Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

About Mapping Arteriogram and Selective Internal Radiation Therapy (SIRT) Treatment

This resource will help you get ready for your mapping arteriogram and selective internal radiation therapy (SIRT) treatment at MSK.

What is SIRT?

SIRT is a treatment that uses tiny radioactive beads to destroy liver tumors. SIRT is sometimes called radioembolization (RAY-dee-oh-EM-boh-lih-ZAY-shun), or Y90.

An interventional radiologist (IN-ter-VEN-shun-al RAY-dee-AH-loh-jist) will do your treatment. An interventional radiologist is also called an IR doctor. An IR doctor is a doctor with special training in using image-guided procedures to diagnose and treat disease.

Your IR doctor will inject the radioactive beads into the tumor through the arteries (blood vessels) in your liver. The beads give off radiation (invisible energy waves). These waves damage cancer cells. The radiation makes it hard for cancer cells to reproduce. The beads help limit how much radiation gets to the rest of your liver and body.

What is a mapping arteriogram procedure?

About a month before your SIRT treatment, you'll have a mapping arteriogram (ar-TEER-ee-oh-gram) procedure. This is an X-ray of your arteries. Your healthcare provider will use the images from this procedure to plan for your SIRT treatment.

The first part of the mapping procedure tells us which liver arteries bring blood to the liver tumors. It will also tell us if any arteries carry blood outside of your liver to other areas in your abdomen (belly). If we find these arteries, we'll block them. This also stops the beads from traveling to or harming your other organs.

The second part of the procedure is a Nuclear Medicine scan. During this scan, we will check for any flow of radiation from your liver to your lungs.

What to do before your procedure

Ask about your medicines

You may need to stop taking some of your usual medicines before your procedure. Or, you may need to take a different dose (amount) than usual. Talk with your healthcare provider about how to take your medicines before your procedure. Do not change how you take your medicines without talking with a healthcare provider.

This section lists some examples of medicines, but there are many others. **Make sure your care team knows all the prescription medicines, over-the-counter medicines, and dietary supplements you take.** A prescription medicine is one you can only get with a prescription from a healthcare provider. An over-the-counter medicine is one you can buy without a prescription.



It's very important to take your medicines and supplements the right way in the days before your procedure. If you don't, we may need to reschedule your procedure.

Diabetes medicines

If you take insulin or other diabetes medicines, talk with the healthcare provider doing your procedure and the healthcare provider who prescribes it. Ask them what to do before your procedure. You may need to stop taking it or take a different dose (amount) than usual. You may also need to follow different eating and drinking instructions before your procedure. Follow your healthcare provider's instructions.

Your care team will check your blood sugar levels before and during your procedure.

GLP-1 medicines for weight loss

It's important to tell your healthcare provider if you take a GLP-1 medicine. You must follow special eating and drinking instructions before your surgery or procedure. **It is very important to follow these instructions if you have taken a GLP-1 medicine at any time in the last 30 days. If you do not follow them, your surgery or procedure may be delayed or canceled.**

- **Start following a clear liquid diet at 6 a.m. the day before your surgery or procedure.** Do not eat any solid food. Read *Clear Liquid Diet* (www.mskcc.org/pe/clear-liquid-diet) to learn more.
- **Stop drinking 8 hours before your arrival time.** Do not eat or drink anything after this time, including clear liquids. You can have small sips of water with your medicines.

To learn more, read *Eating and Drinking Before Your Surgery or Procedure When Taking GLP-1 Medicines* (www.mskcc.org/pe/eat-drink-glp1).

Here are some examples of GLP-1 medicines. There are others, so be sure your care team knows all the medicines you take. Sometimes, these are prescribed to help manage diabetes or other conditions. Other times, they're prescribed for weight loss.

• Semaglutide (Wegovy®, Ozempic®, Rybelsus®) • Dulaglutide (Trulicity®)	• Tirzepatide (Zepbound®, Mounjaro®) • Liraglutide (Saxenda®, Victoza®)

Diuretics (water pills)

A diuretic is a medicine that helps control fluid buildup in your body. Diuretics are often prescribed to help treat hypertension (high blood pressure) or edema (swelling). They can also be prescribed to help treat certain heart or kidney problems.

You may be taking a diuretic. If so, ask the healthcare provider doing your procedure what to do before your procedure. You may need to stop taking it the day of your procedure.

Here are some examples of diuretics. There are others, so be sure your care team knows all the medicines you take.

• Bumetanide (Bumex®) • Furosemide (Lasix®)	• Hydrochlorothiazide (Microzide®) • Spironolactone (Aldactone®)

Reactions to contrast

Contrast is a special dye that makes it easier for your doctor to see differences in your internal organs. You'll get intravenous (IV) contrast as part of your procedure.

