Trimester 1

Test Specification

Available from 9 weeks

Downs Syndrome (Trisomy 21) | Gender Determination (Optional)

Trimester 1

Overview

Trimester 1 is a genetic screening test used to detect the presence Downs Syndrome (Trisomy 21) during pregnancy and includes gender determination (optional). The testing is based on the circulating free DNA (cfDNA) present in the mothers blood which originates from the placenta.

It is performed via a simple test using a small sample of the mothers blood, usually from a blood vessel in the arm. NIPT testing is well regarded as the recommended testing method for chromosomal abnormality in pregnancy and eliminates any risk of miscarriage or other adverse outcomes that are associated with invasive testing procedures, such as amniocentesis or chorionic villus sampling (CVS).

Trimester 1 is not a diagnostic tool and is not used in replacement of invasive diagnostic testing.

A customer may take a NIPT test for any reason, or if assessed as high risk due to:

- Increased Nuchal fold during Ultrasound Scan
- Unknown family history for Downs Syndrome
- A previous pregnancy affected by Downs Syndrome
- Maternal age above 35 years old
- High risk NHS combined test result for Downs Syndrome (Trisomy 21)
- High risk PaPP-A
- Anxiety or Reassurance purposes
- Family History of Downs Syndrome

The blood sample is delivered to a laboratory and processed. Once the test has been analysed, the result is provided to the mother. Where high risk results are received, the Trimester team will provide support for the parents and a medical referral to their Health Care Provider, who will arrange genetic counselling, discuss follow up care and provide diagnostic testing.

Trimester 1

Please read our FAQs, and visit the links below for more information on Downs Syndrome and to access support networks.

https://www.nhs.uk/conditions/downs-syndrome/ https://www.downs-syndrome.org.uk/

Test Specification

Through analysing the cell-free fetal DNA (cfDNA) circulating in the mother's blood and eventually chromosome sequencing quantified through a bioinformatic analysis, the presence of any fetal chromosomal abnormalities can be determined.

Trimester 1 is suitable for singleton pregnancies and can be used following assisted reproduction, even in cases where donor eggs are used, however is not suitable for twin pregnancies.

Detection Rate	False Positive Rate	No Call Rate	Test Turnaround time
99%	0.1%	<0.6%	3-5 working days

Trimester 1	
Prevalence T21 positive cases	1.34% (n = 184)
Sensitivity	98.92%
Specificity	99.99%
PPV	99.46%
NPV	99.99%

PPV - The probability that a person with a positive test result has, or will get, the disease.
NPV – The probability that a person with a negative test result will not have or get the disease.

Limitations of the test

Trimester 1 is the recommended screening test for Downs Syndrome (Trisomy 21), but is not as a diagnostic test. For more information around factors that can affect test results please see FAQs.

Trimester 1 correctly identifies 99% of Downs Syndrome test results, although false positives and false negatives can occur. The Positive Predictive Value (PPV) of the test indicates that there is a chance of a false positive NIPT test results of less than 0.54%. The Negative Predictive Value (NPV) of the test indicates there is a chance of a false negative NIPT test result of less than 0.1%.

Trimester 2

Test Specification

Available from 10 weeks

Downs Syndrome (Trisomy 21) | Patau's Syndrome (Trisomy 18) | Edwards Syndrome (Trisomy 13) | Turners Syndrome (monosomy X) | Klinefelter Syndrome (Trisomy XXY) | Jacobs Syndrome (Trisomy XYY) | Trisomy X | Gender Determination (Optional)

Trimester 2

Overview

Trimester 2 is a genetic screening test used to detect the presence of Downs syndrome (T21), Turners syndrome (MX), Klinefelter syndrome (XXY), Jacobs syndrome (XXY) and Trisomy X. Other serious genetic conditions detected are Patau's syndrome (T18) and Edwards syndrome (T13) and includes gender determination (optional).

The testing is based on the cell free fetal DNA (cfDNA) present in the mothers blood which originates from the placenta.

