

**Discover Interventional Radiology  
at Greensboro Imaging**



THE DOCTORS OF  
**GREENSBORO  
RADIOLOGY**

THE MEDICAL IMAGING PROFESSIONALS

## A note from the Doctors of Greensboro Radiology:



Our team of board-certified interventional radiologists is proud to be practicing a number of minimally invasive, targeted treatments at the new **Greensboro Imaging Interventional Radiology Suite** at Wendover Medical Center.

Today, many conditions that previously required surgery can be treated nonsurgically with interventional radiology. Patients can be treated with minimal pain and very little recovery time for the following procedures:

- Thyroid and liver biopsies
- Paracentesis and thoracentesis
- Varicose vein treatments
- Venous access for chemotherapy, dialysis and long-term IV access
- Vertebroplasty and kyphoplasty for spinal compression fractures

We hope you'll be able to use this technical resource to explain interventional procedures to your patients. And if you have any questions, please feel free to page one of us at your earliest convenience.

Best Regards,

The Doctors of Greensboro Radiology

## Contact information

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# Needle biopsies

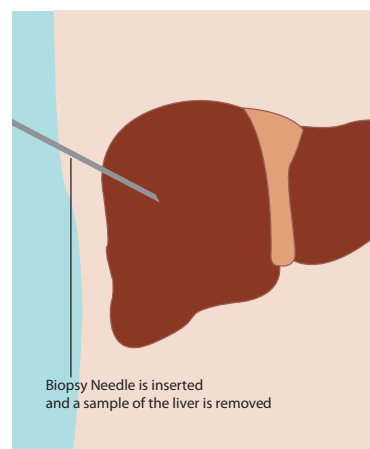
A needle biopsy is a test that helps identify the cause of a lump, mass or other abnormal condition in the body. During the procedure, an interventional radiologist inserts a small needle into the abnormal area and removes a sample of tissue so it can be analyzed.

## Liver biopsy

Liver biopsies are generally recommended to help explain:

- Abnormal liver blood tests
- Liver abnormalities
- Enlargement of the liver

The biopsy itself takes approximately 10 minutes. The radiologist will make a small incision on the upper abdomen and use a small needle to take a tissue sample. Patients are usually sedated, and after the procedure, they are monitored for up to four hours and sent home to rest.

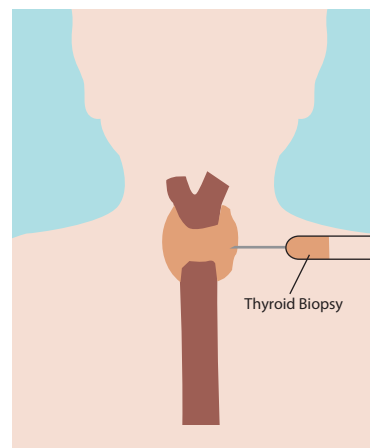


## Thyroid biopsy

Thyroid biopsies are performed to find the cause of:

- A lump in the thyroid gland
- A goiter

During a thyroid biopsy, a thin needle is inserted through the skin to remove a small sample of tissue from the thyroid gland. The patient is awake during the biopsy and will return home the same day.



# Paracentesis

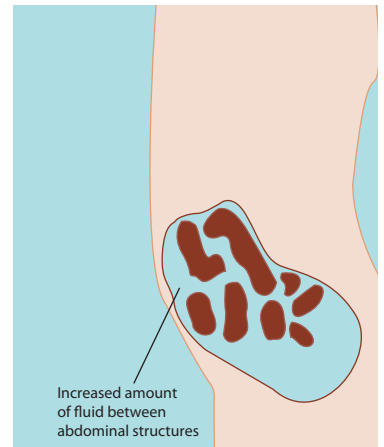
Paracentesis is performed to remove fluid from inside the abdomen. Fluid buildup can be caused by infection, inflammation, injury or other conditions such as cirrhosis or cancer.

## The procedure:

An interventional radiologist first performs an ultrasound to locate the fluid that will be removed. While the patient is under local anesthesia, a thin-needle catheter is inserted into the abdomen and a sample is removed for analysis. The catheter is removed after just a few minutes and no recovery time is necessary.

