## 3D/4D Ultrasound

Having a 3D/4D ultrasound is a memorable experience as it is able to capture the images of your unborn child. With 3D/4D ultrasound you can actually see what your baby is going to look like before he or she is born. Don't miss out on this unforgettable experience.

The 4D dimension is real time. You can therefore see live movements of the baby in-utero, like a video, whilst 3D imaging will allow you to capture static photos of your little one.

## Limitation

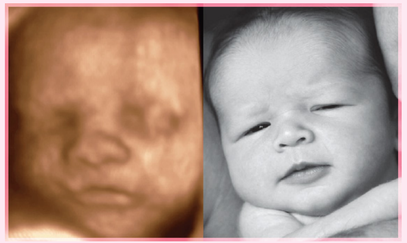
Every baby scan is different depending on its gestational age, fetal position, position of placenta, amount of amniotic fluid and amount of mother's body tissue. Therefore, we cannot guarantee what type of 3D pictures will be captured, but we promise to make every effort to obtain the best possible images.

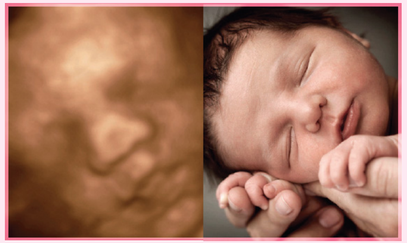
## Is it safe?

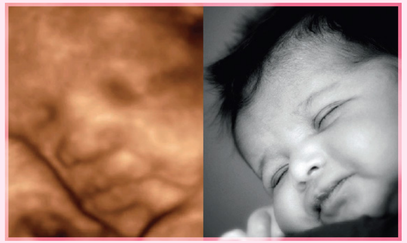
3D and 4D scans use sound waves, which are very safe, just like ordinary 2D scans. In addition, research has shown no harmful effects of 3D/4D scans on both mother and fetus.

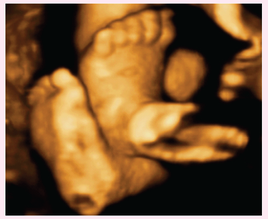
## Interested?

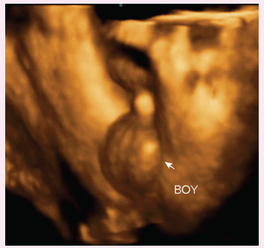
Parents desiring to have the 3D/4D scans should make an appointment to see our sonographer. It is preferable to scan between 27 to 34 weeks of pregnancy for the best view though 3D/4D scans can be performed at any time.



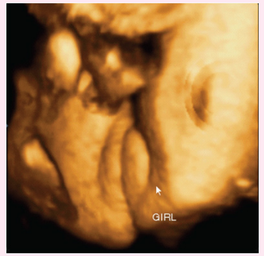








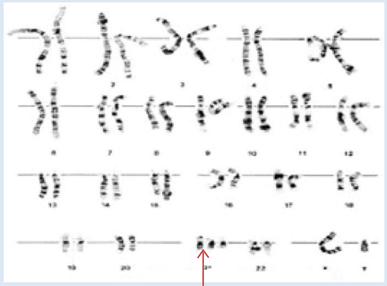

3D image of a baby boy's genital area




3D image of a baby girl's genital area

## What is Down's Syndrome?

It is the most common severe abnormality that a baby can have and is a major cause of handicap occurring in 1 out of every 700 deliveries. Regardless of age, all women are at risk of having a baby with Down's Syndrome. The risk increases with maternal age.



**3 copies of Chromosome 21**

Every human being has 46 chromosomes arranged in 23 pairs. An extra copy of the chromosome number 21 results in the baby having Down's Syndrome. Sometimes called Trisomy 21, it is usually associated with learning disability, mental retardation (often mild to moderate) and a distinctive 'mongoloid' appearance.

TMC FERTILITY

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Patient Education

# Antenatal Screening

08.21.V3

# Antenatal

**CONGRATULATIONS** on your pregnancy! You have just embraced motherhood – the most beautiful and life-giving journey that anyone has ever treaded upon.