It is performed via a simple test using a small sample of the mothers blood, usually from a blood vessel in the arm. NIPT testing is well regarded as the recommended testing method for chromosomal abnormality in pregnancy and eliminates any risk of miscarriage or other adverse outcomes that are associated with invasive testing procedures, such as amniocentesis or chorionic villus sampling (CVS).

Trimester 2 is not a diagnostic tool and is not used in replacement of invasive diagnostic testing.

A customer may take a NIPT test for any reason, or if assessed as high risk due to:

- Increased Nuchal fold on an Ultrasound Scan
- Follow up from a diagnostic scan where a NIPT test is recommended
- Unknown family history
- A previous pregnancy affected by genetic disease
- Maternal age above 35 years old
- High risk NHS combined test result for a genetic condition being tested for
- High risk PaPP-A
- Anxiety or Reassurance purposes
- Family History of a serious genetic condition

Trimester 2

The blood sample is delivered to a laboratory and processed. Once the test has been analysed, the result is provided to the mother. Where high risk results are received, the Trimester team will provide support for the parents and a medical referral to their Health Care Provider, who will arrange genetic counselling, discuss follow up care and provide diagnostic testing. Please read our FAQs for more information on screening tests, NHS advice and to access support networks.

Test Specification

Through analysing the cell-free fetal DNA (cfDNA) circulating in the mother's blood and eventually chromosome sequencing quantified through a bioinformatic analysis, the presence of any fetal chromosomal abnormalities can be determined.

Trimester 2 is suitable for singleton, and twin pregnancies* and can be used following assisted reproduction, even in cases where donor eggs are used.

*Gender determination may be affected in twin pregnancies

Trimester 2	
Trisomy 21	
Sensitivity	99.99%
Specificity	99.99%
PPV	99.37%
NPV	99.99%
Trisomy 18	
Sensitivity	99.99%
Specificity	99.99%
PPV	97.19%
NPV	99.99%
Trisomy 13	
Sensitivity	99.99%
Specificity	99.99%
PPV	92.86%
NPV	99.99%

PPV - The probability that a person with a positive test result has, or will get, the disease.
NPV – The probability that a person with a negative test result will not have or get the disease.

Limitations of the test

Trimester 2 is the recommended screening method but is not as a diagnostic test. *Dichorionic twins are excluded from gender test options with sex chromosome aneuploidies and microdeletions due to ambiguity of monosomy X and CNV's. Fetal gender can only be reported as presence/absence of Y chromosome.

Trimester 2 correctly identifies 99% of chromosome aneuploidies screened for, although false positives and false negatives can occur. The Positive Predictive Value (PPV) of the test indicates that there is a chance of a false positive NIPT test result, varying with the genetic condition. The Negative Predictive Value (NPV) of the test indicates there is a chance of a false negative NIPT test varying with the genetic condition.

Trimester 3

Test Specification Sheet

Available from 10 weeks

Trimester 3

Overview

Trimester 3 is a genetic screening test used to detect the presence of Downs syndrome (T21), Turners syndrome (MX), Klinefelter syndrome (XXY), Pataus Syndrome (T18), Edwards Syndrome (T13), Jacobs syndrome (XYY) as well as Trisomy X, 9 and 16.

Trimester 3 also detects the presence of the 6 most common microdeletion syndromes (listed within Test Specification, on page 2) and includes gender determination (optional).

It is performed via a simple test using a small sample of the mothers blood, usually from a blood vessel in the arm. NIPT testing is well regarded as the recommended testing method for chromosomal abnormality in pregnancy and eliminates any risk of miscarriage or other adverse outcomes that are associated with invasive testing procedures, such as amniocentesis or chorionic villus sampling (CVS).

Trimester 3 is not a diagnostic tool and is not used in replacement of invasive diagnostic testing.

