

Standards for the performance of ultrasound scans in Early Pregnancy Units



This document is aimed at all practitioners performing ultrasound scans in early pregnancy units. The document also applies to ultrasound scans performed for symptomatic women with pain and or bleeding in early pregnancy who are scanned in the community or fertility clinics.

The term 'practitioner' refers to an appropriately trained or appropriately supervised doctor, nurse, sonographer or midwife.

Purpose of the early pregnancy scan is to:

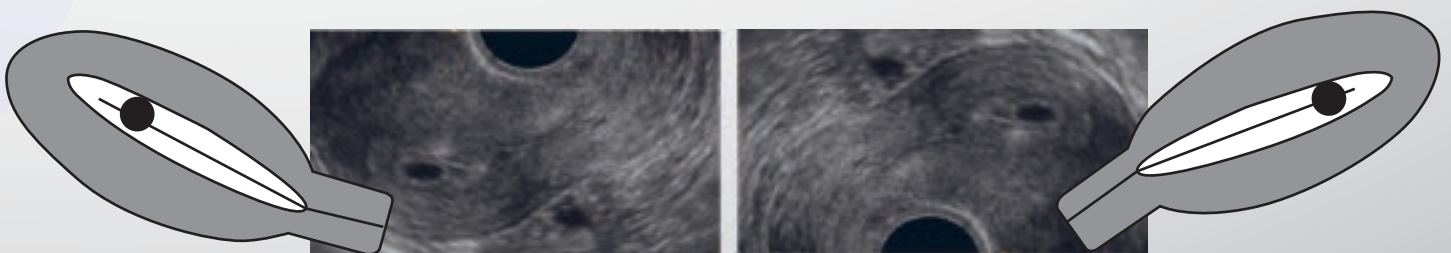
1. locate an early pregnancy (normally sited vs ectopic)
2. determine the gestational age of the pregnancy
3. determine whether a pregnancy is single or multiple
4. establish whether a pregnancy is ongoing (early or live vs miscarriage)
5. identify any co existing pelvic pathology that is present
6. identify the cause of the presenting symptoms

Early pregnancy ultrasound scan views and measurements (base menu)

The early pregnancy (AEPU) ultrasound scan base menu specifies measuring techniques and defines the anatomical structures to be assessed. This is to promote consistency in examinations and allows comparison between serial scans. These standard views and measurements apply equally to transvaginal and transabdominal ultrasound scans. A combined approach may be necessary to gain optimal views. The descriptors used are consistent with 2020 guidance (Terminology for describing normally sited and ectopic pregnancies on ultrasound: ESHRE recommendations for good practice)

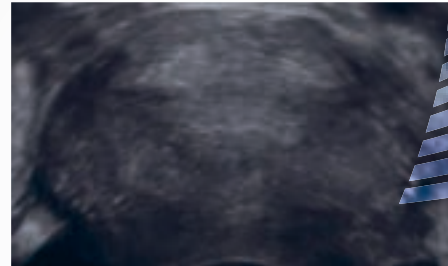
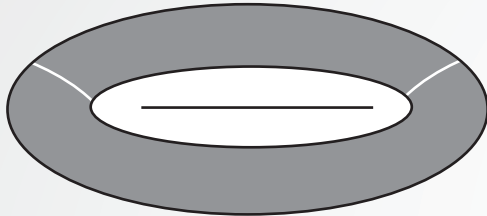
The anatomical structures to be examined, measured and recorded are:

- 1) Midline **sagittal or para-sagittal** section of the uterus. Continuity of the endometrial cavity and pregnancy with the endocervical canal should be shown. This is to demonstrate that the pregnancy is within the endometrial cavity. If there is no evidence of a normally sited gestation sac, the endometrial thickness is measured as the maximum antero-posterior measurement.

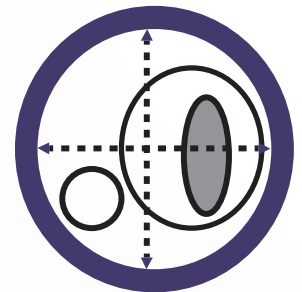


2) **Transverse** section of the uterus at the level of the fundus. The uterus should be examined transversely from the cervical canal through to the fundus. Assess the uterus at the level of the interstitial portions of the fallopian tubes. This is to demonstrate that the entire endometrial cavity has been examined and any major uterine anomalies identified.