## The purpose:

- Discover the cause of fluid buildup
- Remove a large amount of fluid that is causing pain, difficulty breathing or problems with other organs
- Diagnose an infection
- Check for certain types of cancer



# Thoracentesis

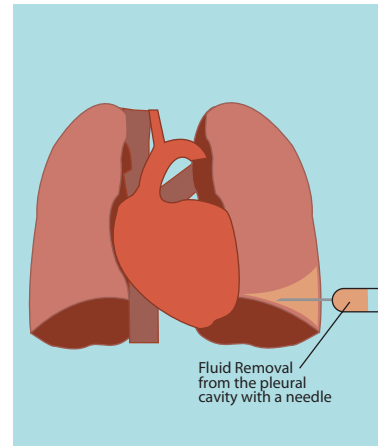
Thoracentesis is performed to remove fluid that has accumulated around the lung. This excess fluid can be a result from many conditions, including infection, inflammation, heart failure or cancer.

## The procedure:

An interventional radiologist first performs an ultrasound to locate the fluid around the lung that will be removed. While the patient is under local anesthesia, a small-needle catheter is inserted through the chest wall and a fluid sample is removed for analysis. The catheter is removed after just a few minutes and a chest X-ray is taken to evaluate the lung. Typically no recovery time is necessary.

## The purpose:

- Discover the cause of excess fluid
- Provide relief from a large fluid accumulation that is causing shortness of breath





# Varicose veins

Varicose veins usually occur in the legs. Approximately half of the U.S. population suffers from venous disease—the cause of varicose veins.

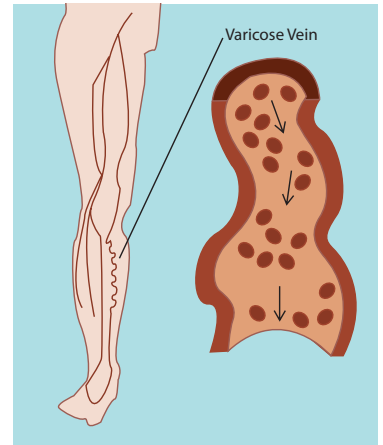
## Why it happens:

Normally, one-way valves in the veins keep blood flowing toward the heart. When the valves become weak and don't close properly, they allow blood to pool and even flow backward, causing veins to become elongated, rope-like, bulged and thickened. These enlarged, swollen vessels are known as varicose veins.

## Outpatient treatment options:

### Laser therapy

An interventional radiologist will make a very small incision and guide a laser fiber to the affected tissue. The laser energy causes the vein to close and blood to be rerouted to other healthy veins. The procedure is minimally invasive, so patients can walk right out of the office when finished.



### Ambulatory phlebectomy

Abnormal veins will be removed through a tiny incision. This procedure is done under local anesthesia and typically takes less than one hour. Recovery is rapid, so most patients do not need to interrupt regular activity.

### Injection sclerotherapy

An extremely fine needle is used to inject the affected vein with a solution that shrinks the vein.

### Ultrasound-guided sclerotherapy

A thin tube is inserted into the affected vein and injects a substance that causes the vein to scar and close so blood can be rerouted to healthier veins. The scar tissue is absorbed by the body over time.

## Benefits of outpatient treatment:

- Instant relief of symptoms
- Little or no pain
- Immediate return to normal activities
- No scars or stitches
- High success rate and low recurrence rate compared to surgery

# Venous access catheters

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More than 3.4 million Central Venous Access Catheters (CVACs) are placed each year to treat a variety of medical problems.

## **The purpose:**

Certain treatments for diseases or medical conditions, such as chemotherapy or dialysis, are more easily treated through a CVAC, such as a port-a-cath or tunneled dialysis catheter. These CVACs allow for easy venous access for treatments and blood draws.

## **Benefits of Central Venous Access Catheters:**

- Long-term venous access with little discomfort
- Avoidance of repeated IV placements and blood draws

## **The procedure:**

Interventional radiologists use imaging guidance to place catheters into the various veins throughout the body. The CVAC remains in the body until treatment is no longer needed.

## **Examples include:**

- PICC lines for intermediate term IV access needs
- Ports for chemotherapy
- Catheters for hemodialysis

Placement can be performed as an outpatient procedure with minimal risk.



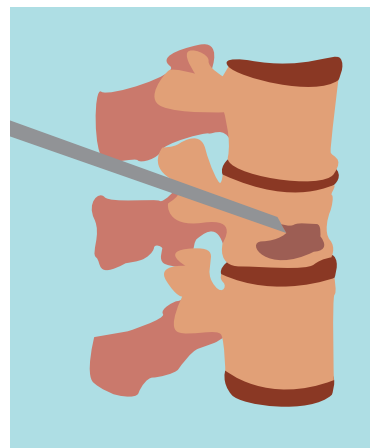


# Spinal compression fractures

Vertebroplasty and kyphoplasty are low-risk procedures used to treat fractures in vertebra, the small bones that create the spinal column.

