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The Integrationist

HEALTH

A Genetic Mutation That Can Affect Mental & Physical Health

MTHFR mutations are linked to depression, ADHD, migraines, miscarriage & more.

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✓ Reviewed by Lybi Ma



KEY POINTS

- Mental health issues associated with a MTHFR mutation include depression, bipolar disorder, schizophrenia, and ADHD.
- Up to 40% of the population may have an MTHFR mutation of some kind.
- To reduce the risks associated with a MTHFR mutation, it's important to speak to one's health care provider.

MTHFR is the acronym for a gene (methylenetetrahydrofolate



DNA Source: © Kts | Dreamstime.com - DNA Structure
Photo

reductase) that produces an essential enzyme. The acronym for the enzyme is also MTHFR. It's worth knowing about this gene because it plays a key role with regard to many aspects of emotional and physical health.

Who Should Know About MTHFR?

This post may be of greatest interest to those who have been diagnosed with one of the mental health issues linked to having an MTHFR mutation, such as depression, bipolar disorder, schizophrenia, attention-deficit hyperactivity disorder (ADHD), or autism. MTHFR mutations also increase the risk of several physical health problems, including but not limited to cardiovascular disease and stroke, recurrent early miscarriage, migraine with aura, osteoporosis, and some cancers. So, it's worth knowing about this mutation even if one or more of the above conditions run in your family.



Response to Drugs

The presence of an MTHFR mutation can also alter one's response to medications, including antidepressants and some chemotherapy drugs. Further, it can increase the risk of having an adverse reaction to receiving nitrous oxide anesthesia (a common dental anesthetic). Therefore, individuals with an MTHFR mutation should speak with their physicians/dentists prior to undergoing any procedure that would require anesthesia.

A Quick, Basic Genetics Overview

As you may remember from biology class, genes are pieces of our DNA that control a specific characteristic (such as hair or eye color, etc.). Each gene is made up of two alleles, or specific forms of that gene. In short, genes and their alleles determine what traits we inherit from our ancestors. Some-

times these traits are obvious, such as having blue vs. brown eyes. Other times, the result of a specific trait may not be immediately obvious, such as whether we will like or detest the herb cilantro, metabolize caffeine quickly or slowly, or have increased or decreased risk of a health problem down the road.

A mutation is a naturally occurring process that causes a specific variation on one or more alleles of a particular gene, changing a sequence in our DNA. Having a mutation on both alleles at a specific location on a gene is generally associated with a greater impact than if only one of a pair of alleles is different from normal.

How Common Are MTHFR Mutations?

By some estimates, up to 40% of the population may have an MTHFR mutation of some kind. The current data suggest that between 6 and 14% of Caucasians and about 2% of those of African descent probably have a more severe (two mutated alleles) version of the mutation. In Hispanics, this number may be as high as 21%.

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But even having one mutated allele is associated with an increased risk of certain health problems. For example, having one mutated allele at either of two specific locations is associated with 20-40% reduced activity of the MTHFR enzyme (depending on where on the gene the mutation is found). Having two mutated alleles at the same location is associated with a 40-70% reduction in enzyme activity, again, with severity depending upon the location of the mutated alleles. Some people may have two mutated alleles – one at each of two different locations on the gene – and that also increases risk of a number of health issues.

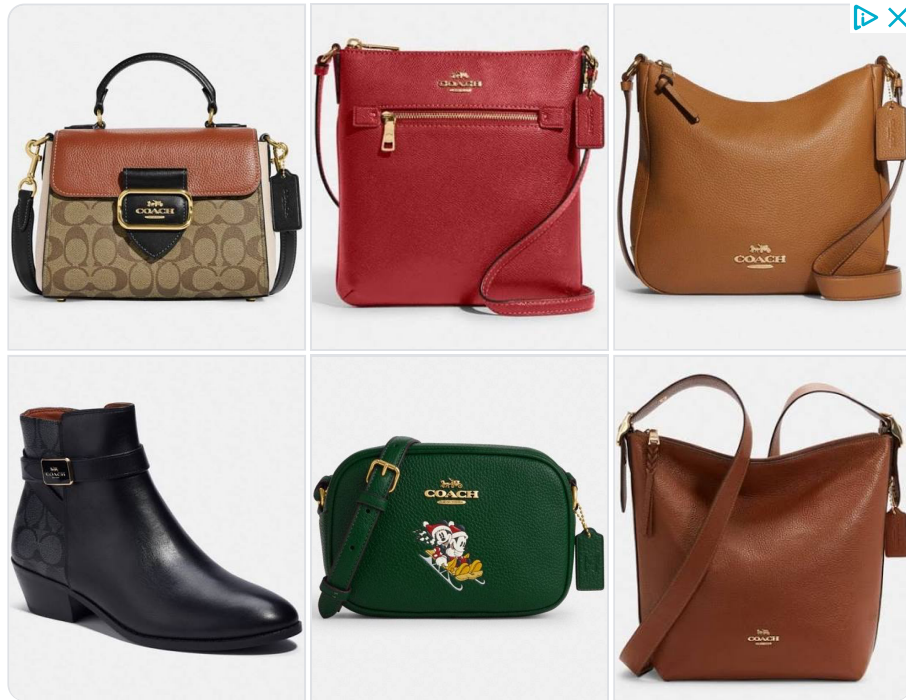
How Does This Gene Impact Health?

