SelfDecode™

Methylation

DNA Health Report

REPORT CATEGORIES

NUTRITION

DETOX

Sample Client

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DISCLAIMER

This report does not diagnose this or any other health conditions. Please talk to a healthcare professional if this condition runs in your family, you think you might have this condition, or you have any concerns about your results.

Personal information

NAME

Sample Client

SEX AT BIRTH

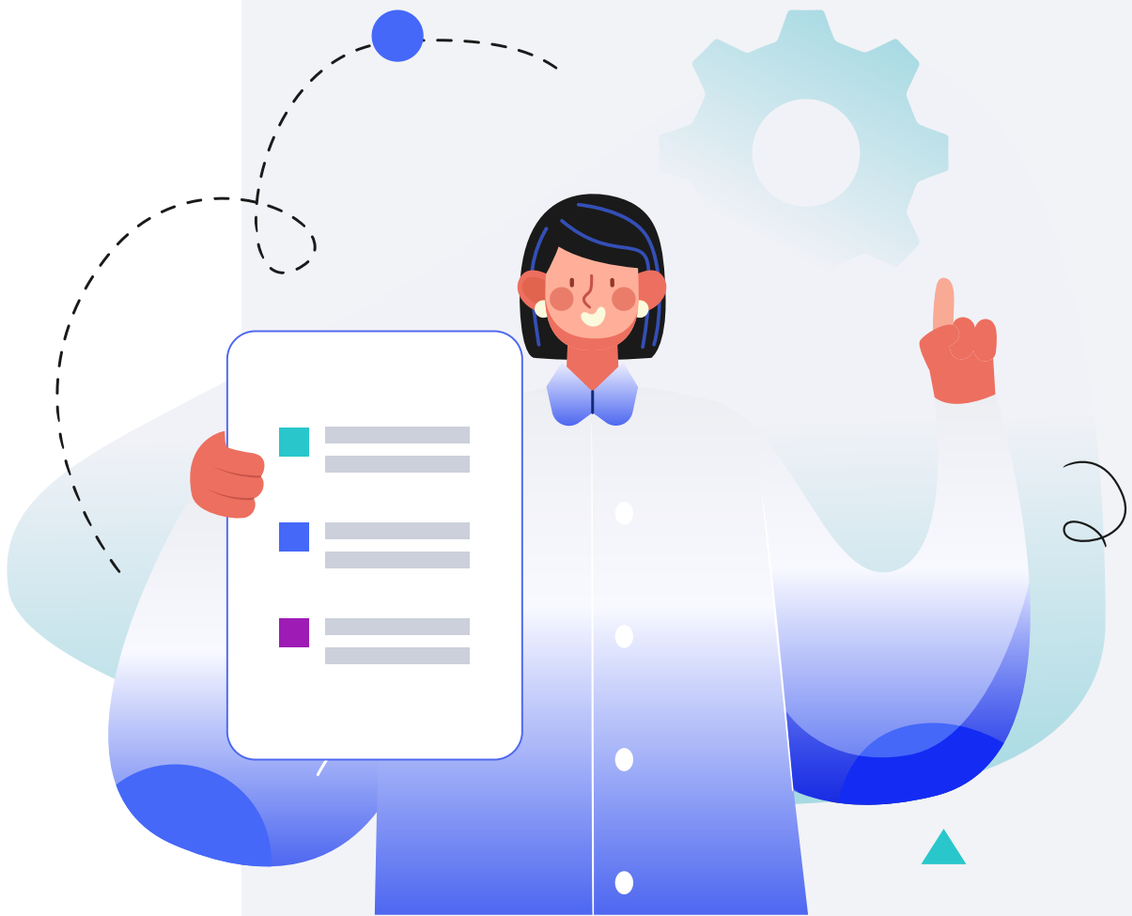
Male

HEIGHT

5ft 5" 165cm

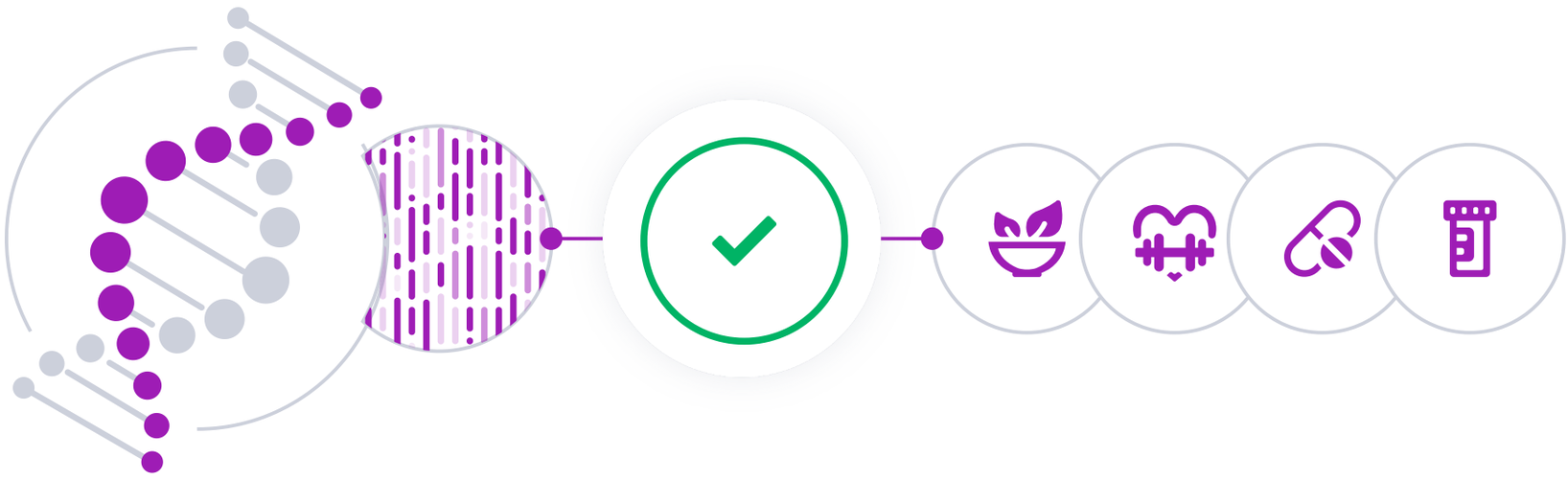
WEIGHT

137lb 62kg



How this works

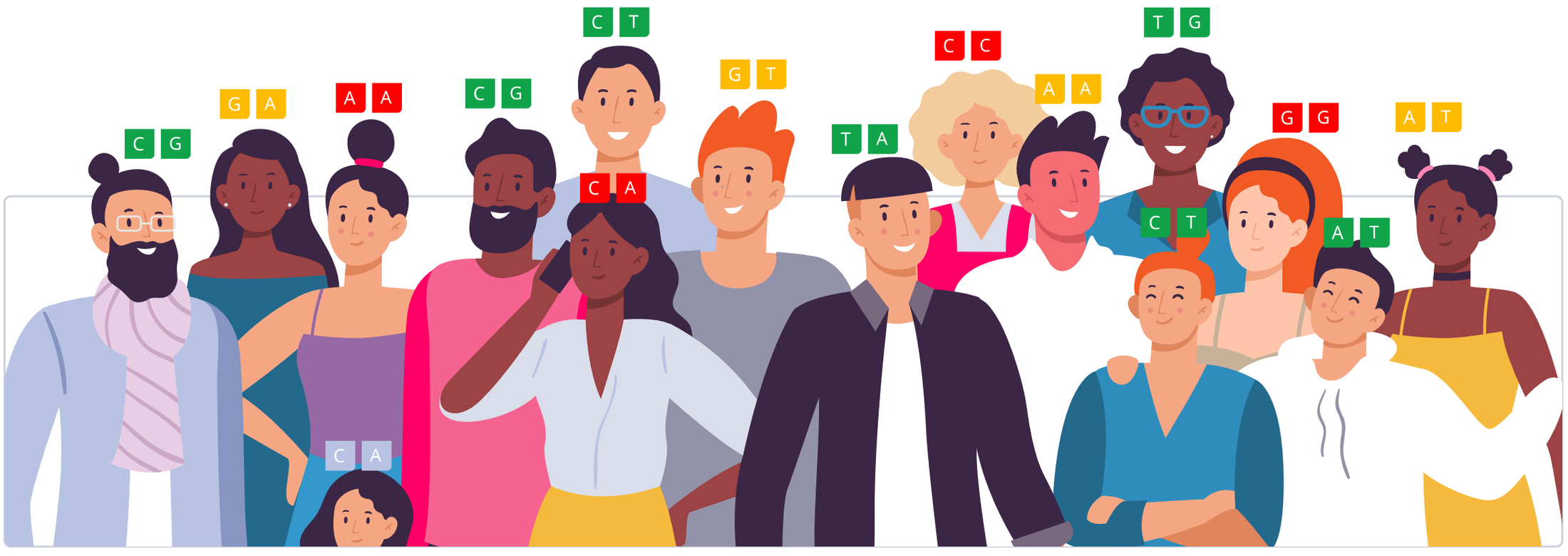
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



Similarly, our Trait Reports look at how your DNA influences your traits.

Your DNA is like an instruction manual — it contains a lot of information.
You can think of it as a blueprint for your body.

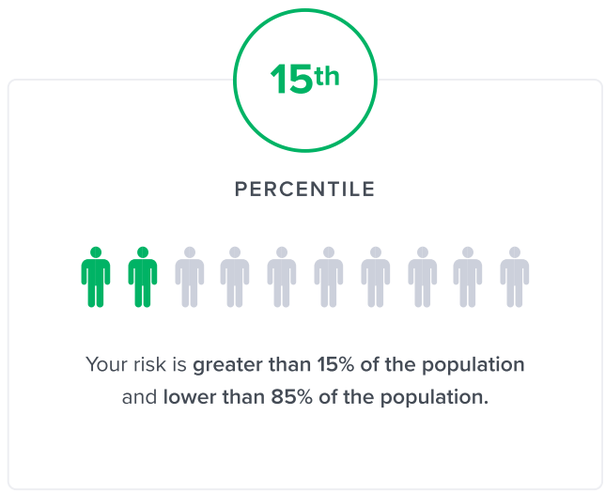
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



We use artificial intelligence and machine learning to analyze all this information. We then summarize your results as a risk score or display it on a gauge.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:

In total, we analyze up to 83 million genetic variants.



Genotype color info: AA You don't have any risk alleles | AA You have 1 risk allele | AA You have 2 risk alleles

Your risk is also displayed as a percentile. This will tell you how your risks compare to our sample population. The lower your percentile number, the lower your risk. The "50th percentile" would be an average risk.

Similarly, the gauge tells you your relative risk score compared to our sample population, or it indicates a specific trait or haplotype you are more likely to have based on your genetic variants.

When applicable, we also list top evidence-based recommendations that may help lower your risk. The focus is on recommendations that may be of benefit to you, based on your genetics.

Our recommendations come in four categories: lifestyle, diet, supplements and drugs.
The following icons tell you which category a recommendation falls into:

Our team of scientists also ranks each recommendation.
We rank based on impact and the strength of evidence in the medical literature.

