getTested

Cardiovascular Health

Summary Report

HEART & BLOOD VESSELS

Report date: 10 January 2024

Table of contents
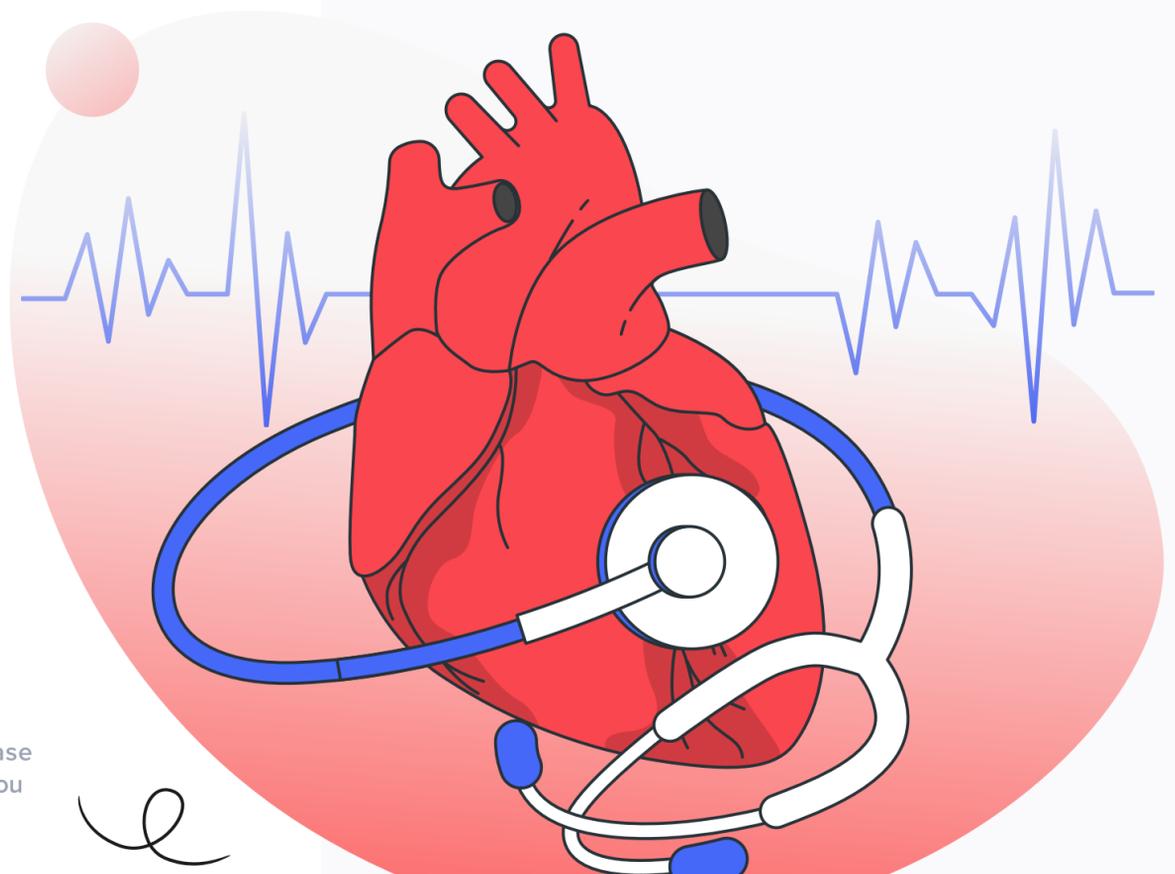
How this works

Our Health 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.
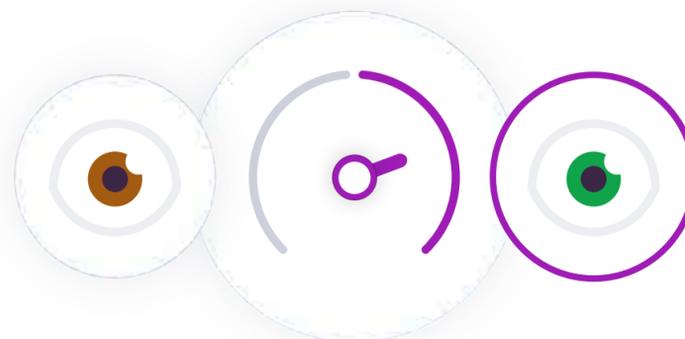
Your DNA is like an instruction manual — it contains a lot of information.
You can think of it as a blueprint for your body.
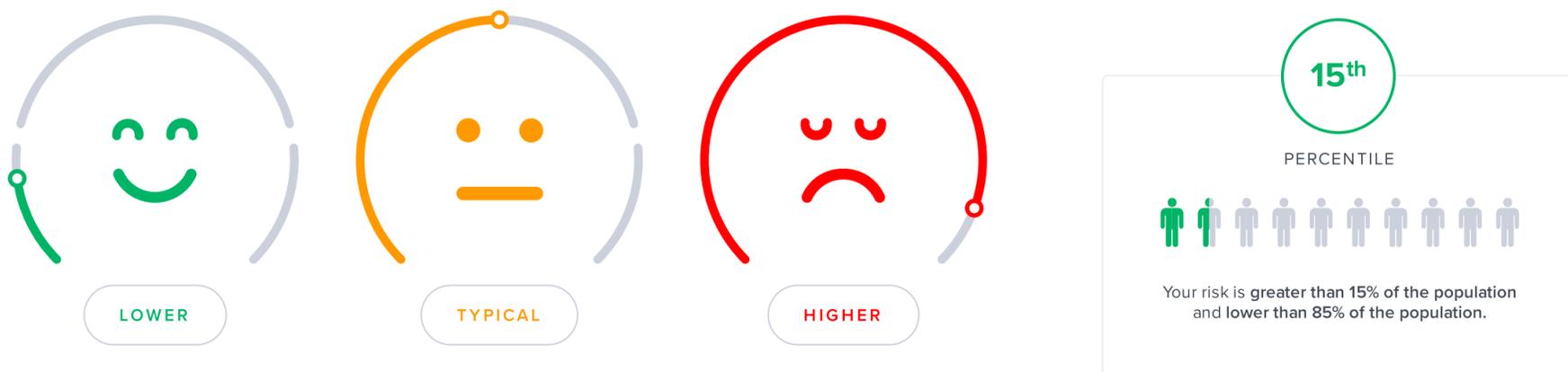
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.

Our Summary Reports combine different Wellness and Trait Reports related to a certain health topic. They give you a more complete picture about different aspects of your health and wellness.

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.

LOWER

TYPICAL

HIGHER

15th
PERCENTILE

Your risk is **greater than 15% of the population** and **lower than 85% of the population.**

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: diet, lifestyle, supplements, and drugs.
The following icons tell you which category a recommendation falls into:

DIETARY

LIFESTYLE

SUPPLEMENT

DRUG

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

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

IMPACT
●●●○○ **3** / 5

EVIDENCE
●●●●○ **4** / 5

In Summary Reports, we combine top evidence-based recommendations for different conditions.

We focus on recommendations that help with more conditions included in a Summary Report.

For each recommendation, we list all conditions it may help with. We also include impact, evidence, regimen, personalized parts, and other details specific to each condition.

1

Recommendation

Helps with the following

| **Condition** | IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●○ 4 / 5 |

| **Condition** | IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●○ 4 / 5 |

| **Condition** | IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●○ 4 / 5 |

| **Condition** | IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●○ 4 / 5 |

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, a few 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:

- The scores/gauges use the latest scientific studies. But they are not perfect and will change as the models improve.

- Not everyone with risk variants will develop a health condition.

- Genetics is not the whole story. Your health is most often a combination of genetics, lifestyle, and environmental factors. Great news, as this means that you can often change your lifestyle to lower your risk.

- Results might be more accurate for some ethnic groups than others. This depends on the studies used in each report.

- People without risk variants can also develop health conditions.

- It's important to work with your doctor to better understand your risks. Our reports do not diagnose or treat any health condition. They are not a substitute for medical advice. If you're diagnosed with a certain health condition, follow your doctor's advice.

Summary

"Oh, my god! That will give you a heart attack!" said every cliche grandmother ever written. There is a notoriously long list for what "that" is, from high cholesterol to stress to weight. Unfortunately, people have a tendency to not worry about a health issue until it becomes a problem. So, it should be no surprise that **heart disease is the number one cause of death worldwide**!

On the bright side, **a third of deaths related to heart disease could be prevented**! Because heart disease is impacted by so many variables, it should come as no surprise that your genetics has a major impact on heart health and your ability to take preventive action.

This comprehensive report analyzes your genetic predisposition to different aspects of heart health, including:

- Heart and blood vessels
- Blood pressure
- Blood lipids and lab markers

This summary report contains:

22	Genetic Results

50	Recommendations

Overview of Your Results

❤️ Heart And Blood Vessels

TYPICAL LIKELIHOOD **Palpitations**	TYPICAL **Heart Rate**	TYPICAL **Heart Health**
Typical likelihood of palpitations	Likely typical heart rate	Typical likelihood of heart vessel issues

TYPICAL LIKELIHOOD **Artery Hardening**	TYPICAL LIKELIHOOD **Varicose Veins**	TYPICAL LIKELIHOOD **Hemorrhoids**
Typical likelihood of atherosclerosis	Typical likelihood of varicose veins	Typical likelihood of hemorrhoids

📋 Heart Rate Parameters

TYPICAL **Heart Rate**	TYPICAL **Heart Rate Variability**	TYPICAL **Heart Rate Recovery**
Likely typical heart rate	Likely typical HRV	Likely typical HRR

💗 Blood Pressure

TYPICAL LIKELIHOOD **High Blood Pressure**	TYPICAL **Salt Sensitivity**	TYPICAL LIKELIHOOD **Low Blood Pressure**
Typical likelihood of high blood pressure	Likely typical sensitivity to salt	Typical likelihood of low blood pressure

🩸 Cholesterol & Lab Markers

TYPICAL LEVELS
ApoB

Likely typical ApoB levels

HIGHER LEVELS
TMAO

Likely higher TMAO levels

TYPICAL LEVELS
Homocysteine

Likely typical homocysteine levels

TYPICAL LEVELS
LDL Cholesterol

Likely typical levels of "bad" cholesterol

LARGER
LDL Particle Size

Likely larger LDL particles

LOWER LEVELS
HDL Cholesterol

Likely lower levels of "good" cholesterol

TYPICAL LEVELS
Lipoprotein(a)

Likely typical Lipoprotein(a) levels

HIGHER LEVELS
Triglycerides

Likely higher triglyceride levels

TYPICAL LEVELS
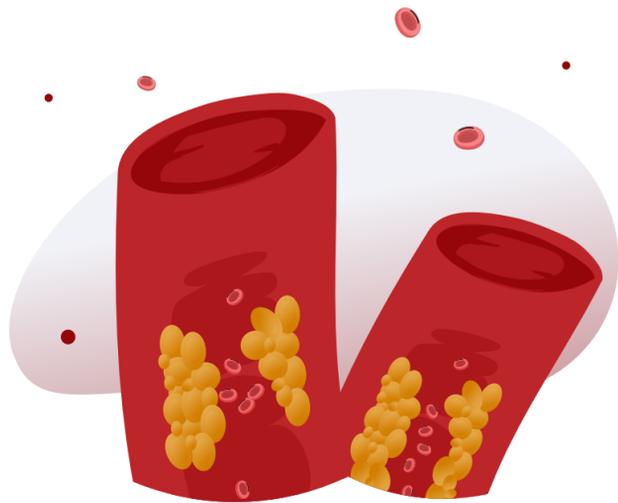**Total Cholesterol**

Likely typical levels of total cholesterol

LESS LIKELY
High Cholesterol

Less likely to have high cholesterol

Your Results in Details

Heart And Blood Vessels

Yes, modern diets have done a lot to promote health issues related to the heart and blood vessels. However, other factors like your lifestyle and your DNA also have a significant impact. After all, ancient mummies have shown signs of artery hardening, and odds are good they weren't chowing down on twinkies!

