Guidelines for performing the 11+3 - 13+6 - week anomaly scan

INTRODUCTION

This document addresses fetal anatomy.

Biometry, chorionicity (if multiple pregnancy), assessment of the uterus including placenta, cervix, uterine masses; and adnexal assessment are addressed in the Nuchal Translucency Online Learning Program (NTOLP). The assessment of fetal anatomy is just one part of the 11-13+ week scan.

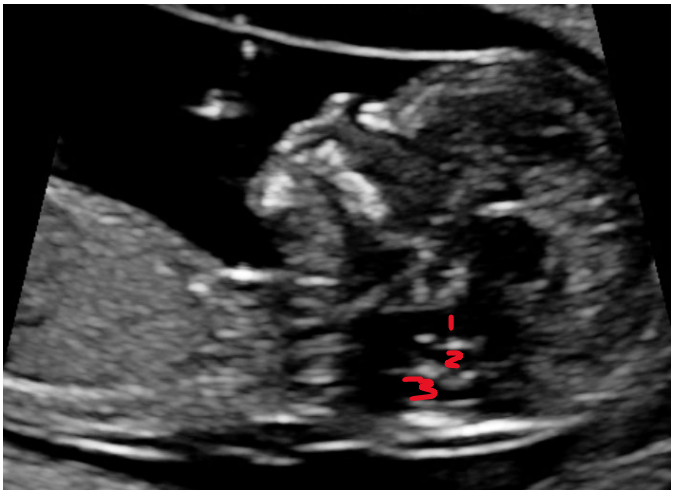
Approximately 70 percent of structural anomalies seen at the mid-trimester scan should be detected at the first trimester morphology scan.

Ideally perform the scan at over 12 weeks, preferably at 13+ weeks as this will enable more detailed views of fetal anatomy.

If you cannot see well transabdominally, try to obtain images transvaginally (with patient consent).

If views are good TV and the abdominal wall is very thick and likely to continue to result in very poor views, consider suggesting a 16-week TV scan of fetal anatomy.

Anatomical assessment:



Assess the fetal profile. This should be seen in all cases. If the fetus is persistently prone the image can be flipped. Confirm a normal appearance of the nose, chin and hard palate.

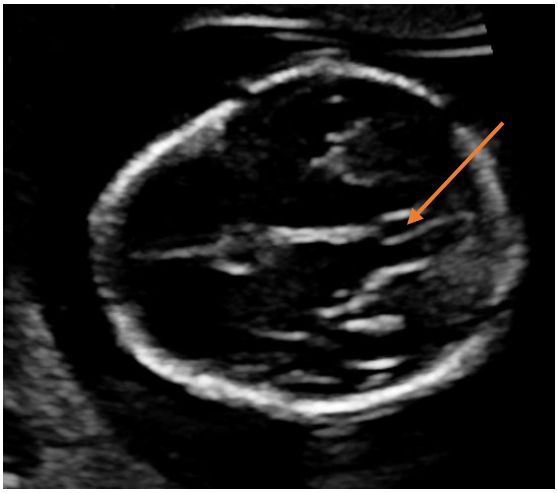
Nasal bone evaluation and nuchal translucency measurement are described in separate guideline documents.

In all cases the posterior fossa is evaluated to confirm that there are 3 black spaces, as numbered above:

1. midbrain
2. 4th ventricle
3. cisterna magna

Below is a further example.

In rare cases maternal habitus/fetal position may make assessment of the posterior fossa in sagittal views difficult; in these cases, an axial view of a normally positioned aqueduct of sylvius (see arrow below) and direct visualization of the spine, including TV images if required, is recommended.

