36 Portland Place, London W1B 1LS
Tel: 020 7636 3714 Fax: 020 7323 2175
Email: office@bmus.org Website: www.bmus.org

BMUS

Overview of Ultrasound

Please click on the links below to move to the relevant part of this document

What is an Ultrasound Scan?

Ultrasound imaging, also called ultrasound scanning or sonography, is a method of obtaining pictures or images from inside the human body. It involves sending very high frequency sound waves through the body. These sound waves are reflected off the internal organs. The reflections are then processed by special instruments and powerful computers that subsequently measure and create a visual image of the organs. Ultrasound images are captured in real time and displayed on a television monitor.

The technology uses the same principle as sonar, used by ships and creatures such as bats and the echo location technique used by dolphins. Ultrasound has revolutionized the care of women during pregnancy and in the UK, is a routine part of care, usually performed when a woman first attends the antenatal clinic and often again at 18 to 22 weeks of pregnancy.

Return to the top

Where are ultrasound scans performed?

The examination has traditionally taken place in hospital, with patients being referred by their GP or midwife. However, ultrasound is available in a small but growing number of doctors' surgeries as well as a number of private clinics which have grown up in the UK to provide supplementary scanning services.

Return to the top

What can Ultrasound be used for?

Ultrasound can be used for imaging the in the following areas: -

Cardiology (Echocardiography) • Heart	**Endocrinology** • Glands
Breast • To determine the nature of a Breast abnormality • As supplemental Breast Cancer screening • For ultrasound-guided Breast Biopsy	**Small Parts** • Testicles • Eyes • Thyroid
Obstetrics • Date the pregnancy (gestational age) • Confirm fetal viability • Determine location of fetus, intrauterine vs ectopic	**Gynaecology** • Assess pelvic organs, • Diagnose and manage conditions including endometriosis, adenomyosis, ovarian cysts and lesions,

• Check the location of the placenta in relation to the cervix • Check for the number of fetuses (multiple pregnancy) • Check for major physical abnormalities. • Assess fetal growth (for evidence of intrauterine growth restriction (IUGR)) • Check for fetal movement and heartbeat. • Determine the sex of the baby	• Identify adnexal masses, including ectopic pregnancy, • Diagnose gynecologic cancer • For infertility treatments, e.g. to track the response of ovarian follicles to fertility medication • HyCoSy (Hystero Contrast Sonography)
Gastroenterology • Gastrointestinal tract, • Esophagus • Stomach • Intestines • Rectum • Gallstones	**Musculoskeletal** • Tendons • Muscles • Nerves • Soft tissues • Skin • Sub-dermal structures • Foreign bodies • Joints • Bones
Urology • Bladder • Urethra • Kidney	**Vascular** • Arteries • Vein • Intravascular ultrasound
Intervention • Ultrasound guided fluid aspiration • Fine needle aspiration • Guided injections • Guided biopsies • Nephrostomy	

Return to the top

What does an Ultrasound machine look like?

Ultrasound machines look like a large computer with a television screen, often on a trolley. On the front of the machine will be a control panel with dials and buttons. These are used by the person carrying out the scanning to adjust the image. This image will be shown on the screen of the machine and the equipment will also have different shaped transducers (probes) attached to it. These are used for different types of examinations and are connected with cables to the machine, or may be wireless. There are a wide range of types of transducers from ones which look like a fat pen to ones similar to a large box of matches.

What does a Transducer do?

The ultrasound transducer (probe) functions as both a loudspeaker to create the sounds and a microphone to record them. When the transducer is pressed against the skin, it directs a stream of high frequency sound waves into the body. As the sound waves reflect from the body's organs, the transducer records tiny changes in their pitch and direction. These changes are measured and interpreted by the computer, which then creates a picture on the monitor. Materials (resembling a rubbery coating) on the face of the transducer enable the sound to be transmitted efficiently into the body. A water-based gel is placed between the patient's skin and the probe to further assist the transmission of the sound waves.

Return to the top

What will happen during a scan?

An ultrasound examination is a painless, usually non-invasive, procedure. There are several methods of performing the examination depending on the part of the body being examined.
When you arrive for a scan you may be shown to a cubicle and asked to take off your outer clothing down to your underwear and put on a hospital gown. Whether you have to undress or not will depend on the part of your body to be scanned.

You will be taken into the scanning room and asked to lie on a couch next to the ultrasound machine. You may be able to sit up depending on which part of your body is being scanned. A clear, water-based gel will be spread onto your skin over the scanning site. This helps to transmit the sound waves to the microphone in the transducer.
The Sonographer will press the transducer onto your skin and move it back and forth over the part of your body that is being scanned. The scan will appear on the machine screen, which will be next to you. You will be awake throughout the examination. If you would like to have the image explained to you, just ask. Ultrasound scans are usually quite difficult to interpret if you don't know what you are looking at. The sonographer may also ask you to take deep breaths in or move into different positions to obtain the best possible images.
Depending on the type of scan being carried out, the examination will usually take between 5 minutes and half an hour. At the end of the scan, the sonographer will wipe the gel from your skin and you will be able to get off the couch and put on any clothes you may have removed. You will be able to go home once the scan is over.

Some types of scan may require the transducer (probe) to be used internally. These are typically transvaginal or transrectal scans. When scanning the female pelvis, a transvaginal approach is used as it gives superior quality images. For this scan, small pen-shaped transducer is given a protective cover, lubricated with a small amount of gel and then gently inserted into the vagina up to the cervix to get the best image. It should not cause more than a slight discomfort.

For any examinations requiring an internal examination, you should be accompanied by a chaperone provided by the hospital or clinic.

Return to the top

Do I need to prepare for a scan?

Generally there is no complicated preparation required for ultrasound scans, although it is recommended to wear comfortable, loose-fitting clothing, which can be easily removed if necessary. There are no general set instructions for all ultrasound examinations. Different examinations require different preparations and you will be given relevant instructions for your type of scan before you arrive at the hospital or clinic.
For some types of scan you may be asked not to eat or drink for about 6 hours before the scan. If you are having your womb scanned, you will probably be asked to come to the appointment with a full bladder. This is because the full bladder pushes the womb up so it is in a position that is easier to scan. You may need a full bladder for a bladder scan too. There will be a toilet close by, so you will be able to go as soon as the scan is over.

When will I find out the results?

For many types of scan, particularly pregnancy scans, the person who is carrying out the examination will be able to explain the images and results to you during or just after the scan has taken place. In other cases the sonographer will analyze the images and send a report with the interpretation of the scan to your referring doctor. In cases of screening, a letter will also be sent to you to explain the findings.

It can take time for test results to come through, usually takes a couple of weeks. If your doctor needed the results urgently, it would have been noted on the scan request form and the results will be ready sooner than that. Try to remember to ask your doctor how long you should expect to wait for the results when you are first asked to go for the test. If it is not an emergency, and you have not heard a couple of weeks after your test, ring your doctor's secretary to check if they are back.

Return to the top

Are ultrasound scans dangerous?

Ultrasound has been used in pregnancy for nearly 30 years is generally considered a "safe" imaging modality. Medical research has found no side effects. No association has been shown between ultrasound exposure and the baby's birth weight, childhood leukaemias or other cancers, eyesight, hearing or dyslexia. Even so, scanning should not be carried out without clear medical reasons and all ultrasound exposure should be justified and limited to the minimum needed to make a diagnosis.

Diagnostic ultrasound examinations of the fetus are generally considered to be safe during pregnancy but should only be performed when there is a valid medical intention. Scans for non-diagnostic purposes, such as the creation of 'keepsake' or souvenir images or videos of the fetus are not recommended.