Quest Diagnostics™

Quest Diagnostics: **empowering better health** with diagnostic insights

Quest Diagnostics empowers people to take action to improve health outcomes. As one of the world's largest providers of clinical laboratory testing services, our diagnostic insights reveal new avenues to identify and treat disease, inspire healthy behaviors, and improve healthcare management. Quest annually serves one in three adult Americans and half the physicians and hospitals in the United States. We're here every day to support the health and well-being of you and your family.

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Quest Diagnostics™

Know about Lynch Syndrome

Genetic testing for colon, uterine, and other cancers

Quest Vantage™
Cancer Testing Solutions

A patient support guide for **Lynch syndrome**

Does cancer run in **your family?**

Colon cancer and uterine cancer are fairly common. In 5% to 10% of cases, these cancers seem to run in families. For these families, the cause can be a gene mutation passed down from one generation to the next. Mutations may also be referred to as pathogenic/likely pathogenic variants. Carrying a mutation increases the risk for cancer.

A genetic test is available to determine if you have a mutation. This blood test can help you and your healthcare provider better understand your cancer risk. If the test does find a mutation, there are options to reduce your risk.

Review this guide with your healthcare provider to decide if this test is right for you.

Some words in this guide are highlighted, **like this**. You will find the definitions in the back of the brochure under **Important terms to know**.

What is Lynch syndrome?

Lynch syndrome is the most common cause of hereditary **colon** and **uterine** cancers. A **mutation** in any of several **genes** can cause Lynch syndrome. People with a mutation in one of these genes have a higher risk for some types of cancer. These include cancers of the colon, **uterus**, **ovaries**, and stomach. A few rarer cancers can also occur with Lynch syndrome. Although the risk for cancer is increased, not everyone with Lynch syndrome will develop cancer.

Who should consider this test?

Families with Lynch syndrome often have multiple relatives with a history of cancer. Frequently, these cancers occur before age 50. Consider talking with your healthcare provider about getting tested if you:

- Have had colon or uterine cancer before age 50
- Have had two or more cancers, such as colon, uterine, ovarian, or stomach cancer
- Have a strong family history of colon, uterine, ovarian, stomach, or other cancers
- Have a relative with positive **genetic** testing for Lynch syndrome

Most of the time, genetic testing is not recommended for anyone under the age of 18.

Lynch syndrome tests

Quest Diagnostics offers different test choices for Lynch syndrome testing:

- The Lynch syndrome panel test analyzes all the genes known to cause Lynch syndrome. These genes are *MLH1*, *MSH2*, *MSH6*, *PMS2*, and *EPCAM*.
- Lynch syndrome targeted testing may be appropriate if you have a relative who tested positive for Lynch syndrome or if you had a positive tumor screen for Lynch syndrome.

Which Lynch syndrome test is right for me?

There are several ways to approach testing for Lynch syndrome. The right test depends on your personal and family history. Be sure to tell your healthcare provider whether anyone in your family has already had testing for Lynch syndrome.

Will the test results tell me if I will develop cancer?

These tests can't tell you whether or not you will develop cancer. They can, however, tell you if you have a mutation that causes Lynch syndrome. Although Lynch syndrome causes a higher risk for cancer, not everyone with a mutation will develop cancer.

If I have a mutation, will someone else in my family have one too?

Possibly. Your parents, siblings, and children would each have a 50% chance. Other relatives may also be at risk, which is why it is so important for families to share this information.

Relative	Their chances of having the same mutation
Identical twin	100%
Parent, sibling, child, fraternal twin	50%
Grandparent, uncle, aunt, niece, nephew	25%
First cousin	12.5%

The genetic testing process

The first step is to talk with your doctor or genetic counselor about your personal and family health history. This will help you figure out if Lynch syndrome testing is right for you. If you and your provider decide to move forward with testing, your provider can order the test.

You then provide a blood sample, drawn either at your doctor's office or at a Quest Diagnostics Patient Services Center. When the test is complete, your doctor will receive your results.

How long will it take to receive results?

Your doctor will get the results about 14 days after receipt of the sample and complete documentation.

Does insurance cover the cost of Lynch syndrome testing?

It depends on your insurance company and if you meet their testing criteria. To find out if your insurance covers Lynch syndrome testing, ask your doctor's office for help. They can either contact your insurance company directly or provide you with the codes and details necessary for you to do so.

Could I lose my health insurance based on my test results?

Most likely not. There is a federal law called the Genetic Information Nondiscrimination Act (GINA). It protects most patients who have genetic testing. Because of this law, health insurance companies cannot use a genetic test result or family health history to:

- Cancel your health insurance
- Increase your rate
- Refuse coverage

There are some exceptions. GINA does not offer protections for life insurance or long-term disability insurance. You can visit **http://ginahelp.org** for more information.

