

## Uterine Fibroid Embolization (UFE)

Uterine fibroid embolization (UFE) is a minimally invasive procedure used to treat fibroid tumors of the uterus which can cause heavy menstrual bleeding, pain, and pressure on the bladder or bowel. It uses a form of real-time x-ray called fluoroscopy to guide the delivery of embolic agents to the uterus and fibroids. These agents block the arteries that provide blood to the fibroids and cause them to shrink. Studies have shown that nearly 90 percent of women who undergo UFE experience significant or complete resolution of their fibroid-related symptoms.

Your doctor will likely first evaluate your condition using diagnostic imaging. Tell your doctor if there's a possibility you are pregnant and discuss any recent illnesses, medical conditions, allergies and medications you're taking, including herbal supplements and aspirin. You may be advised to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs), or blood thinners several days prior to your procedure. You also may be told not to eat or drink anything after midnight before your procedure. Plan to stay at the hospital overnight. Leave jewelry at home and wear loose, comfortable clothing. You will be asked to wear a gown.



## What is Uterine Fibroid Embolization (UFE)?

Uterine fibroid embolization (UFE) is a minimally invasive treatment for fibroid tumors of the uterus. The procedure is also sometimes referred to as Uterine Artery Embolization (UAE), but this term is less specific and, as will be discussed below, UAE is used for conditions other than fibroids.

Fibroid tumors, also known as myomas, are benign tumors that arise from the muscular wall of the uterus. It is extremely rare for them to turn cancerous. More commonly, they cause heavy menstrual bleeding, pain in the pelvic region, and pressure on the bladder or bowel.

In a UFE procedure, physicians use an x-ray camera called a fluoroscope to guide the delivery of small particles to the uterus and fibroids. The small particles are injected through a thin, flexible tube called a catheter. These block the arteries that provide blood flow, causing the fibroids to shrink. Nearly 90 percent of women with fibroids experience relief of their symptoms.

Because the effect of uterine fibroid embolization on fertility is not fully understood, UFE is typically offered to women who no longer wish to become pregnant or who want or need to avoid having a hysterectomy, which is the operation to remove the uterus.

## What are some common uses of the UAE procedure?

Uterine artery embolization has been used for decades to stop severe pelvic bleeding caused by:

- trauma
- malignant gynecological tumors
- hemorrhage after childbirth

Uterine fibroid embolization is a specialized form of UAE for treating symptomatic fibroids.

## How should I prepare?

Imaging of the uterus by magnetic resonance imaging (MRI) or ultrasound is performed prior to the procedure to determine if fibroid tumors are the cause of your symptoms and to fully assess the size, number and location of the fibroids.

Occasionally, your gynecologist may want to take a direct look at the uterus by performing a laparoscopy. If you are bleeding heavily in between periods, a biopsy of the endometrium (the inner lining of the uterus) may be performed to rule out cancer. *See the Abnormal Vaginal Bleeding page (<http://www.radiologyinfo.org/en/info/vaginalbleeding>) for more information.*

Tell your doctor about all the medications you take, including herbal supplements. List any allergies, especially to local anesthetic, general anesthesia or to contrast materials. Your doctor may tell you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners before your procedure.

Tell your doctor about recent illnesses or other medical conditions.

Women should always inform their physician and x-ray technologist if there is any possibility that they are pregnant. Many imaging tests are not performed during pregnancy so as not to expose the fetus to radiation. If an x-ray is necessary, precautions will be taken to minimize radiation exposure to the baby. *See the Safety page (<http://www.radiologyinfo.org/en/info/safety-radiation>) for more information about pregnancy and x-rays.*

You will likely be instructed not to eat or drink anything after midnight before your procedure. Your doctor will tell you which medications you may take in the morning.

You should plan to stay overnight at the hospital following your procedure.

You will be given a gown to wear during the procedure.

## What does the equipment look like?

In this procedure, x-ray equipment, a catheter and a variety of medications and synthetic materials, called embolic agents, are used.

The equipment typically used for this examination consists of a radiographic table, one or two x-ray tubes and a television-like monitor that is located in the examining room. Fluoroscopy, which converts x-rays into video images, is used to watch and guide progress of the procedure. The video is produced by the x-ray machine and a detector that is suspended over a table on which the patient lies.

A catheter is a long, thin plastic tube that is considerably smaller than a "pencil lead", or approximately 1/8 inch in diameter.