Following the initial excitement of discovering that you are pregnant, the next question for most parents is **"Will our baby be alright?"** With medical advancements, there are several antenatal screening tests available that can be carried out during pregnancy which offer reassurance of the baby's health.

## Why do Pregnant Mothers Need to Perform Antenatal Tests?

Tests are carried out to provide information regarding the health of the baby and the genetic or chromosomal information about the baby before birth. If there are problems, knowing about them in advance can help parents and doctors to plan for the baby's future and assess any special requirements for the baby's birth and aftercare.

There is no single test that can identify all possible abnormalities in a baby. Different tests identify different abnormalities. Some of the tests include:

**1. Nuchal Translucency and Nasal Bone Scan**
**2. First Trimester Screen**
**3. Pre-Eclampsia Screen**
**4. Non-Invasive Prenatal Test (NIPT)**
**5. Amniocentesis**
**6. Fetal Anomaly Scan** (to diagnose structural abnormalities in the baby)

Some screening and diagnostic tests that are available to detect Down's Syndrome and other abnormalities in the baby are described below.

### 1. Nuchal Translucency and Nasal Bone Scan

This test is offered at **11 weeks to 13 weeks and 6 days** (CRL: 45mm-84mm) of pregnancy. It involves an ultrasound scan to measure the thickness of the layer of fluid at the back of the baby's neck. Abnormal babies have a thicker layer (>3mm). The presence or absence of the nasal bone (bone of the bridge of the nose) is also determined at this stage. This test has a 75% detection rate of Down's Syndrome.

### 2. First Trimester Screening (FTS)

FTS is a combination of antenatal tests, which includes an early ultrasound scan and a blood test. It is performed between **11 weeks to 13 weeks and 6 days** of pregnancy. FTS identifies women who may have an increased risk of having a baby with Down's Syndrome or cardiac defect.

An ultrasound scan is done to confirm the gestation of the pregnancy and to measure the nuchal translucency and presence or absence of the nasal bone. Subsequently, 10ml of blood is drawn to measure the levels of two hormones normally found in all pregnant women (from the placenta):

- **Pregnancy Associated Protein-A (PAPP-A)**
- **Free beta-subunit of Human Chorionic Gonadotrophin (free β-hCG)**

**A positive screen result does not mean that your baby has Down's Syndrome,** but it means there is an **increased risk of being affected.** You may consider having a diagnostic test such as Amniocentesis. On the other hand, **a negative screen result does not mean your baby does not have Down's Syndrome,** but that the likelihood of the baby being affected is low. Indeed, having an extremely low risk result rapidly reassures the mother-to-be that the baby is likely to be healthy. The FTS also screens for two other chromosomal abnormalities, which are Patau's Syndrome (Trisomy 13) and Edward's Syndrome (Trisomy 18).

### 3. Non-Invasive Prenatal Test (NIPT)

It is a simple and non-invasive screening which can be done at any time after 10 weeks of gestation. It is the latest molecular technology for detecting common genetic disorders such as Down's Syndrome, Edward's Syndrome, Patau's Syndrome and microdeletions.

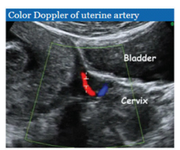
Short fragments of fetal DNA found in maternal blood are extracted and amplified, bringing the accuracy of the test to 99%. If the result is positive, the mother is required to undertake Amniocentesis to confirm the findings.

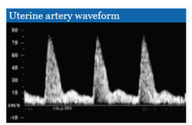
### 4. Pre-Eclampsia (PE)

Pre-eclampsia is a medical condition characterised by high blood pressure and significant amount of protein in the urine of a pregnant woman. If left untreated, it can develop into eclampsia (life-threatening seizures in pregnancy).

Pre-eclampsia may develop from 20 weeks of gestation and its progress is different among patients. PE affects about 2% of pregnancies and is a major cause of perinatal and maternal morbidity and mortality.