Keeping the heart and blood vessels healthy is vital to avoiding long-term health issues. **This section dives into your genetic predispositions to things like heart disease, artery hardening, and varicose veins**. This information can help you take the best course of actions over the long term.

TYPICAL LIKELIHOOD **Palpitations**	TYPICAL **Heart Rate**	TYPICAL **Heart Health**
Typical likelihood of palpitations	Likely typical heart rate	Typical likelihood of heart vessel issues

TYPICAL LIKELIHOOD **Artery Hardening**	TYPICAL LIKELIHOOD **Varicose Veins**	TYPICAL LIKELIHOOD **Hemorrhoids**
Typical likelihood of atherosclerosis	Typical likelihood of varicose veins	Typical likelihood of hemorrhoids

Palpitations

When the heart is working normally, it beats in a steady rhythm. Things like exercise or stress can speed it up temporarily [R, R].

Palpitations are feelings that the heart is racing, pounding, fluttering, or skipping beats. They can be felt in the chest or throat [R].
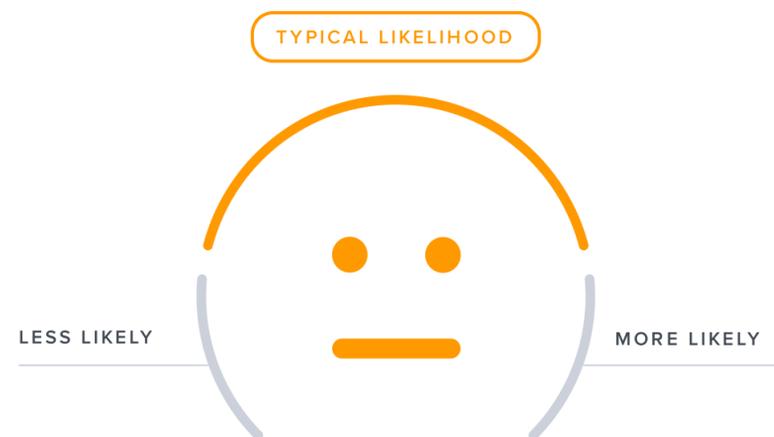
Risk factors for palpitations include [R, R, R]:

- Stress
- Anxiety
- Pregnancy
- Aging
- Stimulants (e.g., in coffee, cigarettes, and some medications)
- Overactive thyroid
- Heart problems

While palpitations can be scary, they are usually harmless. In those with palpitations due to heart problems, complications can occur. Seek emergency care if you have palpitations and [R, R]:

- Chest pain
- Severe shortness of breath
- Fainting
- Severe dizziness

Genetics may play a role in people's chances of having palpitations. Genes involved in palpitations may influence heart function [R, R].

TYPICAL LIKELIHOOD

LESS LIKELY   MORE LIKELY

Typical likelihood of palpitations based on 1,209,944 genetic variants we looked at
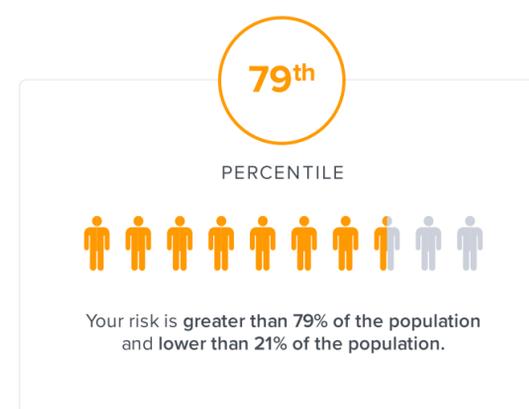
79th

PERCENTILE

Your risk is **greater than 79%** of the population and **lower than 21%** of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TRIM33	rs6693430	GG
TRIM33	rs576432148	AA
TRIM33	rs2336579	TT
VANGL1	rs146633921	CC
NTNG1	rs113586420	CC
/	rs112002694	AA
PEX14	rs111303544	GG
/	rs113879811	TT
PRPF38B	rs150830373	CC
KIF1B	rs374430851	GG
/	rs372345235	CC
/	rs111640537	CC
/	rs12070100	CC
PIFO	rs187038126	TT
FBXO44	rs369701158	CC
COL11A1	rs80206932	CC
PIFO	rs150153130	CC
/	rs530195853	GG
/	rs12057505	GG

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

Heart Rate

Your heart is a pump that drives blood through your body at a rate needed to maintain oxygen supply. The healthier and stronger your heart is, the less effort it needs to accomplish this task, and thus the fewer times it has to beat per minute.

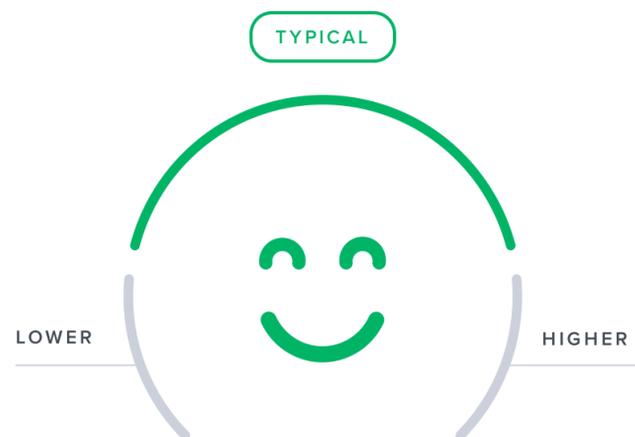There are several risk factors for an abnormal heart rate, including:

- **Heart disease**: conditions such as hypertension, coronary artery disease, and heart valve problems
- **Metabolic disorders**: diabetes, thyroid disease, and other metabolic disorders
- **Medications**: certain medications, such as beta-blockers and anti-arrhythmic drugs
- **Lifestyle factors**: stress, smoking, excessive alcohol consumption, and a sedentary lifestyle
- **Older age**

Up to **30%** of differences in people's heart rate may be due to **genetics**. Involved genes control the production of substances that contract and relax the heart muscle [R].

It's important to consult with a doctor if you have symptoms of abnormal heart rate such as **palpitations, fainting, dizziness, or shortness of breath.**

Genetically higher resting heart rate may be causally associated with:

- High blood sugar [R, R, R, R (null)]
- Atrial fibrillation (lower risk) [R]
- High blood pressure (diastolic) [R]
- Triglycerides [R]
- CRP [R]
- Overweight [R]

TYPICAL

LOWER   HIGHER

Likely typical heart rate based on 1,026,255 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TRAPPC14	rs140367586	TT
FHOD3	rs61735998	GG
SOX5	rs4963772	GG
GRINA	rs56233017	GG
FKBP7	rs151041685	GT
SYT10	rs1994135	CC
ACHE	rs17881696	AG
SCN10A	rs6599255	CC
SLC35F1	rs3951016	TA
RBM6	rs3749237	AA
MICAL2	rs112421686	IA
GJA1	rs3792943	CT
RNF220	rs272564	AC
RASSF3	rs867400	TC
FBXL17	rs9326726	AG
MIX23	rs11920570	GA
MAP3K10	rs16974196	AG
MEIS1	rs62144050	CT
CCDC141	rs10497529	GG

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

Heart Health

In the US, 1 in 3 deaths from heart disease could be prevented. That's about 92,000 deaths each year. **Imagine if we could save all those lives by striving to prevent heart disease** [R]!

Coronary artery disease is the most common type of heart disease. It affects the coronary arteries -- the large blood vessels that feed the heart. When these vessels become narrowed or blocked, they can't deliver as much oxygen to the heart. Because of this, heart muscle tissue can start to die off [R, R].

If a coronary artery is blocked suddenly, it can cause a heart attack. If the artery narrows slowly over a long period of time, it can cause chest pain and other problems [R].

Many factors can increase your risk of heart disease. These include [R, R]:

- Excess weight
- Unhealthy diet
- Stress
- Lack of exercise
- Smoking
- Air pollution
- Age
- High blood pressure
- High cholesterol
- Diabetes
- Genetics

According to the CDC, **over 18 million adults in the US have coronary artery disease**, and the rates keep increasing. However, death rates have been going down. This is likely due to improved diagnosis and treatment [R, R, R, R]!

Medications that doctors often prescribe for coronary artery disease include [R]:

- Low doses of aspirin, to help prevent blood clots
- Statins, to reduce cholesterol and slow down fat buildup in blood vessels
- Beta-blockers, to lower blood pressure and relax the heart

It's much easier to prevent heart disease than to treat it. To avoid heart disease, experts recommend a "heart-healthy" lifestyle, which includes [R]:

- Not smoking cigarettes
- Eating a healthy diet
- Staying physically fit
- Getting good-quality sleep

Up to 40% of differences in people's chances of getting coronary artery disease may be attributed to genetics. Genes that may contribute to coronary artery disease influence [R]:

- Fat metabolism (APOE, APOB, LPL, LPA, PCSK9)
- Inflammation (IL5, IL6R)
- Blood clotting (SERPINA1)
- Blood vessel function (NOS3, TGFB1, VEGFA, ANGPTL4)

Genetically higher levels of the following markers are causally associated

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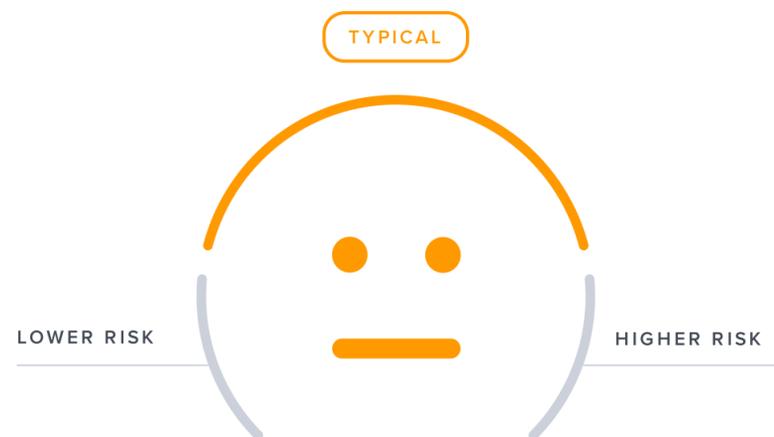
TYPICAL

Typical likelihood of heart vessel issues based on 11,907 genetic variants we looked at

LOWER RISK   HIGHER RISK

60th

PERCENTILE

Your risk is **greater than 60%** of the population and **lower than 40%** of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PEMT	rs12936587	GA
COMT	rs4680	AG
PCSK9	rs11591147	GG
SERPINA1	rs112635299	GG
FHL3	rs190569784	GG
PHOSPHO1	rs191896574	TT
ANGPTL4	rs116843064	GG
APOE	rs7412	CC
/	rs72711827	GG
SORT1	rs12740374	GG
FBXL20	rs72823390	CC
PLPP3	rs17114046	AA
/	rs2457480	AA
MCTP2	rs28607113	TT
FAM177B	rs17465982	AA
TCF21	rs1966248	AA
LDLR	rs6511720	TG
PHACTR1	rs9349379	GA
NOS3	rs2070744	TT

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

- ApoB
- Neutrophils
- L-carnitine

In contrast, genetically high total testosterone and EPA may be causally associated with a lower risk of coronary heart disease [R, R].

