PATIENT CONSENT FORM

Panorama® Non-Invasive Prenatal Test (NIPT)

SIGNED COPY SHOULD BE KEPT IN THE PATIENT MEDICAL RECORD (do not return with the blood kit)

Purpose of the Test(s)

Panorama® Non-Invasive Prenatal Test (NIPT) screens a fetus for chromosome abnormalities that include whole extra or missing chromosomes or microdeletions (small missing sections of a specified chromosome). The specific conditions that are screened for are listed in the table below. You have the option of requesting fetal sex at no additional cost. Panorama® is performed on a maternal blood sample which contains DNA (genetic material) from both the mother and fetus. The fetal DNA tested comes from the placenta; this DNA is identical to the DNA found in the cells of the fetus in ~98% of all pregnancies. Panorama® is available to women who are at least 9 weeks pregnant with a single fetus. Your health care provider can provide you with more details about the conditions screened with this test.

Whole Chromosome Abnormalities and Microdeletions Evaluated With the Panorama® Test Options

Trisomy 21	This is caused by an extra copy of chromosome 21 and is also called Down syndrome. This is the most common genetic cause of intellectual disability and occurs in approximately 1 in every 830 live births. Individuals with Down syndrome have an average IQ of 50 and all have some degree of intellectual disability. Some children with Down syndrome have defects of the heart or other organs that may require surgery or medical treatment. Some have other medical conditions including hearing or vision loss.
Trisomy 18	This is caused by an extra copy of chromosome 18 and is also called Edwards syndrome. Trisomy 18 occurs in about 1 in every 7500 live births and causes severe intellectual disability. Most babies with trisomy 18 have multiple severe birth defects of the brain, heart and other organs. Poor growth during pregnancy is common and many babies are miscarried or stillborn. Of those babies born alive, most die before one year of age. Babies who survive have profound intellectual disabilities and growth and development problems.
Trisomy 13	This is caused by an extra copy of chromosome 13 and is also called Patau syndrome. Trisomy 13 occurs in about 1 in every 22,700 live births and causes severe intellectual disability. Most babies with trisomy 13 have multiple severe birth defects of the brain and other organs. Many babies are miscarried or stillborn. Of those babies born alive, most die before one year of age.
Monosomy X	This is caused by a missing copy of the X chromosome and is also called Turner syndrome. This only affects girls and is found in every 1 in 5000 live births. Girls with Monosomy X are shorter than average. Some girls have heart or kidney defects, hearing problems, and some have minor learning disabilities. Girls with Monosomy X may need growth hormone treatments in early childhood and usually need sex hormone treatments at the time of puberty. As adults, they often have infertility.
Triploidy	Triploidy is a condition in which the fetus has 3 copies of each chromosome instead of two. It is found in about 1 in 1000 first trimester pregnancies. Features include brain and craniofacial abnormalities, neural tube defects, heart defects, as well as genitourinary and gastrointestinal abnormalities. Most pregnancies with triploidy will miscarry in the early part of the first trimester, although later miscarriage or stillbirth can occur. The majority of those that survive die shortly after birth. Triploidy may also put the mother's health at risk from pregnancy complications like pre-eclampsia, postpartum hemorrhage and molar pregnancy with the potential for malignancy.
22q11.2 Deletion Syndrome	22q11.2 deletion syndrome (also known as DiGeorge syndrome) is caused by a small missing piece of chromosome 22. It is found in about 1 in 2000 live born babies[1]. Most children with 22q11.2 deletion syndrome have mild-to-moderate intellectual disability and delayed speech and language. Many have heart defects, immune system problems, and other health problems. Some people with 22q11.2 deletion syndrome have autism spectrum disorder and some develop psychiatric illnesses such as schizophrenia.
1p36 Deletion Syndrome	This syndrome is caused by a small missing piece of chromosome 1 and is also called Monosomy 1p36. About 1 in every 5000 live born babies has this condition[2]. Children with Monosomy 1p36 have moderate-to-severe intellectual disability. Most children have heart defects that may require surgery or medical treatment. Some children may need special physical and occupational therapies to help with weak muscle tone. About half of children with Monosomy 1p36 have seizures and/or behavioral problems; some have hearing and/or vision loss.
Cri du Chat Syndrome (5p-)	This is caused by a small missing piece of chromosome 5 and is also called 5p minus (5p-) syndrome. About 1 in 20,000 live born babies has this condition[4]. Babies are usually small at birth with a small brain and head size. They often have breathing and feeding problems and need extra medical care. Children with cri du chat have severe intellectual disability.
Angelman Syndrome (15q11.2 deletion maternal)	Angelman syndrome (AS) is caused either by a small missing piece of chromosome 15 or from inheriting two copies of chromosome 15 from one parent and none from the other; there are other rare causes as well. About 1 in 12,000 live born babies has this condition[3]. They often have feeding difficulties and weak muscle tone. Children have severe intellectual disability and motor problems; most have a small brain and head size and some have seizures. Most children do not develop speech.
Prader-Willi Syndrome (15q11.2 deletion paternal)	Prader-Willi syndrome (PWS) is caused either by a small missing piece of chromosome number 15 or from inheriting two copies of chromosome 15 from one parent and none from the other; there are other rare causes as well. About 1 in 10,000 live born babies has this condition[3]. Babies have weak muscle tone and feeding problems. Children with PWS typically have intellectual disability, behavior problems, and delayed motor and language development. They also have excessive appetites and may become obese and may develop diabetes.

