Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

About Your Knee Embolization

This information will help you get ready for your knee embolization (EM-boh-lih-ZAY-shun). It will also explain what to expect after your procedure.

Knee embolization is also called geniculate artery embolization or genicular artery embolization (GAE).

What is knee embolization?

Knee embolization is a procedure to plug some of the arteries in the lining of your knee joint. Arteries are blood vessels that carry blood from the heart to an area of your body.

Knee embolization is a treatment for knee pain caused by too much blood flow to your joint. Too much blood flow can make the lining of your knees swell and hurt. Blocking some of the blood flow helps lessen the swelling and pain.

About osteoarthritis

Knee embolization is most often done to treat knee pain from osteoarthritis (OS-tee-oh-ar-THRY-tis). Cartilage is the tough, flexible tissue that lines your joints. With osteoarthritis, your joint's cartilage wears down. This can lead to more blood flow and fluid in the area, causing pain and swelling.

Osteoarthritis is common in the knees. It can also get worse as you age. Pain from osteoarthritis can get in the way of your daily activities and affect your quality of life.

About the knee embolization procedure

An interventional radiologist (also called an IR doctor) will do your knee embolization. IR doctors have special training in doing image-guided procedures. They use pictures from X-rays, CT scans, or ultrasound to help them during the procedure.

Your IR doctor will thread a catheter (a thin, flexible tube) into the small arteries in your knee lining. They'll use special imaging scans to guide the tube to the right place. Then, they'll inject (put) very small particles through the tube into the arteries to block them. The particles are about the size of grains of sand.

You'll get moderate sedation for your procedure. This is medicine to make you sleepy. You may not remember much of what happens, but you can still respond if someone talks to you. You'll go home the same day of your procedure.

Some people feel pain relief within a few hours of their procedure. Others feel pain relief in 1 to 2 weeks. Most people notice a big difference in their pain within 1 month of their procedure. Often, the pain is better for months to years.

You can only have this done to one knee at a time. You have to recover from the first procedure before the next one.

What to do before your knee embolization

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).

Reactions to contrast dye

Contrast is a special dye that makes it easier for your doctor to see differences in your internal organs. Internal organs are the organs inside of your body.

Some people can have an allergic reaction to contrast. Most reactions are mild, such as hives.

Some people can have very rare but more serious reactions, such as anaphylaxis

(A-nuh-fih-LAK-sis). This is a bad allergic reaction that can cause hypotension (a sudden drop in blood pressure) or trouble breathing.

Anaphylaxis is treated with an epinephrine (eh-pih-NEH-frin) autoinjector, commonly known as an EpiPen®. This is an injection (shot) of epinephrine (adrenaline) into a muscle.

Tell your healthcare provider if you have had an allergic reaction to contrast dye in the past. You may need to take medicine before your procedure to help with the allergy.

If you're breastfeeding, you can keep breastfeeding after your procedure with contrast. Talk with your care team if you have questions about contrast and breastfeeding. They'll arrange for a healthcare provider from the lactation team to contact you.

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 knee embolization

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 knee embolization

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.

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.
- Your breathing device for sleep apnea (such as your CPAP machine), if you use one. If you cannot bring it, 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.

Once you're brought to the presurgical area, we'll give you 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 intravenous (IV) line into a vein in your arm or hand, unless you already have:

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

You will get moderate sedation during your procedure. You'll get it through your IV line, CVC, PICC line, or implanted port. You may also get fluids through the same line before your procedure.

Meet with an anesthesiologist

You will also meet with an anesthesiologist (A-nes-THEE-zee-AH-loh-jist). An anesthesiologist is a doctor with special training in anesthesia. They will give you sedation during your procedure. They will also:

- Review your medical history with you.
- Ask if you've had any problems with anesthesia in the past. This includes nausea (feeling like you're going to throw up) or pain.
- Talk with you about your comfort and safety during your procedure.
- Talk with you about the kind of anesthesia you'll get.
- Answer questions you have about anesthesia.

Meet with an IR doctor

You will meet the IR doctor who will do your knee embolization before your procedure. They'll explain the procedure and answer your questions. They'll ask you to sign a consent form, which says you agree to the procedure and

understand the risks.

What to expect during your procedure

When it's time for your procedure, a staff member will bring you into the procedure room and help you onto the table.

A member of your care team may put compression boots on your lower legs. These gently inflate and deflate to help blood flow in your legs. They'll also attach you to equipment to keep track of your heart, breathing, and blood pressure. You'll also get oxygen through a thin tube that rests below your nose.

Then, your anesthesiologist will give you sedation and you'll feel sleepy.

After you're asleep

A member of your care team will clean the skin where your IR doctor will put the catheter into your body. This area is called the insertion site. The insertion site will be in your groin (the area between your belly and thigh). They will also shave the insertion site, if needed.

Next, you'll get an injection (shot) of a local anesthetic to numb the insertion site. Your IR doctor will put a needle into an artery in the numbed area. They will put the catheter through the needle, into the artery.

If you're getting contrast dye, they'll put the contrast into your artery through the catheter. The contrast dye will help them see your blood vessels on the imaging scans.

Your IR doctor will guide the catheter through the artery. They'll reach the small arteries that supply blood to your knee lining. They'll use live imaging scans to guide the catheter to the right place.

Once the catheter is in the right spot, your IR doctor will slowly inject the tiny particles into the catheter. The particles will move through the catheter into the artery to block some of the blood flow.

Many people have more than one artery blocked during their knee embolization. If so, your IR doctor will move the catheter to another artery in

your knee lining. The'll repeat the same steps.

When the procedure is done, your IR doctor will take out the catheter. A member of your care team will clean the insertion site. They will cover it with a small dressing (bandage), such as a Band-Aid®.

A knee embolization takes about 1 to 2 hours.

What to expect after your procedure

After your procedure, you'll be brought to the Post-Anesthesia Care Unit (PACU). While you're in the PACU, tell your nurse if your dressing feels wet or warm.

Your nurse will monitor (keep track of) how you are feeling after your procedure. They will also monitor your insertion site for any bleeding.

We will monitor you in the PACU for up to 2 hours before you are discharged home with your care partner.

Most people feel only minor discomfort in the groin area, where we put the needle into your body. We will send prescriptions to your pharmacy for pain medicines in case you need them.

You will be scheduled for a follow-up appointment with your IR doctor about 2 weeks after your procedure.

What to do at home after your knee embolization

- Avoid lifting anything heavier than 10 pounds (4.5 kilograms) for 3 days
- Do not shower or bathe for the first 24 hours (1 day) after your procedure. You can shower or bathe like usual after that.
- You can remove the bandage the day after your procedure.
- Do not exercise for 1 week after your procedure.
- You can go back to work the day after your procedure for some jobs. It's OK

to return if you do not do physical activity at work that takes lots of effort and energy. It is OK to do desk work. Do not do any work that requires lifting or heavy activity for 1 week.

When to call your healthcare provider

Call your healthcare provider if you have:

- A fever of 100.4° F (38° C) or higher.
- Pain, nausea (a feeling like you're going to throw up), or vomiting (throwing up) that will not stop.
- Pain, nausea, or vomiting that's worse than it was before your procedure.
- Redness, swelling, or bleeding around the insertion site.
- Any symptoms that are worrying 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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