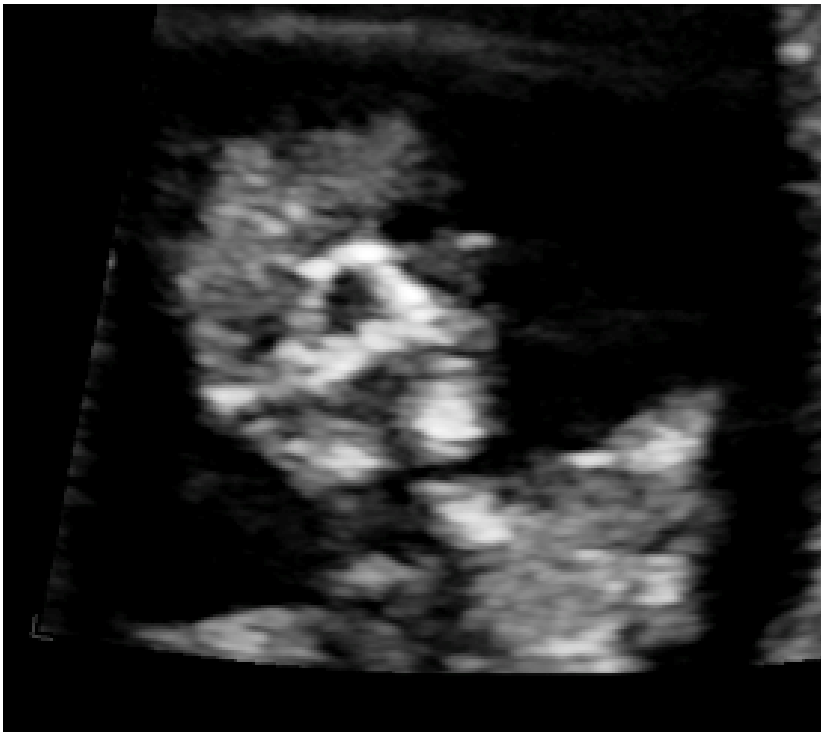


The skull is clearly seen in 100% of cases, along with the midline of the brain. The choroid plexus is visible bilaterally.

The orbits are always seen. In most cases it is possible to see the lenses of the eyes.

Fetal position/maternal habitus may mean that it is necessary to view the orbits in a coronal plane in some cases.

Moving in an axial plane through the face, visualize the retronasal triangle.

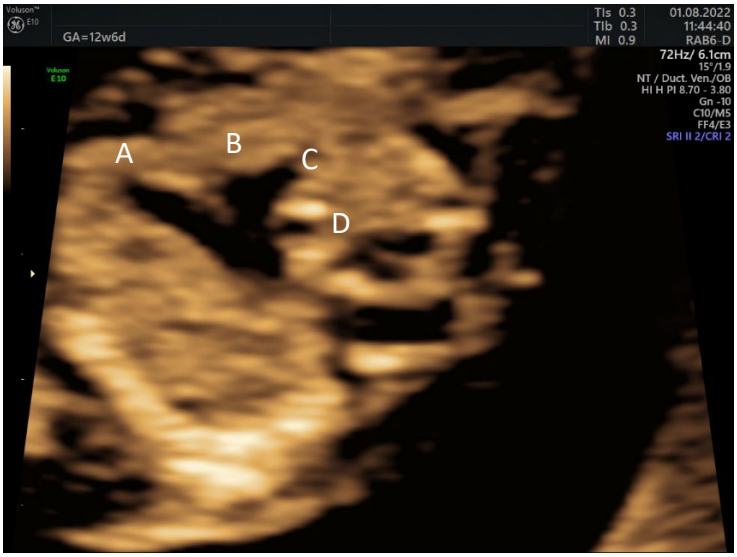


It may be possible to visualize the lips.

Attempt to visualize the 4 cardiac chambers and 2 outflow tracts without colour or power doppler. For technical reasons this may not be possible in all cases.

4 chamber view:

3 vessel tracheal view:



