Genetic Insights: quick reference guide for healthcare providers

This guide is intended to facilitate a discussion between a provider and their patient.

Genetic Insights test results: ***MUTYH*-associated polyposis**

Key results

Two pathogenic, or likely pathogenic, DNA variants associated with *MUTYH*-associated polyposis (MAP) were found in the *MUTYH* gene.

People with MAP have a significantly increased chance of developing colon polyps and colon cancer. Risks for duodenal and ovarian cancer may also be increased.

Next steps

Clinical recommendations	Resources
Genetic Insights is a screening test and not intended for diagnosis. A follow-up genetic test should be performed in a clinical setting before any other action is taken.	**Ready to order?** Check with your institution and/or patient's insurance about the preferred testing laboratory. To confirm this result, Blueprint Genetics® offers **targeted variant testing** for the variant identified. You can order a confirmation test here: Blueprint Genetics/TVT **Have questions?** Call **1.866.GENE.INFO** (1.866.436.3463) to speak to a specialized Quest genetic counselor or geneticist available to healthcare providers to discuss test selection and results.
Refer your patient to a genetic counselor specializing in hereditary cancer. *Genetic counselors can provide counseling on the implications of this test result and next steps for your patient.*	Your patient can schedule a 1-on-1 remote genetic counseling session through their online Genetic Insights Cancer Risk Report at no additional cost. To find a genetic counselor with expertise in hereditary cancer practicing in your patient's area for an in-person session, please visit FindAGeneticCounselor.NSGC.org

Patient conversation starters:

Patient conversation starters summarize the preceding information in plain language to support meaningful conversations between you and your patient.

FindAGeneticCounselor.NSGC.org

Your Genetic Insights test is a genetic screening test. The next step is to have your result confirmed with a second genetic test.

It's also important that you talk with a genetic counselor. Genetic counselors are experts in genetics and can help you understand this result and potential next steps.

You can access a genetic counselor through your online Genetic Insights dashboard at no additional cost to you, and we can discuss a referral to a local genetic counselor.

Visit QuestDiagnostics.com/Genetic-Health-Screening for more information about this test.

What is MAP?

MAP is a hereditary cancer predisposition syndrome characterized by the presence of colon polyps and a significantly increased chance of colon cancer.[1,2] Risks for duodenal, bladder, and ovarian cancer may also be increased.[1]

People with MAP typically have between 10 and a few hundred colon polyps which can be of various types including adenomas, serrated adenomas, hyperplastic/sessile serrated polyps, and mixed polyps.[1] However, some people have no colon polyps but remain at increased risk for colon cancer.[1]

MAP results from 2 DNA variants associated with MAP, 1 in each copy of the *MUTYH* gene.[1]

People with a DNA variant associated with MAP in only 1 copy of *MUTYH* are considered carriers of MAP. Carriers may have a slightly increased chance of developing colon cancer in their lifetime.[1,2,3]

People with the variant in both copies of the *MUTYH* gene are recommended to undergo more frequent colon cancer screening, typically starting at earlier ages than in the general population.[2]

See the Management options section for more detail.

What this result means for family members?

MAP is an inherited condition. Parents of people with MAP are most likely carriers.

Full siblings of people with MAP have a 1 in 4 chance to also have MAP, a 1 in 2 chance to be carriers, and a 1 in 4 chance to neither be a carrier nor have the condition.

Children of people with MAP are carriers and would only be at risk of having MAP if the other biological parent is also a carrier.

In people with MAP, genetic testing for at-risk family members may help inform their cancer screenings. Therefore, people should share their test results with their family members.

In people with MAP, comprehensive *MUTYH* gene analysis may be warranted for their reproductive partners (or sperm/egg donors), especially for family planning purposes and to inform potential risks to their children.

Patient conversation starters:

MAP is a genetic condition that significantly increases the chance of developing colon cancer and certain other cancers.

People with MAP generally develop clumps of cells in the lining of the colon, called polyps ("multiple polyp-osis"). Sometimes polyps can be completely harmless, but some kinds of polyps may signal changes that could lead to cancer.[1] Some people with MAP have no colon polyps but still have a higher risk for colon cancer.[1]

MAP is caused by having a DNA variant in both copies of the *MUTYH* gene. People who have a DNA variant in just 1 copy of the gene are considered carriers of MAP. Carriers don't have MAP, but their children could if the other biological parent is also a carrier.

People with MAP and those who are carriers may be recommended to undergo colon cancer screening earlier in life or more often than other people.

Patient conversation starters:

MAP runs in families.

That means the DNA variants linked to MAP can be passed down from parents to their children.

One of your biological parents is likely a MAP carrier. Your full siblings have a 1 in 2 (50%) chance of also being a MAP carrier. Your biological child's chance of being MAP carrier or having MAP depends on if their other parent is a carrier.

Sharing these results with your family members is important so family members can decide if they want to have genetic testing.

Cancer risk

Select cancer risks in people with MAP include:

Cancer type	Approximate lifetime risk in people with MAP	Approximate lifetime risk in the general population
Colon	80%-90%[1]	4%[3]
Duodenal	4%[1]	<0.3%[1]

Associated cancers and risks may change over time as medical research advances.

Management options

There are options for cancer prevention and early detection for people with MAP. Clinical guidelines from the National Comprehensive Cancer Network® (NCCN®) for adults with MAP and no personal history of an associated cancer include[2]:

Cancer type	Guidelines for people with MAP
Colon	*Begin colonoscopy no later than age 25-30 or earlier based on family history* *Repeat every 1-2 years* *If polyps identified, follow treatment guidelines including polypectomy and surgical evaluation as appropriate*
Duodenal	*Baseline upper endoscopy beginning at age 30-35*

Patient conversation starters:

It's recommended that people with MAP have cancer screenings earlier and more often than typical. This way, cancer is more likely to be caught in the early stages when it's most treatable. In fact, colon cancer can even be prevented if pre-cancerous colon polyps are found and removed during a colonoscopy. If your MAP result is confirmed, it's important to work with the right specialists—like a medical oncologist or gastroenterologist, and a geneticist—to find cancer screening and risk-reducing options that are right for you.

See NCCN for complete recommendations. Recommendations may change over time.
If the test result is confirmed, local centers for excellence in hereditary cancer may be considered for further clinical management.

Additional resources

The following advocacy groups have additional information and resources about MAP:

Colorectal Cancer Alliance: CCAlliance.org
Fight Colorectal Cancer: FightColorectalCancer.org
FORCE: Facing Our Risk of Cancer Empowered: FacingOurRisk.org

References

1. Nielsen M, Infante E, and Brand R. MUTYH Polyposis. October 4, 2012. Updated May 27, 2021. In: Adam MP, Ardinger HH, Pagon RA, et al, editors. GeneReviews® [Internet]. University of Washington, Seattle; 1993-2022. www.ncbi.nlm.nih.gov/books/NBK1266
2. National Comprehensive Cancer Network®. Genetic/Familial High-Risk Assessment: Colorectal (Version 2.2022). NCCN Guidelines®. Accessed December 13, 2022. www.nccn.org
3. National Cancer Institute: Surveillance, Epidemiology, and End Results Program. Cancer Stat Facts: Colorectal Cancer. Accessed October 31, 2022. https://seer.cancer.gov/statfacts/html/colorect.html