Some people can have an allergic reaction to contrast. Tell your doctor or nurse about any allergies you have or if you've had a reaction to contrast in the past.

Take devices off your skin

You may wear certain devices on your skin. Before your procedure, surgery, or scan, some device makers recommend you take off your:

- Continuous glucose monitor (CGM)
- Insulin pump

Talk with your healthcare provider about scheduling your appointment closer to the date you need to change your device. Make sure to bring an extra device with you to put on after your procedure, surgery, or scan.

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

Arrange for someone to take you home

You must have a responsible care partner take you home after your procedure. A responsible care partner is someone who can help you get home safely. They should be able to contact your care team if they have any concerns. Make sure to plan this before the day of your procedure.

If you don't have a responsible care partner to take you home, call one of the agencies below. They'll send someone to go home with you. There's a charge for this service, and you'll need to provide transportation. It's OK to use a taxi or car service, but you still need a responsible care partner with you.

Agencies in New York

VNS Health: 888-735-8913

Caring People: 877-227-4649

Agencies in New Jersey

Caring People: 877-227-4649

Tell us if you're sick

If you get sick (including having a fever, cold, sore throat, or flu) before your procedure, call your IR doctor. You can reach them Monday through Friday from 9 a.m. to 5 p.m.

After 5 p.m., during the weekend, and on holidays, call 212-639-2000. Ask for the Interventional Radiology fellow on call.

Note the time of your appointment

A staff member will call you 2 business days before your procedure. If your procedure is scheduled for a Monday, they'll call you on the Thursday before. They'll tell you what time to get to the hospital for your procedure. They will also remind you where to go.

If you don't get a call by noon (12 p.m.) on the business day before your procedure, call 646-677-7001. If you need to cancel your procedure for any reason, call the healthcare provider who scheduled it for you.

What to do the day before your procedure

Instructions for eating

Important: If you take a GLP-1 medicine, do not follow these instructions. Follow the instructions in *Eating and Drinking Before Your Surgery or Procedure When Taking GLP-1 Medicines* (www.mskcc.org/pe/eat-drink-glp1) instead.



Stop eating at midnight (12 a.m.) the night before your surgery or procedure. This includes hard candy and gum.

Your healthcare provider may have given you different instructions for when to stop eating. If so, follow their instructions. Some people need to fast (not eat) for longer before their surgery or procedure.

What to do the day of your procedure

Instructions for drinking

Important: If you take a GLP-1 medicine, do not follow these instructions. Follow the instructions in *Eating and Drinking Before Your Surgery or Procedure When Taking GLP-1 Medicines* (www.mskcc.org/pe/eat-drink-glp1) instead.

Between midnight (12 a.m.) and 2 hours before your arrival time, only drink the liquids on the list below. Do not eat or drink anything else. Stop drinking 2 hours before your arrival time.

- Water.
- Clear apple juice, clear grape juice, or clear cranberry juice.
- Gatorade or Powerade.
- Black coffee or plain tea. It's OK to add sugar. Do not add anything else.
  - Do not add any amount of any type of milk or creamer. This includes plant-based milks and creamers.
  - Do not add flavored syrup.

If you have diabetes, pay attention to the amount of sugar in your drinks. It's easier to control your blood sugar levels if you include sugar-free, low-sugar, or no added sugar versions of these drinks.

It's helpful to stay hydrated before surgeries and procedures, so drink if you're thirsty. Do not drink more than you need. You'll get intravenous (IV) fluids during your surgery or procedure.



Stop drinking 2 hours before your arrival time. This includes water.

Your healthcare provider may have given you different instructions for when to stop drinking. If so, follow their instructions.

Things to remember

- Take only the medicine your doctor told you to take the morning of your procedure. Take them with a few sips of water.
- Don't put on any cream (thick moisturizer) or petroleum jelly (Vaseline®). You can use deodorant and light moisturizers.
- Don't wear eye makeup.
- Remove any jewelry, including body piercings.
- Leave valuable items at home if you do not need them. This includes extra credit cards, extra cash, and jewelry.
- If you wear contact lenses, wear your glasses instead, if you can. If you don't have glasses, please bring a case for your contacts.

What to bring with you

- A list of the medicine you take at home.
- Medicine for breathing problems (such as inhalers), chest pain, or both.
- A case for your glasses or contacts, if you wear them.
- Your Health Care Proxy form, if you filled one out.
- Your CPAP or BiPAP machine if you use one. If you cannot bring yours with you, we will give you one to use while you're in the hospital.

What to expect when you arrive

Many staff members will ask you to say and spell your name and date of birth. This is for your safety. People with the same or similar names may be having procedures on the same day.

When it's time, we'll ask you to change into a hospital gown, robe, surgical head covering, and nonskid socks. It's important to take off your underwear when you get changed. This will keep the area sterile during your procedure.