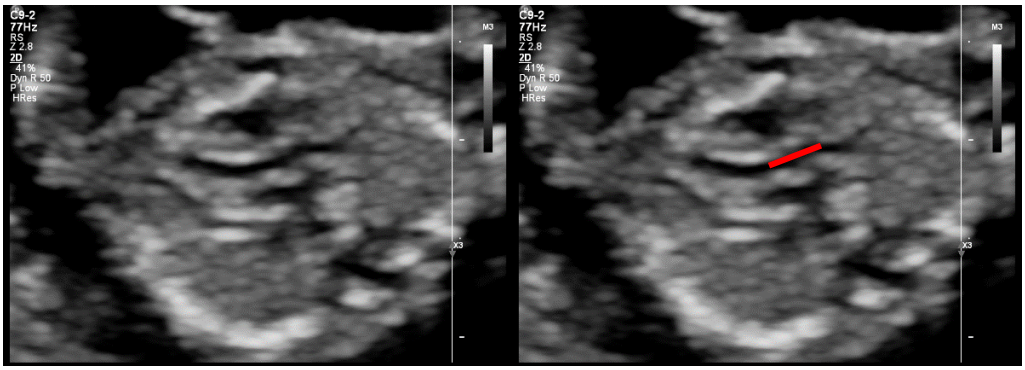
A – pulmonary artery

B- Aorta

C- SVC

D – trachea

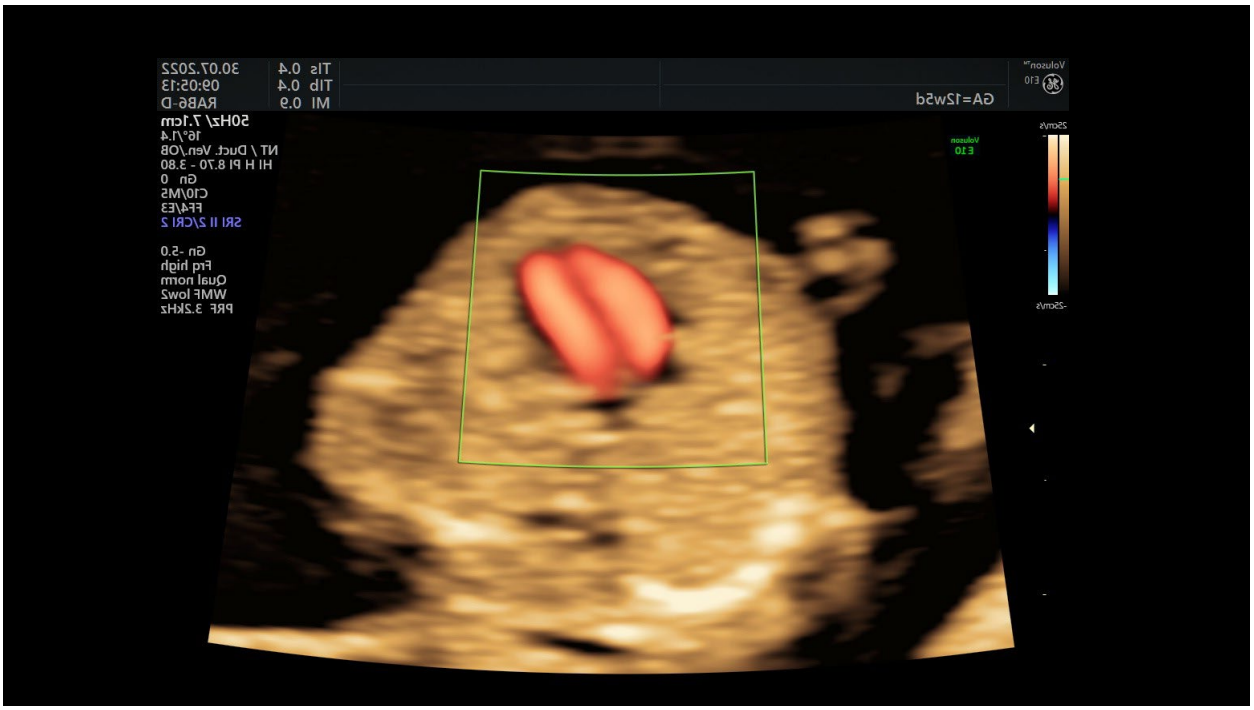
Attempt to visualise the left ventricular outflow tract. This can be more challenging, and it can be difficult to demonstrate good views of the LVOT.



