

Glossary of Interventional Radiology Treatments



Following is a list of medical terms that patients and their families may hear from their interventional radiologist, specialist or primary care physician. SIR continues to add to this list. If you learn of a term that is not listed that you believe would be helpful, please send to comm@sirweb.org.

Angioplasty is a minimally invasive treatment in which a catheter is used to open a blocked blood vessel to improve the blood flow. Angioplasty is performed under X-ray guidance, where catheter is inserted through the groin into the blood vessel with a balloon over it. The balloon is then inflated to open the blockage, sometimes a metal mesh tube (stent) is also placed to keep the vessel open in the long-term.

Atherectomy is a minimally invasive, image-guided endovascular technique used to clean out clogged arteries. An interventional radiologist performs atherectomy with a catheter fitted with a cutting blade or grinding burr to shave away the built-up plaque within arteries.

Central venous access refers to the insertion of a tube beneath the skin and into the blood vessels so patients may receive medication or nutrients directly into the blood stream. This approach may also be used for drawing blood or creating dialysis access.

Carotid artery angioplasty and stenting is performed by interventional radiologists through a tiny incision in the skin, usually in the groin, and using live X-ray guidance. The narrowing of the carotid artery is treated by using a balloon to widen the artery, followed by placement of a stent (a tiny mesh tube) to keep the artery open and prevent narrowing from happening again. If left untreated, this narrowing by plaque of the carotid artery, one of the main arteries supplying blood flow to the brain, can lead to increased risk of transient ischemic attacks or TIAs (mini-strokes) and stroke.

Cerebral aneurysm coiling and stenting is performed by interventional radiologists with additional neurointerventional training, to treat brain aneurysms (bubbles of the artery wall which pose risk of bursting leading to hemorrhagic stroke) with coils (tiny pieces of platinum that fill the aneurysm) and other devices such as special stents called flow-diverters.

Chemoembolization is a minimally invasive treatment performed by an interventional radiologist. Using image guidance, an IR delivers a chemotherapy agent and a blood vessel blocking agent (embolic) through the blood vessel supplying the tumor to stop its blood supply and to deliver chemotherapy in the same setting. This procedure is mostly used for the treatment of liver cell cancer.

Conscious sedation, also known as moderate sedation, is a minimally depressed state-of-mind in which the patient becomes less aware of the treatment being performed but is still able to control breathing, reflexes and able to respond to commands or touch.

Cryoablation destroys cancer cells by emitting extremely cold temperatures at the location of the tumor.

Drug-eluting stent is a tubular, metallic device that contains medication, that is placed within a narrowed or blocked blood vessel to keep it open.

Embolization usually refers to a treatment in which medical materials or devices are placed into a blood vessel to stop bleeding temporarily or permanently. Embolization may be used to treat fibroids, pelvic veins, enlarged prostate, varicoceles and other conditions.

Endovascular thrombectomy uses live X-ray guidance to precisely navigate special catheters and stent devices to restore blood flow to the part of the brain that is not receiving blood due to blockage by a blood clot. The faster this blood flow is restored, the better the chances for good recovery from the stroke.

Feeding support tube is a small catheter that is safely inserted directly into the stomach or small intestine to help children who are unable to take in sufficient food by mouth.

Fluoroscopy is a modality commonly used in interventional radiology to see vessels and anatomy throughout procedures, is the method of looking at continuous X-ray images that appear as a live video on a monitor.

Irreversible electroporation is the newest form of ablation technique that uses electromagnetic waves to destroy cancer cells.

IVC filter placement is a preventative tool placed inside a huge vein in the abdomen called the inferior vena cava to trap any blood clots that may break free from the veins in the legs and potentially reach the heart or the lungs. An IVC filter is one of the many treatments used to prevent a pulmonary embolism (a blood clot that travels to the lungs) and should only be placed in patients that cannot receive blood thinners or in patients in whom blood thinning treatment has failed.

Kyphoplasty is a procedure that injects special cement into the vertebrae to treat fractures in the spine. This procedure involves the use of a balloon-like device to create space in the bone. Under local anesthesia, a needle is inserted through the skin and back muscles and into the bone. Then, the balloon inside the needle is inflated to create space in the vertebrae that the cement will fill to help the bone regain its normal shape.

Microwave ablation uses electromagnetic waves to destroy a tumor. The tumor is localized via image guidance and then a thin microwave antenna is placed directly into the tumor. A microwave generator emits an electromagnetic wave through the antenna and these waves agitate water molecules in the surrounding tissue. The friction and heat generated by this action causes cell death helping to destroy the tumor.