Normally, the MTHFR gene produces enough of the related enzyme to perform its associated functions well. One function that is particularly important to mental health is the conversion of an essential B-vitamin, folate, into the more usable form, l-methylfolate.

L-Methylfolate enables our bodies to convert the amino acid homocysteine to another amino acid, methionine. The body then uses methionine to make proteins and other important compounds, including neurotransmitters (serotonin, dopamine, norepinephrine). These brain chemicals are essential for a number of aspects of mental health; thus, when this process is impaired, it can increase the likelihood of the mental health issues mentioned previously. In addition, when the enzyme is not working at normal capacity, it can lead to elevated levels of homocysteine in the blood, which can lead to cardiovascular and other health problems.

Despite the increased risks, however, having a specific MTHFR mutation has been associated with a *reduced* risk of acute lymphatic leukemia and colon cancer in those who have adequate folate levels.

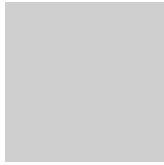
The good news is that the *risk* of a variety of health problems is increased in those with MTHFR mutations, but thankfully, developing these problems is not guaranteed. If you have a personal or significant family history of one or more of the above illnesses, and in particular, if you have not responded as well as expected to conventional treatment for depression or other mental health issues, it is worth speaking with your medical provider about being tested for an MTHFR mutation. The preliminary research on MTHFR, autism, and ADHD suggest that adequate prenatal intake of folate – both in the period 3 months before conception and during the first month of pregnancy in particular – can reduce these risks.



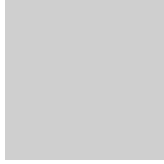
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Other Factors That Interfere With Folate Metabolism and Increase Health Risks

In addition to having an MTHFR mutation, there are other factors associated with decreased folate levels or poor absorption, including malnutrition, gastrointestinal illness, and high alcohol consumption. If you have an MTHFR mutation and/or one of the above issues, it is important to know that you will have reduced ability to metabolize *folic acid*, the synthetic form of folate that is found in processed foods (e.g., breads, cereals) and vitamins.



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What You Can Do

There are some simple and inexpensive steps one can take to reduce the risks associated with MTHFR mutations, possibly improve response to antidepressant therapies, and feel better in general:

1. Speak with your healthcare provider about whether MTHFR testing may be appropriate for you. Your insurance company may or may not cover this expense, but some independent laboratories will process your blood sample for about \$200. Before getting tested, it's worth calling your insurer to see under what circumstances you will be covered for this specific lab test.
2. Swap out folic acid for the more bioavailable form of folate – l-methylfolate). This is more usable by the body and easily available in health food stores, many pharmacies, and online. L-methylfolate is sometimes referred to as “optimized folate.”
3. Avoid processed foods and supplements containing the folic acid form of folate. It's not as easily used by people

with an MTHFR mutation and may interfere with the absorption of l-methylfolate.

4. Strive to eat a diet that is healthy in general and includes folate-rich foods. Leafy greens, broccoli, lentils, and many beans are great sources of folate, fiber, and other nutrients.
5. Because MTHFR impacts the process of methylation, it is also recommended to take a methylated (and more usable) form of B12, known as methylcobalamin, rather than the more commonly available cyanocobalamin form. B12 absorption is essential for good mental health, and is also compromised by the MTHFR mutation and the other factors listed above.
6. Speak with your healthcare provider about what your nutritional and vitamin regimen should consist of, including what doses would be most appropriate for you.
7. If you are planning a pregnancy and are positive for an MTHFR mutation, you may also need to add either low-dose aspirin or a blood thinner to your regimen to reduce the risk of blood clots associated with early miscarriage. Again, consult your healthcare provider to see if this is appropriate for you.
8. Finally, if one or both parents carry an MTHFR mutation, and particularly if your child has attentional difficulties or other cognitive or mental health issues, speak with your child's pediatrician about whether you should supplement his or her diet with l-methylfolate, and at what dose.

For more, see the National Institutes of Health [information on MTHFR](#).

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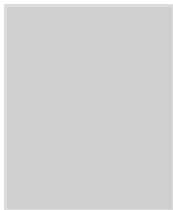


The advertisement is presented in a white-bordered frame. On the left is a weathered, rusty metal sign with the word "askhole" in a large, black, serif font. Below the word is the pronunciation "[noun] [ask-hohl]" and a definition: "a person that constantly asks for your advice, yet always does the complete opposite of what you told them to do." To the right of the sign is a meme featuring a black and white cat. The text of the meme reads: "WHEN VISITING MY HOUSE PLEASE REMEMBER", "IF YOU DONT LIKE CAT HAIR STAY OFF THE SOFA", "I LIVE HERE YOU ARE THE GUEST", "YOU WILL BE SNIFFED & POSSIBLY LICKED DEAL WITH IT", "TO YOU I AM THE CAT, BUT HERE I AM THE BABY", "THEY LIKE ME MORE THAN THEY LIKE MOST HUMANS", and "THEY LOVE ME, THEY'RE ONLY FRIENDS WITH YOU". Below the meme is a pair of light blue baby diapers.



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About the Author



Dr. Traci Stein, Ph.D., is a licensed psychologist, certified clinical hypnotherapist, and health educator who integrates complementary/alternative and conventional healing approaches.

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