Impact shows how strongly a recommendation will affect your health in a certain area.
Evidence is how much scientific support there is for the recommendation. Rankings are from 1 to 5 (low to high):

Impact

Impact scores range from 1-5. These scores reflect how much of an effect each recommendation can have. An impact score of 5 predicts the biggest effect.

When a recommendation affects something we can measure, we use those measurements to assign the impact score. For example, a recommendation that decreases cholesterol by 20% will have a higher impact score than one that decreases it by 5%.

Some recommendations affect things that we cannot directly measure, like stress or mood. For these, the impact score is based on how well they work relative to other recommendations and standard treatments. The best ones get the highest scores.

If there is a lot of research that shows a recommendation works especially well for your genotype, the impact score gets increased.

Recommendation Evidence

5 / 5

Recommendations that are considered effective and generally recommended by experts and medical bodies.

4 / 5

Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.

3 / 5

Recommendations that are considered possibly effective and have many studies supporting them

2 / 5

Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.

1 / 5

Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.

0 / 5

No evidence in humans.

Genotype-specific Evidence

High-quality

Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, afew large clinical trials, or a meta-analysis).

Medium-quality

Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).

Low-quality

Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).

Indirect

A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).

In theory

A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).

Some things to keep in mind:

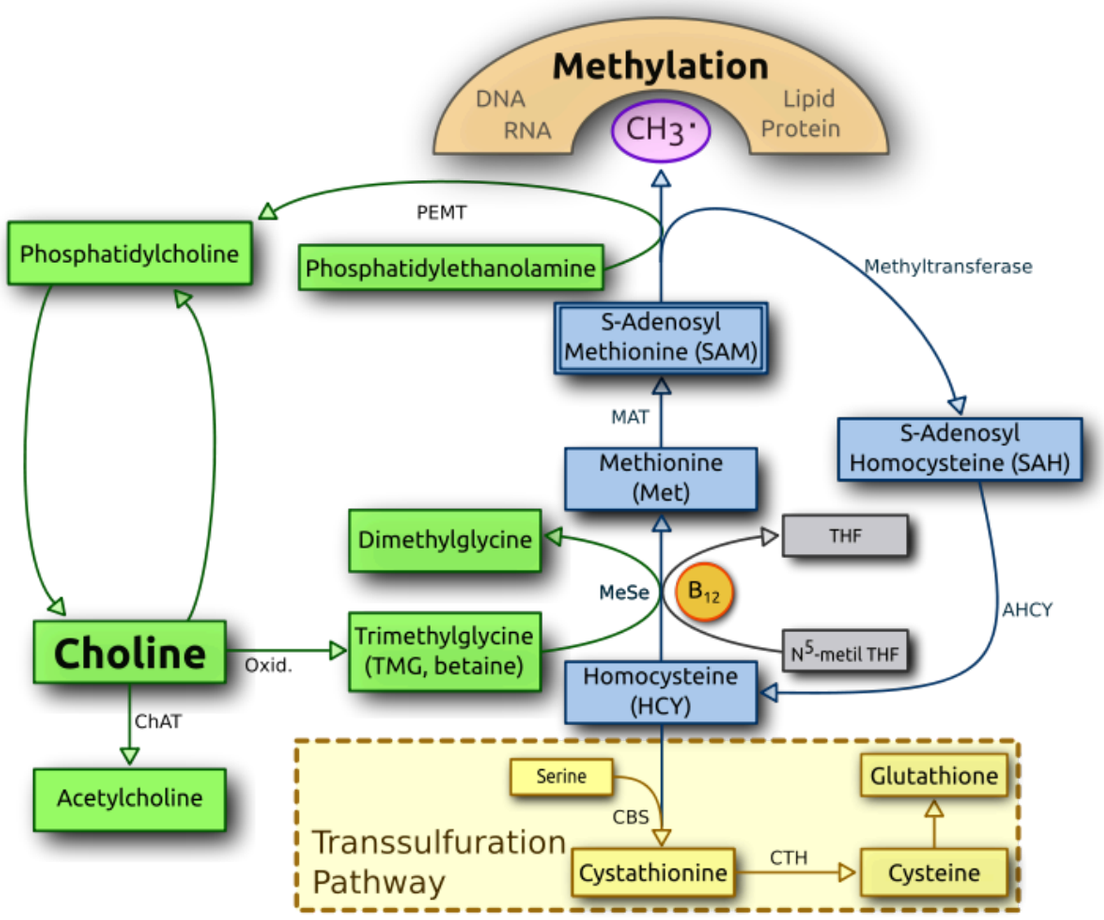
- Genetics doesn’t play a considerable role in a condition or a trait.
- There is not enough research available to estimate a genetic predisposition.
- There are technical limitations to estimating or presenting a genetic predisposition.
- The topic is sensitive, and a genetic predisposition should only be estimated and presented by a healthcare professional.