([1] Nussbaum et al 2007 Thompson and Thompson Genetics in Medicine (7th Ed) Oxford Saunders, Phila, PA; [2]Arthur Robinson & Mary G Linden, 1993, Clinical Genetics Handbook, (2nd Ed). Cambridge, Mass, Blackwell Scientific Publications); [3]GeneReviews: http://genereviews.org/ ; [4]Genetics Home Reference: http://ghr.nlm.nih.gov)

Methods & Test Results

The Panorama Prenatal Test (testing of chromosomes 13, 18, 21, X, Y, triploidy, 22q deletion syndrome, Cri-du-chat syndrome, 1p36 deletion syndrome, Angelman syndrome, and Prader-Willi syndrome) is performed by LifeLabs Genetics (LifeLabs) in Toronto, ON. Panorama was developed by Natera Inc., a laboratory certified under the Clinical Laboratory Improvement Act (CLIA). All testing is performed under prevailing regulations in accredited facilities. Two tubes of blood are required from the mother. The samples are only screened for those chromosome abnormalities listed above. Sex chromosome trisomies (XXY, XXX, and XYY) will also be reported if identified. Incidental findings will **not** be reported.

Your test results will be sent to the health care provider who ordered the test.

- A **low risk** result indicates a reduced chance that your baby has the listed chromosome abnormalities but cannot guarantee normal chromosomes or a healthy baby.
- A **high risk** result indicates that there is an increased chance your baby has one of the chromosome abnormalities listed but does not confirm that the fetus has that abnormality. The recommended follow-up is a prenatal diagnostic test such as chorionic villus sampling (CVS) or amniocentesis. Your health care provider will explain the test results and recommended follow-up steps to you, which may include a referral to a genetic counselor in addition to the prenatal diagnostic testing. In the event of a high risk result, **LifeLabs may contact your healthcare provider to obtain follow-up diagnostic information to ensure quality and accuracy in reporting**
- Panorama® is not a diagnostic test – **DECISIONS ABOUT YOUR PREGNANCY SHOULD NEVER BE MADE BASED ON THESE SCREENING RESULTS ALONE AS THEY NEITHER CONFIRM NOR RULE OUT THE PRESENCE OF A CHROMOSOME ABNORMALITY IN THE FETUS**. Follow-up diagnostic testing should always be performed during pregnancy or at birth to confirm or rule out a chromosome abnormality or microdeletion.

There is a chance that the sample(s) submitted will not return results. In this case, your health care provider will be informed by LifeLabs and you may be asked to provide a second blood sample to repeat the test. There is no charge for a repeat. In rare cases, a result cannot be provided on a subsequent sample. You will receive a full refund in this case.

Test Limitations

Although this screening test will detect the majority of pregnancies in which the fetus has one of the above listed chromosome abnormalities, it cannot detect 100% of pregnancies with these conditions. The result of this test does not eliminate the possibility of other abnormalities of the tested chromosomes, and it does not detect abnormalities of untested chromosomes, other microdeletions, genetic disorders, birth defects, or other complications in your fetus or pregnancy. The Panorama® prenatal test has not been cleared or approved by the U.S. Food and Drug Administration (FDA) or Health Canada.

Inaccurate test results or a failure to obtain test results may occur due to one or more of the following rare occurrences: courier/shipping delay; sample mix-up; laboratory failure or error; biological factors such as but not limited to: sample contamination or degradation, too little DNA from the fetus in the maternal blood sample, mosaicism (a mixture of cells with normal and abnormal chromosomes) in the fetus, placenta or mother, other genetic variants in the mother or fetus, or an unrecognized twin pregnancy; other circumstances beyond our control; or unforeseen problems that may arise. About 1 to 2% of all pregnancies have confined placental mosaicism, a situation in which the placenta has cells with a chromosome abnormality while the fetus has normal chromosomes or vice versa. This means that there is a chance that the chromosomes in the fetus may not match the chromosomes in the DNA screened.

