

# Ultrasound

## Overview

Ultrasound is a noninvasive medical test that uses high-frequency sound waves to look at organs and structures inside the body. Health care professionals use them to view the heart, blood vessels, kidneys, liver, and other organs. Unlike x-rays, ultrasound does not involve exposure to radiation.

During an ultrasound, a technician or doctor moves a device called a transducer over part of your body. When the transducer is pressed against the skin, it directs small pulses of high-frequency sound waves into the body. The sound waves bounce (echo) off the tissues inside your body. The transducer captures the waves that bounce back. The technology is similar to the sonar used by submarines, bats, and boats. The console creates images from these sound waves and displays them on a video monitor/computer screen.

The images can also be presented as still pictures. Conventional ultrasound displays flat images. Advanced ultrasounds create 3D images. 4D ultrasound is 3-D ultrasound in motion. An ultrasound exam takes from 20-30 minutes to an hour, depending on what part of the body is being examined.

## Preparing for the procedure

- When you schedule your ultrasound, you will get detailed instructions on how to prepare. Specific preparation for an ultrasound depends on the part of your body being examined. Your doctor may tell you not to eat or drink before the procedure. For some scans, your doctor may instruct you not to eat or drink for as many as 12 hours before your appointment. For others you may be asked to drink up to six glasses of water two hours prior to your exam and avoid urinating so that your bladder is full when the scan begins. Sometimes, no preparations are needed.
- Wear comfortable, loose-fitting clothing on the day of the exam.
- You will sign a consent form that states you understand the benefits and risks of the test. Please talk to your doctor or nurse if you have any questions or concerns.

## During the procedure

- When you arrive for your ultrasound, you will need to remove some or all of your clothing, depending on what part of your body will be examined. You will be given a gown to wear, if necessary. Jewelry that may interfere with the exam must be removed.
- You will lie on an examination table, either on your back or on your side, next to the ultrasound scanner. The scanner includes a computer; a video display screen; and a transducer, a hand-held device about the size of a bar of soap.
- The ultrasound procedure may use an external transducer, an internal transducer, or both.

## External Ultrasounds

Before the test begins, a small amount of warm gel is applied to the area being examined. The gel helps the transducer make full contact with the skin and creates clearer images. You must lie still while the doctor or technician moves the transducer over your skin. Images of your organs and tissues will appear on the monitor. You may be asked to hold your breath or change positions during the test. This ultrasound procedure is usually painless but if the scan is performed over an area of tenderness, you may feel pressure or minor pain.

## Internal Ultrasounds

During ultrasound exams with an internal transducer, a health care professional attaches the transducer to a probe that is inserted into a natural opening in the body. Ultrasound exams in which the transducer is inserted into an opening of the body may produce minimal discomfort.

## After the procedure

When the procedure is over, you can wipe off the gel and get dressed. You can resume your normal activities, including driving, immediately after your ultrasound.

## Special Uses for Ultrasound

- A Doppler ultrasound is used to measure the direction and speed of red blood cells as they move through blood vessels.
- Ultrasound imaging uses real time, so it can be used to guide a needle to the area a doctor wants to biopsy.
- Bone ultrasound helps diagnose osteoporosis.
- Breast ultrasound produces images of the breast and can guide a breast biopsy procedure.
- Echocardiograms are used to diagnose heart or valve problems.
- Transesophageal echocardiogram involves inserting the transducer into the esophagus to get images of the heart.
- Transrectal ultrasound (TRUS) involves inserting the transducer into a man's rectum to view the prostate.
- Transvaginal ultrasound involves inserting a transducer into a woman's vagina to view the uterus and ovaries.

Sonography, sonogram, ultrasonography, and US are other terms for the same test.