Introduction

On a chemical level, methylation is when a methyl group is transferred from one compound to another. Methyl groups are small backbones for organic compounds, the chemical compounds of all living beings that are found in every cell of your body.

Methyl groups are also switches that turn on or off genes based on environmental cues. This is called *epigenetics*. Additionally, methyl groups signal which hormones, brain chemicals, and amino acids need to be broken down and removed, maintaining a healthy balance in the body.

On a deeper level, the methylation cycle involves several steps outlined in the image below:



Starting from the **MTHFR** enzyme and folate you take in with food, the methylation cycle produces the active vitamin methylfolate that circulates in your bloodstream (5-methyl THF). This step is crucial for turning harmful homocysteine into methionine [R].

This pathway also relies on vitamin B12 and enzymes, including **MTR** and **MTRR**.

The other pathway for clearing homocysteine uses betaine derived from choline. It relies on the **CHDH** and **BHMT** enzymes.

In the next step, methionine obtained via these pathways creates SAM-e (S-adenosyl-methionine), a compound that provides a methyl group for methylation [R, R].

Methionine also helps produce phosphatidylcholine via the **PEMT** enzyme. This cycle reveals a close connection between the genes and enzymes involved in choline, folate & vitamin B12 metabolism [R, R].

The third pathway for clearing homocysteine, the so-called *transsulfuration pathway*, helps produce glutathione, a.k.a the "master" antioxidant. This pathway relies on vitamin B6 and the **CBS** enzyme.

These reactions — collectively known as the **one-carbon metabolism** — are vital for many aspects of physical and mental health. Issues with the methylation cycle play a role in heart health, mental health, fertility problems, birth defects, cancer, and more [R, R, R].

Methylation Genetics

Optimal function of the pathways discussed above depends on a number of enzymes that enable chemical reactions. Gene variants in some of those enzymes can alter their function and potentially compromise methylation.

Please note: Methylation is a complex process that goes way beyond the pathways and enzymes discussed in this report. There is insufficient evidence that any of the gene variants analyzed in this report impair methylation and its vital roles in the human body.
Image source: Pan S, et al. 2020

MTHFR

The *MTHFR* gene helps make an enzyme called methylenetetrahydrofolate reductase (MTHFR). It produces the active form of folate, methylfolate [R].

The whole methylation cycle depends on MTHFR, which is why it is called a "*rate-limiting enzyme*". Low MTHFR activity can make methylation as a whole much less productive [R].

Two of the most widely studied variants—**rs1801133 and rs1801131**—reduce MTHFR enzyme activity [R, R, R, R].

Studies found links between these variants, higher homocysteine, and [R, R, R, R, R, R]:

- Cognitive problems
- Heart disease and stroke
- Asthma and allergies
- Fertility and pregnancy issues
- Mental health issues
- Migraines

Read this blog post for more details about MTHFR variants and potential ways to reduce their impact.

Other Genes

LOWER ABILITY

Predisposed to lower methylation ability based on 45 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MTHFR	rs1801133	AA
MTHFR	rs2066470	GG
BHMT	rs3733890	AG
GNMT	rs9296404	TT
SHMT1	rs1979277	AA
MTR	rs2275565	GG
COMT	rs4680	AG
JMY	rs3797546	TC
MTRR	rs1801394	AG
PEMT	rs7946	CT
MTHFD1	rs2236225	GA
BHMT	rs651852	CT
CBS	rs234706	AG
CHDH	rs9001	TT
MTR	rs1805087	AA
FOLH1	rs61886492	GG
CPS1	rs1047891	AC
MTRR	rs1532268	CT
MAT1A	rs3851059	AG
TRDMT1	rs12780845	GA
BHMT2	rs625879	AC
SLC19A1	rs1051266	CT
PEMT	rs4646343	GT
PEMT	rs12936587	GA
MAT1A	rs7087728	GA
MS4A6A	rs558660	GG
MAT1A	rs2993763	AA
FOLR3	rs651933	AG
MTRR	rs1802059	GA
TCN1	rs526934	AG
COMT	rs4633	TC
BHMT	rs567754	CT

The *PEMT* gene encodes an enzyme that produces phosphatidylcholine (PC) in the liver. This pathway supplies choline and thus plays a key role in the methylation cycle [R, R].

PEMT gene variants like **rs7946** **and** **rs12325817** are linked to:

- Choline deficiency
- Fatty liver
- Heart disease

The *MTHFD1* gene encodes an enzyme that helps produce active folate and supports homocysteine methylation. A variant in this gene, **rs2236225**, is linked to increased choline and folate needs [R, R, R].

The *MTRR* gene encodes an enzyme that helps turn homocysteine into methionine, using vitamin B12 and riboflavin. *MTRR* variants like rs1801394 have been linked to [R, R]:

- Higher homocysteine levels
- Congenital disorders (mixed evidence) [R, R, R]
- Some types of cancer [R, R]
- Male fertility issues (mostly in Asians) [R, R]
- ADHD in children [R]

The *CHDH* codes for choline dehydrogenase, an enzyme that turns choline into betaine or TMG. Betaine then supplies a methyl group needed for homocysteine clearance. CHDH gene variants like rs9001 are linked to choline deficiency and may thus affect methylation [R, R].

Variants in the following genes may also affect methylation and play a role in related health issues:

- *CBS*: a key component of the transsulfuration pathway [R, R, R]
- *BHMT*: helps turn homocysteine into methionine (betaine pathway)
- *COMT*: methylates important chemicals with the help of SAM-e [R]
- *SHMT1*, *DHFR*, and *FOLH1*: involved in folate metabolism [R, R, R, R]
- *GNMT and DNMT3B: play a role in SAM-e metabolism [R, R]*
- *MTR*: helps turn homocysteine into methionine (folate pathway) [R]
- *MAT1A*: helps turn methionine into SAM-e [R]
- *TRDMT1*: plays a role in DNA methylation [R]

GENE	SNP	GENOTYPE
MTHFD1L	rs17349743	TC
MMAB	rs7134594	CT
CBS	rs2851391	TC
MAT1A	rs4934028	GA
MTHFR	rs1801131	TT
CHMP4B	rs819171	TT
ITCH	rs819147	TT
MTHFR	rs3737965	GG
FOLH1	rs202676	AA
PDXK	rs147242481	GG
TYMS	rs2853533	GG
DHFR	rs1643649	TT
AHCY	rs13043752	GG
PEMT	rs12325817	CC
GNMT	rs10948059	CC
NQO1	rs1800566	GG
OGG1	rs1052133	CC
MTHFD1L	rs6922269	GG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

- *PDXK*: plays a role in vitamin B6 metabolism [R]
- *AHCY*: involved in homocysteine and SAM-e metabolism [R, R].
- *TYMS*: supports DNA methylation with the help of methyl-folate [R, R]

Your Recommendations

Your recommendations are prioritized according to the likelihood of it having an impact for you based on your genetics, along with the amount of scientific evidence supporting the recommendation.

You'll likely find common healthy recommendations at the top of the list because they are often the most impactful and most researched.