Several different types of embolic agents are used for uterine fibroid embolization. They act similarly, but differ in their composition:

- polyvinyl alcohol, a plastic material resembling coarse sand
- Gelfoam™, a gelatin sponge material
- microspheres, polyacrylamide spheres with a gelatin coating

All of these have been shown to be safe and effective for uterine fibroid embolization.

Other equipment that may be used during the procedure includes an intravenous line (IV), ultrasound machine and devices that monitor your heart beat and blood pressure.

## How does the procedure work?

The procedure involves inserting a catheter through the groin, maneuvering it through the uterine artery, and injecting the embolic agent into the arteries that supply blood to the uterus and fibroids. As the fibroids die and begin to shrink, the uterus fully recovers.

## How is the procedure performed?

UFE is an image-guided, minimally invasive procedure that uses a high-definition x-ray camera to guide a trained specialist, most commonly an interventional radiologist to introduce a catheter into the uterine arteries to deliver the particles. The procedure is typically performed in a cath lab or occasionally in the operating room.

You will be positioned on the procedure table.

You may be connected to monitors that track your heart rate, blood pressure, oxygen level and pulse.

A nurse or technologist will insert an intravenous (IV) line into a vein in your hand or arm to administer a sedative. This procedure may use moderate sedation. It does not require a breathing tube. However, some patients may require general anesthesia.

The area of your body where the catheter is to be inserted will be sterilized and covered with a surgical drape.

Your physician will numb the area with a local anesthetic. This may briefly burn or sting before the area becomes numb.

A very small skin incision is made at the site.

Using x-ray guidance, a catheter is inserted into your femoral artery, which is located in the groin area. A contrast material provides a roadmap for the catheter as it is maneuvered into your uterine arteries. The embolic agent is released into both the right and left uterine arteries by repositioning the same catheter that was originally inserted. Only one small skin puncture is required for the entire procedure. *See the Catheter Embolization page (<http://www.radiologyinfo.org/en/info/cathembol>) for more information.*

When the procedure is complete, the catheter is removed and pressure is applied to stop any bleeding. Sometimes, your doctor may use a closure device to seal the small hole in the artery. This will allow you to move around more quickly. No stitches are visible on the skin. The tiny opening in the skin is covered with a dressing.

Your IV line is removed before you go home.

You will most likely remain in the hospital overnight so that you may receive pain medications and be observed.

This procedure is usually completed within 90 minutes.

## Who interprets the results and how do I get them?

The interventional radiologist will discuss the results with you and coordinate follow-up care with your primary care physician or gynecologist.

## What will I experience during and after the procedure?

Devices to monitor your heart rate and blood pressure will be attached to your body.

You will feel a slight pinch when the needle is inserted into your vein for the IV line and when the local anesthetic is injected. Most of the sensation is at the skin incision site. This is numbed using local anesthetic. You may feel pressure when the catheter is inserted into the vein or artery. However, you will not feel serious discomfort.

If the procedure is done with sedation, the intravenous (IV) sedative will make you feel relaxed, sleepy and comfortable for the procedure. You may or may not remain awake, depending on how deeply you are sedated.

You may feel slight pressure when the catheter is inserted, but no serious discomfort.

As the contrast material passes through your body, you may feel warm. This will quickly pass.

While you are in the hospital, your pain will be well-controlled with a narcotic.

After staying overnight at the hospital, you should be able to return home the day after the procedure.

You may experience pelvic cramps for several days after your UFE, and possibly mild nausea and low-grade fever as well. The cramps are most severe during the first 24 hours after the procedure and will improve rapidly over the next several days. While in the hospital, the discomfort usually is well-controlled with pain medication delivered through your IV.

Once you return home, you will be given prescriptions for pain and other medications to be taken by mouth. You should be able to return to your normal activities within one to two weeks after UFE.

Afterward, it is common for menstrual bleeding to be much less during the first cycle and gradually increase to a new level that is usually greatly improved as compared to before the procedure. Occasionally you may miss a cycle or two or even rarely stop having periods altogether. Relief of bulk-related symptoms usually takes two to three weeks to be noticeable and over a period of months the fibroids to continue to shrink and soften. By six months, the process has usually finished and the amount of symptom improvement will stabilize.