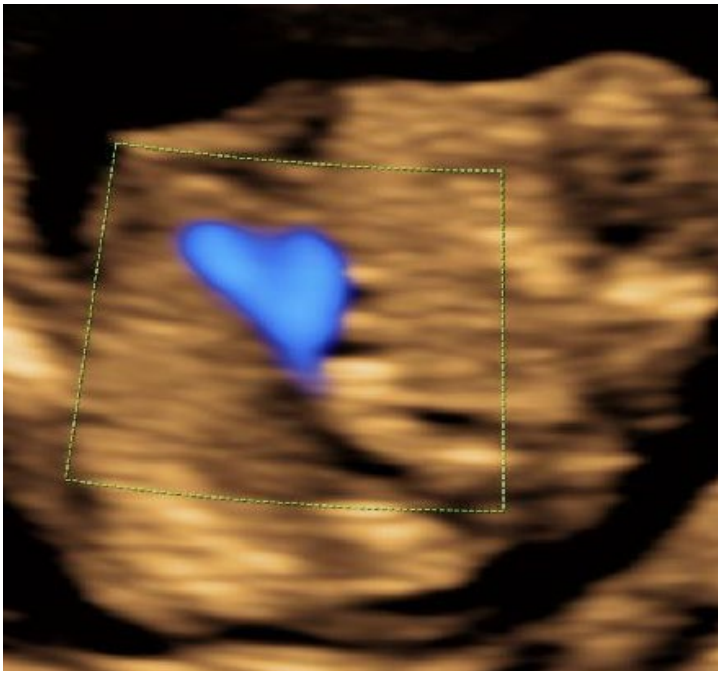
The most important views to obtain of the heart are colour / power doppler images of ventricular filling; and normal filling of the outflow tracts in the 3 vessel tracheal view. If these views are not obtained the likelihood of cardiac anomaly is increased; referral for second opinion at this stage, or rescan at 16 weeks, is recommended.

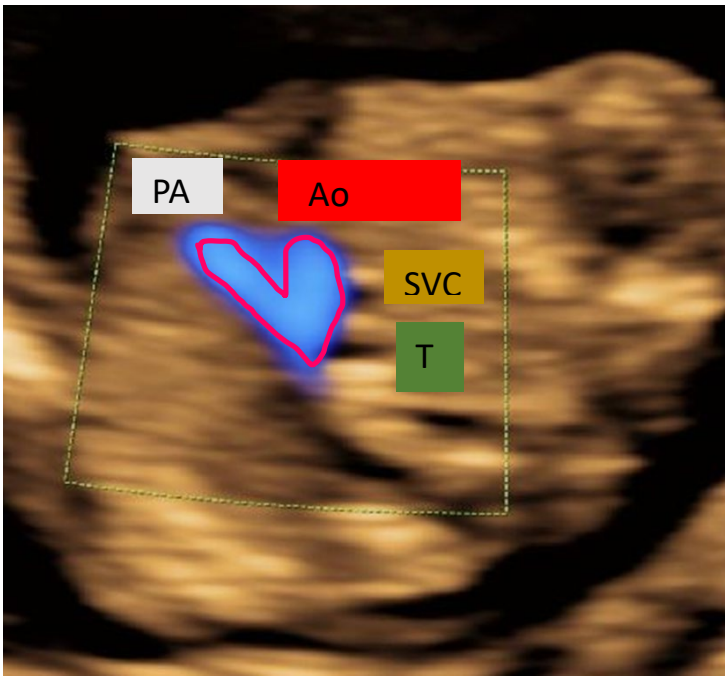
Examples:

Filling of the ventricles (should always be demonstrated):



Normal 3 vessel tracheal view (should always be demonstrated):

