Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

Image-guided Biopsy of Your Lung, Pleura, Mediastinum, or Adrenal Glands

This information will help you get ready for your image-guided biopsy of the lung, pleura (PLOOR-uh), mediastinum (MEE-dee-uh-STY-num), or adrenal glands.

Your healthcare provider recommended that you have a biopsy of your lungs, pleura, mediastinum, or adrenal glands (see Figure 1). A biopsy is a procedure to take a sample of tissue.

Your lungs are surrounded by a layer of tissue, called the pleura, that protect your lungs. The space between the pleura and your lung is called the pleural space.

- Your **pleura** is a layer of tissue that surrounds each lung.
- Your **mediastinum** is the area in the middle of your chest, between your lungs.
- Your **adrenal glands** are glands that sit on top of your kidneys, under your ribs. They make hormones that help control important body functions, such as your heart rate and blood pressure.

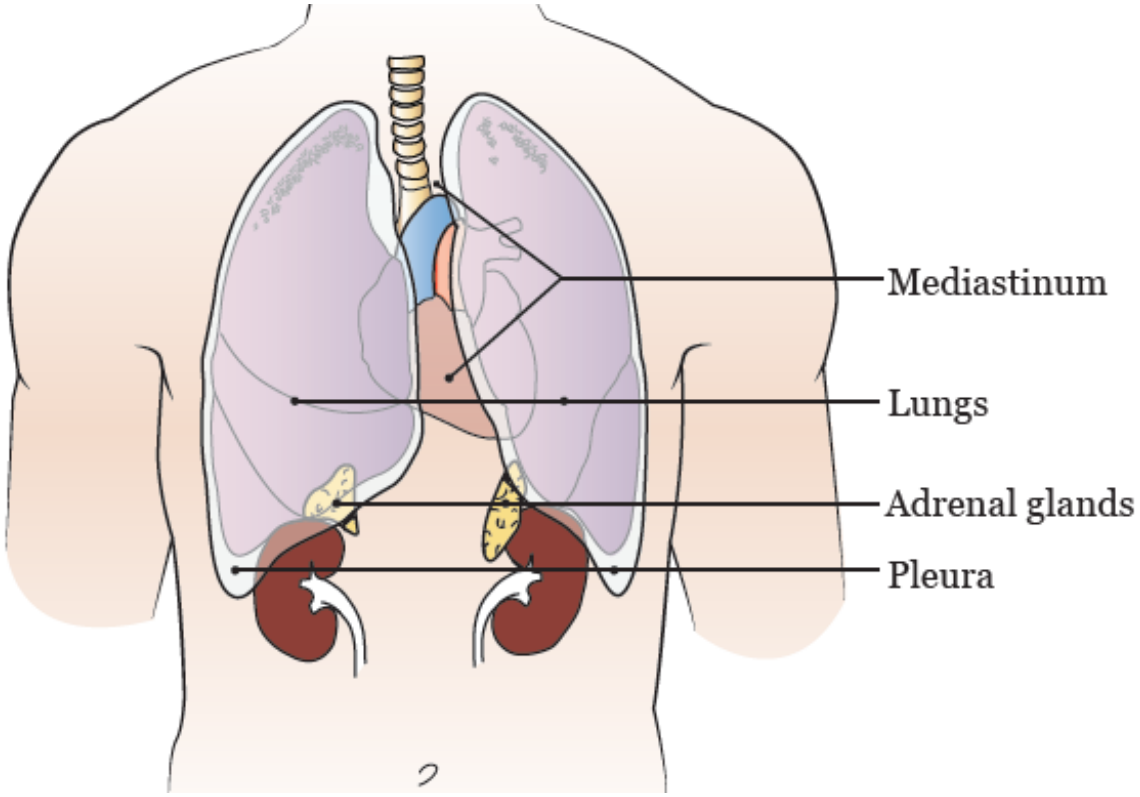


Figure 1. Your organs that may be biopsied

About your procedure

Your biopsy will be done by an interventional radiologist (also called an IR doctor). This is a doctor who has special training in doing image-guided procedures. To find the area to biopsy, they may use one of these imaging techniques:

- Magnetic resonance imaging (MRI)
- Computed tomography (CT)
- Ultrasound
- Fluoroscopy (real-time X-rays)

Once your IR doctor finds the area to biopsy, they will guide a thin needle into your skin. They will use the needle to take out a sample of tissue. The sample is then sent to a lab for testing.

Air leaking out of your lung

Sometimes, this procedure can cause air to leak out of your lung and collect in your pleural space. If this happens, it will prevent your lung from expanding fully. A small amount of air leakage happens to about 30 out of 100 people who have this procedure.