A customer may take a NIPT test for any reason, or if assessed as high risk due to:

- Increased risk of miscarriage
- History of miscarriage
- Risk of Intra-Uterine Growth Restriction
- Increased Nuchal fold on an Ultrasound Scan
- Follow up from a diagnostic scan where a NIPT test is recommended
- Unknown family history
- A previous pregnancy affected by genetic disease
- Maternal age above 35 years old
- High risk NHS combined test result
- High risk PaPP-A
- Anxiety or Reassurance purposes
- Family History of a serious genetic condition

Trimester 3

The blood sample is delivered to a laboratory and processed. Once the test has been analysed, the result is provided to the mother. Where high risk results are received, the Trimester team will provide support for the parents and a medical referral to their Health Care Provider, who will arrange genetic counselling, discuss follow up care and provide diagnostic testing. Please read our FAQs for more information on screening tests, NHS advice and to access support networks.

Test Specification

Through analysing the cell-free fetal DNA (cfDNA) circulating in the mother's blood and eventually chromosome sequencing quantified through a bioinformatic analysis, the presence of any fetal chromosomal abnormalities can be determined.

Trimester 3 is suitable for singleton, and twin pregnancies* and can be used following assisted reproduction, even in cases where donor eggs are used.

**Gender determination may be affected in twin pregnancies*

Microdeletions detected with Trimester 3

Aneuploidies of Chromosomes detected with Trimester 3

	Downs Syndrome Trisomy 21	Patau's Syndrome Trisomy 18	Edwards Syndrome Trisomy 13	Turners Syndrome Monosomy X	Trisomy X XXX	Klinefelter Syndrome XXY	Jacobs Syndrome XYY
Sensitivity	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%
Specificity	99.99%	99.99%	99.99%	99.96%	99.99%	99.99%	99.99%
PPV	99.21%	97.14%	93.52%	71.67%	90.91%	88.76%	99.99%
NPV	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%

PPV - The probability that a person with a positive test result has, or will get, the disease.
NPV – The probability that a person with a negative test result will not have or get the disease.

Micro-deletion	Chromosomal Region	Prevalence
DiGeorge Syndrome	Deletion 22q11.2	1/4,000
Cri du Chat Syndrome	Deletion 5p15.3	1/20,000 - 1/50,000
Prader-Willi Syndrome	Deletion 15q11.2	1/10,000 - 1/25,000
Angelman Syndrome	Deletion 15q11.2	1/12,000
Deletion 1p36 Syndrome	Deletion 1p36	1/4,000 - 1/10,000
Wolf-Hirschhorn Syndrome	Deletion 4p16.3	1/50,000

Trimester 3

Trisomies 9 and 16

Trisomy 9: A rare chromosomal condition with the vast majority of instances resulting in miscarriage in the 1st trimester. While the majority of live births will not survive during early postnatal period, those that do will have serious health concerns, including intellectual disability and cardiac defects. It can also occur in mosaic form;

Trisomy 16: The most commonly occurring autosomal trisomy seen in first trimester miscarriages. Rare survivors with mosaic trisomy 16 are at increased risk for health concerns including intra-uterine growth restriction, intellectual disability, and cardiac defects. The ability to identify these important chromosomal causes of miscarriage can help with risk assessment as well as monitoring and management of subsequent pregnancies.

Of all, trisomy 16 seems to be the most common, occurring in approximately one percent of all pregnancies. and accounting for around 10 percent of miscarriages.
There are different types of trisomy 16; with one type being completely incompatible with life while another may result in a healthy infant at times.

Limitations of the test

Trimester 3 is the recommended primary screening method but is not as a diagnostic test.

*Dichorionic twins are excluded from gender test options with sex chromosome aneuploidies and microdeletions due to ambiguity of monosomy X and CNV's. Fetal gender can only be reported as presence/absence of Y chromosome.

Trimester 3 correctly identifies 99% of chromosome aneuploidies screened for, although false positives and false negatives can occur.

The Positive Predictive Value (PPV) of the test indicates that there is a chance of a false positive NIPT test result, varying with the genetic condition.

The Negative Predictive Value (NPV) of the test indicates there is a chance of a false negative NIPT test varying with the genetic condition.