This test cannot be performed on patients who are carrying multiple babies (twins, triplets, etc.), on pregnancies that used a donor egg or surrogate, or on pregnancies in which the mother has had a prior bone marrow transplant. Also, if you and your partner are related by blood, or if the mother of the pregnancy has parents who are related to each other by blood (e.g., first cousins), Panorama® technology may not be able to return results on your pregnancy. Other testing methods may be a better option for couples with close blood relationships.

If the microdeletion panel is selected and if the mother of the pregnancy is found to be a carrier of one of the microdeletions on this panel, this screen will not be able to return results on the fetus. It is possible that during analysis that you may be identified as a carrier of a 22q11.2 deletion. If this occurs, the Panorama report will state that there is a 1 in 2 or 50% chance to have an affected pregnancy (as fetal status cannot be determined in this case). Your provider may offer additional testing to confirm if you carry the 22q11.2 deletion. Finding out you carry a microdeletion may cause feelings of anxiety or concern about your own health as well as concerns about your pregnancy. If you know you carry one of the microdeletions on this screen, it is recommended that you use another form of testing to detect the presence or absence of that microdeletion in your fetus. Women who do not wish to risk finding out whether they carry a microdeletion should consider opting out of the microdeletion component of the screening testIf the percentage of fetal (placental) DNA in the sample is below 7%, screening for Angelman syndrome will not be performed and the results will be reported as “risk unchanged”. A redraw will not be recommended and if so chosen by the ordering healthcare provider, the cost will be borne by the patient.

Alternatives

There are multiple other prenatal screening options available which you can discuss with your health care provider. You also have the option to decline all chromosome screening tests during your pregnancy. If you want or need more conclusive information about the fetal chromosomes, invasive diagnostic tests such as CVS or amniocentesis are available.

Confidential Reporting Practices

Natera and LifeLabs comply with applicable American and Canadian privacy laws. Test results will be reported to the ordering health care provider(s) or genetic counsellor involved. You must contact your provider to obtain the results of the test. Additionally, your personal information could be released to others as permitted or required by law (e.g. – law enforcement).

Financial Responsibility

Some provincial health plans may cover the cost of Panorama® so speak with your health care provider. As well, some personal medical insurance plans may cover the cost of the test. Check with your carrier. Otherwise, you are responsible for the cost of the test and will provide payment to LifeLabs, who in turn will provide payment to Natera if applicable. Payment can be made by credit card or debit.

Genetic Counselling

If you have remaining questions about non-invasive prenatal testing after talking with your health care provider, we recommend that you speak with a genetic counsellor who can give you more information about your testing options. You can find a genetic counsellor in your area by going to the Canadian Association of Genetic Counsellors website at https://cagc-accg.ca/.

Cancellation, Disposition or Retention of Samples

If a test is cancelled prior to test set-up, LifeLabs will send a cancellation report free of charge. Once testing is initiated, the full price of the analysis will be charged. LifeLabs and/or Natera may also keep your leftover de-identified samples for ongoing research and development. You and your heirs will not receive any payments, benefits, or rights to any resulting products or discoveries. If you do not want your de-identified sample and/or data used for the purposes listed above, you may send a request in writing to LifeLabs at 175 Galaxy Boulevard, Toronto ON, M9W 0C9 within 60 days after test results have been issued and your sample will be destroyed. You may also make this request by email to ask.genetics@lifelabs.com and indicate “Sample Retention” in the subject line. LifeLabs will forward your request to Natera if your sample has been tested at their laboratory.

PATIENT CONSENT STATEMENT

I have read or have had read to me the above informed consent information about the Panorama® Non-Invasive Prenatal Test (NIPT). I have had the opportunity to ask questions of my health care provider regarding this test, including the reliability of test results, the risks, and the alternatives prior to giving my informed consent. I understand that my personal health information and my blood samples will be sent to LifeLabs Genetics in Toronto, ON, and/or to Natera’s testing facility in San Carlos, California, USA. I request and authorize LifeLabs to test my sample(s) for the chromosome conditions listed above. I acknowledge that LifeLabs will send the results to my ordering healthcare provider. In the event of a high risk or no result, I acknowledge that LifeLabs may contact my healthcare provider to obtain follow-up diagnostic information to ensure quality and accuracy in reporting. I acknowledge that I must sign the consent statement located on the test requisition form that will be sent with my sample(s) to LifeLabs. I understand that I must also sign this consent form which will remain in my clinic chart.

_____ _____

Signature of Patient Date

_____

Printed Name