Artery Hardening

Key Takeaways:

● About 60% of differences in people's chances of having atherosclerosis may be due to genetics
● Risk factors: being male, high blood pressure and cholesterol, diabetes, obesity, smoking, lack of exercise, poor diet, and age.
● If you are at high genetic risk, you may lower your overall risk by taking action on risk factors that you can change.
● Artery hardening begins at a young age and your genetics, lifestyle, diet, and exercise may all impact how much and how fast it develops over the course of your lifetime.
● Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

LESS LIKELY   MORE LIKELY

Typical likelihood of atherosclerosis based on 51,588 genetic variants we looked at

The arteries are blood vessels that carry oxygen and nutrients from the heart to the rest of the body. Normally, they are elastic, able to expand and contract as blood flows through them [R, R].

Over time, some people's arteries may lose that flexibility. The blood vessel walls become thick and stiff. This is called artery hardening (*arteriosclerosis*) [R].

The most common type of artery hardening is atherosclerosis. In this condition, fatty substances build up on the blood vessel walls. This buildup is called plaque. It can narrow the arteries, which reduces blood flow. It can also burst and cause a blood clot [R, R, R].

Atherosclerosis is the underlying cause of about 50% of all deaths in the Western world [R].

Men may be more likely to develop atherosclerosis than women. The risk tends to increase with age [R, R].

Other risk factors for atherosclerosis include [R]:

- High blood pressure
- High cholesterol
- Underlying conditions (e.g., diabetes, obesity, sleep apnea)
- Cigarette smoking
- Lack of exercise
- Unhealthy diet
- **Genetics**

In most cases, atherosclerosis won't cause any symptoms. In fact, most people don't have symptoms until a blood vessel is so narrow that an organ stops receiving enough blood. Symptoms of moderate or severe atherosclerosis can vary depending on the artery affected. They can include [R]:

- Chest pain (for blood vessels feeding the heart)
- Weakness, loss of vision, slurred speech (for blood vessels feeding the brain)
- Leg or arm pain (for blood vessels feeding the limbs)
- High blood pressure or kidney failure (for blood vessels feeding the kidneys)

To prevent artery hardening, doctors recommend [R]:

- Quitting smoking
- Eating healthy foods
- Staying fit

Once the condition progresses, treatment options can include [R]:

- Medication
- Surgery
- Lifestyle changes

It's important to prevent, manage, or treat atherosclerosis. Left untreated, it can cause [R]:
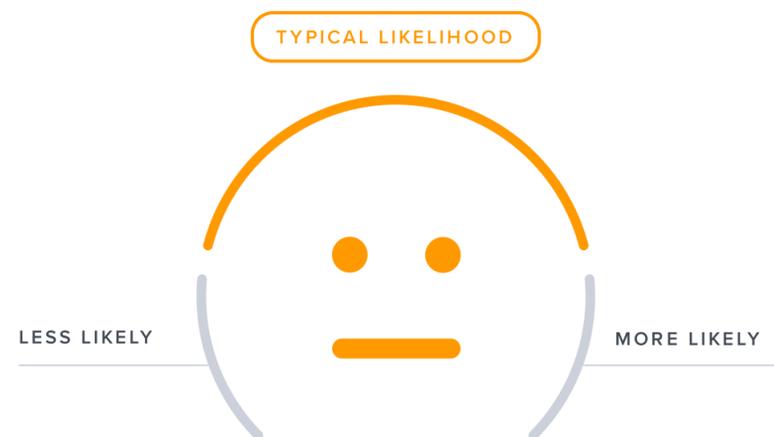
77th

PERCENTILE

Your risk is **greater than 77%** of the population and **lower than 23%** of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PEMT	rs12936587	GA
COMT	rs4633	TC
LRIG1	rs17045031	GG
LDLR	rs6511720	TG
CDKN2B	rs9632884	GC
APOE	rs445925	GG
BTN3A2	rs4712972	GA
ZHX2	rs11781551	AG
NOS3	rs2070744	TT
EDNRA	rs1878406	CC
CCDC71L	rs17398575	GG
CCDC71L	rs17477177	TT
STEAP1	rs259140	GG
FMN1	rs4779614	CC
EDNRA	rs1878406	CC
FAM167A	rs6601530	AA
CCDC71L	rs17398575	GG

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

Around 60% of differences in people's chances of artery hardening may be attributed to genetics. Genes involved in artery hardening may influence [R, R]:

- Cholesterol (LRP6)
- Inflammation (ALOX5AP, LTA4H)

Moreover, genetically high testosterone levels may be causally associated with a lower risk of atherosclerosis in men [R].

Varicose Veins

Key Takeaways:

- Up to **30%** of differences in people's chances of developing varicose veins may be due to genetics. Up to **1 in 3** people over the age of 70 may have varicose veins.
- Risk factors include: age, being female, overweight, sitting or standing most of the day, pregnancy, and childbirth.
- If you have a high genetic risk, you may reduce overall risk by taking action on risk factors that you can change.
- Click the **next steps** tab for relevant labs and lifestyle factors.

Normal, healthy veins have many valves that keep the blood flowing in the right direction. Over time or as a result of physical stress, these valves can become damaged. Damaged valves allow the blood to flow backwards or pool. This is called **venous reflux**, or **chronic venous insufficiency** [R, R, R].

Chronic venous insufficiency is a major cause of **varicose veins**. These are swollen veins that lie just under the skin. They may twist or bulge and appear purple or blue in color. They usually develop in the legs but can affect other parts of the body as well [R, R, R].

Chronic venous insufficiency may also cause [R, R]:

- Swelling, due to a buildup of fluid in the limbs (*edema*)
- Open wounds on the skin (*venous ulcers*)
- Itchy skin
- Pain

Chronic vein problems are more common in older people. In fact, up to **1 in 3 people** over the age of 70 may have varicose veins [R, R].

Besides age, risk factors for chronic vein problems include [R, R, R]:

- Female sex
- Overweight or obesity
- Pregnancy and childbirth
- Sitting or standing for most of the day
- **Genetics**

Ways to manage chronic vein problems include [R, R, R, R]:

- Keeping the legs elevated
- Lifestyle adjustments (e.g., avoiding sitting or standing for long periods, managing weight)
- Compression therapy (using stockings or bandages)
- Laser-based or injectable treatments
- Surgery

The risk of developing chronic vein problems can depend on genes. For example, up to 30% of differences in people's chances of developing varicose veins may be attributed to genetics. Genes involved in varicose veins may influence [R]:

- Blood vessel function (CASZ1, STIM2)
- Blood flow (CASZ1, PIEZO1, EBF1)
- Immune response (PPP3R1, GATA2, NFATC2)
- Blood iron levels (HFE)

TYPICAL LIKELIHOOD

LESS LIKELY   MORE LIKELY
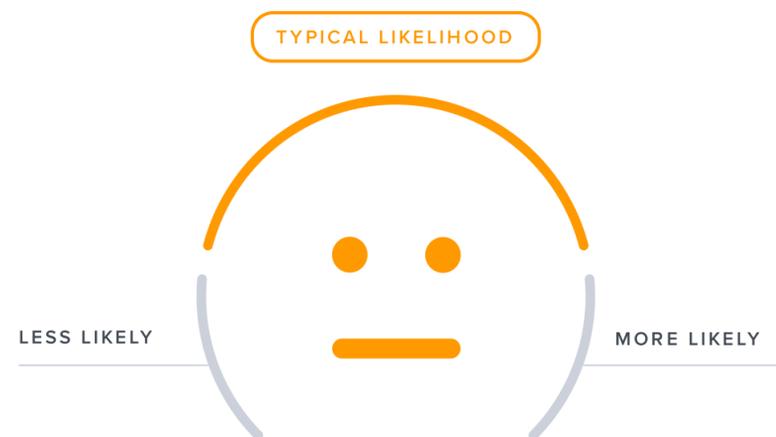
Typical likelihood of varicose veins based on 81,137 genetic variants we looked at

37th

PERCENTILE

Your risk is **greater than 37% of the population** and **lower than 63% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FKBP10	rs550216862	GG
NELFCD	rs76602912	TT
ARID5B	rs3740357	TT
SLC12A2	rs6860245	CC
/	rs4561414	GG
WDR92	rs7569914	GG
NFATC2	rs12625547	TT
UBE2H	rs17559301	TT
C20ORF204	rs6062618	TT
HLA-G	rs2524005	GG
UNC5B	rs7086901	CC
PARK7	rs7524424	TT
SRPX	rs35318931	G
PRKAR1B	rs9719461	TT
SBF2	rs1372809	GG
SLC38A2	rs4768737	TT
DOCK8	rs78216177	CG
DAOA	rs1549061	CT
TMEM87B	rs4849007	CA

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

Hemorrhoids

Key Takeaways:

● Hemorrhoids are a very common condition. Your genetics can make you more susceptible to them.
● Mild cases can be managed with eating more fiber, drinking more water, topical creams or suppositories, soaking in a warm bath, and pain medication. Talk to your doctor if symptoms persist beyond a week.
● If your genetic risk is high, taking more precautions to avoid straining during bowel movements and constipation may prove beneficial.
● Click the **next steps** tab for relevant labs.

LESS LIKELY   MORE LIKELY

Typical likelihood of hemorrhoids based on 640,366 genetic variants we looked at

Hemorrhoids are swollen veins in the anus or lower rectum. They are also called *piles*. They can be [R, R, R, R]:

- **Internal** (on the walls of the rectum)
- **External** (under the skin around the anus)

Hemorrhoids are very common. **In fact, up to 3 out of 4 adults will have them at some point in their lives** [R].

The risk of hemorrhoids increases as the body ages. Hemorrhoids can also occur during pregnancy [R].

Symptoms can vary between different types of hemorrhoids. The symptoms of **external hemorrhoids** may include [R, R]:

- Itching
- Swelling
- Bleeding
- Pain

The symptoms of **internal hemorrhoids** may include [R, R]:

- Bleeding during bowel movements
- Pain and irritation if a hemorrhoid pushes through the anus

In rare cases, hemorrhoids may cause complications such as [R]:

- A lack of healthy red blood cells (*anemia*)
- Blood clots in the hemorrhoid
- Extreme pain if blood supply to the hemorrhoid is cut off

If you have rectal bleeding, don't assume that hemorrhoids are the cause. Rectal bleeding can occur as a result of other conditions, some of them more serious. Be sure to see your doctor if your bleeding lasts longer than a week or you bleed during bowel movements [R].