Palliative interventional radiology involves the treatment of cancer patients who are entering the last phase of an illness that cannot be treated. An interventional radiologist can provide symptom management and treatments for pain relief when decided upon by a patient and their care team. For example, in patients with cancer that has spread to their bones and is causing constant pain that has not improved with medication, a radiofrequency ablation can be performed. Not only does this provide pain relief, but it also assists in preventing breaks in the weakened bone.

Percutaneous drainage is used to drain an abscess or an infection by directing a catheter through a small nick in the skin to the site of the infection. Infection and abscess drainage may also be used to treat complications of open surgery.

Prostate artery embolization is a minimally invasive treatment for enlarged prostate that does not carry the risk of sexual side effects typically associated with prostate surgery. Through image guidance, an interventional radiologist makes a tiny incision in the wrist or groin and guides a very thin catheter (about the size of a strand of spaghetti) through your blood vessels to the artery that supplies blood to the prostate. Once in position, the doctor releases small particles to deprive those prostate cells of oxygen, resulting in the gland's shrinkage. When embolization is completed, the catheter is removed, and pressure is applied to the small incision to allow it to heal.

Radioembolization, or selective internal radiation therapy (SIRT), is a treatment used to destroy tumors. The doctor makes a tiny cut in the skin and inserts a catheter (a thin, flexible tube) into the femoral artery (the large artery of the leg). The catheter is then maneuvered into place, guided by live X-rays. Once at the tumor site, the doctor injects the radioactive beads into the blood vessels that supply the tumor. The beads give off radiation over a very short distance, which concentrates the radiation inside the tumor, helping to reduce radiation exposure to the rest of the body. This treatment may also be referred to as Y-90 because it commonly uses a radioactive isotope called yttrium-90.

Radiofrequency ablation (RFA) uses radio waves to create heat and damage tissue. RFA is used to decrease pain by damaging pain-sensing nerves or to treat cancer by damaging tumor cells. A probe is placed into the target tissue where they emit an electrical current to transmit radio waves to the surrounding tissue, which heats up causing cells to die.

Radiotherapy uses high-energy ionizing radiation to damage cancer cells so that they do not grow and divide. The radiation is created externally and passes through the skin surface to the target tissue inside. This also means the normal tissue cells that the beam passes through will be damaged.

Sclerotherapy is the direct injection through a tiny needle of a chemical irritant into a vein causing it to shrink and close. This technique is often used to treat smaller veins such as spider veins.

Stenting is the placement of a woven tube covered by a metal mesh at the site of weakness to reinforce the arterial wall. Device placement is done with the help of a catheter that is inserted through the groin under real-time X-ray. Stent grafts are metallic stents covered by graft material and often used to treat an enlarged aorta in an abdominal aortic aneurysm.

Transhepatic balloon dilation is a technique that opens bile passages by temporarily inserting a tube through the skin and enter the liver, using ultrasound and X-ray for guidance. In some cases, tiny balloons are directed to the strictures, where they are carefully inflated to open the narrowed passage.

Thrombolysis treats vascular blockages and improves blood flow by dissolving abnormal blood clots. A blood clot, or thrombus, can block off blood supply to certain parts of the body and cause serious damage. During catheter-directed thrombolysis, the physician uses X-ray imaging and a catheter to guide special medication or a medical device to the site of a blood clot to dissolve the blockage, to remove it and to prevent the vein or artery from becoming permanently blocked and restricting blood flow to a limb or organ.

Transjugular intrahepatic portosystemic shunt (TIPS) is a technique used to reduce internal bleeding in the stomach and esophagus in patients with cirrhosis by creating a shunt to bypass the liver. A stent (a tiny mesh tube) is placed to keep the connection open and allow it to bring blood draining from the bowel back to the heart while avoiding the liver.

Vein ablation, or endovenous laser ablation treatment (EVLT), is a minimally invasive approach that uses heat to close off problematic veins and relieve the symptoms they cause. Using image guidance, the interventional radiologist threads a thin laser fiber into the problem vein through a tiny needle. Next, the length of the vein is numbed to minimize discomfort during the heating process and the laser heat causes the vein to close. Once the problem vein is closed, blood will flow through the remaining healthy veins.

Vertebroplasty is a minimally invasive, X-ray guided procedure where a mixture of surgical cement is injected into a damaged vertebra through a hollow needle. It is done when normal bone healing is unlikely to occur after a vertebral compression fracture, leading to a decrease in mobility and quality of life. The procedure is performed using skin numbing medication, on an outpatient basis. Occasionally, patients will be asked to stay overnight.

Y-90 (yttrium-90) microspheres are radioactive particles that are most often employed for treating patients with unresectable hepatocellular carcinoma (HCC).



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