



What to expect from different types of ultrasound examination

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Abdominal Ultrasound

Abdominal ultrasound imaging is performed to evaluate organs such as the kidneys, liver, gallbladder, pancreas and spleen. It can help to diagnose a number of conditions including abdominal pains, inflamed appendix, enlarged abdominal organ or aneurysm in the abdominal aorta or stones in the gallbladder or kidney.

For this type of scan you will need to tell the sonographer if you have had a barium enema or a series of upper GI (gastrointestinal) tests within the past two days as barium remaining in the intestines can interfere with the ultrasound test.

For a study of the liver, gallbladder, spleen, and pancreas, you may be asked to eat a fat-free meal on the evening before the test and then to avoid eating for eight to 12 hours before the test.

For ultrasound of the kidneys, you may be asked to drink four to six glasses of liquid about an hour before the test to fill your bladder. You may be asked to avoid eating for eight to 12 hours before the test to avoid gas buildup in the intestines. For ultrasound of the aorta, you may need to avoid eating for eight to 12 hours before the test.

You will lie on your back on an examination couch and the transducer moved back and forth across your abdomen to image the area of interest. You may be asked to turn on your side or sit up. You may also be asked to take a deep breath in and hold it for a short while in order to obtain the best possible images.

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Obstetric Ultrasound (Pregnancy)

Ultrasound imaging in pregnancy is widely used to evaluate the baby. It can determine if a baby is present, the position of the fetus and if there is a multiple pregnancy. It can also help to diagnose abnormalities or problems, help determine the age of the pregnancy and subsequent due date as well as showing the position of the placenta in relation to the birth canal.

The Royal College of Obstetricians & Gynaecologists (in their 2000 document on Ultrasound Screening), recommend an Early Pregnancy Scan, undertaken before 15 weeks, which can combine the functions of the Early Viability Scan, Nuchal Translucency Scan and dating scan. There is also then a routine scan at 20 weeks. These two scans are the 'minimum' number of scans required during pregnancy and are offered by $\frac{3}{4}$ of ultrasound units in the UK. Individual circumstances may dictate that more scans may be offered and a breakdown of what you could receive is detailed below.

Early viability scan

This usually takes place at 6 to 10 weeks of pregnancy. The scan can confirm the number of babies in the uterus, the embryo can be observed and measured by about five and a half weeks and a heartbeat usually detected by 6 weeks. Scans at this stage in pregnancy are reassuring for women experiencing bleeding, pain or who have had previous miscarriages. Transvaginal scanning may also be used to obtain a better image of the womb.

Nuchal translucency scan

This is a scan which is usually carried out at 11-13 weeks and is a method of screening for chromosomal abnormalities without having an invasive test such as an amniocentesis. The nuchal translucency is a measurement of an area of fluid behind the baby's neck. An increase in the amount of fluid may indicate an increased risk of a chromosomal abnormality, such as Down's syndrome. This has an accuracy of about 70% and can lead to recommendations for further testing, such as an amniocentesis.

Pregnancy Dating

Gestational age is usually determined by the date of the woman's last menstrual period - assuming ovulation occurred on day fourteen of the menstrual cycle. Ultrasound scans offer an alternative method of estimating gestational age. The most accurate measurement for dating is the crown-rump length of the fetus, which can be done between 7 and 13 weeks of gestation. After 13 weeks gestation, the fetal age may be estimated by the diameter of the head and the length of the femur. Dating is more accurate when done early in the pregnancy. When a later scan gives a different estimate of gestational age, the estimated age is not normally changed but rather it is assumed the fetus is not growing at the expected rate.

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Anomaly scan and fetal sex determination (20 weeks scan)

This scan is a routine scan in the UK which takes place at around 20 weeks. This is one of the best times to have an ultrasound done as most infants are the same size at this stage of development. A thorough examination of the fetus's brain, heart, spine, kidneys, organs and limbs will be carried out and the placenta checked for its position. Measurements of the fetus will also be taken to ensure it is growing normally. At this point, should you wish to know the sex of your baby, you can ask the sonographer to tell you. Although this is usually fairly accurate, it can not be taken as a guarantee of sex as ultrasound is not 100% accurate. This scan is the most significant one undertaken during pregnancy, because it can reassure the parents that everything appears to be as it should be. If a potential problem is indicated, a further follow up scan may be needed. If this does occur, the possible complications of or implications for the pregnancy will be fully discussed with the parents by a doctor or consultant and advice and guidance will be provided.