In most cases, hemorrhoids can be managed at home. Some options for mild cases include [R, R]:

- Eating foods high in fiber
- Drinking more water
- Creams or suppositories
- Soaking in a warm bath
- Painkillers

If these strategies don't help within a week, a doctor may recommend [R, R]:

- Topical medication
- Injectable treatments (sclerotherapy)
- Surgical removal

Genetic differences may play a role in people's chances of developing hemorrhoids. Genes involved in hemorrhoids may influence the function of [R]:

- Muscles in the anus
- The gut
- Blood vessels
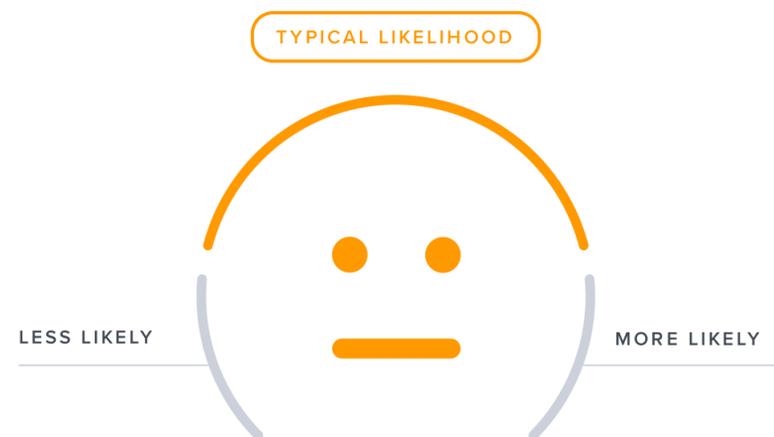
34th

PERCENTILE

Your risk is **greater than 34% of the population** and **lower than 66% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SFMBT1	rs9847710	TT
CDH26	rs35384758	GG
MUC12	rs4556017	CT
PPIE	rs11585073	TA
ATPAF2	rs854786	AA
PIAS1	rs12594232	AA
TBX5	rs2555004	GG
ASPN	rs755209	AA
ISL1	rs4485884	AA
CDKN2B	rs1333047	AT
MYH11	rs6498573	TC
ESR1	rs9322356	AG
MTCH2	rs10838738	AG
/	rs7183672	AG
MERTK	rs57116599	AG
GAS2L1	rs174767	GA
PRKCA	rs4423457	GA
NLRC4	rs6723226	GA
SPRY1	rs2060285	CA

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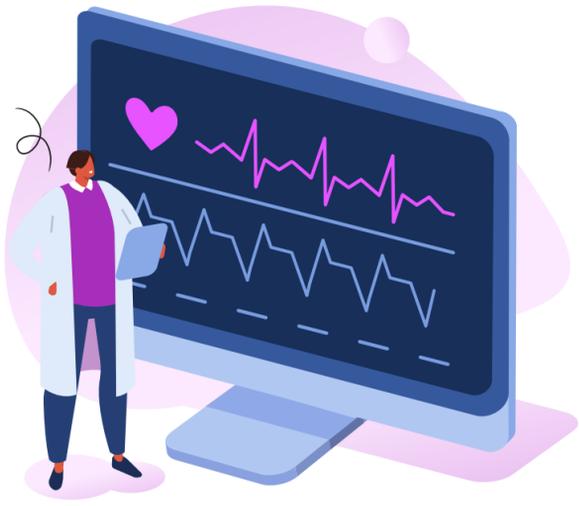
Heart Rate Parameters

Heart rate parameters are various measures related to a person's heart rate. Besides heart rate, which is the number of beats per minute (bpm), the parameters measure how much heart rate varies and how fast it can return to its resting rate.

They help evaluate an individual's **heart health, fitness, health status, and response to things like stress and exercise**. Your genetics affects all heart rate parameters — **dive into this section for the results and what they mean for your health and wellbeing**!

TYPICAL
Heart Rate

Likely typical heart rate

TYPICAL
Heart Rate Variability

Likely typical HRV

TYPICAL
Heart Rate Recovery

Likely typical HRR

Heart Rate

Your heart is a pump that drives blood through your body at a rate needed to maintain oxygen supply. The healthier and stronger your heart is, the less effort it needs to accomplish this task, and thus the fewer times it has to beat per minute.

There are several risk factors for an abnormal heart rate, including:

- **Heart disease**: conditions such as hypertension, coronary artery disease, and heart valve problems
- **Metabolic disorders**: diabetes, thyroid disease, and other metabolic disorders
- **Medications**: certain medications, such as beta-blockers and anti-arrhythmic drugs
- **Lifestyle factors**: stress, smoking, excessive alcohol consumption, and a sedentary lifestyle
- **Older age**

Up to **30%** of differences in people's heart rate may be due to **genetics**. Involved genes control the production of substances that contract and relax the heart muscle [R].

It's important to consult with a doctor if you have symptoms of abnormal heart rate such as **palpitations, fainting, dizziness, or shortness of breath.**

Genetically higher resting heart rate may be causally associated with:

- High blood sugar [R, R, R, R (null)]
- Atrial fibrillation (lower risk) [R]
- High blood pressure (diastolic) [R]
- Triglycerides [R]
- CRP [R]
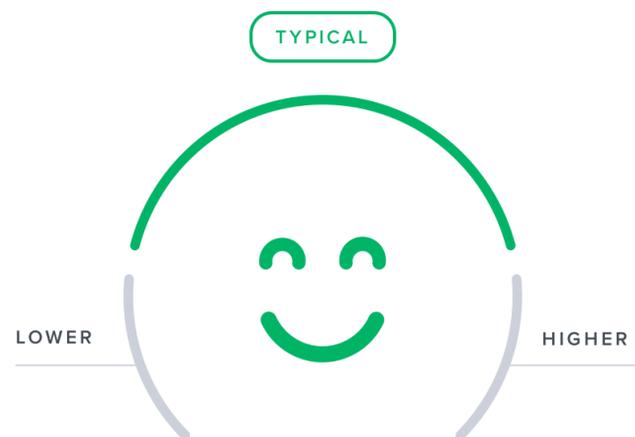- Overweight [R]

TYPICAL

LOWER   HIGHER

Likely typical heart rate based on 1,026,255 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TRAPPC14	rs140367586	TT
FHOD3	rs61735998	GG
SOX5	rs4963772	GG
GRINA	rs56233017	GG
FKBP7	rs151041685	GT
SYT10	rs1994135	CC
ACHE	rs17881696	AG
SCN10A	rs6599255	CC
SLC35F1	rs3951016	TA
RBM6	rs3749237	AA
MICAL2	rs112421686	IA
GJA1	rs3792943	CT
RNF220	rs272564	AC
RASSF3	rs867400	TC
FBXL17	rs9326726	AG
MIX23	rs11920570	GA
MAP3K10	rs16974196	AG
MEIS1	rs62144050	CT
CCDC141	rs10497529	GG

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

Heart Rate Variability

Key Takeaways:

- HRV reflects how adaptable our bodies are.
- People with higher HRV tend to be more relaxed, healthier, and in better shape.
- Up to **60%** of differences in people's HRV may be due to genetics.
- Besides genetics, our emotions, fitness level, physical and mental health, and age influence HRV.
- The relevance of HRV as a health indicator is still being studied.

The heart doesn't keep the same rhythm from one heartbeat to the next. Instead, the time between heartbeats is constantly changing. HRV is a measure of those changes [R].

Up to **60%** of differences in people's HRV may be due to genetics. Involved genes may also influence heart rate and blood pressure [R, R, R].

Genetically higher HRV may be causally associated with [R, R, R]:

- Atrial fibrillation
- Heart attack
- High blood pressure (diastolic)

Many other internal and external factors influence HRV, including [R, R, R]:

- Emotions
- Personality
- Physical fitness
- Race
- Health condition

Factors linked to **lower HRV** include:

- Overtraining [R, R]
- Stress [R, R, R]
- Sleep disturbances [R, R, R]
- Alcohol consumption and smoking [R, R, R, R]
- Air pollution [R, R, R, R]
- Some drugs (e.g., antidepressants) [R, R, R, R]
- Anxiety and depression [R, R]
- Many health conditions (e.g., diabetes and thyroid disorders) [R, R, R]
- Inflammation and obesity [R, R, R]
- Aging [R]

Thankfully, there are a number of ways to increase HRV. One thing to keep in mind is that you should focus on improving your physical health, mental health, and fitness in general. HRV is just a marker that will reflect those changes.

TYPICAL

LOWER   HIGHER
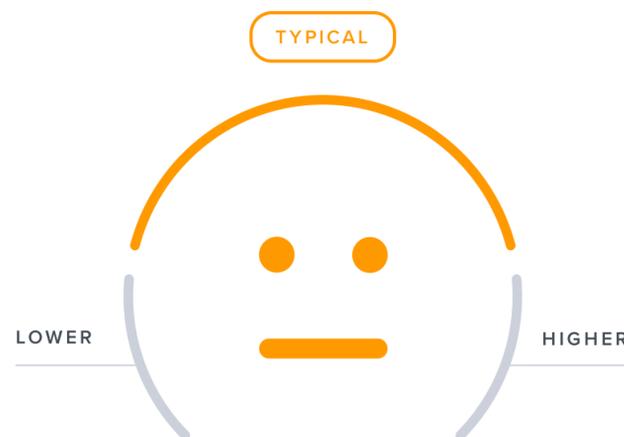
Likely typical HRV based on 1,286 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SOX5	rs10842383	CC
SYT10	rs1351682	GG
NEO1	rs2680344	GA
GNG11	rs4262	TC
NEO1	rs1812835	CA
SYT10	rs1384598	TT
SYT10	rs7980799	AC
RBFOX1	rs4786125	AA
RGS6	rs4899412	TC
CCDC141	rs13004438	CT
CAPS	rs12974440	GG
CAPS	rs12974991	GG
PPIL1	rs236349	AA
RGS6	rs36423	GG
TMPRSS4	rs677652	CC
NDUFA11	rs12980262	GG
RGS6	rs2529471	AA
TGM2	rs6123471	CC
RGS6	rs2052015	CC

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

Heart Rate Recovery

Heart rate recovery (HRR) is the difference between your peak heart rate during exercise and your heart rate soon after you stop. **Normal HRR after one minute of rest is typically 18 bpm or higher**.

About **60%** of the differences in people's HRR may be due to genetics. Many involved genes play a role in nerve function [R, R].

Factors that can affect your ability to recover heart rate after exercise include [R, R, R, R]:

- Fitness level
- Age
- Sleep quality

HRR can also depend on the exercise and resting methods [R].

Talk to your healthcare provider if you have a poor HRR. While it's been linked to certain health problems, it may simply mean you need more physical activity.

TYPICAL

LOWER · HIGHER
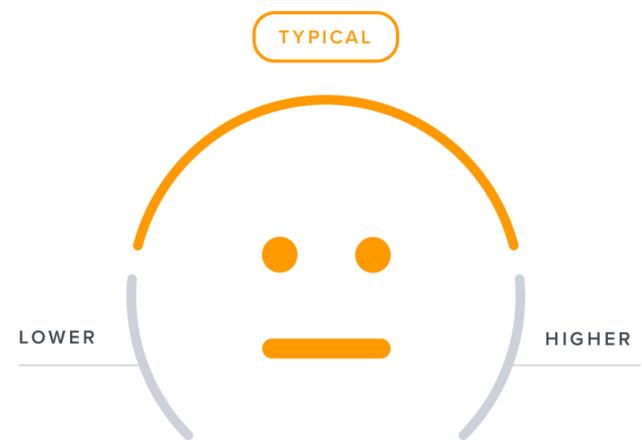
Likely typical HRR based on 704,947 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
SOX5	rs4963772	GG
SYT10	rs6488162	TC
TGM2	rs6127466	GG
GIGYF1	rs221789	TC
INPPL1	rs7130652	GG
SERINC2	rs11589125	CC
NEGR1	rs61765646	TT
C19ORF12	rs55954001	GA
NEGR1	rs12740789	GG
GRIK2	rs2224202	GG
ACHE	rs3757868	AG
/	rs13022107	CC
PAX2	rs10748799	TC
RNF220	rs272564	AC
PRDM6	rs151283	AC
SATB1	rs73043051	CT
SNX2	rs4836027	TC
/	rs12906962	TC
CAV1	rs1997571	AA

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

Blood Pressure

"That guy is going to burst a blood vessel!" The phrase is a reference to high blood pressure, typically induced by stress. On the other hand, if you get dizzy from getting up too fast, that could be due to low blood pressure.