After your procedure, you'll have 2 chest X-rays. The X-rays will show if air leaked out of your lung and into your pleural space. If there's an air leak, a small chest tube (flexible tube) may be placed between your ribs, into your pleural space. The chest tube will suck the extra air out of your pleural space.

Most people will not have any symptoms from this procedure and will get better without treatment. Your care team will monitor you (watch you closely) after your procedure.

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.

Anticoagulants (blood thinners)

A blood thinner is a medicine that changes how your blood clots. Blood thinners are often prescribed to help prevent a heart attack, stroke, or other problems caused by blood clots.

If you take a blood thinner, ask your healthcare provider what to do before your procedure. They may tell you to stop taking it a certain number of days before your procedure. This will depend on the type of procedure you're having and the reason you're taking a blood thinner.

Here are some examples of blood thinners. There are others, so be sure your care team knows all the medicines you take. **Do not stop taking your blood thinner without talking with a member of your care team.**

- Apixaban (Eliquis®)
- Aspirin
- Celecoxib (Celebrex®)
- Cilostazol (Pletal®)
- Clopidogrel (Plavix®)
- Dabigatran (Pradaxa®)
- Dalteparin (Fragmin®)
- Dipyridamole (Persantine®)
- Edoxaban (Savaysa®)
- Enoxaparin (Lovenox®)
- Fondaparinux (Arixtra®)
- Heparin injection (shot)
- Meloxicam (Mobic®)
- Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil®, Motrin®) and naproxen (Aleve®)
- Pentoxifylline (Trental®)
- Prasugrel (Effient®)
- Rivaroxaban (Xarelto®)
- Sulfasalazine (Azulfidine®, Sulfazine®)
- Ticagrelor (Brilinta®)
- Tinzaparin (Innohep®)
- Warfarin (Jantoven®, Coumadin®)

Other medicines and supplements can change how your blood clots. Examples include vitamin E, fish oil, and nonsteroidal anti-inflammatory drugs (NSAIDs). Read *How To Check if a Medicine or Supplement Has Aspirin, Other NSAIDs, Vitamin E, or Fish Oil* (www.mskcc.org/pe/check-med-supplement). It will help you know which medicines and supplements you may need to avoid before your procedure.

Diabetes medicines

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

Your care team will check your blood sugar levels during your surgery or 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 do not follow them, your surgery or procedure may be delayed or canceled.**

- **Follow a clear liquid diet 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®)

Stop taking nonsteroidal anti-inflammatory drugs (NSAIDs)

NSAIDs, such as ibuprofen (Advil® and Motrin®) and naproxen (Aleve®), can cause bleeding. Stop taking them 1 day (24 hours) before your procedure. If your healthcare provider gives you other instructions, follow those instead.

To learn more, read *How To Check if a Medicine or Supplement Has Aspirin, Other NSAIDs, Vitamin E, or Fish Oil* (www.mskcc.org/pe/check-med-supplement).

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.

Ask about air travel

After your biopsy, there is a risk of air leaking out of your lung and into your pleural space. If this happens, you will not be able to travel by plane until the air leak closes. Your healthcare provider will tell you when it's safe to fly.

If you'll be flying within 2 weeks of your biopsy, talk with the healthcare provider doing your procedure.

Arrange for someone to take you home and stay with you overnight

You must have a responsible adult care partner take you home after your procedure and stay with you overnight. Make sure to plan this before the day of your procedure. If you don't have someone to do this, tell your care team before the day of your procedure.

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

Use this area to write down the date, time, and location of your procedure:

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

- Follow your healthcare provider's instructions for taking your medicines the morning of your procedure. It's OK to take them with a few sips of water.
- If you're taking pain medicine, take it before your procedure with a few sips of water. You can take acetaminophen (Tylenol®). Do not take any NSAIDs, such as ibuprofen (Advil® and Motrin®) and naproxen (Aleve®).
- Do not put on body cream, lotion, or petroleum jelly (Vaseline®). You can use deodorant and facial moisturizers. Do not wear eye makeup.
- Do not wear any metal objects. Take off all jewelry, including body piercings. The tools used during your procedure can cause burns if they touch metal.
- Leave valuable items at home.
- If you wear contact lenses, wear your eyeglasses instead, if you can. If you do not have eyeglasses, bring a case for your contacts.
- Wear something comfortable and loose-fitting.
- When it's time for your procedure, you must remove any hearing aids, dentures, prosthetic devices, wigs, and religious articles.

What to bring

- A list of all the medicines you take at home, including prescription and over-the-counter medicines, patches, and creams.
- Medicines for breathing problems (such as your inhaler), medicines for chest pain, or both.
- Your cell phone and charger.
- Only the money you may want for small purchases, such as a newspaper.
- A case for your personal items, if you have any. Eyeglasses or contacts, hearing aids, dentures, prosthetic devices, wigs, and religious articles are examples of personal items.
- Your Health Care Proxy form and other advance directives, if you filled them

out.