Identification of whether a woman is at high risk of PE could potentially improve pregnancy outcome. The patient-specific risk of developing PE can be predicted by a combination of factors in the maternal history and the measurements taken at **11 weeks to 13 weeks and 6 days**, which are: maternal blood pressure, uterine artery pulsatility index (PI), maternal serum level of **Pregnancy Associated Protein-A (PAPP-A)** and maternal serum level of **Placental Growth Factor (PLGF).** Screening using this combined approach could identify about 90% and 45% of developing early PE and late PE, respectively at a false positive rate of 5%.



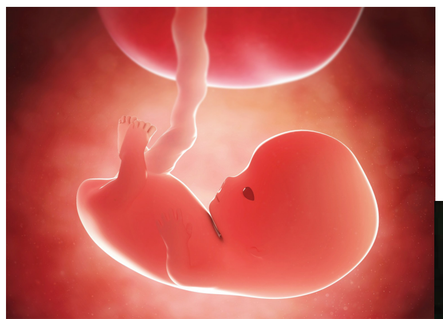




### 5. Amniocentesis

Amniocentesis offers a definitive diagnosis in pregnancy which means it can tell you with **99.7%** accuracy whether or not your baby has got a particular chromosomal abnormality. The test is usually performed between 15 and 17 weeks of pregnancy. Amniocentesis is normally offered to pregnant women who are at high risk of having a baby with chromosomal disorders i.e. positive screen result of FTS, NIPT, maternal age or family history of certain birth defects.

Like all medical procedures, there are some risks associated with amniocentesis. Apart from a 0.5% (1 in 200) risk of miscarriage, there is also a slight risk of infection around the baby and the water bag may break following the procedure. Much less commonly, there are links between amniocentesis and temporary breathing difficulties in the newborn baby, especially if the babies are born early.

### 6. Fetal Anomaly Scan



- **When and why**

It is performed between 20 and 24 weeks (second trimester) of pregnancy. It is an important test to detect structural fetal abnormalities as well as to check the baby's growth and placental position.

- **Who**

A detailed ultrasound examination is performed by the sonographer or doctor. They will examine in detail the baby's brain, face, spine, chest, abdomen, kidneys, arms, hands, legs and feet. The scan is performed through the tummy wall but occasionally the doctor may need to perform the scan through the vagina if the baby's head is low in your tummy in order to check the developing brain.

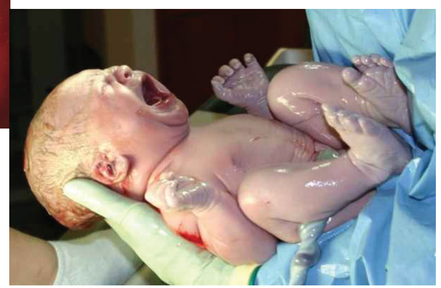
- **Limitations**

It is dependent upon many factors, some of which include the bodyweight of the mother and the position in which the baby lies in the womb. Sometimes the doctor cannot obtain the perfect views of a certain part of the baby's body. In this case, you will be invited back for a repeat scan. This happens in about 10% of cases, so please do not be panicked if this happens to you.

In addition, you will be charged for **ONE** visit only, no matter how many times the doctor asks you to come back for a repeat scan.

- **Accuracy**

More than half of all serious congenital malformations can be detected by the anomaly scan. Thus, if the baby appears normal on scan, there is only a small chance that your baby will have problems. **It is important to understand that not all abnormalities can be diagnosed while performing the anomaly scan. Occasionally, abnormalities may be missed.** This is partly because some problems may not be present at 24 weeks but may develop later in the pregnancy.



## How good or reliable are all these tests?

When considering which tests to perform, the couple should be guided by the detection rates (sensitivity) and the costs of the tests. Detection rate refers to the ability of the test to detect the abnormality, i.e. the higher the detection rate the more sensitive and better the test is.

| Method of Screening | Detection Rate (sensitivity) |
|---|---|
| Maternal age + Nuchal translucency | 75% |
| First trimester screen (Maternal age + PAPP-A + β-hCG + Nuchal translucency + Nasal bone) | 90-95% |
| NIPT Test | 99% |
| Amniocentesis & CVS | 99.7% |

All above tests are optional and a couple should not feel pressured to have any test. However, a negative screening test rapidly reassures the couple that the developing baby has a low chance of being abnormal.