## What are the benefits vs. risks?

### Benefits

- Uterine fibroid embolization, done under local anesthesia, is much less invasive than open or laparoscopic surgery to remove individual uterine fibroids (myomectomy) or the whole uterus (hysterectomy).
- No surgical incision is necessary—only a small nick in the skin that does not need stitches.
- Patients ordinarily can resume their usual activities much earlier than if they had surgery to treat their fibroids.
- As compared to surgery, general anesthesia is not required and the recovery time is much shorter, with virtually no blood loss.
- Follow-up studies have shown that nearly 90 percent of women who have their fibroids treated by uterine fibroid embolization experience either significant or complete resolution of their fibroid-related symptoms. This is true both for women who have heavy bleeding as well as those who have bulk-related symptoms including urinary frequency, pelvic pain or pressure. On average, fibroids will shrink to half their original volume, which amounts to about a 20 percent reduction in their diameter. More importantly, they soften after embolization and no longer exert pressure on the adjacent pelvic organs.
- Follow-up studies over several years have shown that it is rare for treated fibroids to regrow or for new fibroids to develop after uterine fibroid embolization. This is because all fibroids present in the uterus, even early-stage nodules that may be too small to see on imaging exams, are treated during the procedure. Uterine fibroid embolization is a more permanent solution than the option of hormonal therapy, because when hormonal treatment is stopped the fibroid tumors usually grow back. Regrowth also has been a problem with laser treatment of uterine fibroids.

## Risks

- Any procedure that places a catheter inside a blood vessel carries certain risks. These risks include damage to the blood vessel, bruising or bleeding at the puncture site, and infection. The doctor will take precautions to mitigate these risks.
- When performed by an experienced interventional radiologist, the chance of any of these events occurring during uterine fibroid embolization is less than one percent.
- Any procedure where the skin is penetrated carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- There is always a chance that an embolic agent can lodge in the wrong place and deprive normal tissue of its oxygen supply.
- An occasional patient may have an allergic reaction to the x-ray contrast material used during uterine fibroid embolization. These episodes range from mild itching to severe reactions that can affect a woman's breathing or blood pressure. Women undergoing UFE are carefully monitored by a physician and a nurse during the procedure, so that any allergic reaction can be detected immediately and addressed.
- Approximately two to three percent of women will pass small pieces of fibroid tissue after uterine fibroid embolization. This occurs when fibroids located inside the uterine cavity detach after embolization. Women with this problem may require a procedure called D & C (dilatation and curettage) to be certain that all the material is removed to prevent bleeding or infection from developing.
- In the majority of women who undergo uterine fibroid embolization, normal menstrual cycles resume after the procedure. However, in approximately one percent to five percent of women, menopause occurs after uterine fibroid embolization. This appears to occur more commonly in women who are older than 45 years.
- Although the goal of uterine fibroid embolization is to cure fibroid-related symptoms without surgery, some women may eventually need to have a hysterectomy because of infection or persistent symptoms. The likelihood of requiring hysterectomy after uterine fibroid embolization depends on how much time elapses until menopause. The younger the patient, the greater the tendency to develop new fibroids or recurrent symptoms.
- Women are exposed to x-rays during uterine fibroid embolization, but exposure levels usually are well below those where adverse effects on the patient or future childbearing would be a concern.
- The question of whether uterine fibroid embolization impacts fertility has not yet been answered, although a number of healthy pregnancies have been documented in women who have had the procedure. Physicians may recommend that a woman who wishes to have more children consider surgical removal of the individual tumors rather than undergo uterine fibroid embolization. If this is not possible, then UFE may still be the best option. *For an alternative to UFE, see the MR-guided Focused Ultrasound for Uterine Fibroids page (<http://www.radiologyinfo.org/en/info/mrgfus>) .*
- It is not possible to predict whether the uterine wall is in any way weakened by UFE, which might pose a problem during delivery. Therefore, the current recommendation is to use contraception for six months after the procedure and to undergo a Cesarean section during delivery rather than to risk rupture of the wall of the uterus from the intense muscular contractions that occur during labor.

## What are the limitations of Uterine Fibroid Embolization (UFE)?

Uterine fibroid embolization should not be performed in women who have no symptoms from their fibroid tumors, when cancer is a possibility, or when there is inflammation or infection in the pelvis. Uterine fibroid embolization is not an option for women who are pregnant. A woman who is known to be severely allergic to contrast materials that contain iodine require pretreatment before UFE or perhaps should consider a different treatment option.

## Which test, procedure or treatment is best for me?

- Radiologic Management of Uterine Leiomyomas (<http://www.radiologyinfo.org/en/info/article-appropriateness-criteria#260ca67b401c41908514771e0460ac6b>)

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