Your circulatory system is set up to maintain a certain amount of pressure in order to keep blood flowing properly. **High blood pressure can be dangerous in particular**; it's hard to notice and plays a major role in heart disease, stroke, and more. **These reports look at your genetic predispositions for high or low blood pressure, as well as the contributing effects of salt**.

TYPICAL LIKELIHOOD	TYPICAL	TYPICAL LIKELIHOOD
High Blood Pressure	**Salt Sensitivity**	**Low Blood Pressure**
Typical likelihood of high blood pressure	Likely typical sensitivity to salt	Typical likelihood of low blood pressure

High Blood Pressure

Key Takeaways:

● About 50% of people's differences in blood pressure may be due to genetics.
● Risk factors include age, ethnicity, diet, weight, activity levels, and stress which are all highly modifiable.
● If your genetic risk is high or you already have high blood pressure, you can take steps now to help reduce overall risk and improve your health.
● High blood pressure rarely causes symptoms, but it raises the risk for stroke and heart attack. Nine out of 10 Americans develop high blood pressure at some point in their lives.
● Click the **next steps** tab for relevant labs and lifestyle factors

There are two major types of high blood pressure.

The first one is slow-developing and without an underlying cause. Doctors call this *primary* or *essential hypertension*. The majority of people will develop this type of high blood pressure.

Several factors can contribute to primary hypertension [R]:

- Age
- Being overweight or obese
- Not getting enough physical activity
- Tobacco use
- A diet high in salt (sodium)
- A diet low in potassium
- Alcohol abuse
- Stress
- Ethnicity (African ancestry)
- **Genetics**

Sometimes, high blood pressure is the result of a known underlying cause. Doctors call this *secondary* hypertension. Some examples of things that can cause secondary hypertension include [R]:

- Abuse of recreational drugs, such as cocaine and amphetamines
- Some medications, such as birth control pills and painkillers
- Conditions such as obstructive sleep apnea, kidney disease, and blood vessel defects

High blood pressure usually doesn't produce any symptoms. Most people don't realize they have it until they visit their doctor for a routine checkup [R]!

The danger is that high blood pressure increases your chances of heart attack and stroke. In 2018, high blood pressure contributed to the death of almost 500,000 Americans [R, R].

The good news is that high blood pressure is easy to detect and treat. Your doctor will work with you to reduce your blood pressure. They may recommend medication, a low-sodium diet, exercise, and other lifestyle changes [R].

Some strategies and recommendations may work better for some people than others. This is partly due to genetics, which may account for up to 50% of differences in blood pressure [R, R].

Genes that influence blood pressure can affect:

- Blood volume (SCNN1A, NPR3, CSK, AGT, and ACE2) [R, R, R, R, R]
- Blood vessel width (AGT, ACE2, and NOS3) [R, R, R]
- Stress response (ADRB1 and ADRB2) [R, R]
- Breakdown of blood pressure-raising compounds, such as caffeine (*CYP1A2*) [R, R]

AGT and *ACE2* genes raise your blood pressure. They do this by increasing the amount of blood and making your blood vessels smaller. ACE inhibitors are blood pressure-lowering drugs that can counteract this [R, R, R].

Moreover, genetic predisposition to high levels of the following markers may be causally associated with high blood pressure [R, R, R, R, R, R]:

LESS LIKELY   MORE LIKELY
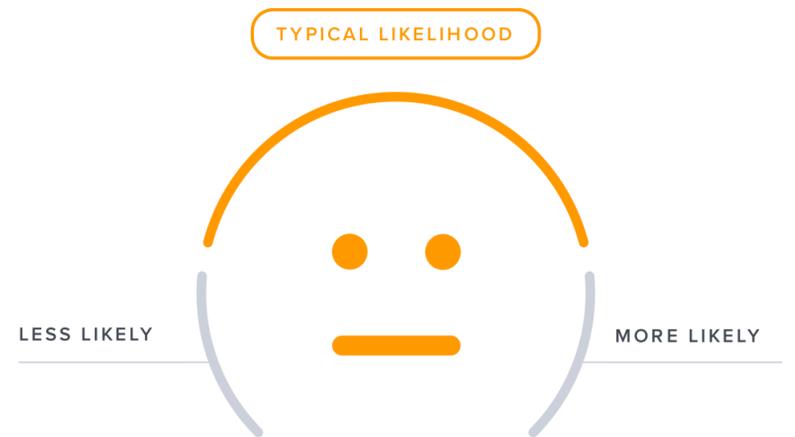
Typical likelihood of high blood pressure based on 949,590 genetic variants we looked at

24th

PERCENTILE

Your risk is **greater than 24% of the population** and **lower than 76% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
EPAS1	rs10168349	GG
ABO	rs579459	TT
ADRB1	rs1801253	CC
APOE	rs7412	CC
ULK3	rs2472299	AA
ARHGAP42	rs633185	CC
AGT	rs699	GA
NPR3	rs1173771	AG
SH2B3	rs3184504	TC
BCL2	rs12454712	CT
ULK3	rs6495122	AC
TNNT3	rs4980379	TC
PRKAG2	rs10224002	AG
FGF5	rs10857147	TA
FGF5	rs16998073	TA
FGF5	rs11099098	TG
KCNK3	rs35021474	CG
FGF5	rs1458038	TC
NT5C2	rs112913898	AG

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

- Alpha-linolenic acid

In contrast, genetically high IGF-1 and EPA levels may be causally associated with lower blood pressure [R, R].

It's important to remember that genetics isn't everything. Your lifestyle and environment account for about 50% of blood pressure differences [R].

Salt Sensitivity

People who are salt sensitive will experience a bump in blood pressure when they eat salty foods. This happens because their kidneys function a bit differently [R, R, R].

Salt sensitivity is partly determined by the genes we carry. Genes involved in salt sensitivity may influence [R, R, R, R, R, R]:

- Sodium levels in the blood and kidney
- Blood vessel function
- Blood pressure

However, other genes and environmental factors may also influence your salt needs. It is important to get the right amount of salt for you.

TYPICAL

HIGHER
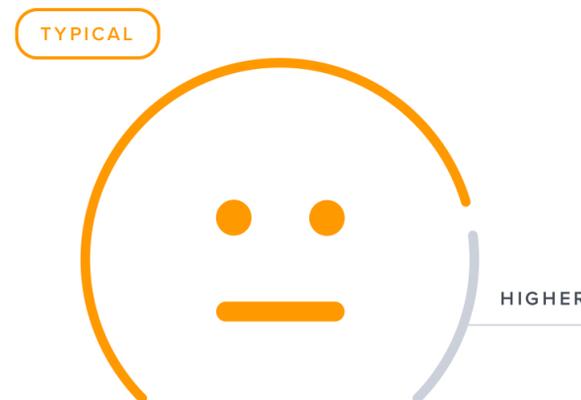
Likely typical sensitivity to salt based on 68 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
BCAT1	rs7961152	AA
NR2F2	rs2398162	GG
WNK1	rs12828016	GG
RAD52	rs2301880	CC
POC1B	rs2681472	AG
ACE	rs4343	GA
SGK1	rs9376026	CT
SLC8A1	rs11893826	GA
PRKG1	rs7905063	TC
PRKG1	rs7897633	AC
ADRB2	rs1042714	CG
FGF5	rs16998073	TA
SCNN1G	rs4073930	TT
SCNN1G	rs4073291	AA
SCNN1G	rs7404408	CC
SCNN1G	rs5735	TT
SCNN1G	rs4299163	GG
CLGN	rs2567241	CC
GC	rs4254735	TT

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

Low Blood Pressure

Key Takeaways:

● Genetics may play a role by influencing nervous system function, kidney function, and hormone activity.
● Other risk factors include certain medications and health conditions.
● It is estimated that up to **25%** of adults may have low blood pressure.
● Symptoms are uncommon, so if you do experience symptoms, speak to a healthcare professional. Managing symptoms may involve things like drinking more water, increasing salt intake, avoiding alcohol, changing positions slowly, diet changes, exercising, and wearing compression stockings.
● Click the **next steps** tab for relevant labs.

LESS LIKELY   MORE LIKELY

Typical likelihood of low blood pressure based on 54,555 genetic variants we looked at

When your heart beats, it pumps blood to your entire body through your blood vessels. As blood circulates, it pushes against the inner walls of these blood vessels. Your blood pressure is a measurement of how hard your blood is pushing on these walls. **Blood pressure drops when the blood vessels widen or when the heart pumps slower** [R, R].

When a doctor measures your blood pressure, they give you two numbers. The first number describes the force when your heart beats (*systolic* blood pressure). The second number describes the force between heartbeats (*diastolic* blood pressure) [R].

A reading below 120/80 is generally considered normal. However, **a reading below 90/60 is considered to be low** [R, R].

Up to 25% of older adults may have low blood pressure. It may be less common in young people [R, R, R].

Besides older age, other risk factors for low blood pressure include some [R]:

- Medications
- Health conditions (e.g., Parkinson's disease, heart problems)

Two of the most common types of low blood pressure are [R]:

- **Orthostatic hypotension** (also called **postural hypotension**): Occurs almost immediately after standing up
- **Postprandial hypotension**: Occurs 1-2 hours after eating a meal

Sudden drops in blood pressure may also be a sign of an underlying health problem. This may be the case if you experience [R]:

- Fainting
- Blurry vision
- Nausea
- Fatigue
- Loss of coordination

Ways to manage low blood pressure include [R]:

- Drinking more water
- Increasing salt intake
- Avoiding alcohol
- Changing positions slowly (e.g., slowly getting up from a chair or from bed)
- Eating smaller, low-carb meals more often
- Exercising
- Wearing compression stockings

If these strategies don't help, your doctor may prescribe medication [R].

Genetics may play a role in blood pressure by influencing [R, R, R]:

- Nervous system function
- Kidney function
- Hormone activity
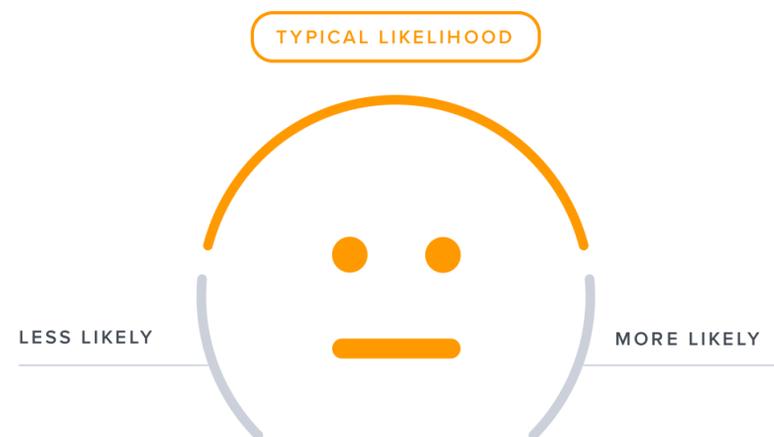
48th

PERCENTILE

Your risk is **greater than 48%** of the population and **lower than 52%** of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
/	rs6736587	CC
STAR	rs16887217	TT
ACTBL2	rs6892553	TT
WRNIP1	rs4959677	CG
PIK3AP1	rs7098785	AG
NEGR1	rs116746813	GG
DNAH14	rs74517776	GG
/	rs140537647	TT
DNAH14	rs76052697	CC
DNAH14	rs141112742	CC
DNAH14	rs115273007	CC
DENND1B	rs116306513	GG
DNAH14	rs115906048	CC
DNAH14	rs114806783	AA
DNAH14	rs143344867	GG
PLXNA2	rs114552486	GG
DNAH14	rs562197190	TT
CNIH3	rs115958935	AA
DNAH14	rs114841428	CC

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

Cholesterol & Lab Markers

Cholesterol and triglycerides (blood lipids) are key lab markers when it comes to heart health! Your body actually requires fats and cholesterol to store energy and help cells function. So, like many other things in the body, they require balance. Too much can increase the risk for health issues like heart disease.