References

Chareonsirisuthigul T, Worawichawong S, Parinayok R, Promsonthi P, Rerkamnuaychoke B. Intrauterine growth retardation fetus with trisomy 16 mosaicism. Case Rep Genet. 2014;2014:739513. doi:10.1155/2014/739513

Sparks TN, Thao K, Norton ME. Mosaic trisomy 16: what are the obstetric and long-term childhood outcomes?. Genet Med. 2017;19(10): 1164–1170. doi:10.1038/gim.2017.23

Trimester 4

Test Specification Sheet

Available from 10 weeks

Trimester 4

Overview

Trimester 4 is a genetic screening test used to detect the presence of Downs syndrome (T21), Turners syndrome (MX), Klinefelter syndrome (XXY), Pataus Syndrome (T18), Edwards Syndrome (T13), Jacobs syndrome (XYY) as well as Trisomy X, 9 and 16.

Trimester 4 also detects the presence of the 9 most common microdeletion syndromes (listed within Test Specification, on page 2), and includes gender determination (optional).

It is performed via a simple test using a small sample of the mothers blood, usually from a blood vessel in the arm. NIPT testing is well regarded as the recommended testing method for chromosomal abnormality in pregnancy and eliminates any risk of miscarriage or other adverse outcomes that are associated with invasive testing procedures, such as amniocentesis or chorionic villus sampling (CVS).

Trimester 4 is not a diagnostic tool and is not used in replacement of invasive diagnostic testing.

A customer may take a NIPT test for any reason, or if assessed as high risk due to:

- Increased risk of miscarriage
- History of miscarriage
- Risk of Intra-Uterine Growth Restriction
- A child affected with clotting disorders
- Increased Nuchal fold on an Ultrasound Scan
- Follow up from a diagnostic scan where a NIPT test is recommended
- Unknown family history
- A previous pregnancy affected by genetic disease
- Maternal age above 35 years old
- High risk NHS combined test result
- High risk PaPP-A
- Anxiety or Reassurance purposes
- Family History of a serious genetic condition

Trimester 4

The blood sample is delivered to a laboratory and processed. Once the test has been analysed, the result is provided to the mother. Where high risk results are received, the Trimester team will provide support for the parents and a medical referral to their Health Care Provider, who will arrange genetic counselling, discuss follow up care and provide diagnostic testing. Please read our FAQs for more information on screening tests, NHS advice and to access support networks.

Test Specification

Through analysing the cell-free fetal DNA (cfDNA) circulating in the mother's blood and eventually chromosome sequencing quantified through a bioinformatic analysis, the presence of any fetal chromosomal abnormalities can be determined.

Trimester 4 is suitable for singleton, and twin pregnancies* and can be used following assisted reproduction, even in cases where donor eggs are used.

**Gender determination may be affected in twin pregnancies.*

Aneuploidies of Chromosomes detected with Trimester 4

	Downs Syndrome Trisomy 21	Patau's Syndrome Trisomy 18	Edwards Syndrome Trisomy 13	Turners Syndrome Monosomy X	SCA*	Rare Trisomies	CNV**
Sensitivity	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%
Specificity	99.99%	99.99%	99.99%	99.96%	99.93%	99.97%	99.97%
PPV	98.99%	95.38%	88.57%	71.67%	84.62%	66.67%	68.75%
NPV	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%

SCA: Sex Chromosomes Aneuploidies *CNV: Copy Number Variation**

PPV - The probability that a person with a positive test result has, or will get, the disease.
NPV – The probability that a person with a negative test result will not have or get the disease.

