Lynch Syndrome is an inherited condition that gives you a higher risk for colon, uterine and other cancers.

Cancer in Lynch Syndrome
Cancer of the colon and uterus (endometrium) are the two most common cancers in Lynch syndrome. Cancer related to Lynch syndrome often happens at a younger age than usual. The average age of a colon cancer diagnosis in Lynch syndrome is 45 years old. Uterine cancer in women with Lynch syndrome often occurs before 50 years of age.

- Men and women with Lynch syndrome have a 40-80% chance for developing colon cancer during their lifetime
- Women with Lynch syndrome have a 20-60% chance for developing uterine (endometrial) cancer
- The combined risk for any of the other cancers seen in Lynch syndrome is less than 20%

Genetics of Lynch Syndrome
Lynch syndrome is caused by a mutation (genetic change) in a cancer susceptibility gene. The four main genes associated with Lynch syndrome are MLH1, MSH2, MSH6, and PMS2. These genes normally help fix errors that happen in our DNA (genetic code). Genetic errors happen now and then when DNA gets copied to make new cells in the body. If any of the cancer susceptibility genes has a mutation and is not working correctly, random DNA errors can build up until cell growth is not well controlled. In some cases, the build-up of genetic errors leads to cancer.

Lynch syndrome runs in families in a dominant pattern. This means that if one parent carries a gene mutation for Lynch syndrome, each child has a 50% chance to inherit the mutation and have a higher risk for cancer. The chance of inheriting a mutation for Lynch syndrome is the same whether the parent with the mutation is the mother or father.

You may have a higher chance of carrying a Lynch syndrome mutation if you answer “yes” to one or more of the following statements:

- I have had colon cancer before 50 years old
- I have had uterine cancer before menopause
- I have had colon cancer AND one of the other cancers seen in Lynch syndrome
- I have had uterine AND ovarian cancer
- I have had tumor testing suggestive of Lynch syndrome
- I have three or more close relatives with the type of cancers seen in Lynch syndrome
- I have a relative with a mutation in a Lynch syndrome gene

Genetic Counseling
As part of a genetics cancer visit, a genetic counselor reviews your medical records, your health history, and your family history. Genetic counselors are trained in genetics and counseling. You may also meet with a medical geneticist. Medical geneticists are doctors who specialize in genetic conditions. Your genetic providers help determine if your history might be due to Lynch syndrome and guide you through decisions about genetic testing, if indicated. If you have testing, they will help you understand the result and arrange any follow-up services that are needed.
Testing for Lynch Syndrome

Tumor Testing
The first step in identifying Lynch syndrome is often tumor testing. Tumor testing looks for specific changes in the tumor cells that are more likely to happen in Lynch syndrome. One common tumor test is called immunohistochemistry (IHC) testing. IHC testing looks at the proteins normally made from the Lynch syndrome genes. The result from IHC testing can help determine if a tumor might be due to a mutation in one of these genes. When tumor testing suggest that one of the Lynch syndrome genes may not be working, genetic counseling and further testing are offered.

Genetic Testing
Genetic testing is usually done by testing many different genes at the same time using a cancer gene panel. The gene panel includes genes that are known to raise the risk for cancer, including those that cause Lynch syndrome. This type of testing usually starts with a blood sample from someone who has had cancer, not from a tumor sample.

Results of genetic testing for Lynch syndrome may show:

**POSITIVE (pathogenic variant)** - A positive result means that a gene mutation was found that is expected to raise the chance for cancer to develop. It does NOT mean that you will definitely get cancer, but it does mean your lifetime chance to develop cancer is higher than average.

**NEGATIVE (no variant detected)** - A negative result means that no gene mutation was found. If a mutation has already been identified in the family, a negative test provides reassurance that your cancer risk is not higher than average. However, if you are the first person in the family to have testing, a negative test may not be as reassuring. Genetic testing is not always able to find a mutation in families with Lynch syndrome. This could be due to limitations in the way testing is done or a mutation might be on a gene that is not part of testing panel. If the cancer history is suspicious for Lynch syndrome, there may still be a hereditary risk for cancer, even if your test result is negative.

**VARIANT of UNKNOWN SIGNIFICANCE (VUS)** - Genetic testing sometimes finds a genetic change that is not able to be interpreted. This is called a variant of unknown significance (VUS). This means that there is not enough information to know if the gene is still working or not. When a VUS is found, we do not know whether or not the genetic change raises your risk for cancer.

Cancer Management in Lynch Syndrome
If you are at a higher risk for cancer, you and your doctor will develop a cancer management plan that could include starting cancer screening at an early age or having a risk-lowering surgery.

- **Cancer screening** - Cancer screening helps find some cancers early or in precancerous stages – when they are easier to treat.

- **Risk-lowering surgery** - Not all cancer can be found by screening tests. Risk-lowering surgeries are optional procedures that are done before cancer develops.

It is important to discuss the risks and benefits of screening and surgical options with your doctor to decide on the right care plan for you.