How your body handles fats and cholesterol depends on a variety of factors, including your genetics.

Besides blood lipids, several other lab markers can tell a lot about heart health and potential risks. **Reports in this section look at your genetic predispositions for all lab markers relevant to heart health.**

TYPICAL LEVELS
ApoB
Likely typical ApoB levels

HIGHER LEVELS
TMAO
Likely higher TMAO levels

TYPICAL LEVELS
Homocysteine
Likely typical homocysteine levels

TYPICAL LEVELS
LDL Cholesterol
Likely typical levels of "bad" cholesterol

LARGER
LDL Particle Size
Likely larger LDL particles

LOWER LEVELS
HDL Cholesterol
Likely lower levels of "good" cholesterol

TYPICAL LEVELS
Lipoprotein(a)
Likely typical Lipoprotein(a) levels

HIGHER LEVELS
Triglycerides
Likely higher triglyceride levels

TYPICAL LEVELS
Total Cholesterol
Likely typical levels of total cholesterol

LESS LIKELY
High Cholesterol
Less likely to have high cholesterol

ApoB

Key takeaways:

- ApoB is a protein that forms part of "bad cholesterol".
- High ApoB levels are linked to heart disease.
- Genetically high ApoB may be involved in the development of heart disease and Alzheimer's disease.
- Up to **70%** of differences in people's ApoB levels may be due to **genetics.**
- Besides genetics, different lifestyle factors, health conditions, and drugs can affect ApoB levels.

Apolipoprotein B (ApoB) is a large protein that helps build three major lipoproteins, collectively called "bad cholesterol" [R].

Up to **70%** of differences in people's ApoB levels may be due to **genetics**. Involved genes may influence ApoB production [R, R, R].

Some factors that may lead to **high ApoB** include:

- High-sugar foods [R, R]
- Diets high in saturated fats and cholesterol [R, R, R]
- Smoking [R, R, R]
- Drinking coffee (including decaf) [R, R, R]
- Sleep deprivation [R, R]
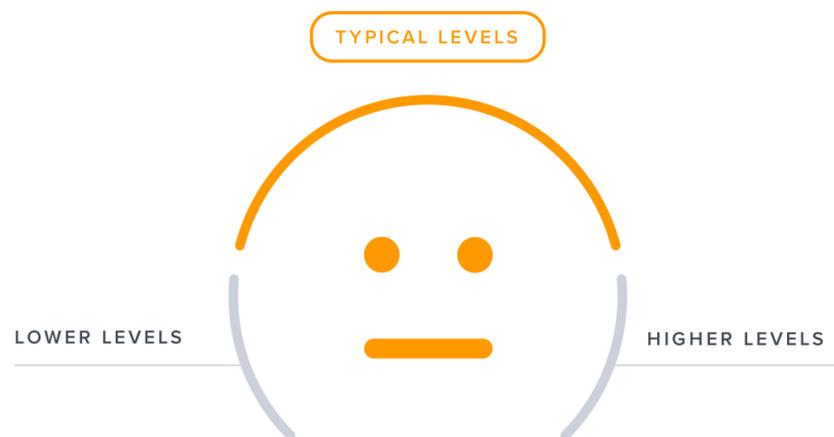- Some drugs (e.g., steroids, chemotherapy) [R, R, R, R]

ApoB levels may increase during pregnancy and menopause. Some health conditions may also lead to high ApoB levels, including [R, R, R]:

- Obesity [R, R, R]
- Underactive thyroid [R, R, R]
- Diabetes [R, R, R]
- Liver and kidney disease [R, R, R, R, R]
- Rare genetic disorders [R, R, R, R]

Low ApoB levels may result from:

- Overactive thyroid [R, R, R]
- Liver disease [R, R, R, R]
- Some drugs (e.g., cholesterol-lowering drugs) [R, R, R, R, R, R, R]
- Rare genetic disorders [R, R, R, R, R]

Keep in mind that this report is not about the rare genetic disorders mentioned above. They are very rare and usually diagnosed in infancy.

TYPICAL LEVELS

LOWER LEVELS   HIGHER LEVELS

Likely typical ApoB levels based on 6,389 genetic variants we looked at

79th

PERCENTILE

Your risk is **greater than 79%** of the population and **lower than 21%** of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NECTIN2	rs28399637	AA
APOB	rs550619	AA
TDRD15	rs111548358	TC
/	rs12713559	GG
APOC4	rs140526515	AA
NECTIN2	rs138914864	CC
APOE	rs769449	GG
NECTIN2	rs117310449	CC
CLPTM1	rs490243	CC
NECTIN2	rs144261139	CC
NECTIN2	rs76366838	GG
APOE	rs4420638	AA
CLPTM1	rs12691088	GG
TOMM40	rs394819	GG
NECTIN2	rs34095326	GG
NECTIN2	rs41289512	CC
TOMM40	rs157587	AA
NECTIN2	rs138607350	TT
APOC1	rs389261	GG

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

TMAO

HIGHER LEVELS

LOWER LEVELS

Likely higher TMAO levels based on 9 genetic variants we looked at

---

Key Takeaways:

- Up to **30%** of differences in people's TMAO levels may be due to genetics.
- Other factors that may lead to high TMAO include L-carnitine, choline, and histidine supplements, certain foods, sleep deprivation, aging, kidney disease, and diabetes.
- If you have a high genetic risk or other risk factors, you may lower your overall risk by taking action now on factors that you can change.
- Click the **next steps** tab for relevant labs and lifestyle changes.

TMAO (trimethylamine N-oxide) is an oxidation product of our gut microbiome, generated from the breakdown of foods. It can also be found in some foods, especially fish [R, R].

Up to **30%** of differences in people's TMAO levels may be due to **genetics** [R, R].

Our diet and, thereby, our gut microbiome play a key role in TMAO production. Consuming animal products rich in TMAO, choline, betaine, lecithin, and carnitine may increase TMAO levels. Some examples include [R, R, R, R, R, R, R, R, R]:

- Fish and seafood
- Eggs
- Dairy
- Red meat

In line with this, the following diets may raise TMAO levels:

- Western-like and high-fat diets [R, R]
- Red meat-rich diets (e.g., Paleo diet, low-carbohydrate diet) [R]

If your TMAO levels are elevated due to high fish and seafood intake, there is likely no need for concern. Many studies link fish and seafood consumption to lower heart disease risk. Fish is also an excellent source of omega-3 fatty acids [R, R].

Other factors that may lead to **high TMAO** include:

- L-carnitine, choline, and histidine supplements [R, R, R]
- Sleep deprivation [R]
- Aging [R]
- Kidney disease [R, R, R]
- Diabetes [R]

Genetically higher levels of TMAO may be causally associated with:

- Gut inflammation [R]
- High blood pressure (systolic) [R]

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PHACTR4	rs114145653	AA
UBE2G1	rs75116832	GG
RPA2	rs148553452	AA
IFNK	rs143482172	CC
PLN	rs75363923	CC
ENPP4	rs146839869	GG
TENM3	rs114755225	CC
AK9	rs143831173	AA
RHOBTB2	rs6557607	GG

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

Homocysteine

Key Takeaways:

- About 55% of differences in people's homocysteine levels may be due to genetics.
- High homocysteine is usually caused by the lack of vitamins B12, B9 (folate), and B6.
- People with heart disease and cognitive problems tend to have higher homocysteine.
- High homocysteine may not be a risk factor for heart disease.

Homocysteine is a metabolic byproduct linked to heart disease and cognitive decline. It's cleared out of our bodies with the aid of **vitamins B12, B9 (folate), and B6** [R].

A deficiency of vitamins B12, B9 (folate), or B6 is the most common cause of high homocysteine levels [R].

Homocysteine can also be increased by:

- Stress [R, R, R]
- Cigarette smoke [R, R]
- Alcohol [R, R]
- Certain medications [R, R, R, R, R, R, R]

About 55% of differences in people's homocysteine levels may be due to genetics. Unsurprisingly, involved genes like MTHFR play a role in the metabolism of folate and other B vitamins [R].

Gene variants that increase homocysteine levels may also play a role in schizophrenia and some types of cancer [R, R, R, R, R].

If you are worried about your genetic results, make sure to check your homocysteine lab marker to see your actual levels. It may also be a good idea to check your genetics and levels of folate and other B vitamins.

TYPICAL LEVELS

HIGHER LEVELS

Likely typical homocysteine levels based on 24 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
NOX4	rs7130284	CC
SPATA2L	rs154657	AA
MTR	rs2275565	GG
TRDMT1	rs12780845	AA
C1ORF167	rs12134663	CA
CBS	rs234709	CT
H2BC5	rs548987	GC
CBS	rs2851391	TC
OASL	rs2251468	AC
CUBN	rs1801222	AG
NOX4	rs957140	AG
MMUT	rs9369898	GA
AKR1A1	rs4660306	TC
FUT2	rs838133	AG
RNF175	rs2404916	GG
GTPBP10	rs42648	GA
ZDHHC20	rs17356983	GA
MTHFR	rs1801133	GG
FANCA	rs12921383	TT

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

LDL Cholesterol

Cholesterol in the blood is carried by proteins, mainly LDL, HDL, and VLDL. We call cholesterol carried by LDL "bad" cholesterol because it can stick to your blood vessels. This can cause heart problems [R, R].

Some risk factors for high LDL cholesterol include [R, R]:

- A diet high in saturated fat
- Obesity
- Lack of exercise
- Older age
- **Genetics**

If your cholesterol levels rise, your doctor will recommend strategies for lowering them. These may include [R]:

- A diet low in saturated fat (such as the Mediterranean diet)
- Exercise
- Losing excess weight
- Cholesterol-lowering medication

How well you respond to these strategies may depend on your genes.

Genetically higher LDL cholesterol levels may play a role in:

- Heart Health [R, R, R, R, R, R, R, R, R, R, R, R, R]
- High Blood Sugar [R, R, R, R, R, R, R, R]
- Stroke [R, R, R, R, R]
- Kidney Health/eGFR/Artery Hardening [R].
- Bone Health [R, R, R]
- Joint Pain [R]
- Parkinson's Disease [R]
- Longevity [R, R, R, R]
- High Blood Pressure [R]

Up to 65% of differences in cholesterol levels may be attributed to genetics. Genes that may contribute to high cholesterol influence [R, R, R, R, R, R]:

- Cholesterol production (HMGCR)
- Cholesterol transport (APOB)
- HDL and LDL cholesterol balance (CETP, LPL, LIPC)

Genetically high testosterone levels may be causally associated with a high risk of increased LDL-cholesterol [R].

