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percept™ NIPT fact sheet

Increased risk for segmental chromosome imbalance

This fact sheet is for women and their partners who receive an increased risk result for a segmental chromosome imbalance from the *percept* non-invasive prenatal test (NIPT) offered by the Victorian Clinical Genetics Services (VCGS). This information may not be applicable to test results reported by other NIPT service providers.

As part of the service offered by VCGS, women and their partners have the opportunity to discuss their result with a genetic counsellor at no additional cost. Genetic councilors are experts at assisting people to understand genetic test results and make informed decisions about further testing options.

What does this result mean?

percept NIPT looks at all 23 pairs of chromosomes (1-22, X & Y) and gives an estimate of the chance the baby has a condition caused by an extra or missing copy of a chromosome. This includes conditions such as trisomy 21 (Down syndrome), trisomy 18 and trisomy 13; and also extra or missing copies of the sex chromosomes (X and Y). *percept* NIPT can also identify if large (>7Mb) parts of a chromosome are missing or duplicated. These are called segmental chromosome imbalances or partial chromosome deletions and duplications.

An increased risk result for a segmental chromosome imbalance **does not** mean the baby definitely has that genetic change

An increased risk result indicates there is a chance of a segmental chromosome imbalance in the baby which may cause serious health problems. *percept* NIPT is a screening test. Only a diagnostic procedure (such as chorionic villus sampling (CVS) or amniocentesis) with chromosome testing can confirm if the baby has this chromosome change.

What is a segmental chromosome imbalance?

People have 23 pairs of chromosomes that contain the genetic instructions for how our bodies grow and develop. Segmental chromosome imbalances are changes within a chromosome caused by missing or extra parts of genetic material. Larger segmental chromosome imbalances occur in about 1 in 2,500 births.

Possible explanations for this high risk result:

There are a number of reasons why *percept* NIPT may give an increased risk result for a segmental chromosome imbalance.

The baby may have a genetic condition caused by a segmental chromosome imbalance. If this is the case there is an increased chance of physical and intellectual problems in the baby.

The segmental chromosome imbalance may only be present in the placenta. This is called confined placental mosaicism (CPM). CPM occurs when there are some cells in the placenta with the segmental chromosome imbalance. These cells are only in the placenta, they are not found in the baby.

Maternal mosaicism. In rare cases, the mother may have the segmental chromosome imbalance in some of her cells, and this can be passed on to the baby. If this is suspected, further testing of the mother may be recommended.

Statistical false positive. This is an incorrect result with no apparent biological cause.

What are the next steps?

All women who receive a *percept* NIPT result showing an increased risk of a segmental chromosome imbalance should discuss this with their healthcare provider.

Women should be offered the option of further diagnostic testing. Referral for genetic counselling may be helpful in decision making about further testing options.

Further testing options:

- A follow-up ultrasound is recommended. In some cases an abnormality may be seen, however not all pregnancies with a segmental chromosome imbalance will show ultrasound abnormalities.
- Diagnostic testing will be offered. CVS can be performed at 12-13 weeks to provide a sample for diagnostic testing. Occasionally, an amniocentesis may also be required, depending on the CVS result.
- Amniocentesis can be performed at 15-16 weeks gestation and will give the most definitive result in these circumstances.
- In some situations a maternal chromosome test may be recommended to determine if the mother carries a segmental imbalance. This will be highlighted on the *percept* NIPT report when indicated. If the mother carries the segmental imbalance, it may not cause any health problems in her if it is only present in some of her cells (this is called mosaicism). However, if she passes this on to her baby, the genetic change may be present in all the baby's cells which may cause physical and intellectual problems.

What are diagnostic procedures?

CVS and amniocentesis are procedures used to collect tissue samples for diagnostic testing during pregnancy. Diagnostic testing can identify for certain if the baby has a segmental imbalance.

CVS involves passing a fine needle into the developing placenta (chorion) under ultrasound guidance and drawing a few small fragments of tissue into a syringe. CVS carries a small risk of miscarriage (1 in 500 or 0.2%)*, generally within two weeks of the procedure. CVS collects placental tissue for testing. If cells with the segmental chromosome imbalance are found in only part of the CVS sample, an amniocentesis may also be offered to see whether the segmental chromosome imbalance is also present in the baby. This is why it is sometimes recommended waiting for an amniocentesis.

Amniocentesis involves the removal of a small sample of amniotic fluid from the sac around the developing baby. Under ultrasound guidance, a fine needle is inserted through the mother's abdomen to obtain the fluid. The fluid contains cells that are shed naturally from the baby. Amniocentesis carries a very small risk of miscarriage (1 in 1000 or 0.1%)*, generally within two weeks of the procedure.

What are diagnostic tests?

After the CVS or amniocentesis procedure, chromosome analysis is performed. This can include FISH, karyotype, and microarray. These laboratory tests are considered diagnostic tests.

Microarray (or molecular karyotype): a detailed test that provides more information than a karyotype. This very accurate test looks for extra or missing segments of DNA in the chromosomes. Results are usually available in 10-14 days. This is the recommended diagnostic test when an increased risk for a segmental chromosome imbalance has been reported using *percept* NIPT.

FISH: stands for 'Fluorescence In Situ Hybridisation'. This test looks at whether the cells contain the correct number of chromosomes. This is a rapid, preliminary test with results available in 1-2 working days.

Karyotype: looks at the size, shape and number of chromosomes to determine whether there are any extra, missing or abnormal chromosomes present. Results are usually available in 10-14 days.

Only an invasive diagnostic procedure with chromosome testing can confirm if the baby has the segmental chromosome imbalance

Who can I speak to about this result?

We recommend discussing an increased risk result with your health professional. They can refer you to our genetic counselling team.

Alternatively, you can contact a VCGS genetic counsellor directly on 03 9936 6402.

Genetic counsellors are experts in communicating genetic information and assisting people to understand complex genetic results. They can support people in making informed decisions that are right for them and their family. Genetic counselling is free for women (and their partners) having *percept* NIPT.

Contact details

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The information on this fact sheet is based on a comprehensive assessment of outcomes from 15,600 women who have had *percept* NIPT#.

*Akolelar R et al. *Ultrasound Obstet Gynecol*, 2015, Jan;45(1): 16-26.

VCGS data (2017) on file.

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