Whole Exome Sequencing

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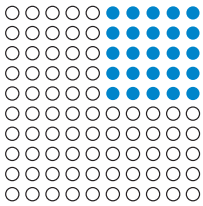
This document is to help you make decisions about whole exome sequencing. References to "You" and "Your" may stand for either an adult patient or for the parents or legal guardians of a child.

What is Whole Exome Sequencing (WES)?

Whole exome sequencing (WES) is a genetic test. It usually requires a small blood sample from the child and parent(s). WES is offered to patients with conditions that may be genetic. WES looks at areas of DNA called exons, which are the sections of genes that tell cells what jobs to do. WES can find variations in the exons. Most variations do not cause any problems. Some variations can cause genetic conditions or can increase the risk for diseases.

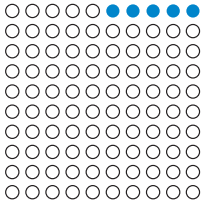
If 100 people have WES



a primary finding will be found in 25

a primary finding will not be found in 75

If 100 people choose secondary findings



a secondary finding will be found in 5

a secondary finding will not be found in 95

What are Primary Findings in Whole Exome Sequencing?

A primary finding is a variation in one gene or a pair of genes that is thought to be the cause of a patient's current condition. A primary finding is found in about 25 out of 100 (25%) patients who have the test. Primary findings may or may not guide medical care.

What are Secondary Findings in Whole Exome Sequencing?

A secondary finding is a variation that may contribute to disease but is not the cause of the patient's current condition. Secondary findings are found in up to 5 out of 100 (5%) patients who choose to have WES. Secondary findings may be important for other family members to know about because other family members may have the same variation. Doctors may suggest more health screenings or testing if a secondary finding is found. Secondary findings are optional.

You Have a Choice about Whether You Receive Secondary Findings

In addition to trying to find the cause of your condition, you can choose to learn about variations in 56 genes that are not the cause of your current condition. Some variations in these genes may increase your risk for serious health problems such as cancer, heart problems or life threatening reactions to certain types of medication. Variations in most of the 56 genes increase chances for health problems in adulthood. A few may increase chances for health problems during childhood. Often, these health problems can be monitored or treated.

What Happens if I Choose to Learn Secondary Findings?

If you choose to have WES and to receive secondary findings, the lab will also look for variations in 56 genes that are not the cause of your current condition.

What Happens if I Choose Not to Learn Secondary Findings?

If you choose to have WES but do not want to receive secondary findings, the lab will only look for the cause of your condition. The lab will not look for secondary findings.

What Does it Mean if the Lab Tells me I have a Secondary Finding?

If you have a secondary finding it means you might have a higher chance of developing a specific health condition than someone who does not have that secondary finding. It does not mean you will definitely develop the health condition.

What Are The Testing Options?

Options	Primary Finding	Secondary Finding
No test at all (no whole exome sequencing)	—	—
Whole exome sequencing with primary findings only	●	—
Whole exome sequencing with primary and secondary findings	●	●

Division of Human Genetics
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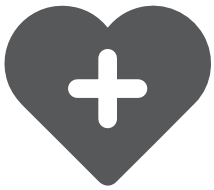
What Should I Consider When Deciding On Testing Options?

1 Health Implications



If a primary or secondary finding is identified, this information could:

- **Guide medical care.** For example, doctors may ask you to have more screening tests or take different medicines. Your doctor might refer you to specialists. You may be asked to consider surgery or other procedures.
- **Determine the chance other children or family members have or will develop the same condition.** Other family members may want to consider genetic testing.
- **Lead to recommended changes in daily routines.** For example, dietary changes or exercise restrictions may be recommended.

2 Emotional Implications

If a primary or secondary finding is identified, you may feel:

Anxious. You may learn that you have a genetic condition that will get worse or be fatal. You may learn you are at increased risk for a health condition. You may feel anxious or sad, particularly if there is no known treatment or screening for the condition.

Relieved. You may feel a sense of closure or relief if you learn the genetic cause of your symptoms.

Conflicted. You may be unsure about what and when to tell other family members about the result. It can be hard to know when to tell children about a secondary finding. Family members may react differently to this information.

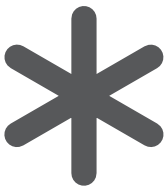
Empowered. You may feel you can take charge of your health if you learn you have or are at increased risk for a condition that can be prevented, screened or treated.

Connected. You may find additional resources are available to you such as support groups. These resources may provide information or support.

3 Insurance Implications

- WES is an expensive test. You should check with your health insurance company to find out if it is covered.
- Health insurance companies cannot deny a person health insurance based on genetic test results.
- Insurance companies can deny people life, disability, or long-term care insurance based on genetic test results. These companies could also charge higher prices based on genetic test results.

4 Other Considerations



- Our understanding of primary and secondary findings can change over time. Large sections of DNA and some exons are not looked at.
- Certain types of variations cannot be detected with WES.
- WES may not find the genetic cause of your condition. If this happens, your condition could still be genetic. Your doctor may recommend more testing now or in the future.
- WES could find uncomfortable information about family relationships. For example, WES could reveal that parents are related by blood. Or, WES could reveal that the father is not the biological parent of the child.