



PATIENT & CAREGIVER EDUCATION

Stereotactic Body Radiation Therapy (SBRT) to the Chest

This information will help you get ready for stereotactic body radiation therapy (SBRT) at MSK. It will help you know 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.

Read through this resource at least once before you start radiation therapy. Use it as a reference in the days leading up to your treatments so that you can get ready as much as possible. Bring this resource to your simulation appointment and all future appointments with your radiation oncologist. You and your healthcare 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 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 can't.

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

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

About SBRT

With SBRT, imaging scans are used to guide the radiation. Radiation is only delivered to the target area, sparing the nearby healthy tissue. This means that higher doses (amounts) of radiation can be used during each treatment. You will have an imaging scan before each of your treatments to make sure the high doses of radiation are being given to the correct area.

SBRT is used to treat lung tumors that are small and only in your lungs. It can also be used to treat cancer that has spread to your lungs from another part of your body.

SBRT is usually given in 1 to 8 treatments.

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 us when you have side effects.
- Telling us if you're in pain.
- Caring for yourself at home by:
 - Quitting smoking if you smoke. MSK has specialists who can help. To learn more about our [Tobacco Treatment Program](#), call 212-610-0507. You can also ask your nurse for more information.
 - Caring for your skin based on our instructions
 - Drinking liquids based on our instructions.
 - Eating or avoiding the foods we suggest.
 - Staying around the same weight.

Simulation

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

- Your treatment site is mapped out.
- You get the correct dose of radiation.
- The radiation dose to nearby tissues is as small as possible.

During your simulation appointment:

- You and your radiation therapists will make a mold of your upper body. This will help you stay in the same position for your simulation and treatments.
- You will have a computed tomography (CT) scan. The images from the scan will be used to map your treatment.
- Your skin will be marked with little tattoo dots. These marks identify the area that will be treated.

Your simulation may take 2 to 4 hours or longer. The exact time depends on the specific treatment that your doctor has planned for you.

Getting ready for your simulation

Your nurse will tell you if you need to follow additional instructions to get ready for your simulation. 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, ask your doctor if medication may be helpful.
- Wear comfortable clothes that are easy to take off. You may need to

change into a hospital gown.

- Don't wear jewelry, powders, or lotions.

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

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 similar name may be having care on the same day as you.

You will be greeted by your radiation therapist. 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 the simulation to you. 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

For your simulation, you may need to change into a hospital gown. You should keep your shoes on.

Your radiation therapists will help you lie down on a table. They will do everything they can to ensure your comfort and privacy. Although the table will have a sheet on it, it's hard and has no cushion. If you haven't taken pain medication and think you may need it, tell your radiation therapists before your simulation starts. Also, the room is usually cool. If you feel uncomfortable at any time, tell your radiation therapists.

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 radiation therapists use these laser lights as a guide when they position you on the table. Don't look directly into the red beam, because it may damage your eyes.

There will be an intercom and a camera inside the simulation room. Although your radiation 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 radiation therapists speaking to each other as they work, and they will explain to you what they are doing.

Don't move once your simulation starts, because it may change your position. However, if you're uncomfortable or need help, tell your radiation therapists.

Positioning and molds

You will lie on your back during your simulation and SBRT treatments. A mold of your upper body will be made to make sure you're in the same position for each treatment. You will lie in this mold during your simulation and each of your treatments.

To make the mold, your radiation therapists will pour a warm fluid into a large plastic bag. They will seal the bag and place it on the table. You will lie on top of the bag on your back. Most patients will be positioned with their

arms raised above their head (see Figure 1). If you will be positioned with your arms down, your team will discuss this with you.



Figure 1. A body mold

The fluid will feel warm at first, but it will cool as it hardens. While it's cooling, your radiation therapist will tape the bag to your skin so that it takes the shape of your upper body and arms. This takes about 15 minutes.

CT scan

While you're lying in your position, you will have a CT scan of the area to be treated. The images from the scan will be used to map your treatment. They won't be used for diagnosis or to find tumors. If you need other imaging scans, your nurse will explain this to you.

The CT scan will take about 45 minutes. During the scan, 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 speak with them.

Skin markings (tattoos)

Your radiation therapists will use a felt-tipped marker to draw on your skin in treatment area. You will also need skin markings called tattoos. Your radiation therapists will use a sterile (clean) needle and a drop of ink to make the them. Each tattoo will feel like a pinprick. They will not be bigger than the head of a pin.