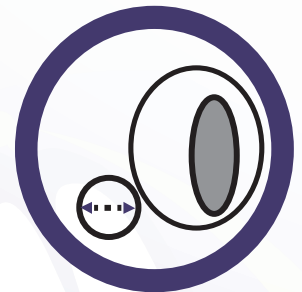
3) If there is a pregnancy within the endometrial cavity, the extraembryonic structures and embryo should be measured:



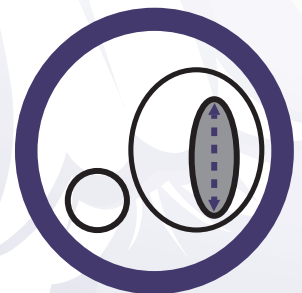
a) **Gestational sac** – Measurements should be performed from the inner edges of trophoblast in three planes at right angles to each other. The diameters measured correspond to those of the chorionic cavity. The mean diameter should be calculated. This measurement can be used to date an early pregnancy and to facilitate the diagnosis of miscarriage if applicable.



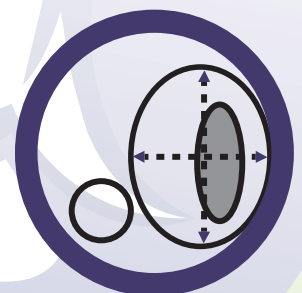
b) **Yolk sac** - Measure three perpendicular diameters from the centre of the yolk sac wall. The yolk sac is in the chorionic cavity. A dilated or collapsed yolk sac may be seen with embryonic demise.



c) **Embryo** - In early pregnancy this is the greatest length of the embryo, as the crown and rump cannot be distinguished. From seven weeks onwards the measurement should be taken from a sagittal section of the embryo, with care taken not to include the yolk sac. The embryo is in the amniotic cavity. The presence or absence of cardiac activity should be noted. If the rate is measured, then M-mode should be used. Do not use pulsed Doppler in early pregnancy before 10 weeks (BMUS-Safety-Guidelines-2009)



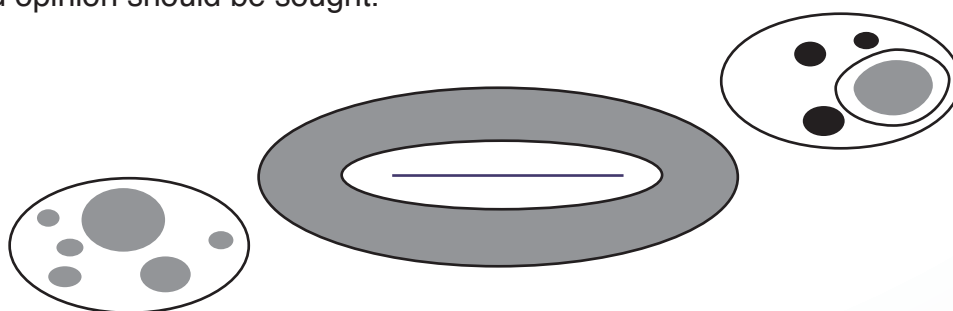
d) **Amniotic sac** - The three perpendicular diameters should be measured and the mean diameter calculated. As the amnion is very thin the measurements should be taken from the centre of the membrane. An empty amniotic cavity with an absent or small embryo may be seen with embryonic demise. This is important because if the amniotic sac is recognised and documented routinely it enables recognition of the embryo, amnionicity in monozygotic twins and the absence of an embryo in the amnion in some miscarriages.



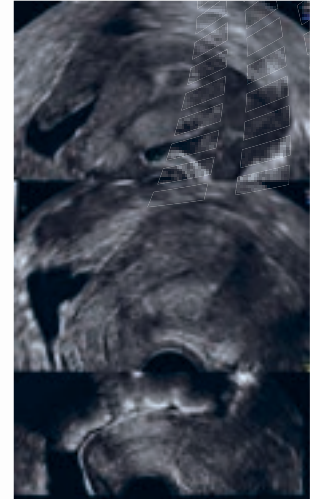
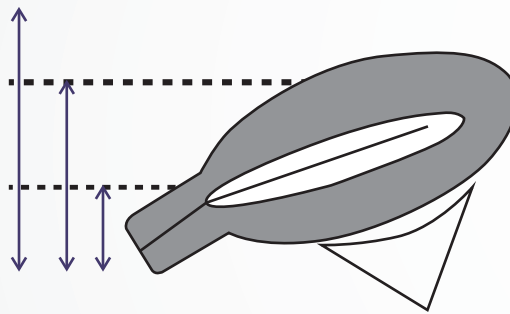
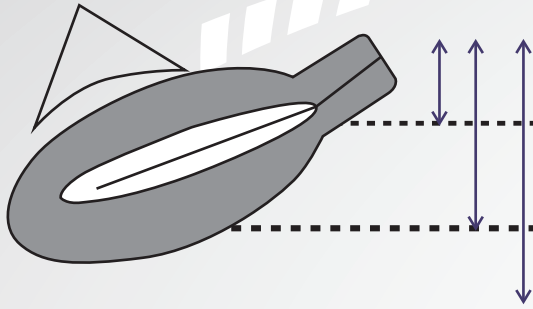
Multiple pregnancies