Meet with a nurse

You'll meet with a nurse before your procedure. Tell them the dose of any medicines you took after midnight (12 a.m.) and the time you took them. Make sure to include prescription and over-the-counter medicine, patches, and creams.

Your nurse may place an intravenous (IV) line in one of your veins, usually in your arm or hand. If your nurse does not place the IV, your anesthesiologist will do it in the procedure room.

You may not need to see an anesthesiologist.

Going into the procedure room

When it's time for your procedure, you'll take off your eyeglasses, hearing aids, dentures, prosthetic devices, wig, and religious articles. You'll either walk into the procedure room or a staff member will bring you there on a stretcher.

Inside the procedure room

A member of the procedure room team will help you onto the procedure table. They may put compression boots on your lower legs. These gently inflate and deflate to help blood flow in your legs.

You'll be attached to equipment to monitor your heart rate, breathing, and blood pressure. You'll get oxygen through a thin tube that rests below your nose.

While lying on your back on the table, you'll get sedation through your IV. Sedation is medicine to make you sleepy and relaxed during your procedure.

After you're sedated, a member of your care team will clean your groin area or wrist. They'll shave the area if needed and cover it with sterile drapes.

Your IR doctor will inject local anesthesia into the area of your body where they'll be working. Local anesthesia is medicine that numbs an area of your body. They'll place a catheter through the artery in your groin or wrist. The catheter will go up to the arteries that bring blood to your liver. Then, they'll give you contrast dye through the catheter.

Your doctor will use fluoroscopy (X-ray) to take pictures of your blood vessels. The contrast dye helps them see your blood vessels in the images. They'll use these images to find the tumor in your liver.

When they reach the tumor, they'll inject radioactive particles into the area.

Once they're done, your doctor will remove the catheter. They'll seal the artery before you leave the procedure room.

After your procedure

After your mapping procedure, you'll go to a room in the Molecular Imaging and Therapy Service for a scan. This is also known as Nuclear Medicine. This scan will check if any radioactive imaging dye traveled to your lungs or anywhere else outside of your liver. This will help us decide whether it will be safe to do your SIRT treatment.

Your scan will take about 45 minutes.

Your IR doctor will tell you how long you'll need to rest and recover.

In the Post-Anesthesia Care Unit (PACU)

You'll be in the PACU when you wake up after your procedure. A nurse will keep track of your temperature, pulse, blood pressure, and oxygen levels. You may get oxygen through a tube resting below your nose or a mask over your nose and mouth. You may also have compression boots on your lower legs.

A nurse will ask you to lie flat with your right leg straight for 1 to 4 hours. You will not be able to get up during this time. If you need to use the bathroom, your care team will help you.

You'll be in the recovery area for up to 3 to 4 hours before you go home. You cannot eat or drink during this time.

Getting ready for your SIRT treatment

You'll have your SIRT treatment a few weeks after your mapping arteriogram procedure. The preparation (prep) for your SIRT treatment will be almost the same as the prep for your mapping arteriogram. Follow the instructions in the "What to do before your procedure" section of this resource.

You'll have a blood test before you have your SIRT treatment. This is to test your liver function. Your nurse will set this up for you before your treatment.

If you have cancer on both sides of your liver, you may get 2 SIRT treatments 6 weeks apart.

What to do 5 days before your treatment

Your nurse will prescribe medicine to help prevent stomach pain, if you aren't already taking any. Start taking this medicine 5 days before your SIRT treatment. You'll keep taking this medicine after your treatment.

What to do the day of your treatment

Your SIRT treatment will be almost the same as your mapping arteriogram procedure. Follow the same instructions for what to bring, where to park, and where to go.

What to expect when you arrive

Many staff members will ask you to say and spell your name and date of birth. This is for your safety. People with the same or similar names may be having procedures on the same day.

When it's time to change, you'll get a hospital gown, robe, surgical head covering, and nonskid socks to wear.

Meet with a nurse

You'll meet with a nurse before your procedure. Tell them the dose of any medicines you took after midnight (12 a.m.) and the time you took them. Make sure to include prescription and over-the-counter medicine, patches, and creams.

Your nurse may place an intravenous (IV) line in one of your veins, usually in your arm or hand. If your nurse does not place the IV, your anesthesiologist will do it in the procedure room.

You may not need to see an anesthesiologist.

Going into the procedure room

When it's time for your procedure, you'll take off your eyeglasses, hearing aids, dentures, prosthetic devices, wig, and religious articles. You'll either walk into the procedure room or a staff member will bring you there on a stretcher.

Inside the procedure room

A member of your care team will help you onto the procedure table. They may put compression boots on your lower legs. These gently inflate and deflate to help blood flow in your legs.

