General Ultrasound



Ultrasound imaging uses sound waves to produce pictures of the inside of the body. It helps diagnose the causes of pain, swelling and infection in the body's internal organs and to examine an unborn child (fetus) in pregnant women. In infants, doctors commonly use ultrasound to evaluate the brain, hips, and spine. It also helps guide biopsies, diagnose heart conditions, and assess damage after a heart attack. Ultrasound is safe, noninvasive, and does not use radiation.

This procedure requires little to no special preparation. Your doctor will tell you how to prepare, including whether you should not eat or drink beforehand. Leave jewelry at home and wear loose, comfortable clothing. You may need to change into a gown.

What is General Ultrasound Imaging?

Conventional ultrasound displays the images in thin, flat sections of the body. Advancements in ultrasound technology include three-dimensional (3-D) ultrasound that formats the sound wave data into 3-D images.

A Doppler ultrasound study may be part of an ultrasound examination.

Doppler ultrasound (http://www.radiologyinfo.org) is a special ultrasound technique that evaluates movement of materials in the body. It allows the doctor to see and evaluate blood flow through arteries and veins in the body.

There are three types of Doppler ultrasound:

- Color Doppler (http://www.radiologyinfo.org) uses a computer to convert Doppler measurements into an array of colors to show the speed and direction of blood flow through a blood vessel.
- Power Doppler (http://www.radiologyinfo.org) is a newer technique that is more sensitive than color Doppler and capable of providing greater detail of blood flow, especially when blood flow is little or minimal. Power Doppler, however, does not help the radiologist determine the direction of blood flow, which may be important in some situations.
- Spectral Doppler (http://www.radiologyinfo.org) displays blood flow measurements graphically, in terms of the distance traveled per unit of time, rather than as a color picture. It can also convert blood flow information into a distinctive sound that can be heard with every heartbeat.

What are some common uses of the procedure?

Ultrasound exams can help diagnose a variety of conditions and assess organ damage following illness.

Doctors use ultrasound to evaluate:

- pain
- swelling
- infection

Copyright© 2026, RadiologyInfo.org

Ultrasound is a useful way of examining many of the body's internal organs, including but not limited to the:

- heart and blood vessels, including the abdominal aorta (http://www.radiologyinfo.org) and its major branches
- liver (http://www.radiologyinfo.org)
- gallbladder (http://www.radiologyinfo.org)
- spleen (http://www.radiologyinfo.org)
- pancreas (http://www.radiologyinfo.org)
- kidneys (http://www.radiologyinfo.org)
- bladder (http://www.radiologyinfo.org)
- uterus (http://www.radiologyinfo.org) , ovaries (http://www.radiologyinfo.org) , and unborn child (fetus (http://www.radiologyinfo.org)) in pregnant patients
- eyes
- thyroid (http://www.radiologyinfo.org) and parathyroid glands (http://www.radiologyinfo.org)
- scrotum (http://www.radiologyinfo.org) (testicles)
- brain in infants
- hips in infants
- spine in infants

Ultrasound is also used to:

- guide procedures such as needle biopsies (http://www.radiologyinfo.org) , in which needles remove cells from an abnormal area for laboratory testing.
- image the breasts and guide biopsy (http://www.radiologyinfo.org) of breast cancer (*see the Ultrasound-Guided Breast Biopsy (https://www.radiologyinfo.org/en/info/breastbius) page*.
- diagnose a variety of heart conditions, including valve problems and congestive heart failure, and to assess damage after a heart attack. Ultrasound of the heart is commonly called an "echocardiogram" or "echo" for short.

Doppler ultrasound helps the doctor to see and evaluate:

- blockages to blood flow (such as clots)
- narrowing of vessels
- tumors and congenital vascular malformations
- reduced or absent blood flow to various organs, such as the testes or ovary
- increased blood flow, which may be a sign of infection

With knowledge about the speed and volume of blood flow gained from a Doppler ultrasound image, the doctor can often determine whether a patient is a good candidate for a procedure like angioplasty (http://www.radiologyinfo.org) .

Who interprets the results and how do I get them?

A radiologist, a doctor trained to supervise and interpret radiology exams, will analyze the images. The radiologist will send a signed report to the doctor who requested the exam. Your doctor will then share the results with you. In some cases, the radiologist may discuss results with you after the exam.

You may need a follow-up exam. If so, your doctor will explain why. Sometimes a follow-up exam further evaluates a potential issue with more views or a special imaging technique. It may also see if there has been any change in an issue over time. Follow-up exams are often the best way to see if treatment is working or if a problem needs attention.

Copyright© 2026, RadiologyInfo.org

What are the benefits vs. risks?

Benefits

- Most ultrasound scanning is noninvasive (no needles or injections).
- Occasionally, an ultrasound exam may be temporarily uncomfortable, but it should not be painful.
- Ultrasound is widely available, easy to use, and less expensive than most other imaging methods.
- Ultrasound imaging is extremely safe and does not use radiation.
- Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.
- Ultrasound is the preferred imaging modality (http://www.radiologyinfo.org) for the diagnosis and monitoring of pregnant women and their unborn babies.
- Ultrasound provides real-time imaging. This makes it a good tool for guiding minimally invasive (http://www.radiologyinfo.org) procedures such as needle biopsies (http://www.radiologyinfo.org) and fluid aspiration.

Risks

- Standard diagnostic ultrasound (http://www.radiologyinfo.org) has no known harmful effects on humans.

What are the limitations of General Ultrasound Imaging?

Ultrasound waves are disrupted by air or gas. Therefore, ultrasound is not an ideal imaging technique for the air-filled bowel or organs obscured by the bowel. Ultrasound is not as useful for imaging air-filled lungs, but it may be used to detect fluid around or within the lungs. Similarly, ultrasound cannot penetrate bone, but may be used for imaging bone fractures or for infection surrounding a bone.

Large patients are more difficult to image by ultrasound because greater amounts of tissue weaken the sound waves as they pass deeper into the body and need to return to the transducer for analysis.

Ultrasound has difficulty penetrating bone and, therefore, can only see the outer surface of bony structures and not what lies within (except in infants who have more cartilage in their skeletons than older children or adults). Doctors typically use other imaging modalities (http://www.radiologyinfo.org) such as MRI (http://www.radiologyinfo.org) to visualize the internal structure of bones or certain joints.

Disclaimer

This information is copied from the RadiologyInfo Web site (http://www.radiologyinfo.org) which is dedicated to providing the highest quality information. To ensure that, each section is reviewed by a physician with expertise in the area presented. All information contained in the Web site is further reviewed by an ACR (American College of Radiology) - RSNA (Radiological Society of North America) committee, comprising physicians with expertise in several radiologic areas.

However, it is not possible to assure that this Web site contains complete, up-to-date information on any particular subject. Therefore, ACR and RSNA make no representations or warranties about the suitability of this information for use for any particular purpose. All information is provided "as is" without express or implied warranty.

Please visit the RadiologyInfo Web site at **http://www.radiologyinfo.org** to view or download the latest information.

Note: Images may be shown for illustrative purposes. Do not attempt to draw conclusions or make diagnoses by comparing these images to other medical images, particularly your own. Only qualified physicians should interpret images; the radiologist is the physician expert trained in medical imaging.

Copyright

This material is copyrighted by either the Radiological Society of North America (RSNA), 820 Jorie Boulevard, Oak Brook, IL 60523-2251 or

the American College of Radiology (ACR), 1891 Preston White Drive, Reston, VA 20191-4397. Commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is prohibited.

Copyright ® 2026 Radiological Society of North America, Inc.