When is interventional radiology used?
Interventional radiologists use a combination of fluoroscopy, ultrasound and CT imaging to guide treatments inside the body. Some procedures help to diagnose a condition or disease. To do this, the radiologist injects a contrast material into a part of the patient’s body to get a better view of the internal anatomy and any abnormality. Other procedures are therapeutic. We use these procedures to open blockages, contain bleeding vessels, drain collections of fluid or to gather sample tissue.

This subspecialty service is now used in an ever-growing number of areas, including:
■ Vascular (vessels that carry fluid to parts of the body)
■ Gastrointestinal (stomach and intestines)
■ Hepatobiliary (liver, gallbladder, bile ducts)
■ Genitourinary (genital and urinary organs)
■ Pulmonary (lungs)
■ Musculoskeletal (muscles and bones)
■ Central nervous system (brain and spinal cord)

Our interventional radiology physicians work in multi-disciplinary teams with other health care providers to provide the most comprehensive care for our patients.

Common interventional radiology treatments
■ Abscess drainage
■ Angioplasty or stent recanalization of arterial obstruction
■ Biopsy
■ Brain aneurysm coiling
■ Drainage of obstructed urinary or biliary systems
■ Embolization (blockage of arteries) for bleeding due to trauma, gastrointestinal bleeding, tumors or vascular malformations
■ Placement of central venous access catheters or subcutaneous ports

More information
■ The Alliance for Radiation Safety in Pediatric Imaging: www.imagegently.org
■ The Alliance for Radiation Safety in Adult Medical Imaging: www.imagewisely.org
■ American College of Radiology: www.acr.org
■ Health Physics Society: www.hps.org
■ Radiological Society of North America: www.rsna.org
■ Radiology Information for Patients: www.radiologyinfo.org
■ American Registry for Diagnostic Medical Sonography: www.arrs.org
■ American Registry of Radiologic Technologists: www.arrt.org

Questions
If you have any questions regarding our services, please call the Dartmouth-Hitchcock Radiology Department at 603.650.4477 and ask to speak to one of our interventional radiology specialists. We will be happy to answer your questions to put you at ease before your appointment.
What is interventional radiology?

Interventional radiology is a medical subspecialty of radiology. Our specialists perform minimally invasive, image-guided procedures to diagnose and treat diseases in nearly every organ system of the body. Patients can be diagnosed and treated using the least invasive techniques available. This means that most procedures will only require small incisions, rather than one or more large incision, as is often the case with major surgery. By having an interventional radiology treatment, patients will have a lower risk of complications or infections, less pain and less recovery time compared to surgery.

Although these types of procedures are less painful than major surgery, patients often receive medications to relieve pain and anxiety. Therefore, patients are instructed to not eat or drink anything for 12 hours before their procedure. Most patients will be in the recovery room for one to two hours after their procedure. Those that have more extensive procedures may need to stay overnight in the hospital. Most patients do fall asleep during their procedure, but it is different from general anesthesia which is given during major surgery.

When sedation is necessary for a procedure, a nurse administers medication through an IV that is placed in your arm. For some procedures pain medication is given, and for some procedures a sedating medication to help you relax is also given. These medications affect judgment and reaction time. A friend or family member must come with you to your appointment since you will be unable to drive after receiving sedation. Patients are instructed to not eat or drink anything for six hours before receiving sedation. After their procedure, most patients will be in the recovery room for one to two hours, some patients will need to stay for four hours, and patients that have more extensive procedures may need to stay overnight in the hospital.

How images are gathered

At Dartmouth-Hitchcock, we are committed to making sure that each patient receives the smallest radiation dose needed to obtain the desired result. All higher dose radiographic equipment is tested on a monthly basis; this is well above and beyond the annual testing required by the state. We adhere to the more comprehensive and stringent, but voluntary, guidelines established by the American College of Radiology and the Joint Commission. Our staff Diagnostic Physicist makes sure that the equipment is performing as it should and assists in the equipment installations and the control of radiation hazards. Our Radiation Safety Officer is responsible for the safety and protection of those using radiologic materials and keeps detailed records to ensure safety and compliance with local, state and federal laws.

Fluoroscopy

When you have a fluoroscopy procedure, we use x-rays to capture real-time imaging of an organ or body system such as the vascular, skeletal, digestive, urinary, respiratory or reproductive systems. The patient lies between an x-ray machine and a fluorescent screen. The latest fluoroscopes combine the fluorescent screen and the x-ray machine with a special video camera which allows the images to be recorded and played on a monitor. Fluoroscopy is used to pinpoint a blockage in a blood vessel or duct, or to place a catheter or needle in the appropriate spot.

The fluoroscopic image is obtained by exposing the area of concern to x-rays, which creates an image based on the different densities of tissue that they pass through. X-rays are an ionizing form of radiation. The risk from added radiation should be considered in perspective; the average effective dose received in a year from background sources is about 3 mSv (milli-Sieverts).

Doses from IR procedures vary depending on the type of procedure you are having. If you have any concerns about your radiation exposure, you should first talk with your doctor who is requesting the exam.

Ultrasound

During an ultrasound, we gather information by recording sound waves in a part of the body. These sound waves have a higher frequency than what we can physically hear (about 20 kilohertz in healthy, young adults). Ultrasound devices use frequencies from 20 kilohertz up to several gigahertz. The ultrasound machine records the echoes as the sound waves bounce back to determine the size, shape and consistency of soft tissues and organs. Ultrasound is often used to:

- Monitor pregnancies
- Diagnose a wide variety of conditions
- Assist during medical procedures such as needle biopsies
- Detect and treat soft tissue injuries

There is no pain or known adverse side effects from ultrasound imaging.