## Vertebroplasty

Vertebroplasty is useful in reducing or alleviating pain in compression fractures when typical conservative treatments such as bed rest, bracing and pain medication have failed. Cement is placed within the vertebral body to stabilize the fracture and prevent further collapse. Vertebroplasty is useful in patients whose activities of daily living and independence are threatened by the pain from the compression fracture.



## Kyphoplasty

Kyphoplasty is a similar procedure which utilizes a balloon to create a cavity within the bone. Cement is then injected into the cavity.

The Doctors of Greensboro Radiology can help decide which procedure should be performed based on a patient's situation.

# Hospital interventions

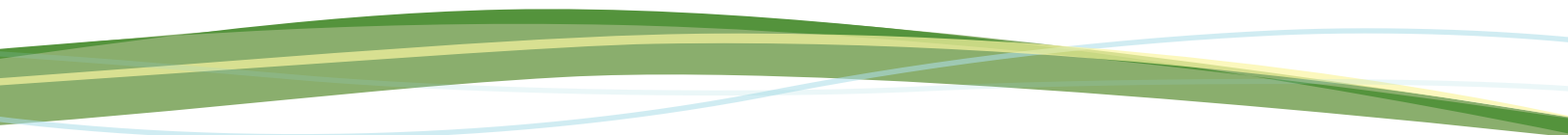
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The interventional radiology experts at Greensboro Imaging are also equipped to perform consultations and follow-up appointments for a number of interventional radiology procedures that are typically performed in a hospital setting.

## **Consultations and follow-ups are provided for:**

- Peripheral arterial disease (angioplasty and stent placement)
- DVT thrombolysis and thrombectomy
- Chemoembolization
- Radiofrequency ablation
- Uterine fibroid embolization
- Gastrostomy
- Stroke treatment and prevention
- Transjugular intrahepatic portosystemic shunt (TIPS)
- IVC filter placement
- Cerebral aneurysm coiling
- Nephrostomy tube placement
- Ureteral stenting

During a consultation, we will perform all necessary scans or tests to confirm the patient's condition and determine the best possible course of action. If hospitalization is required for the procedure, we will schedule the appropriate procedure and provide follow-up care based on the individual's needs.



## Peripheral arterial disease

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Peripheral arterial disease (PAD) is a common circulation problem in which the arteries that carry blood to the legs or arms become narrowed or clogged. Left untreated, insufficient blood flow will necessitate limb amputation in some patients.

To treat PAD, a physician threads a catheter through a small incision in the skin to the blocked artery in the legs and inflates a balloon to open the blood vessel. In some cases, the artery is then held open with a stent, a tiny hollow metal cylinder.

## DVT thrombolysis and thrombectomy

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Deep vein thrombosis (DVT) is the formation of a blood clot in the deep leg vein. It is a very serious condition that can cause permanent damage to the leg or even death.

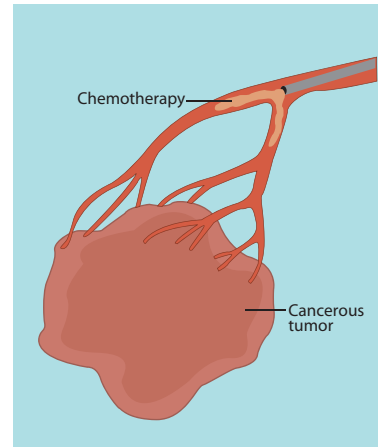
Catheter-directed thrombolysis is a minimally invasive treatment for DVT. During this procedure, a catheter is threaded through a vein to the blood clot and a “clot busting” drug is released. Most clots dissolve within one to two days.

A thrombectomy may also be performed to remove a blood clot in the leg. In this case, a balloon catheter is inserted into the vein, opened and moved gently so the clot can be drawn out of the vein.

## Chemoembolization

Chemoembolization is a cancer treatment with dual modes of attack. First, a high concentration of chemotherapy drugs is injected directly into the cancerous tumor. Second, a synthetic material called an embolic agent is used to cut off the tumor's blood supply, trap the anti-cancer drugs at the site and deprive the tumor of the oxygen and nutrients it needs to grow.