The chorionicity of multiple pregnancies is easier to assess in the first than the second trimester so it is important to document whether there are separate gestational sacs (dichorionic) or a single gestational sac (monochorionic). It is hard to look at amnioticity in very early pregnancy but by 8 weeks the amniotic membrane round each pregnancy should be clear. The number of yolk sacs variable in monochorionic twins and does not always correlate with amnioticity. Later in the first trimester chorionicity can be determined by the thickness to the separating membrane. A lambda connection would indicate dichorionic pregnancy while a thinner T sign could suggest monochorionic gestation.

- 4) Both **ovaries** should be examined in longitudinal and transverse sections. The number and location of the corpus luteum/lutei should be noted. If there are multiple corpora lutea then the practitioner should be alerted to the possibility of heterotopic pregnancy. The presence of any ovarian cysts should be recorded and the cyst characterised using IOTA criteria (Terms, definitions and measurements to describe the sonographic features of adnexal tumors). If this is not possible, then a second opinion should be sought.



- 5) If there is an **ectopic pregnancy** then the following features & measurements should be recorded
- a) the outer to outer margins of the trophoblast
 - b) in ectopic pregnancies presenting with a well-defined gestational sac the inner to inner margins of the coelomic cavity should also be measured in a manner similar to the measurement of 'gestational sac' diameters in normally implanted pregnancies
 - c) in women with evidence of haematosalpinx, the measurements should be taken between the inner margins of the Fallopian tube distended with blood. This technique ensures better correlation between the pre-operative ultrasound and surgical findings.
- 6) The **pouch of Douglas** should be examined for the presence or absence of masses, blood clots and fluid. Any fluid present should be characterised as anechoic or echogenic. The amount of fluid should be estimated as small, moderate or large according to the level in relation to an anteverted uterus (small = less than or up to posterior aspect of cervix, moderate = to midway up the posterior aspect of the uterine body & large = to the uterine fundus, above uterus or in Morrison's pouch anterior to the liver). A small or moderate amount of anechoic fluid is unlikely to be of any clinical significance in early pregnancy, so therefore it is important to be specific. Blood in the pouch of Douglas secondary to an ectopic pregnancy may be due to either to rupture or leakage of blood from the fimbrial end of the tube. Isolated fluid anterior to the uterus should alert the practitioner to adhesions in the pouch of Douglas which may complicate surgery.



- These specific anatomical sections should be captured and archived at examination. The base menu is a recommended minimum. Further images are required as anatomical variants and pathology dictates.
- The sections should be **magnified sufficiently** so that the maximum information is available to the viewer. This is typically so that the organ being examined fills 2/3 of the screen.
- Ultrasound **images should be captured, stored and archived** on an electronic reporting system in order to provide minimum audit data. There should be a permanent, easily accessible record, preferably digital, of all imaging studies. All imaging studies should be accompanied by an electronic report available with the images.
- Good practice would include **peer review** of recorded images BMUS Peer Review Audit Tool
- A **standardised report** must be written or generated by appropriate software. This should correspond to the standard images and systematic approach detailed above.
 1. Uterus longitudinal – anteverted / retroverted
 2. Uterus transverse at fundus – normal cavity yes/no
 3. Presence of pregnancy- location, number, size, morphology
 4. Left ovary – size, corpus luteum?. Right ovary – size, corpus luteum?
 5. Pouch of Douglas – free fluid? Echogenic or anechoic? Approximate volume
 6. Diagnosis – normally located pregnancy, ectopic pregnancy or pregnancy of unknown location (PUL).
 7. Comments & plan – this should include details of any follow up scan arranged, onward referral to a clinical team or any blood tests performed. There is never a need to use the statement ‘an ectopic pregnancy cannot be excluded’.