After they make the tattoos, your radiation therapists will take photos of you in your position. They will use the photos and tattoos to make sure you're in the right position for your radiation treatments.

You can wash off the felt markings after your simulation. **The tattoos are permanent. They will not wash off.** If you're concerned about having tattoos as part of your radiation therapy, talk with your radiation oncologist.

Additional imaging scans

You may need to have other imaging scans along with the CT scan to help plan your treatment. These scans will be done after your simulation. We will schedule these for you and bring you to the area where they will be done.

- **Magnetic resonance imaging (MRI) scan:** This scan will help us see your spine more clearly. It will be done in the Department of Radiation Oncology. You will lie in the body mold made during your simulation during this scan.
- **Positron emission tomography (PET) scan:** This scan will help us see the difference between normal and abnormal tissues in your body. It will be done in the Department of Radiation Oncology or the Molecular Imaging and Therapy Service (MITS). The MITS is sometimes called Nuclear Medicine. You will lie in the body mold made during your simulation during this scan.

After your simulation

At the end of your simulation, you may be given an appointment reminder with the date and time for your first treatment. If your appointment can't be made then, we will call you to tell you the date and time.

Scheduling your treatment

SBRT treatments can be given in several different schedules. Your schedule will be based on what your radiation oncologist recommends. It can be:

- A single treatment, usually given on the same day as your set-up procedure.
- Three to 8 treatments, usually given every other day.

You must come in every day that you're scheduled for treatment. Your treatment may not be as effective if you skip or miss appointments. If you

can't come in for treatment for any reason, 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.

If your treatment schedule needs to be changed, your radiation oncologist will tell you.

Planning your treatment

During the time between your simulation and the start of your treatment, your radiation oncologist will work with a team to plan your treatment. They will use the CT scan from your simulation appointment and any other imaging tests that were done 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 may take up to 2 weeks.

Vitamins and dietary supplements during radiation therapy

It's OK to take a multivitamin during your radiation therapy. Do not take more than the recommended daily allowance (RDA) of any vitamin or mineral.

Do not take any other dietary supplements without talking with a member of your care team. Vitamins, minerals, and herbal or botanical (plant-based) supplements are examples of dietary supplements.

During your treatment

Each day that you have treatment, check in at the reception desk and have a seat in the waiting room.

Set-up procedure and first treatment

Your set-up procedure and first treatment will be done on the same day. It will take about 60 minutes. If pain medication was helpful during your simulation, you may want to take it before this procedure.

When you arrive for your appointment, 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.

Your radiation therapists will bring you to the treatment room. They will help you lie in your mold on the treatment table. You will be positioned exactly as you were lying during your simulation.

You will have a low-dose CT scan before each of your treatments to make sure that your position and the area being treated is correct.

Once you're positioned correctly, your radiation therapists will leave the room, close the door, and start your treatment (see Figure 2). 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 1 hour, depending on your treatment plan. Most of this time will be spent putting you in the correct position.

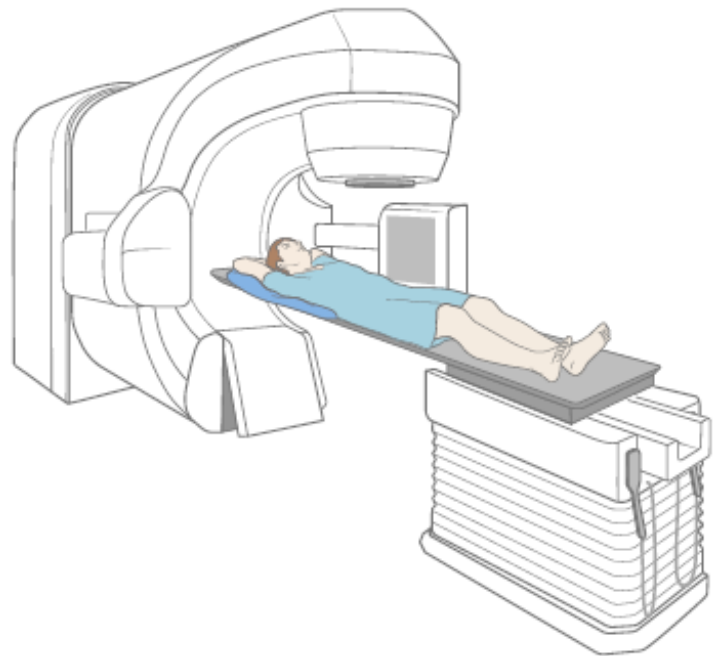


Figure 2. Getting the SBRT treatment

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

Breathe normally during the treatment, but don't move. However, if you're uncomfortable or need help, speak to 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 is safe for you to be around other people.

