PATIENT & CAREGIVER EDUCATION

Stereotactic Body Radiation Therapy (SBRT) to the Chest

This information will help you prepare for stereotactic body radiation therapy (SBRT) at Memorial Sloan Kettering (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 prepare 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**

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

- Arriving on time for all of your radiation therapy appointments.
- Asking questions and talking about your concerns. We have included a list of possible questions at the end of this
• Telling someone on your radiation therapy team when you have side effects.

• Telling your doctor or nurse if you’re 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 for your skin.

• Drinking liquids as instructed by your healthcare team.

• Eating the foods suggested by your healthcare team.

• Maintaining your 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.

**Preparing for your simulation**

Your nurse will tell you if you need to follow additional instructions to prepare 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.

**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.

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 marker to draw on your skin in the area to be treated. You can wash off the felt markings after your simulation.
You will also need permanent skin markings called tattoos. Your radiation 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 tattoos are permanent and won’t wash off.** If you’re concerned about receiving tattoos as part of your radiation treatment, talk with your radiation oncologist.

After the tattoos are made, your radiation 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.

**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 Nuclear Medicine Department. 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**
Many people ask about taking vitamins during treatment. You may take a daily multivitamin, if you wish. Check the multivitamin’s label to make sure it doesn’t contain more than the recommended daily allowance of any vitamin.

Don’t take any other vitamins or supplements without talking to your doctor. This includes both nutritional and herbal 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.

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. 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.

**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**

You 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 and After Your Cancer Treatment* ([www.mskcc.org/pe/eating_cancer_treatment](http://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](http://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.
The diagnosis and treatment of cancer can be a very stressful and overwhelming event.

You may feel:

- Anxious
- Afraid
- Alone
- Ambivalent
- Angry
- Depressed
- Helpless
- Frustrated
- Nervous
- Numb
- Worried

If you or someone you love has a serious illness, all of these kinds of feelings are expected. 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 on your body, or if you will continue to be sexually attractive. You may worry that the cancer will come back. 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. 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’s 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 listen to other people who have the 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, paying attention to each breath, or listening to a soothing music or sound. For some people, praying is another form 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 isn’t enough. We encourage you to speak 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 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.

**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.

**Nutrition Services**

212-639-7071

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-to-Patient Support Program**

212-639-5007

You may find it comforting to talk with a cancer survivor or caregiver who has been through a similar treatment. Through our Patient-to-Patient 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.

**Sexual Health Program**
Cancer and cancer treatments can have an impact on your sexual health. MSK’s Sexual Health Program can help you take action and address sexual health issues before, during, or after your treatment.

- Our Male Sexual and Reproductive Medicine Program helps male patients who are dealing with cancer-related sexual health challenges, including erectile dysfunction. For more information, or to make an appointment, call 646-888-6024.

- Our Female Sexual Medicine and Women’s Health Program helps female patients who are dealing with cancer-related sexual health challenges, including premature menopause and fertility issues. For more information, or to make an appointment, call 646-888-5076.

**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](http://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 Seventh Avenue (Between West 25\textsuperscript{th} & 26\textsuperscript{th} 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
Questions to Ask Your Doctor or Nurse

We recommend that you write down 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.

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?