Microdeletion Syndromes detected with Trimester 4

Micro-deletion	Chromosomal Region	Prevalence
DiGeorge Syndrome	Deletion 22q11.2	1/4,000
Cri du Chat Syndrome	Deletion 5p15.3	1/20,000 - 1/50,000
Prader-Willi Syndrome	Deletion 15q11.2	1/10,000 - 1/25,000
Angelman Syndrome	Deletion 15q11.2	1/12,000
Deletion 1p36 Syndrome	Deletion 1p36	1/4,000 - 1/10,000
Wolf-Hirschhorn Syndrome	Deletion 4p16.3	1/50,000
Additional 3 Syndromes:		
Jacobsen Syndrome	Deletion 11q23	1/100,000
Langer-Giedion Syndrome	Deletion 8q24	1/200,000
Smith-Magenis Syndrome	Deletion 17p11.2	1/15,000 - 1/25,000

Trimester 4

Trisomies 9 and 16, and Additional Trimester 4 Microdeletion Syndromes

Trisomy 9: A rare chromosomal condition with the vast majority of instances resulting in miscarriage in the 1st trimester. While the majority of live births will not survive during early postnatal period, those that do will have serious health concerns, including intellectual disability and cardiac defects. It can also occur in mosaic form;

Trisomy 16: The most commonly occurring autosomal trisomy seen in first trimester miscarriages. Rare survivors with mosaic trisomy 16 are at increased risk for health concerns including intra-uterine growth restriction, intellectual disability, and cardiac defects. The ability to identify these important chromosomal causes of miscarriage can help with risk assessment as well as monitoring and management of subsequent pregnancies.

Of all Trisomies, trisomy 16 seems to be the most common, occurring in approximately one percent of all pregnancies. and accounting for around 10 percent of miscarriages.
There are different types of trisomy 16; with one type being completely incompatible with life while another may result in a healthy infant at times.

Additional Microdeletion Syndromes (11q23, 8q24, 17p11.2)
These are conditions that can affect motor skills, physical features, speech and language and cause distinctive behavioural problems. Health concerns include clotting disorders.

Limitations of the test

Trimester 4 is the recommended primary screening method but is not as a diagnostic test.

*Dichorionic twins are excluded from gender test options with sex chromosome aneuploidies and microdeletions due to ambiguity of monosomy X and CNV's. Fetal gender can only be reported as presence/absence of Y chromosome.

Trimester 4 correctly identifies 99% of chromosome aneuploidies screened for, although false positives and false negatives can occur.

The Positive Predictive Value (PPV) of the test indicates that there is a chance of a false positive NIPT test result, varying with the genetic condition.

The Negative Predictive Value (NPV) of the test indicates there is a chance of a false negative NIPT test varying with the genetic condition.

References

1 Chareonsirisuthigul T, Worawichawong S, Parinayok R, Promsonthi P, Rerkamnuaychoke B. Intrauterine growth retardation fetus with trisomy 16 mosaicism. Case Rep Genet. 2014;2014:739513. doi:10.1155/2014/739513

2 Sparks TN, Thao K, Norton ME. Mosaic trisomy 16: what are the obstetric and long-term childhood outcomes?. Genet Med. 2017;19(10): 1164–1170. doi:10.1038/gim.2017.23

Trimester Complete

Test Specification

Available from 10 weeks

Trimester Complete

Overview

Trimester Complete is the most technologically advanced non-invasive prenatal test currently available.

Offering a comprehensive screening profile, Trimester Complete detects Downs syndrome (T21), Turners syndrome (MX), Klinefelter syndrome (XXY), Patau's Syndrome (T18), Edwards Syndrome (T13), Jacobs syndrome (XYY) as well as Trisomy X, 9 and 16.

Detecting the presence of the 9 most common microdeletion syndromes (listed with Test Specification, on page 2). Gender determination is included (optional).

Trimester Complete also detects mutations in 4 genes testing for 5 common Inherited genetic disorders and 25 gene mutations testing for 44 Non-Inherited genetic disorders. Mutations in these 25 genes cause skeletal dysplasia, congenital heart defects, multiple congenital malformation syndromes and neurodevelopmental disorders, such as autism and epilepsy. The wider profile of testing is achieved by screening both parents DNA for the most common genetic diseases (full list within Test Specification, on page 2).
It is performed via a simple test using a small sample of the mothers blood, usually from a blood vessel in the arm. An oral swab is taken from the father to test his DNA.
NIPT testing is well regarded as the recommended testing method for chromosomal abnormality in pregnancy and eliminates any risk of miscarriage or other adverse outcomes that are associated with invasive testing procedures, such as amniocentesis or chorionic villus sampling (CVS).