Questions about insurance?

Call Quest Genomics Client Services at **1.866.GENE.INFO** (1.866.436.3463). Ask for our concierge service.

Making sense of your test results

Your healthcare provider or genetic counselor will review your test results with you. There are three possible results:

– Negative

The test did not detect a Lynch syndrome mutation. Although this greatly reduces your chance for Lynch syndrome, there are other genes that can cause an increased risk for cancer. Your healthcare provider can help you understand what your revised risk is.

+ Positive

The test did detect a Lynch syndrome mutation. This means that you are at increased risk for Lynch syndrome cancers. Discuss cancer screening and risk reduction options with your healthcare provider to reduce your risk.

VUS Variant of unknown clinical significance

It's not uncommon to find genetic differences that we don't know much about. We call these "**variants** of unknown significance." They should not be used to guide cancer-related screenings or risk-reduction options. Over time, we may learn more about these variants. Check with your healthcare provider annually for updates about a specific variant.

Would a negative result mean I'm not at risk for hereditary cancer?

Not necessarily. It's possible that a gene or condition other than Lynch syndrome is responsible for the cancer in your family. Science continues to expand our knowledge about the causes of **hereditary cancer**. Be sure to update your provider with any changes in your personal or family history. You may wish to revisit genetic testing again in the future.

Would a positive result mean I will develop cancer?

Not necessarily. A positive result means you carry a mutation that puts you at a higher-than-average risk for cancer. The good news is that there are options to lower your risk.

Cancer risks associated with Lynch syndrome

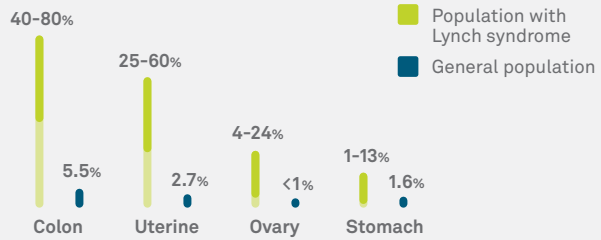

Exhibit 1

- Please note, there is a range in cancer risk
- Data suggests lower cancer risk for *MSH6* and *PMS2* mutation carriers
- Other Lynch syndrome cancers include hepatobiliary tract, urinary tract, small bowel, brain/CNS, sebaceous neoplasms, and pancreatic

Lowering your risk for cancer if you have a positive result

If your result is positive, you have a higher risk for cancer. There are options for reducing this risk, including:

- Increased cancer screening
- Surgery
- Medicines (such as aspirin)
- Lifestyle changes

Talk with your healthcare provider to find out what is best for you. Some testing options are described in the table below.

Test	Definition
Colonoscopy	Looking inside the entire colon to identify areas that look like cancer
Endometrial biopsy	Removing a small piece of the inside of the lining of the uterus to look for uterine cancer cells
Transvaginal ultrasound	Using sound waves to look at the ovaries; a screen for **ovarian** cancer
Upper endoscopy or EGD	Looking inside the esophagus, stomach, and part of the small intestine to identify areas that look like cancer

Will increased cancer testing keep me from getting cancer?

Possibly. It can also detect cancer earlier. Early detection improves the chances of beating cancer.

Will surgery keep me from getting cancer?

Studies show that surgery does lower cancer risk. But surgery is not for everyone. Talk with your healthcare provider to learn more.

Important terms to know

Colon—the last part of the digestive system that absorbs water and nutrients; also called the large intestine

DNA—the molecules that contain the biological instructions for making all the cells in your body

Gene—a set of instructions, made of **DNA**, that tell your body how to develop and function

Genetic—having to do with a person's genes

Hereditary cancer—cancer caused by a genetic change or mutation passed down from one generation to the next

Lynch syndrome—a condition that runs in families and leads to a higher risk for certain cancers (see *Exhibit 1*); also known as hereditary nonpolyposis colorectal cancer syndrome or HNPCC

Mutation—a permanent change in DNA; may also be referred to as pathogenic/likely pathogenic variants

Ovaries or **ovarian**—refers to a pair of organs in a woman's pelvis that contain her eggs and make hormones that control the menstrual cycle

Uterus or **uterine**—refers to an organ in a woman's pelvis; when a woman is pregnant, the uterus is where the baby grows and develops until birth

Variant—another word for mutation

Feel good about getting tested for Lynch syndrome. The more you know, the more you can do to enjoy better health.