Status check visit

Your radiation oncologist and radiation nurse will visit you during your treatment to talk with you about any concerns, ask about any side effects you're having, and answer your questions. This visit will be before or after your treatment. You should plan on being at your appointment about 1 extra hour on this day.

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

Side effects of SBRT

Some people develop side effects from radiation therapy. The type and how severe they are depend on many things. These include the dose of radiation, the number of treatments, and your overall health.

With SBRT, only a small area of your body is exposed to radiation. This means that SBRT usually causes fewer side effects than other types of radiation therapy. About half of the people who have SBRT don't have any side effects from treatment.

Below are the most common side effects of radiation therapy. You may have all, some, or none of these. Depending on the area being treated, there may be other side effects that your doctor and nurse will discuss with you.

Cough or shortness of breath

You may develop a cough or shortness of breath after your treatment is completed. Call your doctor or nurse if you develop these symptoms or if they become 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. MSK has specialists who can help you quit smoking. For

more information about our Tobacco Treatment Program, call 212-610-0507, or your nurse can refer you.

- 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.

Skin and hair reactions

Most people getting SBRT don't have any skin changes during treatment. You may notice skin changes 4 to 6 weeks after you finish treatment.

Your skin may become pink or tanned on the front or back of your chest in the area being treated. Your nurse will teach you how to care for your skin during your treatment.

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. Don't use a washcloth, scrubbing cloth, or brush.
- The tattoo marks you received before your treatment 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 radiation therapists say it's okay.

- Don't use alcohol or alcohol pads on your skin in the area being treated.

Moisturize your skin often

Your nurse may suggest that you start using a moisturizer on the first day of your treatment. If you aren't likely to develop a skin reaction, you don't need to use a moisturizer unless your skin becomes dry or itchy. You can use any over-the-counter (not prescription) moisturizer as long as it's fragrance-free and doesn't contain lanolin.

Your nurse may also recommend using other products. Don't use more than 1 product at a time unless your nurse tells you to use more.

If you're 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. Don't wear tight clothing that will rub against your skin.
- Use only the moisturizers, creams, or lotions that your doctor or nurse recommends.
- 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, don't scratch it. Apply moisturizer. Ask your nurse for recommendations on how to relieve the itching.
- Don't shave in the area that's 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 don't have any 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're 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 feeling tired or weak, not wanting to do things, not being able to concentrate, or feeling slowed down. You may develop fatigue 4 to 6 weeks after you finish treatment. The fatigue can range from mild to severe. It may last for several 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 your treatments.
- 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're working and are feeling well, continue to do so. However, working less may help increase your energy.
- Plan your daily activities. Pick the 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 child'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're 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 and drink liquids that are high in protein and calories. Ask your nurse for the resource *Eating Well During 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 radiation oncologist or nurse for help with any other symptoms you may have.

Other side effects

You may have other side effects. Your radiation oncologist or nurse will discuss these with you.

Sexual health

You may have concerns about the effects of cancer and your treatment on 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 excellent resources that discuss 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 has a Sexual Health Program to help people address the impact of their disease and treatment on sexual health. You can meet with a specialist before, during, or after your treatment.

- Female Sexual Medicine and Women's Health Program: call 646-888-5076 for an appointment.
- Male Sexual and Reproductive Medicine Program: call 646-888-6024 for an appointment.

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 lead 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.

After your treatment

After you finish treatment, you will have regular follow-up appointments with your radiation oncologist. You will have a CT scan before each of these appointments. Your radiation oncologist will use the images from the CT scans to see how your body responds to the treatment.

If you have any questions or concerns, talk with your radiation oncologist or radiation nurse.

Late side effects

Radiation may cause permanent changes in the treatment area. You may develop a cough, shortness of breath, or rib pain months after your treatment. If you do, please tell your doctor. It's important to go to your follow-up appointment so your radiation oncologist and nurse can watch for these side effects.

Contact information

If you have questions or concerns, contact 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: _____

Outside those hours, you can leave a message or talk with another MSK provider. There is always a doctor or nurse on call. If you're not sure how to reach your healthcare provider, 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

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.

Stereotactic Body Radiation Therapy (SBRT) to the Chest - Last updated on April 22, 2023

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