		DOSAGE
1	Betaine (TMG)	500 mg
2	Vitamin B12	10 mcg
3	Dietary Folate	
4	Beef liver	
5	Leafy Green Vegetables	
6	Dietary Vitamin B12	
7	Dietary Choline	
8	Eggs	
9	Choline Supplements	425 mg
10	SAM-e	200 mg
11	Methylsulfonylmethane (MSM)	1 g
12	Dietary Pyridoxine (Vitamin B6)	
13	Zinc	15 mg
14	Pyridoxine (Vitamin B6)	50 mg
15	Riboflavin (Vitamin B2)	25 mg
16	Low-Intensity Exercise	1 hour
17	Sleep for 7+ Hours	
18	Avoid High-Dose Niacin Supplements	35 mg
19	Avoid Exposure to Heavy Metals	
20	Dietary Selenium	
21	Dietary Magnesium	
22	Avoid BPA (Bisphenol A) Exposure	
23	Relaxation Techniques	30 minutes
24	Yoga	30 minutes
25	Beetroot	
26	Avoid Secondhand Smoke	
27	Creatine	4 g

1

Betaine (TMG)

IMPACT 4 / 5

EVIDENCE 3 / 5

How to implement

To take Betaine (TMG) as a supplement, consume 500-2000 mg daily, preferably with a meal to enhance absorption. It is recommended to start at the lower end of the dosage range and adjust based on personal tolerance and effectiveness. This supplement can be taken indefinitely for ongoing support of heart health and liver function.

TYPICAL STARTING DOSE

500 mg

Description

Betaine is a compound found in various foods and used in dietary supplements for its potential to support liver health and contribute to healthy homocysteine levels.

How it helps

TMG or betaine helps turn homocysteine into methionine. For this reason, it plays a key role in the methylation cycle.

People with poor methylation may have reduced betaine production. To make up for this effect, consume a variety of betaine-rich foods such as [R]:

- Liver meats
- Quinoa
- Beets
- Wheat germ
- Spinach

A study of 860 mothers observed much lower neural tube defect rates for the highest vs. lowest dietary intakes of choline, betaine, and methionine [R].

Supplementing with TMG (1.5-4 g/day for 6-24 weeks) may lower homocysteine levels [R, R].

Homocystinuria is a rare genetic disorder that results in elevated homocysteine levels in the urine. In people with this condition, TMG is approved by the FDA to lower urinary homocysteine [R].

Please note: *doses above 4 g/day may increase LDL and triglyceride levels. TMG supplementation can cause a person's urine and sweat to smell fishy* [R, R].

PERSONALIZED TO YOUR GENES

Your MTRR gene variant may be linked to impaired methylation and higher homocysteine levels. People with this variant might not produce enough betaine from choline and may thus need more dietary betaine [R, R, R, R].
A BHMT enzyme uses betaine to metabolize homocysteine. Your *BHMT* gene variant may be linked to impaired methylation and higher homocysteine levels. People with this variant may benefit from increasing betaine intake [R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MTRR	**rs1801394**	AG	

GENE	SNP	GENOTYPE	EVIDENCE
BHMT	**rs3733890**	AG	

2

Vitamin B12

IMPACT 4 / 5

EVIDENCE 3 / 5

How to implement

Take a 50 mcg vitamin B12 supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

10 mcg

Description

Vitamin B12 is a water-soluble vitamin primarily found in animal-based foods like meat, fish, and dairy products. It plays a crucial role in maintaining healthy nerve cells, DNA synthesis, and red blood cell formation. Vitamin B12 deficiency can lead to anemia, neurological issues, and fatigue.

Vitamin B12 is important for [R, R]:

- Building DNA
- Nervous system function
- Energy production

You can get vitamin B12 from [R]:

- Animal products (meat, fish, eggs, and dairy)
- Fortified foods
- Supplements

Adults should be getting **2.4 micrograms** of vitamin B12 every day [R].

How it helps

People with methylation issues may have higher homocysteine and increased needs for vitamin B12 [R].

Supplementation with vitamin B12 (1 mg/day) may lower homocysteine levels in older people [R, R, R].

Methylcobalamin is the active form of vitamin B12 that might be more suitable for people with poor methylation [R].

In people supplementing with folate, taking vitamin B12 (0.5 mg/day), may further lower homocysteine levels. The combination may work in healthy people and those at risk of dementia or heart disease [R, R, R, R, R].

The combination of folate, vitamin B12, vitamin B6, and omega-3 fatty acids may further lower homocysteine levels [R].

B vitamins are required for the enzymes that break down homocysteine to work [R].

Please note: *B12 may interact with certain medications, including tetracycline. If you have Leber's disease please consult your doctor before supplementing with B12.*

PERSONALIZED TO YOUR GENES

Your MTRR gene variant may be linked to impaired methylation and higher homocysteine levels. Vitamin B12 is essential for the MTRR enzyme function [R, R, R].

In one study, this variant was linked to birth defects but only in mothers deficient in vitamin B12 [R].

Your MTRR gene variant may be linked to impaired methylation and higher homocysteine levels. Vitamin B12 is essential for the MTRR enzyme function. The effects of this variant on homocysteine may be stronger in people with low vitamin B12 levels [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MTRR	**rs1801394**	AG	●●●

GENE	SNP	GENOTYPE	EVIDENCE
MTRR	**rs1532268**	CT	●●●

3

Dietary Folate

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

Increase your intake of folate-rich foods such as leafy green vegetables, fruits, nuts, and legumes. Aim to consume these foods daily, incorporating them into various meals throughout the day to meet the recommended dietary allowance of 400 micrograms for adults.

Description

Vitamin B9 (*folate*) plays an essential role in [R, R, R]:

- Making DNA
- Metabolism
- Energy production

Rich sources of folate include [R, R]:

- Beef liver
- Spinach
- Black-eyed peas
- Asparagus
- Citrus fruits

While folate deficiency is rare, it can happen in people who don't eat enough fruits and vegetables. Alcoholics and lactating women may also be at increased risk [R].

Adults should get **400 micrograms (mcg)** of folate per day. Pregnant or breastfeeding women should get **500-600 mcg per day**. Supplements are usually in the form of *folic acid* or L-methylfolate (5-MTHF) [R, R].

How it helps

People with methylation issues may not be able to produce enough methylfolate, which is the active form [R].

Food sources of folate provide the active form of this vitamin. They include raw leafy greens, liver, eggs, nuts, seeds, kimchi, and nutritional yeast [R].

High dietary intake of folate is associated with lower homocysteine levels [R, R].

4

Beef liver

IMPACT 3 / 5

EVIDENCE 2 / 5

How to implement

Incorporate beef liver into your diet 1-2 times per week, aiming for a serving size of about 3-4 ounces (85-113 grams) each time. This can be pan-fried, baked, or incorporated into dishes like stews or pate to make it more palatable.

Description

Beef liver is a commonly recommended organ meat due to its rich content of protein, B-vitamins, and minerals.

Chickpeas are a good source of vitamin B6, iron, folate, fiber, and rich in minerals like copper, zinc, and phosphorus. A ½ cup serving provides 1.1 mg of vitamin B6 or 65%DV.

How it helps

Beef liver is a nutrient-dense source of bioavailable choline, folate, and vitamins B12 and B6, which are necessary for effective methylation.

5

Leafy Green Vegetables

IMPACT 3 / 5

EVIDENCE 2 / 5

How to implement

Incorporate at least one serving of leafy green vegetables, such as spinach, kale, or Swiss chard, into your diet daily. This can be done by adding them to salads, smoothies, or as a side dish to your meals.