Souvenir Scanning

Developments in real-time 3D and 4D ultrasonic imaging have led to parents asking for souvenir (keepsake) video recordings of the fetus, sometimes at several stages during the pregnancy. Anyone who wishes to have a "keepsake" scan carried out at a private clinic should ensure that the person carrying out the scan is fully qualified. Since such scans are performed for non-diagnostic purposes, potential clients should ensure that the clinic has procedures in place to deal with any incidental findings, such as the finding of fetal abnormality, in a sensitive and professional manner, and that the ultrasound equipment is operated at settings which conform to the BMUS guidelines for non-diagnostic scanning. A balance must always be maintained between diagnostic benefit and risk to the patient.

The position of BMUS on the use of ultrasound to produce "keepsake" images of the fetus is outlined in the European Committee of Medical Ultrasound Safety (ECMUS) statement, endorsed by BMUS. The views expressed in this statement are that:

1. *Ultrasound scans should not be performed solely for producing souvenir images or recordings of a fetus or embryo.*
2. *The production of souvenir images or recordings for the parents to keep is reasonable if they are produced during a diagnostic scan, provided that this does not require the ultrasound exposure to be greater in time or magnitude (as indicated by the displayed MI and TI) than that necessary to produce the required diagnostic information.*
3. *Attention is drawn to the recommendation of the EFSUMB Clinical Safety Statement for Diagnostic Ultrasound that ultrasound examinations should be performed only by competent personnel who are trained and updated in ultrasound safety matters.*

For all Obstetrics scans, no special preparation is needed, although it is best to wear loose clothing that can easily be lifted or removed in order to expose your abdomen. You will lie on your back on an examination couch and the transducer moved back and forth across your stomach in order to gain the best possible image of the fetus.

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Pelvic/Gynaecology Ultrasound (including transvaginal)

A Pelvic ultrasound scan is the most effective imaging modality used to examine the uterus and ovaries. It may also be used during pregnancy to monitor the health and development of the embryo or fetus. In males, a pelvic ultrasound usually focuses on the bladder and prostate gland.

There are two methods of performing pelvic ultrasound; Supra-pubic (through a full bladder) and transvaginal (via the vagina). For Supra-pubic ultrasound you will need a full bladder for the scan and will be advised on how much water to drink and how long before the examination. For transvaginal ultrasound, no preparation is required.

Transvaginal Ultrasound

This is usually employed to examine the ovaries, pelvis or part of the womb. You will be asked to lie on your back with your knees bent and legs apart (as if you were having a smear test or an internal examination). If this position is difficult for you, you may be able to lie on your side with your knees drawn up to your chest. The sonographer will lubricate a small probe with gel and then insert this into the vagina. This may be slightly uncomfortable, but should not be painful. This type of scan does not take long.

Supra-pubic Ultrasound

For this type of scan you will be asked to drink fluid prior to the examination to fill the bladder, which is used as a "window" to examine the uterus and ovaries behind it. Because of the distance between the transducer and the organs of interest, information might be lost and the sensitivity of the scan is not as good as the trans-vaginal approach. You will lie on your back on an examination couch and the transducer moved back and forth across your lower abdomen to image the area of interest.

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Renal Ultrasound (Kidneys and bladder)

Renal ultrasound can be used to diagnose variety of complaints and conditions including determining the source of abdominal pains, such as kidney stones, evaluating infection in or injury to the kidneys or bladder, diagnosing congenital abnormalities of the renal tract or identifying problems related to the prostate gland. For this type of scan you will need a full bladder for the scan and will be advised on how much water to drink and how long before the examination. You will lie on your back on an examination couch and the transducer moved back and forth across your lower abdomen to image the area of interest. You may be asked to turn on your side in order to obtain the best possible images. Finally, your bladder volume may be measured before and after urinating to assist in detecting any problems.

Small parts Ultrasound (Thyroid, Testes, etc.)

Ultrasound imaging of small parts is a useful way of evaluating many of the superficial organs of the body such as the thyroid gland, the neck and the testes. The ultrasound images can help an ultrasound practitioner to evaluate these organs and look for signs of disease.