What to expect when you arrive

Many doctors, nurses, and other 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.

Once you're brought to the presurgical area, you'll get a hospital gown and nonskid socks to wear. You'll take off your eyeglasses, hearing aids, dentures, prosthetic devices, wig, and religious articles.

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 medicines, patches, and creams.

Your nurse will place an IV line into a vein in your arm or hand, unless you already have:

- A central venous catheter (CVC) or any other type of CVC.
- A peripherally inserted central catheter (PICC).
- An implanted port (also called a mediport or Port-A-Cath).

Before your procedure, your care team will talk with you about the kind of anesthesia you'll get. It will be given through the IV line, CVC, PICC line, or implanted port. You may also get fluids through the same line before your procedure.

Meet with a doctor

Before your procedure, you will meet the IR doctor who will do the biopsy. They will explain the procedure to you and answer your questions. You'll be asked to sign a consent form, which says you agree to the procedure and understand the risks.

During your procedure

When it's time for your procedure, you'll be brought into the procedure room and helped onto the table. A member of your care team will help you get into position for the procedure.

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

Then, you'll get sedation. This is a kind of anesthesia that will make you sleepy and relaxed.

A member of your care team will clean the skin in the area where your doctor will be working. They will cover the area with a sterile (clean) drape.

You'll get an injection (shot) of a local anesthetic to numb the area. Once the area is numb, your doctor will guide the biopsy needle into your skin. They will check the position of the needle with an MRI, CT, ultrasound, or fluoroscopy. When the needle is in the right place, they will use it to take out a sample of tissue.

Your doctor will check the sample to make sure there is enough tissue. If there is enough tissue, they will take out the needle. If there isn't enough tissue, they will use the needle to take out another sample. The sample will then be sent to a lab for testing.

When the procedure is done, your doctor will clean the biopsy site and cover it with a dressing (bandage).

The procedure will take less than 1 hour.

Hemoptysis

Hemoptysis (hee-MOP-tih-sis) is when you cough up blood from your lungs. It is caused by bleeding around your biopsy site. If hemoptysis happens during your biopsy, it can make it hard for your doctor to continue with the procedure.

You may be asked to lie on your side if this happens.

After your procedure

In the hospital

After your procedure, you'll be brought to the Post-Anesthesia Care Unit (PACU). You'll have at least 2 chest X-rays to check if air leaked out of your lung and into your pleural space. The first X-ray is done right away. The second X-ray will be done about 1 to 2 hours later.

While you're in the PACU, tell your nurse if you have:

- Shortness of breath or trouble breathing.
- Pain or discomfort.
- Any symptoms that are worrying you.

During this time, you may be given oxygen through your nose. You will not be allowed to eat right after your procedure.

After 1 to 2 hours, you'll have your second chest X-ray. If it's normal, you'll be able to go home. You will need a responsible care partner to take you home and spend the night with you.

If your X-ray shows an air leak, your doctor will decide if you need more X-rays to monitor your lung. You may need to have a small chest tube placed to allow your lung to re-expand. You may be admitted to the hospital while your lung re-expands. This happens to about 8 out of 100 people who have this procedure.

If you use a CPAP or BiPAP machine at home, tell your care team before you're discharged (released). Your IR doctor will talk with you and tell you when you can start using it again.

At home

- You must have a responsible care partner stay with you until the next morning. This is for your safety.
- You can go back to your normal diet when you leave the hospital.
- You can shower or bathe the day after your biopsy. Take off the bandage after your shower or bath.
    - Place a new bandage (Band Aid®) over your biopsy site if there is any drainage. Change the bandage once a day if you still have drainage. Once a scab forms over the site, you do not need to wear a bandage anymore.
- You can go back to your normal activities the day after your biopsy.
- If no air leaked out of your lung, it's safe to travel by plane 2 days after your biopsy. If you have an air leak, you may need to delay flying until your doctor tells you it's safe.
- Call the doctor who scheduled your biopsy a few days after your procedure to get the results.
    - If you have a MSK MyChart account, you'll be able to see your results as soon as they're available. You may see them before your doctor does. While some results are easy to understand, others may be confusing or worrying. You can choose to look at your results, but we recommend waiting until you talk with your doctor. They can explain what your results mean.

Call 911 or go to the nearest emergency room if:

- You become short of breath or have chest pain. This may mean you have an air leak that's getting worse. This is a serious condition. Tell the paramedic or healthcare provider that you had a needle biopsy of your lung, pleura, mediastinum, or adrenal glands.

When to call your healthcare provider

Call your healthcare provider if:

- You have a fever of 100.4 °F (38 °C) or higher.
- You have pain at your biopsy site that's getting worse.
- You have swelling at your biopsy site.
- You are coughing up bright red blood.

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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