Description

Leafy green vegetables like spinach and kale are packed with vitamins, minerals, and antioxidants. Incorporating them into your diet can promote overall health by providing essential nutrients, supporting digestion, and reducing the risk of chronic diseases like heart disease and certain cancers.

Leafy green vegetables, also called leafy greens, or greens, are edible plant leaves, which can include stalks and shoots as well. Common examples include: lettuce, spinach, kale, chard, endive, and fennel.

Leafy greens contain a host of vitamins and minerals, as well as fiber. Most of them are a particularly good source of vitamin K.

How it helps

Leafy greens are rich in folate, which is critical for methylation pathways in the body. Regular consumption ensures a steady supply of this methyl-donor nutrient.

6

Dietary Vitamin B12

IMPACT 3 / 5

EVIDENCE 2 / 5

How to implement

Incorporate foods rich in vitamin B12 into your daily diet, such as beef, chicken, fish, and dairy products. If you are vegetarian or vegan, consider fortified cereals or plant-based milks. Aim to meet the recommended dietary allowance (RDA) for adults of 2.4 micrograms of vitamin B12 per day.

Description

Vitamin B12 is important for nerve function, red blood cell production, and overall energy metabolism. It's crucial for preventing pernicious anemia and maintaining neurological health.

How it helps

People with methylation issues may have increased needs for B vitamins, especially B12 and folate. B12 is crucial for removing homocysteine, which tends to be higher in people with poor methylation [R].

High dietary intake of vitamin B12 is associated with lower homocysteine levels [R, R].

PERSONALIZED TO YOUR GENES

Your MTRR gene variant may be linked to impaired methylation and higher homocysteine levels. Vitamin B12 is essential for the MTRR enzyme function [R, R, R].

In one study, this variant was linked to birth defects but only in mothers deficient in vitamin B12 [R].
Your MTRR gene variant may be linked to impaired methylation and higher homocysteine levels. Vitamin B12 is essential for the MTRR enzyme function. The effects of this variant on homocysteine may be stronger in people with low vitamin B12 levels [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MTRR	**rs1801394**	AG	

GENE	SNP	GENOTYPE	EVIDENCE
MTRR	**rs1532268**	CT	

7

Dietary Choline

IMPACT 2 / 5

EVIDENCE 3 / 5

How to implement

Increase your intake of choline-rich foods such as eggs, beef liver, chicken liver, fish, peanuts, and dairy products. Aim for an adult intake of about 425 mg to 550 mg of choline per day through these food sources, as part of your regular diet.

Description

Choline is an essential nutrient that supports brain function, nerve signaling, and liver health. It is involved in neurotransmitter synthesis and cell membrane structure.

How it helps

Choline is a crucial nutrient in the methylation cycle. It provides betaine (TMG), which helps clear homocysteine. Betaine donates methyl groups to homocysteine, converting it to methionine. This process is crucial for maintaining cellular function, gene expression, and neurological health [R].

People with methylation issues may have increased choline needs. Insufficient choline can disrupt this cycle, leading to impaired methylation and associated health issues like liver dysfunction, neural tube defects, and more [R].

8

Eggs

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Incorporate eggs into your diet 3-4 times a week, preferably for breakfast or as part of a balanced meal. They can be boiled, scrambled, or made into omelets, ensuring they are cooked thoroughly.

Description

Eggs are a nutrient-dense food rich in protein, vitamins, and minerals. They support various aspects of health, including muscle development, brain function, and eye health.

Eggs are great nutrition sources, with protein, healthy fats, arachidonic acid, and numerous vitamins and minerals.

How it helps

Eggs are rich in choline and methionine, which are used in the body's methylation processes, especially in liver function and brain development.

9

Choline Supplements

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take choline supplements at a dosage of 425 mg to 550 mg daily, depending on age and gender, with a glass of water. It is best to consume choline supplements with a meal for optimal absorption. Continue this regimen daily as part of your dietary supplement routine.

TYPICAL STARTING DOSE

425 mg

Description

Choline is an essential nutrient that plays a crucial role in various bodily functions, including brain health, liver function, and metabolism. Incorporating choline-rich foods into your diet supports cognitive function and overall nutritional well-being.

Choline is a nutrient required for optimal health. Although the body makes some, we need to get choline from our diets to avoid deficiency [R].

It plays key roles in supporting [R, R]:

- DNA production
- Cell structure and function
- Brain, nerve, and heart health

Eggs and beef liver are the best sources of choline. If you can't meet your daily requirements with food, consider taking a choline supplement such as [R]:

- Phosphatidylcholine (PC)
- Citicoline (CDP-choline)
- Alpha-GPC
- Lecithin

They all supply choline, but each one has unique health perks you may prefer. Check out our posts on different choline-containing supplements to find out which one suits you best.

How it helps

Choline is a crucial nutrient in the methylation cycle. It provides betaine (TMG), which helps clear homocysteine. Betaine donates methyl groups to homocysteine, converting it to methionine. This process is crucial for maintaining cellular function, gene expression, and neurological health [R].

People with methylation issues may have increased choline needs. Insufficient choline can disrupt this cycle, leading to impaired methylation and associated health issues like liver dysfunction, neural tube defects, and more [R].

10

SAM-e

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take 400-1600 mg of SAM-e as a supplement daily, preferably on an empty stomach to enhance absorption. It is often recommended to start with low dosage and observe how your body responds over a few weeks, adjusting as necessary under the guidance of a healthcare provider.

TYPICAL STARTING DOSE

200 mg

Description

SAM-e is a chemical that helps maintain liver and brain health. Your body makes SAM-e from the amino acid *methionine*, but it's also available as a supplement [R].

SAM-e supplementation may help with:

- Joint pain [R]
- Liver disease [R]
- Depression [R]

> **Please note:** *SAM-e may not be safe for people with a bipolar disorder. It may also interact with 5-HTP, St. John's wort, and different medications. Combining it with antidepressants can be dangerous and even life-threatening. Never take SAM-e supplements without consulting your doctor* [R, R, R].

How it helps

S-adenosylmethionine or SAM-e provides methyl groups for methylation reactions and helps clear homocysteine [R, R].

It also boosts glutathione and may help support liver health, mood, and more [R].

Please note: *SAM-e may not be safe for people with bipolar disorder. It may also interact with 5-HTP, St. John's wort, and different medications. Combining it with antidepressants can be dangerous and even life-threatening. Never take SAM-e supplements without consulting your doctor* [R, R, R].

11

Methylsulfonylmethane (MSM)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take 1 to 3 grams of Methylsulfonylmethane (MSM) per day, divided into three doses. This can be in the form of capsules or powder that is mixed with water. It is recommended to start with a lower dose to assess tolerance, then gradually increase to the desired dose over a period of 1 to 2 weeks.

TYPICAL STARTING DOSE

1 g

Description

MSM is a naturally occurring sulfur compound found in foods and used in dietary supplements. It has anti-inflammatory properties and may be used to support joint health and reduce exercise-related muscle soreness.

A molecule of MSM is broken down in the body into a sulfate (sulfur) group and two methyl groups.

The following may increase people’s needs for sulfur and methyl groups: physical activity, recovery from injuries, inflammation, infections/sickness, toxins, etc.

People also need more sulfur when taking hormones (DHEA, pregnenolone, etc.), drugs (Aspirin, Tylenol, NSAIDs, birth control, etc.) or supplements (flavonoids & polyphenols - resveratrol, quercetin, curcumin, etc.) that undergo sulfation.

How it helps

MSM can act as a methyl donor in the body. MSM contains sulfur and methyl groups (-CH3) in its molecular structure. The presence of these methyl groups allows MSM to participate in methylation processes.

As a source of sulfur, MSM contributes to the synthesis of sulfur-containing amino acids like methionine, which can help in methylation. MTHFR MSM may thus support MTHFR indirectly

Accordingly, it reduced homocysteine levels in some small trials [R, R].