Chemoembolization is most beneficial to patients whose disease is limited to the liver. In this case, a thin catheter is inserted through the skin, into a blood vessel and to the liver where the anti-cancer drugs and embolic agents are injected. Patients generally stay overnight in the hospital.



[www.radiologyinfo.org/en/info.cfm?pg=chemoembol](http://www.radiologyinfo.org/en/info.cfm?pg=chemoembol)

## Radiofrequency ablation

Radiofrequency ablation is used to treat certain types of tumors. During the procedure, a thin-needle probe is placed in the center of the tumor and radiofrequency energy is used to heat the tumor. This kills the tumor cells, leaving only scar tissue. Radiofrequency ablation can be used as an alternative to more invasive surgical techniques in selected patients.

Patients may be put under general anesthesia or conscious sedation while the procedure is being performed. Most patients feel little or no pain.

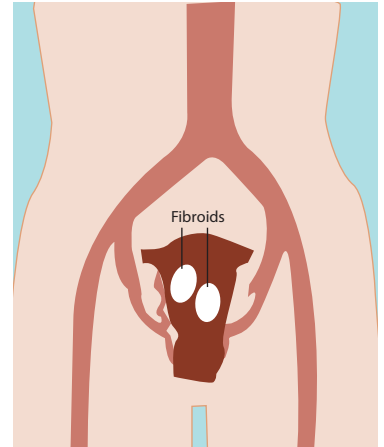
## Uterine fibroid embolization

Uterine fibroids are the most frequent indication for hysterectomy in premenopausal women. Fortunately, some women today can receive a nonsurgical treatment called uterine fibroid embolization (UFE).

Fibroids are very common non-cancerous growths that develop in the muscular wall of the uterus. UFE is a minimally invasive treatment procedure in which an interventional radiologist makes a tiny incision in the skin and inserts a catheter into an artery. The catheter releases tiny particles into the arteries that supply blood to the tumor, blocking blood flow and causing the tumor to shrink and dissipate.

Fibroid embolization usually only requires a hospital stay of one night and most women can return to normal activities within 7 to 10 days. Recurrence of treated fibroids is very rare.

<http://www.sirweb.org/patients/uterine-fibroids>



## Gastrostomy (feeding) tube

Gastrostomy tubes are placed in the stomach for a variety of conditions in which a patient is unable to take sufficient food by mouth. A feeding tube is inserted through a small incision in the skin and into the stomach under X-ray guidance.

## Stroke treatment and prevention

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Strokes occur when a blood vessel that carries oxygen and nutrients to the brain is blocked by a clot or bursts. Without oxygen, the brain cells begin to die and paralysis or other impairments can occur.

If a patient is having a stroke, tPA can be administered via an intra-arterial catheter. If the clot-busting drug is unsuccessful, additional mechanical devices can be deployed to remove the clot.

Stroke prevention includes optimizing medical therapy and lifestyle choices. It may also include balloon angioplasty and/or stenting of the arteries leading to the brain. This involves placing a catheter within the vessels of either the neck (carotid artery) or brain. A small balloon is then deployed to widen the artery and push the plaque against the wall. A stent may be placed to keep that artery open.

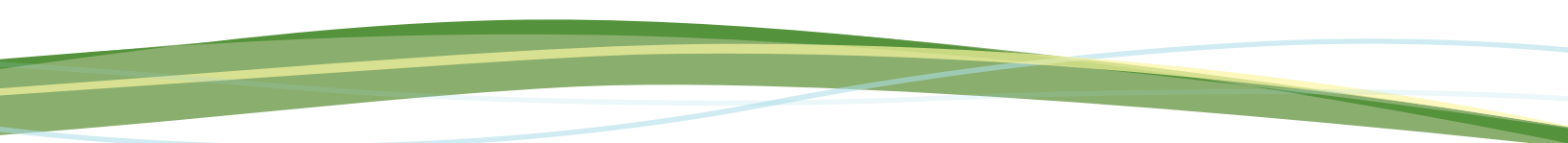
## Transjugular intrahepatic portosystemic shunt (TIPS)

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TIPS is a procedure that is used to treat complications of portal hypertension. Portal hypertension often results from cirrhosis or other damage to the liver.

This procedure is performed by inserting a catheter into the jugular vein of the neck. Under X-ray guidance, the catheter is inserted into a hepatic vein of the liver. A shunt, or hollow passage, is then formed between the hepatic vein and portal vein to help blood flow through the liver. The shunt is held open by a covered stent.

