About Lynch Syndrome

About Genes

Genes are in every cell in our bodies. Genes are made of DNA, which gives instructions to cells about how to grow and work together. We have two copies of each gene in every cell—one from our mother and one from our father. When they work properly, some genes help keep cancer from developing. When these genes have mutations, they cannot repair mistakes that happen in DNA. The mistakes can let cancer develop.

Lynch Syndrome

Between 1 in 300 to 1 in 440 people are thought to have Lynch syndrome. Lynch syndrome raises the risk for certain cancers. It passes down through families. Mutations in any of these genes can cause Lynch syndrome: *MLH1, MSH2/EPCAM, MSH6,* or *PMS2*. These are signs that a person may have Lynch syndrome:

- Cancer at a young age such as colorectal or uterine cancer before 50
- More than one kind of Lynch syndrome-related cancer in the same person
- Several members on the same side of the family who have had Lynch syndrome-related cancers
- Tumor testing that shows a high risk for Lynch syndrome

Lynch Syndrome Cancer Risks

People with Lynch syndrome have a higher risk of getting certain cancers than people who do not have it.

The most common cancers are colorectal, uterine, ovarian, and stomach. The lifetime risk for different cancers depends on which of these genes has a mutation.

Table 1 shows the lifetime cancer risks for each of the different mutations. It also shows the risk of these cancers for people who do not have Lynch syndrome.

Lynch syndrome also raises the risk for getting these less common cancers:

- brain and central nervous system
- gall bladder and bile ducts
- pancreatic
- sebaceous gland
- small bowel
- urinary tract

Some people with Lynch syndrome do not get cancer at all. However, they can still pass the condition to their children.

Table 1. Lifetime Risk of Cancers with Different Lynch Syndrome Mutations

	Colorectal Cancer	Uterine Cancer	Ovarian Cancer	Stomach Cancer
No Lynch syndrome	4 in 100	3 in 100	1 in 100	Less than 1 in 100
MLH1	46-61 in 100	34-54 in 100	4-20 in 100	5-7 in 100
MSH2/EPCAM	33-52 in 100	21-57 in 100	3-38 in 100	Up to 9 in 100
MSH6	10-44 in 100	16-49 in 100	Up to 13 in 100	Up to 8 in 100
PMS2	8-20 in 100	13-26 in 100	3 in 100	Unknown

Recommendations

MEN AND WOMEN

- Colonoscopy every 1–2 years
  If a parent or sibling was diagnosed with colorectal cancer at a younger age, start colonoscopy 2–5 years before the age when their colon cancer was diagnosed. Otherwise:
  - For people with *MLH1* and *MSH2* mutations, start colonoscopies at age 20-25.
  - For people with *MSH6* and *PMS2* mutations, start colonoscopies at age 30-35.
- Consider upper endoscopy every 3-5 years starting at age 40
- Consider dermatology exam every year
- Depending on gene mutation, family history and sex, consider urinalysis every year starting at age 30-35
- Depending on gene mutation and family history, consider pancreatic cancer screening starting at age 50
- Consider physical exam every year beginning at age 25-30

WOMEN

Talk with your doctor about ways to prevent cancers or find them early. These may include:

- Medicines to lower the risk of cancers starting
- Surgery to remove your ovaries, fallopian tubes and/or uterus
- An endometrial biopsy every two years starting between ages 30-35

Your doctor can help you decide which steps to take, and at what age.

CHILDREN AND SIBLINGS

Siblings and children of people with Lynch syndrome have a 1 in 2 chance of also having the mutation. We recommend genetic counseling and testing after age 18.

Constitutional Mismatch Repair Deficiency (CMMR-D)

CMMR-D is a more severe cancer syndrome. It raises the risk for many types of cancer. It can cause childhood cancers.

People are at risk for CMMR-D if both parents have Lynch syndrome due to mutations in the same gene. For example, if a child inherits *MSH2* mutations from both mother and father, the child would have CMMR-D.

If two people with the same type of Lynch syndrome have a child, the risk that the child will have Lynch syndrome is 1 in 2. The risk that the child will have CMMR-D is 1 in 4. If two people with different types of Lynch syndrome, we don't expect the child to have CMMR-D.

Resources

If you have a personal or family history of cancer, you may be eligible for genetic testing and counseling. If you know you or a family member has a mutation in *MLH1, MSH2, MSH6, PMS2*, or *EPCAM*, our team can help create a management plan.

Family Cancer Assessment Clinic

Do you have questions about your risk for cancer?

Our doctors and genetic counselors can help find the cancer screening plan you need.

Call Huntsman Cancer Institute's Family Cancer Assessment Clinic 801-587-9555.