12

Dietary Pyridoxine (Vitamin B6)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Increase your intake of vitamin B6 by eating more foods rich in this nutrient, such as bananas, chickpeas, tuna, salmon, chicken breast, and spinach. Aim for a balanced diet that includes these foods regularly, about 2-3 servings of B6-rich foods per day, to help meet the general daily requirement of 1.3mg for adults.

Description

Vitamin B6 is involved in over 100 enzyme reactions in the body and plays a role in brain development, immune function, and hormone regulation. It is found in foods like poultry, fish, potatoes, and bananas.

Vitamin B6 (*pyridoxine*) is important for nervous and immune system health [R].

Good sources of vitamin B6 include [R]:

- Poultry
- Fish
- Potatoes
- Chickpeas
- Bananas
- Fortified cereals

How it helps

People with methylation issues may have increased needs for B vitamins, especially folate, B12, and B6 [R].

Vitamin B6 helps support methylation. It's crucial for the **transsulfuration pathway** that clears homocysteine and produces glutathione [R].

13

Zinc

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take a 15 mg zinc supplement daily, ideally with a meal to enhance absorption.

TYPICAL STARTING DOSE

15 mg

Description

Zinc is an essential mineral found in various foods, including meat, dairy, and nuts. It is crucial for immune function, wound healing, DNA synthesis, and maintaining healthy skin and nails. Zinc supplements are sometimes used to support immune health and manage zinc deficiencies.

Zinc is an essential mineral. Your body needs it to [R, R]:

- Defend against disease
- Protect DNA from damage
- Heal wounds
- Control blood sugar

Some of the best sources of zinc include **shellfish, pork, beef, and beans**. It is also available as a supplement [R].

Adults should get **8-11 mg of zinc** per day [R].

How it helps

Zinc is important for folate absorption and healthy methylation. Ensure that your zinc levels are optimal [R].

If you are deficient in zinc, your gut enzymes can’t break down folate into the form you can absorb [R, R].

Zinc also helps folate carry out its role in the body [R].

14

Pyridoxine (Vitamin B6)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take a pyridoxine (vitamin B6) supplement daily. Requirements range from 1.3 to 1.7 milligrams per day for adults, but supplement doses usually start from 50 mg. Consult with a healthcare provider for higher doses or specific medical conditions that might benefit from increased supplementation.

TYPICAL STARTING DOSE

50 mg

Description

A **vitamin B6 supplement** of up to 1.3-1.7 mg per day can be taken to meet needs not achieved through diet. Long term supplementation of vitamin B6 can be problematic, so talk to your doctor before using.

How it helps

People with methylation issues may have increased needs for B vitamins, especially folate, B12, and B6 [R].

Vitamin B6 helps support methylation. It's crucial for the **transsulfuration pathway** that clears homocysteine and produces glutathione [R].

15

Riboflavin (Vitamin B2)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take a riboflavin (vitamin B2) supplement daily, with a dose ranging from 5mg to 400mg, depending on the specific health concern or advice from a healthcare provider. Swallow the supplement with water, preferably with a meal to enhance absorption. This regimen can be continued long-term or as directed by a healthcare professional.

TYPICAL STARTING DOSE

25 mg

Description

Riboflavin is a water-soluble B vitamin found in various foods like dairy products, leafy greens, and lean meats. It plays a crucial role in energy production, metabolism, building red blood cells, and maintaining healthy skin and eyes.

Vitamin B2 helps our cells create energy. It's also known as riboflavin [R, R].

This vitamin is important for [R, R]:

- Brain, liver, and gut health
- Building red blood cells

Riboflavin deficiency is rare in the US. People with gut, eating, or hormonal disorders may be at a higher risk. Alcohol abuse and certain medications can also deplete this vitamin [R, R].

Good sources of riboflavin include [R, R]:

- Eggs
- Dairy
- Lean and organ meats
- Green vegetables
- Fortified cereals

How it helps

Riboflavin helps in the activation of vitamin B6, which is essential for methylation and homocysteine removal.

In a placebo-controlled trial of 42 older participants, supplementation with riboflavin (10 mg/day) for 28 days **significantly decreased blood homocysteine** [R].

However, supplementation with riboflavin (8.4 mg/day) for 2 weeks **failed to lower homocysteine and blunted the effects of folic acid supplementation** in a placebo-controlled trial of 32 healthy men [R].

Riboflavin (1.6 mg/day for 12 weeks) also **failed to lower homocysteine** in a placebo-controlled trial of 52 elderly participants with sub-optimal riboflavin status [R].

The beneficial effects of riboflavin on methylation and homocysteine removal might be limited to people with **lower MTHFR activity** [R, R, R, R].

PERSONALIZED TO YOUR GENES

Supplementing with riboflavin may lower homocysteine levels more in people with your *MTHFR* gene variant. Make sure to get enough of this vitamin to support methylation and homocysteine removal [R, R, R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MTHFR	**rs1801133**	AA	●●●●○

16

Low-Intensity Exercise

IMPACT ●●○○○ 2 / 5

EVIDENCE ●○○○○ 1 / 5

How to implement

Incorporate 60 minutes of low-intensity activities, such as walking or gentle yoga, into your daily routine. Aim to do this 5 days a week to achieve the best results.

TYPICAL STARTING DOSE

1 hour

Description

Low-intensity exercise, such as walking or gentle yoga, provides numerous health benefits, including improved cardiovascular health, stress reduction, and enhanced overall fitness without the strain of high-intensity workouts.

How it helps

Regular physical activity is known to influence DNA methylation and thus has an effect on gene expression and can promote health through epigenetic mechanisms.

However, excess exercise might increase methylation demand through several mechanisms:

- **Increased Energy Metabolism**: Physical activity boosts cellular metabolism, which relies on methylation reactions for energy production, repair, and recovery processes.
- **DNA Methylation Changes**: Exercise can induce alterations in DNA methylation patterns, particularly in genes involved in muscle growth, energy metabolism, and inflammation. These epigenetic changes are part of how the body adapts to exercise.
- **Stress Response**: Exercise, especially intense physical activity, is a form of stress that can temporarily increase oxidative stress and inflammation. The body responds to this by upregulating methylation processes to manage and counteract these effects.
- **Muscle Repair and Growth**: Exercise-induced muscle damage and subsequent repair processes involve methylation for protein synthesis and tissue remodeling.

If you are exercising a lot, make sure to get adequate methyl groups from your diet and supplements.

17

Sleep for 7+ Hours

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Ensure you allocate enough time in your schedule to achieve a minimum of 7 hours of sleep each night. This might involve going to bed earlier or adjusting your evening routine to promote relaxation and make it easier to fall asleep.

Description

Optimizing sleep involves adopting healthy sleep habits and creating a sleep-conducive environment to ensure restorative and sufficient sleep duration. It supports cognitive function, mood stability, and overall physical health. Most experts recommend getting **at least 7 hours of good-quality sleep each night**.

Sleep supports your body and mind [R, R]. More precisely, sleep helps:

- Support brain health [R, R]
- Maintain a healthy weight and appetite [R, R, R]
- Regulate blood pressure [R, R]
- Balance blood sugar [R, R]

Ways to sleep better include [R]:

- Reducing your bright light exposure (screen time) in the evenings
- Sticking to a regular sleep schedule
- Avoiding hunger or large meals before bed
- Avoiding nicotine, caffeine, and alcohol before bed
- Maintaining a sleep area that's cool, dark, and quiet

How it helps

Sleep plays a crucial role in regulating methylation processes in the body, impacting gene expression and overall health. Here's how adequate sleep can support methylation:

- **Cellular Repair and Regeneration**: Sleep is a time for the body to repair and regenerate. During sleep, methylation processes are involved in cell repair and the maintenance of DNA integrity. Adequate sleep ensures these processes occur efficiently.
- **Stress Hormone Regulation**: Sleep helps regulate cortisol, a stress hormone. Disrupted sleep patterns can lead to altered cortisol levels, impacting methylation patterns. Stress and cortisol are known to affect DNA methylation, particularly in genes related to the stress response.
- **Detoxification**: Sleep aids in the body's detoxification processes, partly mediated by methylation. This includes the clearance of metabolic byproducts and toxins that can interfere with methylation if accumulated.