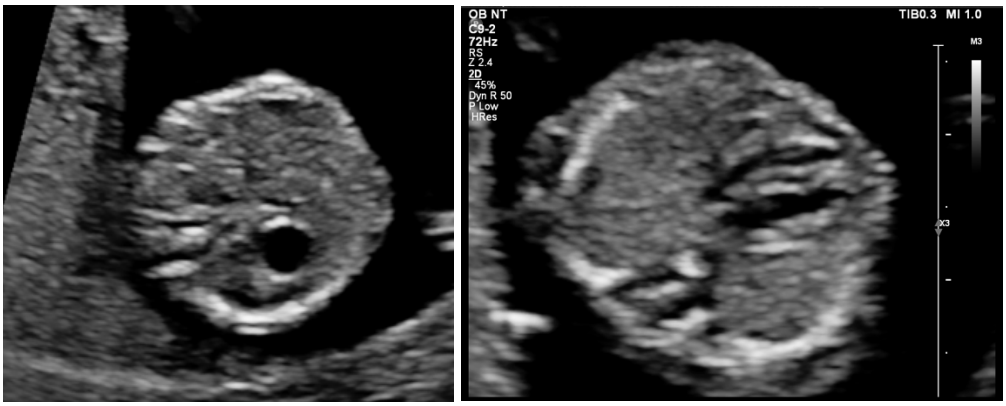




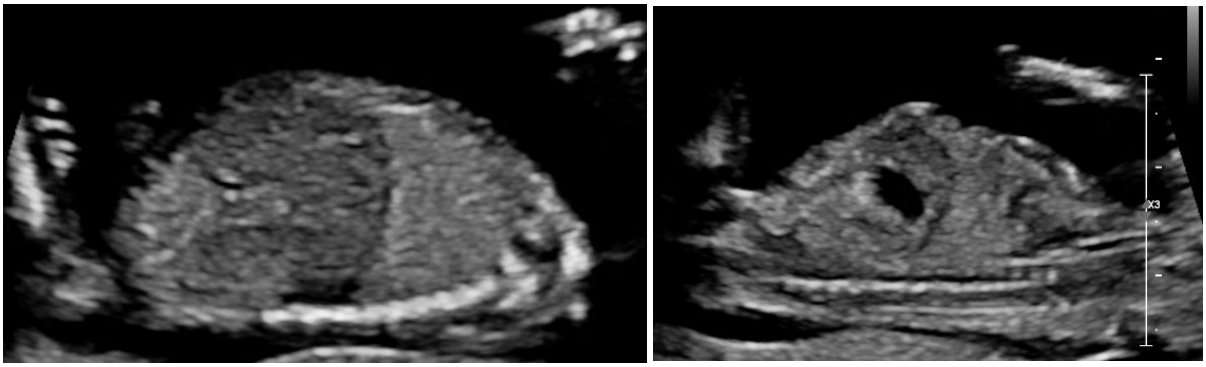
Colour demonstration of the LVOT (can be more challenging to demonstrate):

The stomach should be visualized in almost 100% of cases, and like other structures is more likely to be adequately visualized at 13+ than 11+ weeks.

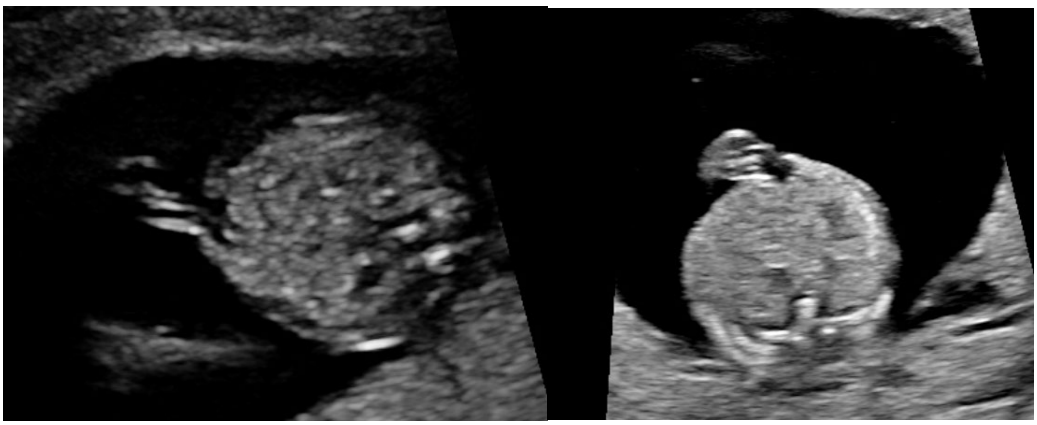
Confirm that the stomach is below the diaphragm, and that it is on the same side of the body as the heart.



The diaphragm is visible in a sagittal or coronal plane, visualize both sides.

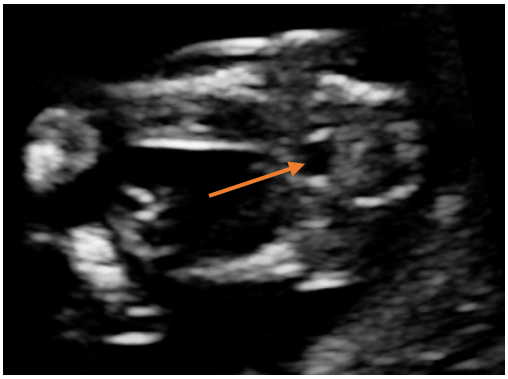


The cord insertion should always be visualized.