HIGHER LEVELS

Likely typical levels of "bad" cholesterol based on 1,366,051 genetic variants we looked at

12th

PERCENTILE

Your risk is **greater than 12% of the population** and **lower than 88% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOE	rs7412	CC
APOE	rs141622900	GG
APOE	rs7254892	GG
PCSK9	rs11591147	GG
APOE	rs12721109	GG
APOE	rs62117160	GG
LDLR	rs72658867	GG
BCAM	rs28399654	GG
USP24	rs72660594	TT
LDLR	rs6511720	TG
NECTIN2	rs11668327	CG
/	rs12713559	GG
APOC4	rs140526515	AA
NECTIN2	rs138914864	CC
NECTIN2	rs117310449	CC
APOE	rs769449	GG
/	rs150401285	AA
NECTIN2	rs144261139	CC
NECTIN2	rs76366838	GG

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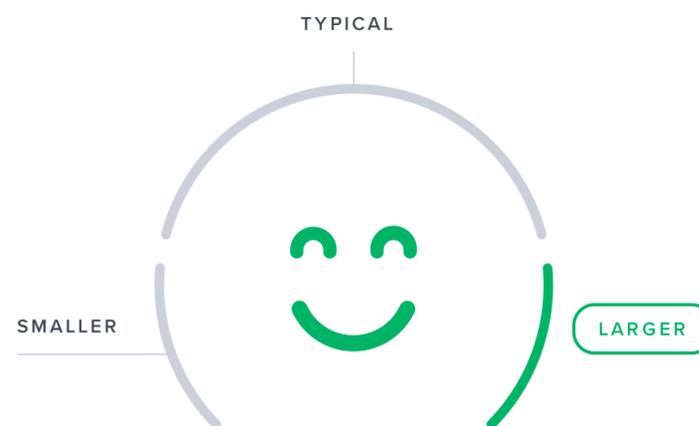
LDL Particle Size

Research suggests that small LDL more easily goes into blood vessel walls, where it deposits as plaque, while larger particles tend to bounce off blood vessel walls. That's why small LDL may be worse, even though it carries less cholesterol than the larger particles [R, R, R, R, R].

Up to **50%** of differences in people's LDL particle size may be due to genetics [R].

Other factors that can raise small LDL levels include:

- Obesity [R]
- Physical inactivity [R, R]
- A diet high in simple carbs and saturated fat [R, R]

TYPICAL

SMALLER

LARGER

Likely larger LDL particles based on 57 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ANGPTL4	rs116843064	GG
LPA	rs56393506	CC
APOH	rs1801689	AA
NLRC5	rs12446515	CC
TMEM116	rs73412716	GG
MLXIPL	rs71556736	CC
ALDH1A2	rs1601935	TT
SMARCA4	rs10412048	GA
TRPS1	rs13262459	CC
ADAM10	rs1077835	GA
KLF14	rs553015785	AA
SAMM50	rs3747207	AG
GCKR	rs1260326	CT
TRIB1	rs2954025	TC
APOE	rs157594	TG
PLTP	rs4810479	CT
SLC38A11	rs13389219	TC
ABCA1	rs1883025	CT
BLK	rs34962960	AG

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

HDL Cholesterol

Cholesterol in the blood is carried by proteins, mainly LDL, HDL, and VLDL. We call cholesterol carried by HDL "good" cholesterol because it helps your liver get rid of excess cholesterol [R, R].

Normal to high levels of HDL cholesterol are linked to a lower risk of heart disease. Causes of low HDL cholesterol include [R, R, R]

- Being overweight or obese
- Smoking
- Metabolic syndrome
- A diet rich in trans fats
- Low physical activity

However, research has shown that medications that increase HDL cholesterol don't necessarily decrease one's risk of heart disease. In addition, genetic studies suggest that low HDL cholesterol levels probably don't cause heart disease on their own [R, R, R, R, R, R, R, R].

This is why doctors will often suggest lifestyle and diet strategies that can improve both your "good" and your "bad" cholesterol, as well as your heart health. These strategies include [R, R]:

- A healthy diet rich in fiber, and low in saturated fat and trans fat
- Exercise
- Losing weight
- Stopping tobacco use

Up to 65% of differences in cholesterol levels may be attributed to genetics. Genes that may affect HDL cholesterol influence [R, R, R, R, R, R]:

- Cholesterol production (LPL, LIPC, HMGCR)
- Cholesterol transport (APOB)
- HDL and LDL cholesterol balance (CETP)

Genetically high fasting insulin and total, bioavailable, and free testosterone may be causally associated with low HDL cholesterol [R, R, R].
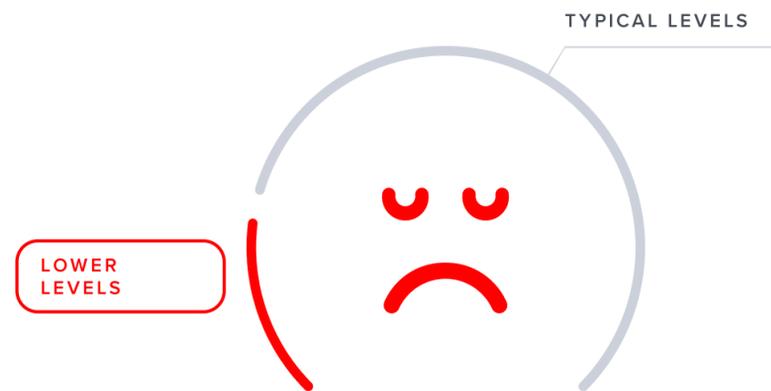
LOWER LEVELS

Likely lower levels of "good" cholesterol based on 916,929 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOB	rs2678379	GG
/	rs200748895	TT
SCARB1	rs921919	AA
ABCA1	rs2740488	AC
GPAM	rs2792751	CC
/	rs71926466	GG
WDR11	rs10886863	CC
PLTP	rs6073958	CT
PLG	rs571848809	GA
VEGFA	rs998584	AC
ETV5	rs57912727	AC
CD300LG	rs72836561	CC
MCUB	rs189866430	TT
HNF4A	rs1800961	CC
ACAD10	rs11066015	GG
ADAL	rs150844304	AA
ARID1A	rs193084249	AA
SLC39A8	rs13107325	CC
APOE	rs429358	TT

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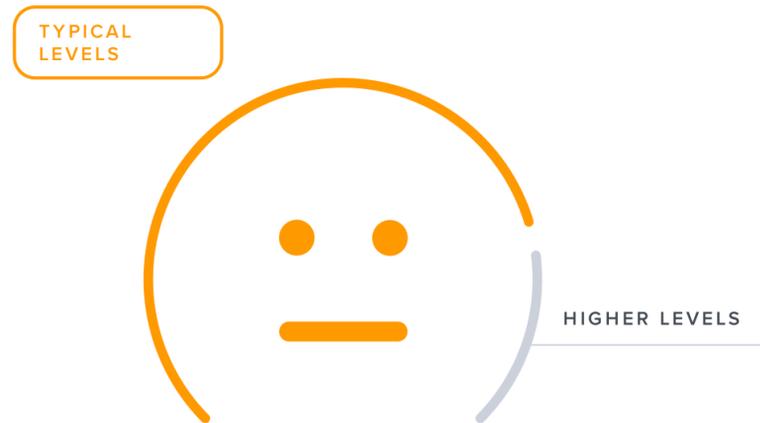
Lipoprotein(a)

Lipoprotein(a), or Lp(a), is a type of LDL. It is made in the liver and carries fats such as cholesterol around the body. **Lp(a) may deposit on the artery walls**. This may lead to the formation of plaques that narrow the arteries. In line with this, higher Lp(a) levels have been associated with heart disease and stroke [R, R, R, R, R, R, R, R].

Genetics strongly influence Lp(a) levels. Up to **90%** of differences in people's Lp(a) levels may be due to genetics [R, R].

Genetically higher Lp(a) levels may be causally associated with:

- Heart health (cardiovascular diseases) [R, R, R, R, R]
- Stroke [R, R, R]
- Longevity (reduced) [R]
- Atrial fibrillation [R, R]
- Anemia [R]
- Prostate cancer [R]

The effect of diet on Lp(a) is still a matter of research [R].

TYPICAL LEVELS

HIGHER LEVELS

Likely typical Lipoprotein(a) levels based on 839 genetic variants we looked at

4th

PERCENTILE

Your risk is **greater than 4% of the population** and **lower than 96% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LPA	rs41267819	GG
LPA	rs76144756	GG
LPA	rs143431368	TT
SLC22A1	rs182980975	CC
LPA	rs41267809	AA
LPA	rs41272114	CC
SLC22A3	rs6919346	CC
LPA	rs4708871	TT
LPA	rs74617384	AA
SLC22A3	rs3918291	TT
LPA	rs142720914	GG
SLC22A3	rs117446263	GG
LPA	rs73596816	GG
LPA	rs3798220	TT
AGPAT4	rs61735260	GG
SLC22A1	rs146534110	GG
SLC22A3	rs118133674	GG
PLG	rs4252152	TT
LPA	rs41272112	CC

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

Triglycerides

Triglycerides are the most common type of fat in the body. Some triglycerides are needed for the body to function. However, high levels can lead to health problems like artery hardening, stroke, heart disease, and pancreas inflammation [R, R, R, R, R].

About 1 in 3 adults in the US may have high triglycerides. This estimate is slightly higher in older adults. Over 4 in 10 people over 60 may be affected [R].

Many health conditions can lead to high triglycerides. These include [R, R]:

- Overweight or obesity
- Low thyroid hormones (*hypothyroidism*)
- Metabolic syndrome
- Diabetes
- Chronic kidney disease
- Autoimmune diseases like lupus
- HIV infection

To help lower triglycerides, doctors may recommend [R, R]:

- Diet changes
- Avoiding alcohol
- Exercise
- Weight loss
- Omega-3s
- Medication

Genetically higher triglyceride levels are likely causally associated with:

- Heart health [R, R, R, R]
- High blood pressure [R]
- Heart attack [R]
- Low mood [R, R]
- Gout [R]
- Kidney Health [R, R, R (null)]
- Parkinson's (lower risk) [R]
- Bone health [R]
- Pancreas inflammation [R, R]
- Fatty liver [R]
- Age-related macular degeneration (lower risk) [R, R]
- Joint pain [R]
- Psoriasis [R]

Up to 45% of differences in people's triglyceride levels may be attributed to genetics. Genes involved in high triglycerides may influence fat metabolism. They include [R, R]:

- BUD13
- APOC3
- APOA5
- GCKR
- LPL
- ZPR1

Genetically higher fasting insulin may be causally associated with high triglycerides [R].

HIGHER LEVELS

Likely higher triglyceride levels based on 17,845 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOC3	rs147210663	GG
ACACB	rs149793040	AA
ANGPTL4	rs116843064	GG
APOA4	rs12721043	CC
PAFAH1B2	rs186808413	CC
LPL	rs17091905	GG
LPL	rs117604010	GG
MLXIPL	rs71556711	CC
LPL	rs17489373	GG
MAU2	rs58542926	CC
MLXIPL	rs113296769	AA
APOB	rs533617	TT
DNAJC30	rs13242693	CC
LPL	rs75218485	TC
/	rs118204057	GG
LPL	rs268	AA
APOA5	rs3135506	GG
APOA4	rs12721041	CC
BACE1	rs116987336	GG

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

Total Cholesterol

If your doctor has ever told you that you have high cholesterol, they were either referring to [R]:

- LDL cholesterol
- Total cholesterol (LDL, HDL, and VLDL)

Some risk factors for high cholesterol include [R, R]:

- A diet high in saturated fat
- Obesity
- Lack of exercise
- Older age
- **Genetics**

If your cholesterol levels rise, your doctor will recommend strategies for lowering them. These may include [R]:

- A diet low in saturated fat (such as the Mediterranean diet)
- Exercise
- Losing excess weight
- Cholesterol-lowering medication

How well you respond to these strategies may, in part, depend on your genes.

