KAISER PERMANENTE®

Prenatal Exome Sequencing

Prenatal exome sequencing is a genetic test done during pregnancy. The test looks for DNA changes called variants that can cause a genetic condition in a fetus.

Why It Is Done

This test helps diagnose conditions that can't be found by standard prenatal tests (for example: chromosome study, microarray, or cell-free DNA screening).

Exome testing may be offered when a fetus has ultrasound findings that could be due to a genetic condition. Finding a diagnosis may help with pregnancy care. It could also let parents know the chance for the same condition in a future pregnancy.

Exome testing is not used to check for genetic conditions in a normal fetus and pregnancy.

How It Is Done

This test is done on a fetal sample. The sample can be taken by chorionic villus sampling (CVS) or amniocentesis. Either procedure collects fetal DNA without touching the baby.

Exome testing may also be done on a fetal sample after the loss of a pregnancy.

The test studies thousands of genes at once. It looks at a part of the genes called **exons**. Most harmful variants are found in the exons.

Genetic samples from both parents are also requested, when possible. Testing both parents and the fetus gives the most complete results. This helps the laboratory figure out which fetal variants might cause a genetic condition.

Risks

CVS and amniocentesis are considered safe when done by a trained doctor. There is a very small risk for miscarriage from either procedure (less than 1 in 500).

This test does not diagnose all genetic conditions.

- Some genes are hard to study by exome sequencing
- Certain types of variants are not found by this test
- Not all of the fetal DNA is studied with this test

Possible Results

NEGATIVE: A negative (normal) result means no harmful variants were found by this test. This is usually reported as "No pathogenic variants detected". A normal result does not guarantee a healthy child. Some conditions can't be diagnosed with exome testing.

POSITIVE: Pathogenic or **likely pathogenic** variants are genetic changes that could cause a genetic condition. If you get this result, you can talk with your genetic counselor or doctor to learn more about the specific condition(s) and what to expect. It is possible to have more than one pathogenic variant.

UNCERTAIN: Some tests show a **variant of uncertain significance (VUS)** result. This is a genetic change, but we don't know if it's a harmless change or one that could cause a genetic condition. This is a very common result with exome testing. Most likely, this does not explain the ultrasound findings. Most of the time when more is learned about a VUS, we find that it is actually normal (harmless).

Timing of Results

It could take up to 4 weeks after CVS or amniocentesis before the exome result is ready. The sample often needs special handling before it is sent for testing. Other testing, like a chromosome study, may be done first.

Results usually take about 2 weeks once the sample is sent for exome sequencing.

Other Testing

More testing may be done if a medical exam on the fetus or baby shows new findings. The exome may be re-studied or new testing may be ordered.

TERMS:

Exon – The part of a gene that codes for amino acids. One gene can have many exons. The exons in a gene are the instructions for the gene product (protein).

Exome – All of the exons in your DNA.

Sequencing – Determining the order of the 4 chemical building blocks of DNA: **A, G, T, C**

Variant – A difference in the DNA sequence.