

Fetal brain anatomy – First trimester scan evaluation

Patient Information Series – What you should know, what you should ask.

Why is the brain evaluated during the first trimester fetal ultrasound scan?

Congenital brain abnormalities are among the most common fetal malformations and include a range of anomalies that develop before childbirth. While some may be linked to infections, genetic disorders or exposure to certain substances during pregnancy, others occur spontaneously without any identifiable cause. These anomalies vary in severity, from mild to severe, and can occur in isolation or alongside other malformations. Depending on their nature and severity, they may lead to clinical issues or developmental delays in the future.

During routine prenatal care, first trimester fetal ultrasound scan is usually offered between 11–13 weeks of gestation. This evaluation allows obstetricians or sonographers to examine the structure and development of your baby's brain early in pregnancy. Identifying brain malformations at this stage allows us understand the potential impact on your baby's health and neurological development. It also allows us to devise appropriate management strategies before and after birth and develop a tailored follow-up plan for your baby's needs.

How is the fetal brain examination performed?

Evaluation of the fetal brain in the first trimester follows guidelines from the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG). Typically, the routine ultrasound examination is performed over the abdomen. The obstetrician or sonographer will take images of the baby's brain from two different planes to check the main cerebral structures visible at this stage of the pregnancy.

Getting a good look at the fetal brain requires skill and careful scanning, and sometimes it depends on how the baby is positioned. While this examination can usually rule out some major brain malformations, several parts of the brain are still developing and can be only seen later in pregnancy. Thus, it is important to reevaluate the baby's brain later in pregnancy, specifically between 20 – 24 weeks of gestation.

What happens if there is suspicion of brain malformation?

If routine ultrasound examination shows concerns about the baby's brain, the baby should undergo a more specialized brain examination, called early neurosonography. This can be done by the same person who did the regular ultrasound, if they have the expertise needed, or they might refer you to a specialized center for further evaluation. During this examination, doctors will take additional ultrasound images of your baby's brain from different planes, and sometimes they may require the use of a transvaginal probe to better visualize the fetal brain anatomy.

This approach allows the specialist to better visualize and classify the identified anomaly. After diagnosis, the specialists would provide you with detailed information on the possible consequences for the baby's health, and establish an appropriate management plan. They might also offer genetic testing to learn more about your baby's condition. It is important to understand everything and make the best decisions for the baby's health.

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