The procedure is most commonly used to treat bleeding varices (dilated blood vessels in the esophagus or stomach) or refractory ascites.

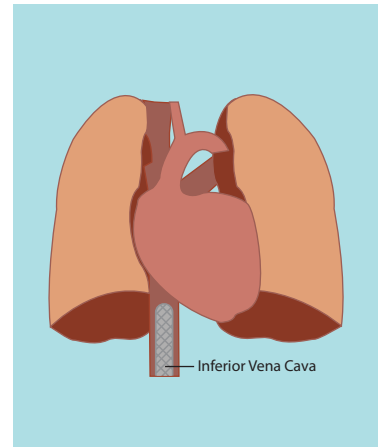




## Inferior vena cava filter

The inferior vena cava (IVC) is a large blood vessel that runs from the abdomen up to the heart. An IVC filter is placed in the vein when there is a risk of blood clots entering the heart and lungs.

During the procedure, a thin catheter is inserted into a vein. Imaging is used to guide the catheter and a thin wire filter into the IVC where the filter attaches to the walls of the vein. At completion, the catheter is removed but the filter remains to help prevent blood clots from blocking blood vessels in the heart and lungs, which can cause serious damage. IVC filters are also now designed to be retrievable in certain cases in which only a temporary filter is needed.



[www.drugs.com/cg/inferior-vena-cava-filter-placement.html](http://www.drugs.com/cg/inferior-vena-cava-filter-placement.html)

## Cerebral aneurysm coiling

An aneurysm is a small swelling along the blood vessels in the brain. Depending on size and location, an aneurysm can pose a significant threat of rupture and hemorrhage into the brain.

Most cerebral aneurysms can be treated with coiling, a minimally invasive alternative to open brain surgery. During coiling, a microcatheter is carefully threaded in the cerebral vasculature and advanced into the aneurysm. Thin platinum wires (coils) are then inserted into the aneurysm to pack the lumen. Once the aneurysm is filled, blood can no longer reach the aneurysm and the entrance can heal over.

# Nephrostomy tube placement

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A nephrostomy tube is used when a collecting system has become obstructed. Most often, this procedure helps to decompress and temporarily drain the part of the urinary tract that drains urine from the kidney to the bladder.

During the procedure, patients are sedated and given a local anesthetic to minimize pain. A small incision is made in the skin and a needle is inserted. Imaging guidance is then used to move the needle into the fluid-containing structures inside the kidney and drain the urine.

[www.nortonhealthcare.com/specialties/medical/diagnostics/intervention/nephrostomy\\_tube\\_placement.aspx](http://www.nortonhealthcare.com/specialties/medical/diagnostics/intervention/nephrostomy_tube_placement.aspx)

# Ureteral stenting

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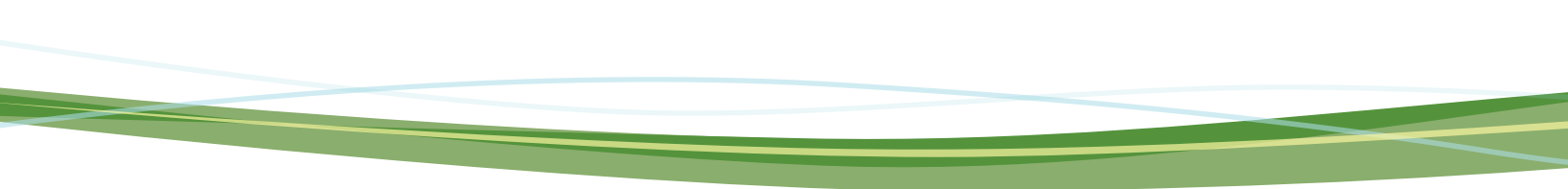
Urine is intended to travel from the kidneys to the bladder through a pair of long, narrow tubes called ureters. When one of these ureters becomes blocked by kidney stones, tumors, blood clots or other conditions, ureteral stents allow urine to drain from the kidney to either the bladder or an external collection system.

For this procedure, patients are put under general anesthesia and a guide wire is inserted into the ureter to provide a path for the stent. Once the stent is placed, the wire is removed. The stent can remain in place for months if needed.

Ureteral stents can also be used during or after surgery to divert urine from areas of leakage, manipulate kidney stones, prevent stone migration before treatment or provide a mold around which healing can occur.

<http://www.surgeryencyclopedia.com/St-Wr/Ureteral-Stenting.html>



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