan for creating a healthy lifestyle and managing side effects. To make an appointment, call 646-608-8550.

Male Sexual and Reproductive Medicine Program

646-888-6024

Cancer and cancer treatments can affect your sexual health, fertility, or both. Our [Male Sexual and Reproductive Medicine Program](#) can help with sexual health problems, such as erectile dysfunction (ED). We can help before, during, or after your treatment. Call for more information or to make an appointment.

Nutrition Services

www.msk.org/nutrition

212-639-7312

Our Nutrition Service offers nutritional counseling with one of our clinical dietitian-nutritionists. Your clinical dietitian-nutritionist will talk with you about your eating habits. They can also give advice on what to eat during and after treatment. To make an appointment, ask a member of your care team for a referral or call the number above.

Resources for Life After Cancer (RLAC) Program

646-888-8106

At MSK, care does not end after your treatment. The RLAC Program is for patients and their families who have finished treatment.

This program has many services. We offer seminars, workshops, support groups, and counseling on life after treatment. We can also help with insurance and employment issues.

Tobacco Treatment Program

www.msk.org/tobacco

212-610-0507

MSK has specialists who can help you quit smoking. For more information about our Tobacco Treatment Program, call 212-610-0507. You can also ask

your nurse about the program.

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.cancercare.org

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

275 7th Ave. (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 radiation oncologist

Before your appointment, it's helpful to write down questions you want to ask. Examples are listed below. Write down the answers during your appointment so you can review them later.

What kind of radiation therapy will I get?

How many radiation treatments will I get?

What side effects should I expect during my radiation therapy?

Will these side effects go away after I finish my radiation therapy?

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

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

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