18

Avoid High-Dose Niacin Supplements

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Ensure your daily intake of niacin (vitamin B3) from supplements does not exceed 35 mg, which is the upper intake level for adults, to prevent the risk of negative side effects like flushing and liver damage. Always check the label of your supplement to confirm the niacin dosage.

TYPICAL STARTING DOSE

35 mg

Description

High doses of Niacin (greater than 500 mg) may reduce T4 levels [R].

Please note: *There is no evidence from controlled clinical trials to support this recommendation. It is included based on uncontrolled clinical trials, animal or cell studies, or non-scientific criteria. Please take this recommendation with a grain of salt until more research is available*

How it helps

Methylation is essential for converting homocysteine to methionine. High doses of niacin can exacerbate the accumulation of homocysteine in individuals with reduced MTHFR function.

This is because niacin in large amounts can deplete methyl donors like SAMe (S-adenosylmethionine), which are needed for methylation [R].

19

Avoid Exposure to Heavy Metals

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

To avoid exposure to heavy metals, ensure you're not using cosmetic products with heavy metals, opt for organic foods to minimize pesticide exposure, and use filters for drinking water to remove possible contaminants. Check for lead-based paints in older homes and avoid cooking or storing food in uncoated metal containers. When possible, choose glass or BPA-free plastics instead.

Description

Heavy metals are elements naturally found in the environment. They are also used for agricultural, industrial, and medicinal purposes. Some can even be found in small amounts in your body [R, R].

Long-term exposure to high amounts of heavy metals can be harmful to your health [R, R].

Heavy metals that are most often linked to health problems include [R, R]:

- Lead
- Cadmium
- Arsenic
- Chromium
- Mercury

How it helps

Heavy metals can interfere with the activity of enzymes involved in methylation, potentially leading to impaired methylation of essential molecules like DNA and proteins. This can have negative consequences for various physiological functions.

Some heavy metals, like mercury and arsenic, can be methylated by the body as a way to facilitate their excretion. This process further increases methylation demand.

20

Dietary Selenium

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate selenium-rich foods into your daily diet, such as Brazil nuts, seafood, and organ meats. Eating 1-2 Brazil nuts a day can meet the daily selenium requirement for most adults.

Description

Selenium is a trace mineral found in various foods, including nuts, seeds, and seafood. It is an essential nutrient that plays a crucial role in maintaining the body's antioxidant defenses and supporting thyroid function.

Selenium supports [R]:

- Reproduction
- Thyroid function
- DNA production
- Immune response

Adults should be getting **55 micrograms** of selenium per day. Good sources of selenium include [R]:

- Brazil nuts
- Fish
- Meat
- Eggs
- Rice
- Oatmeal

How it helps

Selenium plays a role in protection against oxidative damage and affects selenoproteins which have been implicated in methylation pathways.

Positive effects:

- **Enzymatic cofactor**: Selenium is a crucial component of several enzymes involved in methylation pathways, particularly glutathione peroxidases. These enzymes contribute to antioxidant defense and protect against oxidative stress, which can disrupt methylation processes.
- **Gene expression modulation**: Selenium can influence the expression of genes involved in folate metabolism and other methylation-related pathways. This can potentially enhance overall methylation efficiency.
- **DNA methylation**: Some studies suggest selenium may influence global DNA methylation patterns, impacting gene expression and cell function. However, the exact mechanisms and long-term implications of this influence require further investigation.

Negative effects:

- **Excess selenium**: High selenium intake can inhibit the activity of certain methylation enzymes, potentially leading to impaired methylation processes. This can have negative consequences for various physiological functions, including DNA repair and gene expression.

21

Dietary Magnesium

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Increase your intake of magnesium-rich foods such as leafy green vegetables, nuts, seeds, and whole grains. Aim to include these foods in your diet daily, following the recommended dietary allowance of 320 mg per day for women and 420 mg per day for men.

Description

Magnesium is a vital mineral involved in over 300 biochemical reactions in the body. It supports various functions, including muscle and nerve function, bone health, and blood sugar regulation.

Magnesium is an essential mineral. Your body needs it for [R, R, R]:

- Muscle, nerve, and bone function
- Blood sugar and blood pressure control
- DNA and protein production
- Strong immunity

Women need **310-320 mg** of magnesium per day, while men need **400-420 mg** [R].

Foods rich in magnesium include **nuts, seeds, and leafy greens**. Magnesium is also available as a supplement [R].

How it helps

Magnesium acts as a cofactor in many enzymatic reactions in the methylation cycle, and inclusion in the diet may support those with MTHFR mutations. It helps with the following enzymes:

- **S-adenosylmethionine (SAM) synthase**: This enzyme catalyzes the synthesis of SAM, the major methyl donor in the body. Magnesium binds to the active site of SAM synthase, stabilizing its structure and facilitating the reaction between methionine and ATP to produce SAM.
- **Methionine adenosyltransferase (MAT)**: This enzyme plays a role in the regeneration of SAM from S-adenosylhomocysteine (SAH), which is formed when SAM donates its methyl group. Magnesium acts as a cofactor for MAT, enhancing its activity and ensuring efficient SAM production.
- **Methyltransferases**: These enzymes directly transfer methyl groups from SAM to various acceptor molecules, including DNA, proteins, and other metabolites. Magnesium is essential for the proper folding and activity of these enzymes, ensuring accurate and efficient methylation processes throughout the body.
- **Other enzymes**: Magnesium may also play a role in the activity of other enzymes involved in related pathways, such as folate metabolism and one-carbon metabolism, which indirectly contribute to the methylation cycle.

22

Avoid BPA (Bisphenol A) Exposure

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

To avoid BPA exposure, choose BPA-free products, particularly when selecting food containers, water bottles, and baby bottles. Prefer glass, porcelain, or stainless steel containers, especially for hot food or liquids. Reduce use of canned foods as they may be lined with BPA and avoid handling thermal paper receipts, as they can contain BPA. When possible, select fresh or frozen foods over canned goods.

Description

Avoiding BPA (Bisphenol A) exposure involves minimizing contact with products or containers containing this chemical, which is commonly found in plastics and can potentially disrupt hormone regulation.

BPA (bisphenol A) is a chemical used to make certain plastics and resins. BPA-containing plastics are often used in containers that store food and beverages. Plastics marked with **recycling code 3 or 7** may contain BPA [R].

BPA is a well-known hormone disruptor. Research has linked BPA exposure to diabetes, heart disease, altered behavior, and more [R].

How it helps

Industrial toxins like bisphenol A (BPA) inhibit methylation enzymes. BPA is mostly found in plastics, but it can also sneak into cosmetics.

All the while, toxins increase the body's methylation demands, since methylation eliminates them. Methylation also creates the antioxidant glutathione, which you need more of to neutralize BPA and other toxins [R].

Be mindful of your exposure to chemicals and substances that increase your need for detoxification. Consider switching to toxin-free household and cosmetic products, eating organic foods, filtering your water, and avoiding polluted areas.