You'll be attached to equipment to monitor your heart rate, breathing, and blood pressure. You'll get oxygen through a thin tube that rests below your nose.

While lying on your back on the table, you'll get sedation medicine through your IV. After you're sedated, a member of your care team will clean your groin area or wrist. They'll shave the area if needed and cover it with sterile drapes.

Your IR doctor will inject local anesthesia into the area where they'll be working. They'll place a catheter through the artery in your groin or wrist. The catheter will go up to the arteries that bring blood to your liver. Then, they'll give you contrast dye through the catheter.

Your doctor will take images. Once they reach the tumor, they'll inject radioactive beads into your liver artery.

They'll remove the catheter and seal the artery before you leave the procedure room.

After your SIRT treatment

In the Post-Anesthesia Care Unit (PACU)

You'll be in the PACU when you wake up after your procedure. A nurse will be keeping track of your temperature, pulse, blood pressure, and oxygen levels. You may get oxygen through a tube resting below your nose or a mask over your nose and mouth. You may also have compression boots on your lower legs.

Once you're discharged from the PACU, you'll go to the Molecular Imaging and Therapy Service for a scan. In some cases, this may happen after your procedure, before you go to the PACU. The scan will take about 45 minutes.

Your recovery time will be about the same as for the mapping procedure.

Take your Medrol® dose pack

A Medrol dose pack is a low dose steroid. It is used to prevent fatigue (feeling more tired or weak than usual) caused by radiation. The Medrol dose pack makes fatigue easier to manage. It does not completely stop fatigue.

You'll need to take Medrol after your treatment. You'll start taking your Medrol dose pack before breakfast the day after your treatment procedure. Follow the instructions on the package for taking the medicine.

Do not take the Medrol dose pack if you have diabetes. This is because steroids can raise your blood glucose (blood sugar). Talk with your doctor to learn more.

Follow radiation safety guidelines

After your SIRT treatment, a small amount of radiation may be in your body. The radiation decreases over time and becomes inactive. Follow your healthcare provider's instructions and the guidelines below.

General guidelines

Do not get pregnant or father a child during treatment. Talk with your care team about breastfeeding and sexual activity (sex).

- If you need medical care within 1 week of treatment, tell the healthcare provider that you had radioactive treatment.
- You may get a card stating that you had radioactive treatment done. Keep this card with you. Some security systems can find radioactivity until it leaves your body.
- If you have any questions about radiation safety, call 212-639-7391 Monday through Friday from 9 a.m. to 5 p.m.

Distancing guidelines

It's safe to be around other people, including pregnant people and children. You may need to follow distancing guidelines around children or pregnant women for up to 6 days after your treatment. This will depend on your treatment plan.

Your healthcare provider will tell you how long to follow these guidelines. Follow their instructions.

- **Do not share a bed** with pregnant people or children.
- **Limit close contact** with pregnant people and children to **2 to 3 hours per day**. Stay at least **1 foot away**.
- **Limit holding a child on your lap** to **no more than 30 minutes per day**.

Body fluids

Body fluids may have small amounts of radiation after treatment. These fluids include:

- Urine
- Stool (poop)
- Blood
- Vomit
- Saliva
- Semen

You may need to follow certain guidelines when handling body fluids for up to 6 days after your treatment. This will depend on your treatment plan. Follow your healthcare provider's instructions.

- Sit on a toilet when you urinate (pee) to prevent splashing. Do not use a urinal.
- If you use a catheter bag, empty the bag into the toilet and flush.
- Wash hands thoroughly with soap for at least 20 seconds after using the bathroom or touching body fluids.
- Wear disposable gloves when cleaning spilled body fluids.
- Wipe body fluids with disposable wipes, paper towels, or toilet paper. Then flush or throw them away. Clean the area with household cleaner, such as soap and water or Clorox wipes.
- If you get body fluids on clothing, towels, or linens, wash them separately from other laundry.
- Use condoms during sexual activity (sex). Read *Sex and Your Cancer Treatment* (www.mskcc.org/pe/sex-cancer-treatment) learn more about sexual activity during treatment.
- Do not share dishes or utensils. Wash them with soap and water or run through the dishwasher before using them again.

Side effects of SIRT treatment

After leaving the hospital, some people get side effects from SIRT treatment, including:

- A fever of 100.4 °F (38 °C) or higher.
- Pain in your abdomen.
- Nausea.

When to call your healthcare provider

Call your healthcare provider when you have any of the following:

- A fever of 100.4 °F (38 °C) or higher.
- Pain that doesn't go away, especially around your abdomen or groin.
- Nausea or vomiting that is worse than it was before your mapping procedure or treatment.
- Any other symptoms that worry you.

If you have questions or concerns, contact your healthcare provider. A member of your care team will answer Monday through Friday from 9 a.m. to 5 p.m. 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.

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

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