Trimester Complete is not a diagnostic tool and is not used in replacement of invasive diagnostic testing

Please read our FAQs for more information on screening tests, NHS advice and to access support networks.

Trimester Complete

A customer may take a NIPT test for any reason, or if assessed as high risk due to:

- Advanced Paternal age of 40+ years old
- Increased risk of miscarriage
- History of miscarriage
- Risk of Intra-Uterine Growth Restriction [1] – deets at bottom
- A child affected with clotting disorders
- Increased Nuchal fold on an Ultrasound Scan
- Follow up from a diagnostic scan where a NIPT test is recommended
- Unknown family history
- A previous pregnancy affected by genetic disease
- Maternal age above 35 years old
- High risk NHS combined test result
- High risk PaPP-A
- Anxiety or Reassurance purposes
- Family History of a serious genetic condition

The maternal blood, and paternal DNA sample is delivered to a laboratory and processed. Once the test has been analysed, the result is provided to the parents. Where high risk results are received, the Trimester team will provide support for the parents and a medical referral to their Health Care Provider, who will arrange genetic counselling, discuss follow up care and provide diagnostic testing.

Test Specification

Through analysing the cell-free fetal DNA (cfDNA) circulating in the mother's blood and eventually chromosome sequencing quantified through a bioinformatic analysis, the presence of any fetal chromosomal abnormalities can be determined.

Trimester Complete is suitable for singleton, and twin pregnancies* and can be used following assisted reproduction, even in cases where donor eggs are used.

Gender determination may be affected in twin pregnancies.

Trimester Complete

Aneuploidies of Chromosomes detected with Trimester Complete

	Downs Syndrome Trisomy 21	Patau's Syndrome Trisomy 18	Edwards Syndrome Trisomy 13	Turners Syndrome Monosomy X	SCA*	Rare Trisomies	CNV**
Sensitivity	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%
Specificity	99.99%	99.99%	99.99%	99.96%	99.93%	99.97%	99.97%
PPV	98.99%	95.38%	88.57%	71.67%	84.62%	66.67%	68.75%
NPV	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%	99.99%

SCA: Sex Chromosomes Aneuploidies *, CNV: Copy Number Variation**

PPV - The probability that a person with a positive test result has, or will get, the disease.
NPV – The probability that a person with a negative test result will not have or get the disease.

Microdeletions detected with Trimester Complete

Micro-deletion	Chromosomal Region	Prevalence
DiGeorge Syndrome	Deletion 22q11.2	1/4,000
Cri du Chat Syndrome	Deletion 5p15.3	1/20,000 - 1/50,000
Prader-Willi Syndrome	Deletion 15q11.2	1/10,000 - 1/25,000
Angelman Syndrome	Deletion 15q11.2	1/12,000
Deletion 1p36 Syndrome	Deletion 1p36	1/4,000 - 1/10,000
Wolf-Hirschhorn Syndrome	Deletion 4p16.3	1/50,000
Additional 3 Syndromes:		
Jacobsen Syndrome	Deletion 11q23	1/100,000
Langer-Giedion Syndrome	Deletion 8q24	1/200,000
Smith-Magenis Syndrome	Deletion 17p11.2	1/15,000 - 1/25,000

For more information on each syndrome, including clinical features and life expectancy please visit the NHS website and the Trimester FAQs for more test related information.

Trisomies 9 and 16 and Additional Trimester Complete Microdeletion Syndromes

Trisomy 9: A rare chromosomal condition with the vast majority of instances resulting in miscarriage in the 1st trimester. While the majority of live births will not survive during early postnatal period, those that do will have serious health concerns, including intellectual disability and cardiac defects. It can also occur in mosaic form;

Trisomy 16: The most commonly occurring autosomal trisomy seen in first trimester miscarriages. Rare survivors with mosaic trisomy 16 are at increased risk for health concerns including intra-uterine growth restriction, intellectual disability, and cardiac defects. The ability to identify these important chromosomal causes of miscarriage can help with risk assessment as well as monitoring and management of subsequent pregnancies.