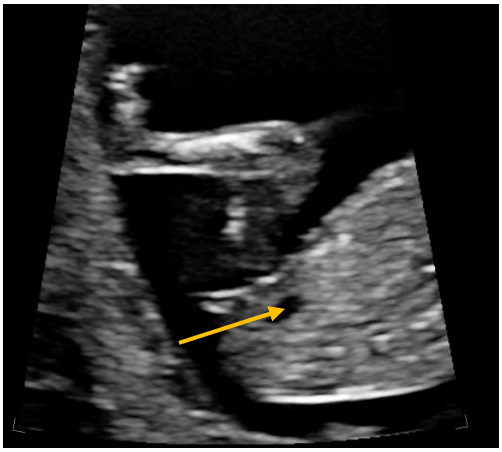


The bladder should be visualized in an increasing proportion of fetuses as gestation increases from 11+ to 13+ weeks gestation. The bladder can be visualized in an axial or a longitudinal plane.

Axial -



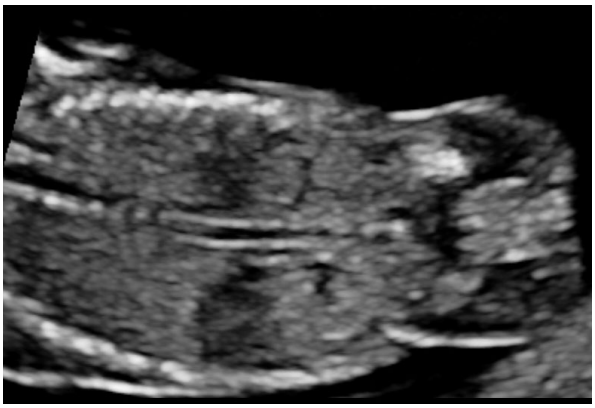
Longitudinal –



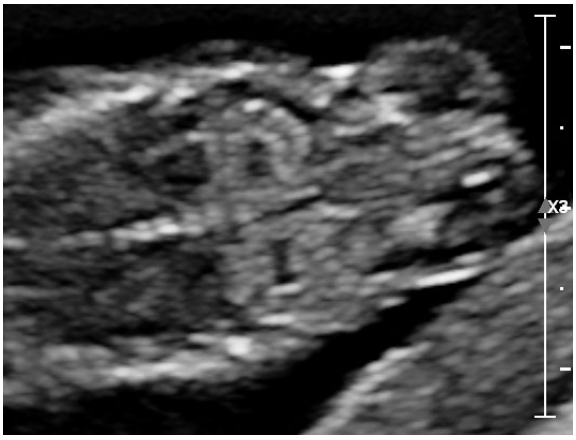
The bladder length can be measured in the longitudinal plane. Always measure the bladder length if it looks prominent, an abnormal bladder length is 7mm or more.

Arterial vessels can be seen passing around either side of the bladder to enter the umbilical cord. It is often challenging to see both vessels without reducing the colour scale (PRF), or else using power doppler. There can therefore be a high false positive rate for labelling a 2-vessel cord at this scan.

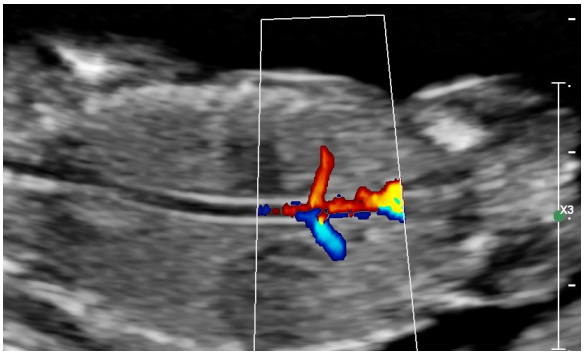
An attempt should be made to visualize the fetal kidneys. This is particularly important if the bladder has not been seen to contain urine.



