About *MLH1* Gene Mutations

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 each cell—one from our mother and one from our father. When genes work right, they help stop cancer cells from developing.

Sometimes changes to genes can happen. These changes are called mutations. Mutations can make the genes stop working and raise the risk for certain types of cancer. Some mutations can be passed through families. When that happens, family members who have the mutation have a hereditary cancer syndrome.

The *MLH1* gene helps fix mistakes in DNA. When *MLH1* has a mutation, DNA mistakes build up and can cause cancer. A person who inherits a mutated copy of *MLH1* has a hereditary cancer syndrome called Lynch syndrome.

Lynch Syndrome

Lynch syndrome is passed down through families. It raises the risk of getting colorectal, uterine, and other types of cancer. People with Lynch syndrome may get cancer at a younger age than those in the general population. They can have multiple cancers in their lifetime. Often there is a family history of similar cancers.

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

MLH1 Mutations and Cancer Risk

This table compares the lifetime risk for getting certain cancers among those with and without *MLH1* mutations.

Cancer Type	Risk with *MLH1* Mutation	Risk in General Population
Colorectal	40-60 in 100	4 in 100
Uterine (endometrial) – Women only	30-50 in 100	3 in 100
Ovarian – Women only	Up to 20 in 100	2 in 100
Other Cancers		
Stomach	5-7 in 100	Less than 1 in 100
Renal pelvis and/or ureter	1-7 in 100	
Small bowel	Up to 11 in 100	
Brain and central nervous system	Up to 2 in 100	
Biliary Tract	2-4 in 100	
Bladder	Up to 7 in 100	2 in 100
Pancreatic	6 in 100	1 in 100

We do not believe that people with Lynch syndrome have a higher risk for breast cancer.

Recommendations

MEN AND WOMEN

- Colonoscopy every 1–2 years
  - Start at age 20-25
  - If a parent or sibling was diagnosed with colorectal cancer at before age 20, start colonoscopy 2–5 years before the age when their colon cancer was diagnosed.
- Consider upper endoscopy every 3-5 years starting at age 40
- Consider dermatology exam every year
- Depending on family history and sex, consider urinalysis every year starting at age 30-35
- Depending on family history, consider pancreatic cancer screening starting at age 50 or 10 years before the age their relative was diagnosed with pancreatic cancer, whichever comes first.
- 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.

Family Members Who Test Negative

Family members who do not have the *MLH1* mutation probably do not have a higher risk of getting cancer. They should follow general cancer screening guidelines.

Knowing which side of the family carries Lynch syndrome is important. That information can help us decide which family members are at risk for cancer. A genetic counselor can help you discuss Lynch syndrome with your family members.

Constitutional Mismatch Repair Deficiency (CMMR-D)

People whose parents both have Lynch syndrome are at risk to have CMMR-D. This raises the risk for many types of cancer and can cause childhood cancers. If two people with Lynch syndrome from an *MLH1* mutation have a child, the risk that their child will have Lynch syndrome is 1 in 2. The risk for CMMR-D is 1 in 4.

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.