Of all Trisomies, trisomy 16 seems to be the most common, occurring in approximately one percent of all pregnancies. and accounting for around 10 percent of miscarriages.
There are different types of trisomy 16; with one type being completely incompatible with life while another may result in a healthy infant at times.

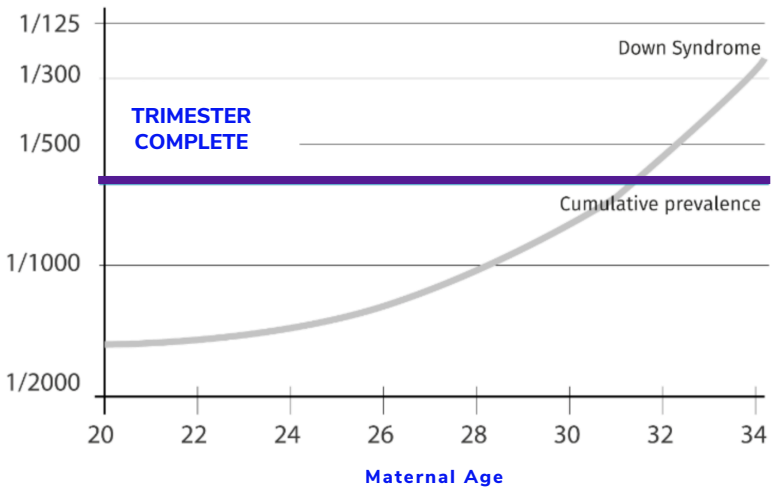
Additional Microdeletion Syndromes (11q23, 8q24, 17p11.2)
These are conditions that can affect motor skills, physical features, speech and language and cause distinctive behavioural problems. Health concerns include clotting disorders.

Trimester Complete

Trimester Complete includes Inherited and Non-Inherited (De Novo) features can identify conditions that may have otherwise gone undetected until after birth. Many disorders tested for are not typically associated with abnormal ultrasound findings (especially in the first trimester) or may not be evident until the late second or third trimester, when diagnostic invasive testing can pose a risk of preterm birth, or after delivery.

Although the occurrence of each Non-Inherited (De Novo) disorder is relatively rare, the cumulative rate of occurrence of these conditions (~1 in 600 or ~1 in 300, for mutations causing development disorders [3]) is similar to that of Downs Syndrome.

Knowing whether or not a fetus has one of these significant, genetic disorders can allow for healthcare providers and families to form a plan of care including, but not limited to, genetic counselling, specialist referrals, confirmatory studies, and delivery care.



The difference in detecting a significant genetic disorder in the first or second trimester versus late in pregnancy, or in the neonatal period, can be of immeasurable benefit to families and healthcare providers.

Inherited, and Non-Inherited (De Novo) single Gene Disorders

This feature screens for inherited gene disorders, and non-inherited gene mutations which cause life-altering genetic disorders.

Inherited gene disorders	Gene
Cystic Fibrosis	CFTR
Deafness autosomal recessive type 1A	CX26 (GJB2)
Deafness autosomal recessive type 1B	CX30 (GJB6)
Thalassemia-Beta	HBB
Sickle cell anaemia	HBB

Trimester Complete

Non-Inherited (De Novo) – Detecting mutations in 25 genes screens for 44 different genetic disorders. These include Syndromic disorders, Noonan syndromes, Skeletal disorders and Craniosynostosis syndromes. For full list of Non-Inherited disorders please see below.