23

Relaxation Techniques

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate relaxation techniques such as deep breathing exercises, meditation, or yoga into your daily routine. Spend at least 15-30 minutes each day practicing one of these techniques, preferably in a quiet, comfortable space without interruptions.

TYPICAL STARTING DOSE

30 minutes

Description

Relaxation techniques encompass various methods like deep breathing, yoga, meditation, and progressive muscle relaxation, aimed at reducing stress and promoting mental and physical relaxation. Practicing these techniques regularly can help manage stress, improve mental clarity, and enhance overall emotional well-being.

We all get stressed from time to time.

Stress can help you deal with a challenge or avoid danger. However, **it's not healthy to be stressed for a long time** [R, R].

Relaxation techniques such as yoga and meditation can relieve stress in different ways. Most of them focus on breathing and help you get rid of negative thoughts and emotions [R].

People use relaxation techniques to improve conditions like [R, R, R]:

- Anxiety
- Depression
- Chronic pain

Progressive muscle relaxation is another relaxation technique. In this technique, you focus on tensing and relaxing different parts of your body. It is common to start with the toes and slowly work your way up to the neck and head [R, R].

Autogenic training is a relaxation technique that a person may carry out on their own. It uses exercises that take the mind's attention to bodily sensations such as warmth and heaviness [R, R].

How it helps

Stress demands more out of your methylation cycle. If you are going through a stressful period, you may have a higher need for folate and other B vitamins. Make sure you get enough and manage your stress levels.

Stress requires your body to have more methyl donors to produce and break down catecholamine neurotransmitters (such as epinephrine, norepinephrine, and dopamine). In balanced amounts, these neurotransmitters enhance motivation, focus, and feelings of pleasure. In excess, they trigger anxiety, high blood pressure, addiction, and aggression.

Psychological stress temporarily increases homocysteine levels, which return to normal levels after the stress resolves. If you are constantly under stress, your homocysteine may remain high [R].

24

Yoga

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Practice yoga for at least 20 to 30 minutes a day, most days of the week. Choose a style that matches your fitness level and goals, and consider attending a class or using online resources to guide your practice.

TYPICAL STARTING DOSE

30 minutes

Description

Yoga is a mind-body practice that combines physical postures, breathing exercises, and meditation. It enhances flexibility, strength, and mental well-being and is used for stress reduction, relaxation, and overall health improvement.

Yoga combines breathing, stretching, and relaxation techniques. Practicing yoga may help [R, R, R]:

- Reduce stress
- Improve fitness
- Lower blood pressure and heart rate
- Manage pain

How it helps

Yoga has been associated with changes in DNA methylation, which may reflect its health benefits. A pilot study found that a brief yoga intervention could influence the methylation of genes related to immune function and inflammation in women experiencing chronic stress. Detailed mechanisms include [R]:

1. **Stress Reduction**: Yoga is known for its stress-reducing effects. Chronic stress can lead to changes in DNA methylation patterns, particularly in genes associated with the stress response. By reducing stress, yoga can help maintain balanced methylation in these genes.
2. **Anti-inflammatory Effects**: Regular yoga practice can reduce inflammation. Inflammation is linked to alterations in DNA methylation, especially in genes involved in the immune response. Yoga's anti-inflammatory benefits might therefore support healthier methylation patterns.
3. **Hormonal Balance**: Yoga can help regulate hormones, including cortisol, the stress hormone. Since hormonal balance is crucial for proper methylation processes, yoga may indirectly support efficient methylation through its regulatory effects on hormones.
4. **Improved Sleep Quality**: As yoga can enhance sleep quality, and adequate sleep is essential for optimal methylation processes, yoga indirectly supports methylation through its positive impact on sleep.

25

Beetroot

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate beetroot into your diet by eating it raw in salads or drinking beetroot juice. Aim for a serving of about one small beetroot or 200-250 ml of beetroot juice daily. You can maintain this dietary practice consistently as part of your regular diet.

Description

Beetroot is a vegetable rich in dietary nitrates, which may help improve cardiovascular health and exercise performance.

How it helps

Beetroot naturally contains betaine, also known as trimethylglycine, which acts as a methyl donor in the body, potentially aiding individuals with their methylation cycle.

PERSONALIZED TO YOUR GENES

Your MTRR gene variant may be linked to impaired methylation and higher homocysteine levels. People with this variant might not produce enough betaine from choline. They may thus need more dietary betaine from beetroot [R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MTRR	**rs1801394**	AG	

26

Avoid Secondhand Smoke

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Implementing a smoke-free lifestyle involves communicating your needs to family, friends, and coworkers, requesting they respect your choice by smoking away from you. At home, establish strict no-smoking policies indoors. When out, choose smoke-free venues and accommodations. Advocate for smoke-free environments in your community and support legislation that promotes public health by reducing exposure to secondhand smoke. Utilize air purifiers at home to reduce any residual particles.

Description

Avoiding secondhand smoke is crucial for maintaining good health. Exposure to secondhand smoke can lead to respiratory problems, cardiovascular disease, and an increased risk of lung cancer, even in non-smokers. Protecting oneself from secondhand smoke involves staying away from smoking areas, ensuring smoke-free environments at home and work, and advocating for smoke-free policies in public spaces.

How it helps

Cigarette smoke can impair methylation, through several mechanisms.

Smoke contains toxic compounds like arsenic, cadmium, and nickel, which can inhibit the activity of enzymes involved in the one-carbon cycle, such as methionine synthase and MTHFR. This disruption leads to decreased production of SAM-e, the primary methyl donor for DNA methylation.

Secondly, cigarette smoke increases oxidative stress in cells, producing reactive oxygen species (ROS) that can deplete folate and other B vitamins essential for the one-carbon cycle. Lower levels of these vitamins compromise the methylation process.

27

Creatine

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take 4 grams of creatine supplement daily, ideally mixed with water or juice. This dosage can be maintained consistently without needing specific periods of cycling on or off.

TYPICAL STARTING DOSE

4 g

Description

Creatine is a popular dietary supplement among athletes and bodybuilders, known to enhance muscle performance during short bursts of high-intensity activities. It may help improve exercise performance and support muscle growth when used as directed.

Creatine is a compound naturally produced by the body. It's stored in the muscles and brain [R].

During exercise, creatine is released to boost performance and help build muscles. For this reason, it's a popular supplement among athletes [R, R].

Sources of creatine include [R]:

- Red meat
- Seafood
- Supplements

How it helps

Approximately half of your body's methylation efforts are used to make creatine, which muscles require to quickly produce energy (ATP). Creatine might thus lower the body's need for methylation.

Creatine may help reduce your requirements for methylation, especially if you have high homocysteine [R].

Some studies suggest that creatine supplementation does not reduce plasma homocysteine levels or may even increase them. Other studies suggest it may reduce homocysteine levels in specific populations such as strict vegans or individuals with certain genetic backgrounds [R, R, R, R, R, R, R].

PERSONALIZED TO YOUR GENES

In one case study, creatine supplementation reduced homocysteine in a person with your *MTHFR* gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MTHFR	**rs1801133**	AA	

Next Steps

Remember, your genes only tell one important part of your health story!

Now that you've seen your DNA-based results for this health topic, let's take a look at other contributing factors.

Your lab results

Your lab results are impacted by the combined effect of your genes, environment and lifestyle.

Lab tests will give you the best picture of your current health status, while your genes provide insight into your health predispositions and which recommendations are best for you.

Vitamin B12	687 pg/mL	200 – 400 – 1000 – 1100	9 Nov 2025
Active B12	500 pmol/L	20 – 35 – 134	13 Jan 2026
Homocysteine	12.84 umol/L	5 – 9 – 15 – 100	9 Nov 2025
Vitamin B6	55 ng/mL	5 – 8.15 – 115.4	13 Jan 2026