Thyroid ultrasound

This is used for diagnosing suspected thyroid disease, for example, a lump in the thyroid or a thyroid that is not functioning properly. Most scans are performed to look at palpable or visible "lumps", or enlargement of the gland found during a clinical examination. The ultrasound can establish if the nodule is inside the thyroid gland or outside it and whether it is a cyst or a soft tissue nodule. Cysts are almost always non cancerous (benign), although in some cases the fluid may be taken out by a needle under ultrasound guidance for additional testing.

Because ultrasound provides real-time images, it also can be used to guide procedures such as needle biopsies, in which needles are used to extract sample cells from an abnormal area for laboratory testing. Ultrasound may also be used to guide the insertion of a catheter or drainage device and helps assure accurate placement.

You will need to remove all clothing and jewelry in the area to be examined and you may be asked to wear a gown during the procedure. No other preparation is required. You will lie on your back on an examination couch and the transducer moved back and forth across your neck and upper chest to image the area of interest.

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Testicular ultrasound

Is used for the diagnosis of suspected abnormalities of the scrotum and is the main technique used to evaluate problems of the testicles and surrounding tissues. It is used when a patient has pain or feels a lump in the scrotum. Other indications for an ultrasound scan include an absent or undescended testicle, inflammation, testicular torsion (twisted testis), fluid collection, abnormal blood vessels or a mass (lump or tumor).

You should wear comfortable, loose fitting clothing for your ultrasound examination. No other preparation is required. Before the scan, you will need to remove all your clothes from the waist down and put on a gown before the test. You will be asked to lie on your back on the examination couch. Folded towels will be used to cover the penis and lift the scrotum. Gel will be spread on your scrotum and the transducer will be pressed gently against the skin and moved back and forth across your scrotum to obtain the required images. The procedure is painless and non-invasive. You will need to lie very still during the ultrasound scan and may be asked to take a breath and hold it for several seconds.

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Vascular Ultrasound

Vascular ultrasound is carried out in order to monitor blood flow to organs and tissues throughout the body, locate and identify blockages and abnormalities like blood clots, plaque or emboli and help plan for their effective treatment. It can also be used to determine whether a patient is a good candidate for a procedure such as angioplasty or plan or evaluate the success of procedures that graft or bypass blood vessels. Vascular ultrasound can also help to identify areas of abnormal widening of blood vessels (aneurysm) that, if left untreated, can lead to serious consequences. In people with varicose veins, it can help to identify the source of the supply of these veins and help the surgeon decide how best to deal with this condition.

A Doppler ultrasound study may be part of a vascular ultrasound examination. Doppler is a special ultrasound technique that evaluates the speed and volume of blood as it flows through a blood vessel, including the body's major arteries and veins in the abdomen, arms, legs and neck. It can help to diagnose blockages to blood flow (such as clots) narrowing of vessels (possibly caused by plaque) and tumors and congenital malformation. As the images are captured in real time, they can help the ultrasound practitioner monitor the blood flow to organs and tissues throughout the body.

No special preparation is required for these types of scan. At the examination you will need to remove all clothing and jewelry in the area to be examined and may be asked to wear a gown during the procedure.

You will lie on your back on an examination couch and the transducer moved back and forth across the relevant part of your body on order to image the area of interest.

Musculoskeletal Ultrasound

Ultrasound images of the musculoskeletal system provide pictures of muscles, tendons, ligaments, joints and soft tissue throughout the body. This type of scanning is typically used to assist in the diagnosis of tendon tears, such as tears of the rotator cuff in the shoulder or Achilles tendon in the ankle, abnormalities of the muscles, such as tears and soft-tissue masses, bleeding or other fluid collections within the muscles or damage to the major joints. It can also be used as a guide for steroid injections into joints and surrounding soft tissues as an effective treatment for painful joints.

No special preparation is required for these types of scan. At the examination you will need to remove all clothing and jewelry in the area to be examined and may be asked to wear a gown during the procedure. Usually you will lie on your back on an examination couch, but for specialized areas you may be in different positions. The transducer will be moved back and forth across the relevant part of your body on order to image the area of interest. You may also be asked to move joints or limbs during the scanning so that the sonographer can look at the affected area while it is in motion.

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Trans-rectal Scanning

Information coming soon

Interventional Ultrasound

Information coming soon