Interventional radiologists are board-certified experts who deliver minimally invasive treatments with less risk, less pain and less recovery time than traditional surgery. Most interventional radiology (IR) procedures are delivered through a tiny nick in the skin and use different types of radiology imaging guidance, including x-ray, CT scanning and ultrasound, to deliver precise treatment. For many of the therapies, patients receive medicine in their veins through an IV that helps them relax (sedation) or, in some cases, patients receive anesthesia. Many treatments are performed on an outpatient basis or with a short overnight stay. Learn more or find an interventional radiologist near you at ***sirweb.org***.

Recovery

Due to the minimally invasive nature of the treatments performed by an interventional radiologist, the recovery time from the procedures is normally very short.

Follow-up

Your interventional radiologist is part of your clinical care team and will work closely with your other physicians to ensure that you receive the best possible care. This includes follow-up during your hospital stay and after you are discharged. During your follow-up appointment, your interventional radiologist will evaluate your progress and address any remaining issues or symptoms that you may have.

For more information on how interventional radiology can help you, the Society of Interventional Radiology's website, ***sirweb.org***, provides easy-to-use tools to find a local interventional radiologist. He or she will be able to answer any additional questions you may have.

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Deep vein thrombosis and pulmonary embolism:

Life-threatening blood clots

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The vision to heal®

What is a blood clot?

When the flow of blood in blood vessels changes or the clotting system of the blood vessels is abnormal, a blood clot can form. Blood clots in the veins are known as deep vein thrombosis (DVT) and can travel to the lungs, becoming a pulmonary embolism (PE).

- **Deep vein thrombosis:** Deep vein thrombosis can occur in any vein in your body, but most commonly DVT forms in the legs. A leg DVT can be in a small vein or can span the entire leg. This can lead to swelling, pain and color changes of the leg.
- **Pulmonary embolism:** When pulmonary embolism occurs, it is usually small enough so that blood can flow around the clot and into the lungs. However, in some cases, the clot can be large enough to block much of the blood flow to the lungs. In severe cases, this can lead to heart failure and/or death.

Together, DVT and PE are called venous thromboembolism (VTE).

Risk factors

Risk factors for VTE include:

- Previous family history of DVT or PE
- Lack of movement following stroke or paralysis
- Sitting for prolonged periods
- Recent surgery
- Certain medications including oral contraceptives or other hormone treatments
- Current or recent pregnancy
- Current or previous cancer
- Injury from an accident
- Blood clotting problems
- Excessive weight or obesity
- Smoking

Symptoms

Common symptoms for DVT include:

- Swelling of the limb
- Pain or tenderness in the limb
- Tiredness, heaviness or abnormal color of the limb
- Surface veins becoming more visible

Common symptoms for PE include:

- Shortness of breath
- Pain when taking a deep breath
- Cough, sometimes bloody or with a frothy pink quality
- Increased heart rate

Diagnosis

Venous thromboembolism can be life threatening. If you suspect that you may have DVT or PE, you should notify your health care provider or go to the emergency room as soon as possible. Part of the evaluation will include an ultrasound of your leg veins. A specialized CT and/or another scan of your lungs can be performed. Once DVT or PE is found, an interventional radiologist may be able to perform minimally invasive, image-guided treatment.

Interventional radiology treatments

- **Blood-thinning medication:** The main treatment for VTE is blood-thinning medication. Blood thinners are given to stop new clots from forming. In patients who cannot receive blood thinners, have additional clot formation despite blood-thinning medication, or have a particularly large amount of clotting, an interventional radiologist may place a filtering device in the affected vessel (described below).
- **Venography:** Any image-guided treatment performed by an interventional radiologist will begin with a venogram, which is an x-ray exam that outlines the flow of blood in the veins by injecting contrast. Contrast is an agent the radiologists use to improve the visibility of internal organs during scans. This allows an interventional radiologist to see inside your veins and locate the blood clot to treat it.
- **Thrombolysis:** Using imaging guidance, interventional radiologists can place specialized catheters within a blood clot. These catheters will allow clot-melting medication, called tissue plasmogen activator (TPA), to be injected directly into the clot. This allows for complete treatment of the blood clot over one to two days rather than taking several weeks to months as is common with other treatments alone. During this treatment, patients are placed in the intensive care unit (ICU) for closer monitoring.
- **Angioplasty and stenting:** After treating the blood clot, the interventional radiologist may find a stenosis, which is a narrowing in the vein that limits blood flow. The stenosis can be treated by angioplasty, where inflating a balloon makes the vein larger. In some situations, a metal tube called a stent may need to be placed as a scaffold to widen the vein.
- **Inferior vena cava filter:** Patients for whom other treatments are not medically appropriate can have a filtering device placed within the inferior vena cava (IVC), the large vein in the abdomen that drains the blood from the legs. The IVC filter acts like a small net, allowing for normal blood flow but catching any traveling blood clots, preventing a DVT from moving to the lungs. Additionally, most IVC filters will be removed once the blood clot has cleared or when the patient can begin taking blood thinners to treat the clot.