Introduction

Noninvasive prenatal screening via cell-free DNA (cfDNA) uses a sample of maternal blood to screen for certain chromosome problems in pregnancy. The test examines small pieces of DNA in your blood as well as DNA from the pregnancy (placenta and fetus). This screening test can be used to determine whether or not the fetus has a high-risk of certain chromosome conditions. It is also commonly referred to as NIPS (noninvasive prenatal screening) or NIPT (noninvasive prenatal testing). The results of this screen provide patients with information regarding the chance that their fetus has a chromosome condition but does not provide definitive diagnostic information.

What does cfDNA screening detect?

- cfDNA screening will determine if a fetus has an increased chance of one of the following:
  - Trisomy 21 (Down syndrome)
  - Trisomy 13 (Patau syndrome)
  - Trisomy 18 (Edwards syndrome)
  - Sex chromosome aneuploidy: monosomy X, XXY (Klinefelter syndrome), XXX, XYY

Will cfDNA screening tell me the sex of my fetus?

- cfDNA screening will also report the presence of Y chromosome material (suggesting a male fetus) or absence of Y chromosome material (suggesting a female fetus).
- These results are not diagnostic and there is a possibility that the gender of the fetus may not match the chromosome sex reported by cfDNA screening.

Can I have cfDNA screening performed if I am pregnant with twins?

- Guidelines do not currently recommend screening for women with multiple gestations.
- cfDNA screening may be performed in this situation; however results may not be as accurate.

Can I have cfDNA performed if I am pregnant but not biologically related to the fetus (ie, pregnant through the use of a donor egg or embryo, gestational carrier)?

- cfDNA results may be impacted by the presence of a fetus that is not biologically related to the woman carrying the pregnancy, and results may not be as accurate.

When can I have this screen done?

- Screening can be performed as early as 10 weeks gestation.

How long will it take to get my results?

- Results are typically reported in 7 to 10 days.

What kinds of results will be reported?

- **Low risk for chromosomes 13, 18, 21, sex chromosome aneuploidy**: screen results indicate there is a low risk that the fetus has a trisomy involving the chromosomes studied or a sex chromosome aneuploidy.
- **High risk**: screen results indicate that there is an increased risk the fetus has a trisomy of one of the chromosomes studied or a sex chromosome aneuploidy.
- **Not reportable**: screening is not possible and no results will be provided. Results may not be possible due to low fetal fraction, meaning that the amount of fetal genetic material in the maternal serum is too low to properly analyze the results. It may be possible to attempt this screen again after a few weeks. Low fetal fraction can often occur due to early gestational age or a high maternal BMI (body mass index).
- **Uncertain**: screening may also detect other chromosome abnormalities, such as a trisomy of a chromosome other than 13, 18, or 21, or another type of chromosome imbalance.
- Some uncertain/not reportable results may also indicate maternal health information, including malignancy (cancer). If results suggest a possible maternal health concern, the laboratory will report and recommend appropriate follow-up with your medical care provider.
What should I do if my results indicate a low-risk of a trisomy or a sex chromosome aneuploidy?

- Normal results do not ensure a healthy or unaffected pregnancy, and you should continue to obtain appropriate prenatal care.

What are the chances that my results are not correct? Keep in mind this screen is not diagnostic and a false result, while not a high likelihood, is possible.

- **Trisomy 21** — The false-positive rate for trisomy 21 is 0.09% and the false-negative rate is less than 1%. Thus, when a low-risk result for trisomy 21 is received, the pregnancy will not be affected with trisomy 21, 99% of the time. When a high-risk result for trisomy 21 is received, the pregnancy will be affected with trisomy 21, 99% of the time.

- **Trisomy 13** — The false-positive rate for trisomy 13 is 0.13% and the false-negative rate is 9.4%. Thus, when a low-risk result for trisomy 13 is received, the pregnancy will not be affected with trisomy 13, 99.9% of the time. When a high-risk result for trisomy 13 is received, the pregnancy will be affected with trisomy 13, 90.6% of the time.

- **Trisomy 18** — The false-positive rate for trisomy 18 is 0.13% and the false-negative rate is 3.6%. Thus, when a low-risk result for trisomy 18 is received, the pregnancy will not be affected with trisomy 18, 99.9% of the time. When a high-risk result for trisomy 18 is received, the pregnancy will be affected with trisomy 18, 96.4% of the time.

- **Monosomy X** — The false-positive rate is 0.23% and the false-negative rate is 9.0%. Thus, when a low-risk result for monosomy X is received, the pregnancy will not be affected with monosomy X 99.8% of the time. When a high-risk result for monosomy X is received, the pregnancy will be affected with monosomy X, 91% of the time.

- **Other sex chromosome aneuploidies** — The false-positive rate is 0.14% and the false-negative rate is 3.6%. Thus, when a low-risk result for sex chromosome aneuploidies is received, the pregnancy will not be affected with a non-monosomy X sex chromosome aneuploidy 99.9% of the time. When a high-risk result for a non-monosomy X sex chromosome aneuploidy is received, the pregnancy will be affected 96.4% of the time.

What should I do if my results indicate a high-risk of a trisomy or a sex chromosome aneuploidy?

- If the results are reported as high-risk, genetic counseling is recommended. Your genetic counselor or physician will discuss possible options, including invasive prenatal diagnosis, such as chorionic villus sampling or amniocentesis. Invasive testing is used to determine if the chromosome condition is present. You may also be provided or request educational materials if the fetus does in fact have that particular chromosome abnormality.

Will insurance cover cfDNA screening?

- Your insurance may cover screening.

- Prior authorization is available to verify coverage before having the screening performed.