Syndromic disorders (GENE): Alagille syndrome (JAG1), CHARGE syndrome (CHD7), Cornelia de Lange syndrome 5 (HDAC8), Cornelia de Lange syndrome 1 (NIPBL), Rett syndrome (MECP2), Sotos Syndrome 1 (NSD1), Bohring-Opitz syndrome (ASXL1), Schinzel-Giedion syndrome (SETBP1), Holoprosencephaly (SIX3)

Noonan syndromes (GENE): Cardiofaciocutaneous syndrome 1 (BRAF), Noonan syndrome-like disorder with or without juvenile myelomonocytic leukaemia NSLL (CBL), Noonan syndrome/cancers (KRAS), Cardiofaciocutaneous 3 (MAP2K1), Cardiofaciocutaneous 4 (MAP2K2), Noonan syndrome 6/cancers (PTPN11), Juvenile myelomonocytic leukaemia JMML (PTPN11), Noonan syndrome 5/LEOPARD syndrome 2 (RAF1), Noonan syndrome 8 (RIT1), Noonan syndrome-like disorder with loose anagen hair (SHOC2), Noonan syndrome 4 (SOS1)

Skeletal disorders (GENE): Achondrogenesis type II or hypochondrogenesis (COL2A1), Achondroplasia, CATSHL syndrome, Crouzon syndrome with acanthosis nigricans, Hypochondroplasia, Muenke syndrome, Thanatophoric dysplasia type I, Thanatophoric dysplasia type II (FGFR3), Ehlers-Danlos syndrome classic, Ehlers-Danlos syndrome type VIIA, Osteogenesis imperfecta type I, Osteogenesis imperfecta type II, Osteogenesis imperfecta type III, Osteogenesis imperfecta type IIII, Osteogenesis imperfecta type IV (COL1A1), Ehlers-Danlos syndrome cardiac valvular form, Ehlers-Danlos syndrome type VIIB, Osteogenesis imperfecta type II, Osteogenesis imperfecta type III, Osteogenesis imperfecta type IV (COL1A2).

Craniosynostosis syndromes (GENE): Antley-Bixler syndrome without genital anomalies or disordered steroidogenesis, Apert syndrome, Crouzon syndrome, Jackson-Weiss syndrome, Pfeiffer syndrome type 1, Pfeiffer syndrome type 2, Pfeiffer syndrome type 3 (FGFR2).

Limitations of the test

Trimester Complete is the recommended primary screening method but is not as a diagnostic test.

*Dichorionic twins are excluded from gender test options with sex chromosome aneuploidies and microdeletions due to ambiguity of monosomy X and CNV's. Fetal gender can only be reported as presence/absence of Y chromosome.

Trimester Complete correctly identifies 99% of chromosome aneuploidies screened for, although false positives and false negatives can occur.

The Positive Predictive Value (PPV) of the test indicates that there is a chance of a false positive NIPT test result, varying with the genetic condition.

The Negative Predictive Value (NPV) of the test indicates there is a chance of a false negative NIPT test varying with the genetic condition.

References

Chareonsirisuthigul T, Worawichawong S, Parinayok R, Promsonthi P, Rerkamnuaychoke B. Intrauterine growth retardation fetus with trisomy 16 mosaicism. Case Rep Genet. 2014; 2014:739513. doi:10.1155/2014/739513

Sparks TN, Thao K, Norton ME. Mosaic trisomy 16: what are the obstetric and long-term childhood outcomes?. Genet Med. 2017;19(10): 1164–1170. doi:10.1038/gim.2017.23

McRae J, et al.: Prevalence and architecture of de novo mutations in development disorders Nature 2017: 542:433-438.

NIPT	Commonly found trisomies				Additional Trisomies	Complete chromosome check	Microdeletion syndromes		Inherited and Non-Inherited Single Gene Disorders	Fetal Gender (Optional)
	T21	T18	T13	X/Y	T9 & T16		6 PANEL	+3 PANEL		
TRIMESTER 1	✓									✓
TRIMESTER 2	✓	✓	✓	✓						✓
TRIMESTER 3	✓	✓	✓	✓	✓		✓			✓
TRIMESTER 4	✓	✓	✓	✓	✓	✓	✓	✓		✓
TRIMESTER COMPLETE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Reference: T21 – Downs Syndrome, T18 – Patau's Syndrome, T13 – Edwards Syndrome, X/Y - Monosomy X - Trisomy XXY - Trisomy XYY