

# WHAT IS AN ULTRASOUND/SONOGRAM

## What is Ultrasound/Sonogram?

1. The ultrasound machine transmits high-frequency (1 to 5 megahertz) sound pulses into your body using a probe.
2. The sound waves travel into your body and hit a boundary between tissues (e.g. between fluid and soft tissue, soft tissue and bone).
3. Some of the sound waves get reflected back to the probe, while some travel on further until they reach another boundary and get reflected.
4. The reflected waves are picked up by the probe and relayed to the machine.
5. The machine calculates the distance from the probe to the tissue or organ (boundaries) using the speed of sound in tissue (5,005 ft/s or 1,540 m/s) and the time of the each echo's return (usually on the order of millionths of a second).
6. The machine displays the distances and intensities of the echoes on the screen, forming a two dimensional image.

## Major Uses of Ultrasound

Ultrasound has been used in a variety of clinical settings, including obstetrics and gynecology, cardiology and cancer detection. The main advantage of ultrasound is that certain structures can be observed without using radiation. Ultrasound can also be done much faster than X-rays or other radiographic techniques. Here is a short list of some uses for ultrasound:

## What is an ultrasound test used for?

It is used in many situations. The way the ultrasound bounces back from different tissues can help to determine the size, shape and consistency of organs, structures and abnormalities. So, it can:

- help to monitor the growth of an unborn child, and check for abnormalities. An ultrasound scan is routine for pregnant women.
- detect abnormalities of heart structures such as the heart valves. (An ultrasound scan of the heart is called an echocardiogram.)
- help to diagnose problems of the liver, gallbladder (such as gallstones), pancreas, thyroid gland, lymph nodes, ovaries, testes, kidneys, bladder and breast. For example, it can help to determine if an abnormal lump in one of these organs is a solid tumor or fluid filled cyst.
- detect abnormal widening of blood vessels (aneurysms).

## Some specialist ultrasound techniques

In some situations, a clearer picture can be obtained from a probe which is within the body. So a small probe, still attached by a wire to the ultrasound machine, can be:

- placed in the vagina or rectum to get clearer images of the pelvic and reproductive organs.
- passed into the esophagus. This is sometimes used to get clearer images of the heart which lies just in front of the gullet.
- used during an operation to look 'deeper' into structures to help guide a surgeon.