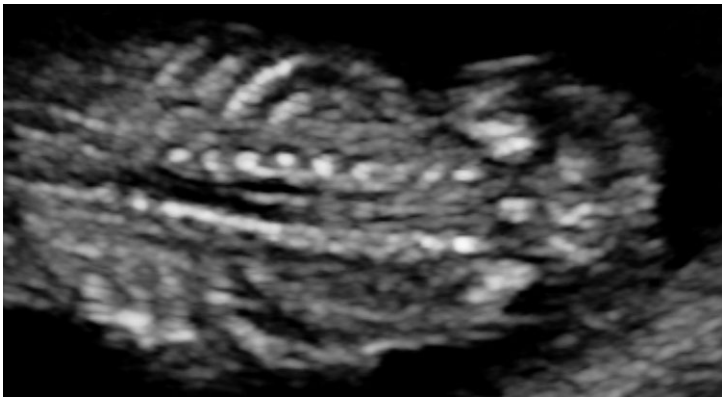
The kidneys can appear quite echogenic at this stage of pregnancy.

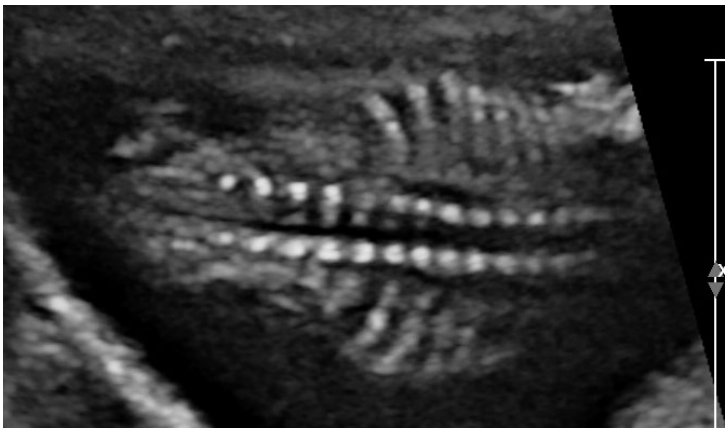


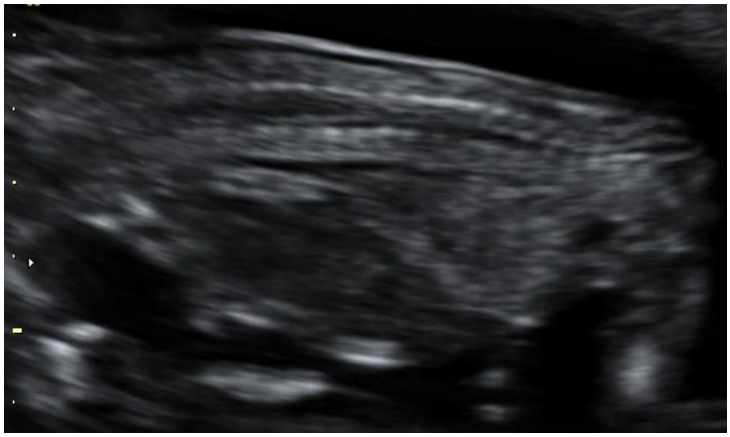
An attempt can be made to see the renal arteries, which can also be challenging due to the size of the fetal vessels at this early stage.



The spine should be assessed in a coronal plane in particular, but also sagittal and transverse planes.

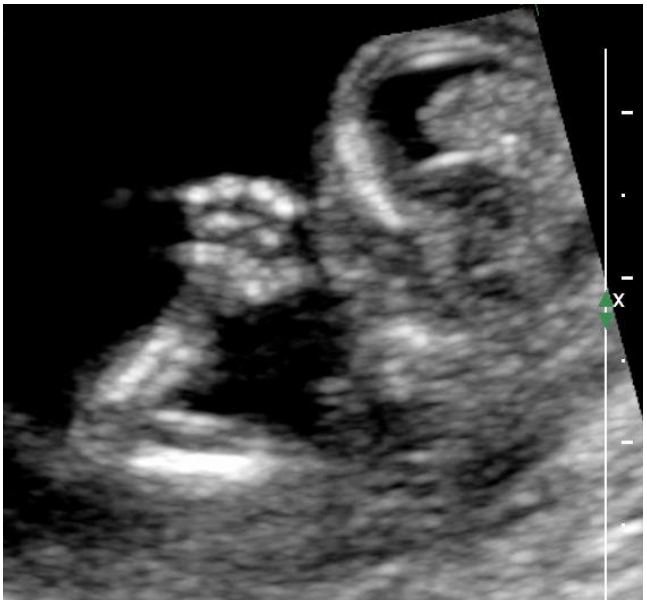






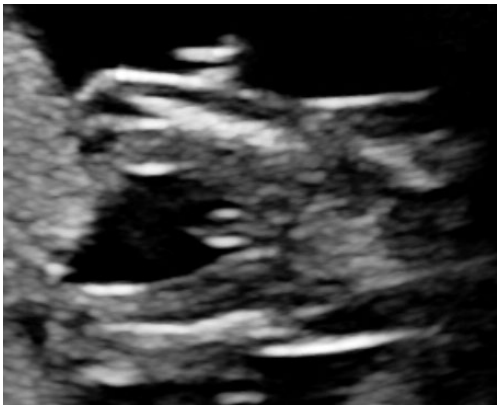
In 100% of cases all 4 limbs should be visualised, including all long bones, both hands and both feet.

The upper arms, forearms and hands should be visualised, and the digits counted on each hand.

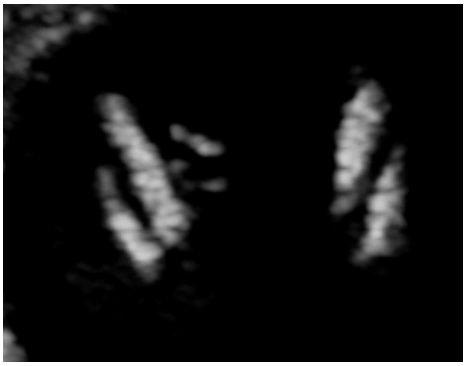


Ensure each foot is present and normally shaped. Attempt to count the toes, this is more readily done with the toes directed toward the transducer.

Ensure all long bones are present. Demonstrate both femora.



Both lower legs are demonstrated in this image, with 2 long bones in each.



It is important to visual both upper limbs and both lower limbs, either at the same time or one immediately after the other, as this scan provides a good opportunity to detect a missing limb or part of limb.

Attempt to look at foot position, although talipes does not necessarily present by the 12 - 13+ week scan.

Checklist for performing the 12 - 13+ week scan

Obtain longitudinal images and axial images.

Some structures can be visualised on either a longitudinal or an axial image.

In the longitudinal images the following can be seen:

1. Profile
2. Nuchal translucency thickness
3. Posterior fossa
4. Nasal bone
5. Palate
6. Regular skull contour - top of the head
7. Diaphragm (both sides)
8. Stomach below diaphragm
9. Vertebrae
10. Kidneys
11. Bladder
12. Phallus
13. Limbs.

In the axial views the following structures can be seen, moving down the fetus in a craniocaudal direction:

1. Skull
2. Midline of brain
3. Choroid plexuses
4. Orbits, lenses
5. Retronasal triangle
6. Lips
7. Heart - 4 chambers, outflow tracts, with and without colour/power doppler. Ventricular filling
8. Heart rate and rhythm
9. Chest - symmetrical; no masses or effusions
10. Stomach - left upper quadrant, on same side as heart
11. Vertebrae - including intact overlying skin line
12. Bladder
13. Cord insertion
14. 3 vessel cord - arterial vessels passing around the bladder
15. Extremities - 4 limbs, each with 3 segments; hands and feet present with normal appearance and orientation.

Practice Tips

- Use the highest resolution (highest frequency) suitable transducer possible.
- Use appropriate presets, nuchal translucency presets if available. Other suitable presets may be cardiac or early pregnancy.
- Ask the applications specialist to help with presets if required.
- Consider transvaginal scan if you are unable to obtain adequate resolution transabdominally.
- If you are unable to obtain normal views of anatomy, consider the possibility that the anatomy is abnormal. Get a second opinion/rescan at 16 weeks.
- Reduce the sector width and ensure you focus on the fetus. Reduce depth and enlarge the image.
- When using colour/power doppler, use appropriate settings. Reduce the colour box size, increase the PRF if required to obtain more meaningful blood flow images, use power doppler if colour doppler images are suboptimal.