Up to 65% of differences in cholesterol levels may be attributed to genetics. Genes that may contribute to high cholesterol influence [R, R, R, R, R, R, R]:

- Cholesterol production (HMGCR)
- Cholesterol transport (APOB)
- HDL and LDL cholesterol balance (CETP, LIPC, LPL)

TYPICAL LEVELS

HIGHER LEVELS
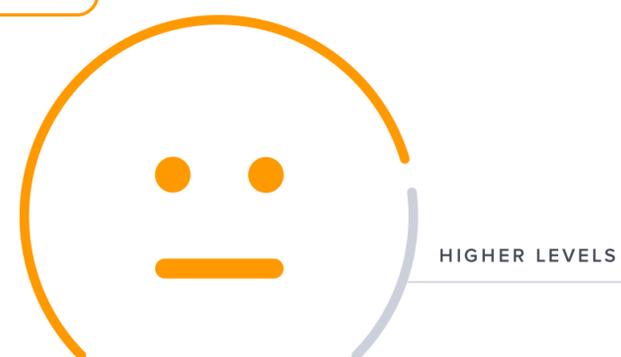
Likely typical levels of total cholesterol based on 1,290,924 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOE	rs7412	CC
PCSK9	rs11591147	GG
SLC16A11	rs186021206	GG
DNAJB14	rs140280172	CC
MINK1	rs79202680	GG
SORT1	rs12740374	GG
HNF4A	rs1800961	CC
APOB	rs562338	GG
SMARCA4	rs142158911	AG
FLT3	rs76428106	TT
PPP1R3B	rs9987289	GG
KIF13B	rs117139027	GG
HMGCR	rs12916	CC
CD300LG	rs72836561	CC
SEZ6	rs72817635	CC
SLC39A8	rs13107325	CC
GATA6	rs79120103	AA
LCAT	rs4986970	AA
HAVCR2	rs12657266	TT

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

High Cholesterol

Key Takeaways:

● Up to **65%** of people's differences in cholesterol levels may be due to genetics.
● Other risk factors include a diet high in saturated fat, obesity, lack of exercise, older age, smoking, and diabetes.
● If you have high genetic risk, monitoring your cholesterol levels and taking action on modifiable risk factors can reduce your overall risk. If your genetic risk is low but you are testing high or have several risk factors, you may want to take action now.
● Click the **Recommendations** tab for potential dietary and lifestyle changes and **next steps** for relevant labs.

People think of cholesterol as being bad, but it's actually essential. Cholesterol gives shape to all of your cells. Your body also uses it to make vitamin D and some types of hormones [R].

There are two major types of cholesterol: LDL and HDL. We call HDL "good cholesterol" because it helps your liver get rid of excess cholesterol. On the other hand, LDL cholesterol is "bad" because it can stick to your blood vessels. This can cause heart problems [R, R].

If your doctor has ever told you that you have high cholesterol, they were either referring to [R]:

- LDL cholesterol
- Total cholesterol (LDL + HDL)

Some risk factors for high LDL cholesterol include [R, R]:

- A diet high in saturated fat
- Obesity
- Lack of exercise
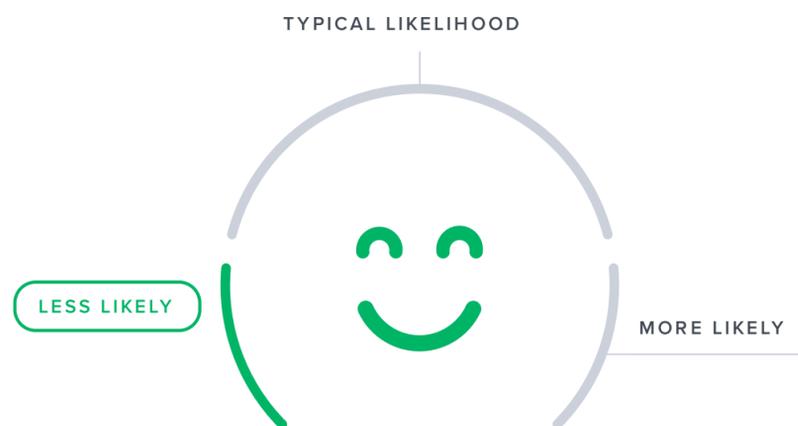- Older age
- Smoking
- Diabetes
- Family history (genetics)

If your cholesterol levels rise, your doctor will recommend strategies for lowering them. These may include [R]:

- A diet low in saturated fat
- The Mediterranean diet
- Exercise
- Losing weight

How well you respond to these strategies may depend on your genes.

Up to 65% of differences in cholesterol levels may be attributed to genetics. Genes that may contribute to high cholesterol influence [R, R, R, R, R, R]:

- Cholesterol production (LPL, LIPC, HMGCR)
- Cholesterol transport (APOB)
- HDL and LDL cholesterol balance (CETP)

TYPICAL LIKELIHOOD

LESS LIKELY

MORE LIKELY

Less likely to have high cholesterol based on 1,171,067 genetic variants we looked at

12th

PERCENTILE

Your risk is **greater than 12% of the population** and **lower than 88% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
APOE	rs7412	CC
PCSK9	rs11591147	GG
APOE	rs141622900	GG
APOE	rs7254892	GG
APOE	rs12721109	GG
LDLR	rs72658867	GG
APOE	rs62117160	GG
ABCA1	rs188308962	AA
LIPG	rs77960347	AA
/	rs12713559	GG
SNX8	rs144787122	AA
LIPG	rs117623631	CC
APOC4	rs140526515	AA
/	rs150401285	AA
NECTIN2	rs138914864	CC
NECTIN2	rs117310449	CC
NECTIN2	rs144261139	CC
NECTIN2	rs76366838	GG
APOE	rs769449	GG

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

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.

1

Maintain A Healthy Weight
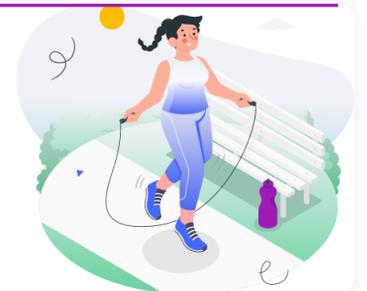
Helps with the following

Triglycerides

IMPACT	EVIDENCE
4 / 5	5 / 5

Obesity is strongly linked to high triglycerides. Being overweight throughout childhood and adulthood may triple the risk of high triglycerides [R, R].

Excess calories get converted into triglycerides and stored as fat. Losing weight by consuming fewer calories or exercising may help reduce this fat mass [R, R, R].

In people with high triglycerides, a 5-10% drop in body weight is linked to a 20% drop in triglycerides [R].

PERSONALIZED TO YOUR GENES

Your LPL gene variant is linked to higher triglycerides. Excess weight may have a stronger impact on triglycerides in people with this variant [R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs328**	/	●●●○○

HDL Cholesterol

IMPACT 4 / 5

EVIDENCE 5 / 5

Excess weight is associated with lower HDL cholesterol [R, R].

This may be because obesity is linked to inflammation. Inflammation changes the way HDL cholesterol is made and used by the body [R].

Weight loss through diet or exercise may help improve HDL cholesterol [R, R, R].

PERSONALIZED TO YOUR GENES

Maintaining a healthy weight can help balance your cholesterol by targeting many of your gene variants at once [R, R].

Your ABCA1 gene variant may be linked to higher HDL cholesterol. However, excess weight may cancel out the beneficial effect of this variant [R].

Your CETP gene variant is linked to lower HDL cholesterol. Maintaining a healthy weight may cancel out the negative effect of this variant [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2230806**	/	
GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3764261**	/	

TMAO

IMPACT 1 / 5

EVIDENCE 2 / 5

Losing weight may help reduce TMAO levels. A studied weight loss strategy to reduce TMAO levels is exercise (5x/week), especially accompanied by caloric restriction [R].

LDL Cholesterol

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●●● 5 / 5

People who are overweight or obese may be more likely to have high LDL cholesterol. Most experts recommend aiming for a BMI below 25 to support heart health [R, R, R, R].

In line with this, losing weight may help lower LDL cholesterol [R, R, R, R].

Some people may need to lose at least **5%** of their starting weight to see a drop in cholesterol. This is especially true for obese people or those with diabetes [R, R, R].

PERSONALIZED TO YOUR GENES

Maintaining a healthy weight can help prevent high LDL cholesterol by targeting many of your gene variants at once [R, R].

Your FTO variant has been linked to a higher risk of obesity. In people with this variant, weight loss may cause a bigger drop in LDL cholesterol [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs9939609**	/	●●●○○

Heart Health

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●●○ 4 / 5

Being overweight or obese may increase the odds of heart disease. **The risk may increase by 16% for every 5-unit increase in BMI** [R, R].

Experts recommend maintaining a healthy weight to prevent this condition. Doing so may help control risk factors like [R, R, R, R]:

- High blood pressure
- High blood sugar
- High cholesterol

PERSONALIZED TO YOUR GENES

Your FTO gene variant is linked to obesity and heart disease [R, R, R]. **Maintaining a healthy weight may help protect your heart.**

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs9939609**	/	●●●●○

High Blood Pressure

IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●● 5 / 5

Obesity is a major risk factor for high blood pressure [R, R].

Excessive body fat can increase your blood pressure by [R, R]:

- Damaging the blood vessels
- Worsening kidney function
- Causing insulin resistance

Blood pressure tends to improve with weight loss. Generally, the more weight you lose, the greater the improvement [R, R].

Artery Hardening

IMPACT ●●●●● 5 / 5 | EVIDENCE ●●●●○ 4 / 5

People who are obese or overweight may be at greater risk of artery hardening [R, R, R].

In those with hardened arteries, obesity may increase the risk of heart problems [R].

Experts recommend maintaining a healthy weight to help manage risk factors for artery hardening. A healthy weight supports normal [R, R, R]:

- Blood sugar
- Cholesterol levels
- Blood pressure

Eating fewer calories and exercising regularly is the best way to lose weight. Doing so may help reduce artery hardening and improve blood vessel elasticity [R, R, R, R, R, R].

PERSONALIZED TO YOUR GENES

Maintaining a healthy weight is a great way to prevent artery hardening by targeting many of your gene variants at once [R, R].

Your FTO variant is linked to a higher risk of obesity. Weight loss may reduce cholesterol more in people with this variant [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs9939609**	/	●●●○○

Total Cholesterol

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●●● 5 / 5

People who are overweight or obese may be more likely to have high cholesterol. Most experts recommend aiming for a BMI below 25 to support heart health [R, R, R, R].

In line with this, losing weight may help lower total cholesterol [R, R, R, R].

Some people may need to lose at least **5%** of their starting weight to see a drop in cholesterol. This is especially true for obese people and those with diabetes [R, R, R].

🧬 PERSONALIZED TO YOUR GENES

Maintaining a healthy weight can help prevent high cholesterol by targeting many of your gene variants at once [R, R].

Your FTO variant has been linked to a higher risk of obesity. In people with this variant, weight loss may cause a bigger drop in cholesterol [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs9939609**	/	●●●○○

ApoB

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●○○ 3 / 5

Overweight or obese people may have higher ApoB levels than slim people, especially when excessive weight is accumulated in the upper body [R, R, R].

Putting on weight may increase ApoB levels. Fortunately, losing weight through exercise, diet, or both may help reduce ApoB levels [R, R, R, R, R, R, R, R, R, R, R, R].

Heart Rate Variability

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●●○ 4 / 5

Obese people may have a lower HRV [R, R, R, R].

In line with this, losing weight may improve HRV [R, R].

Homocysteine

IMPACT ●●●○○ 3 / 5   EVIDENCE ●●●○○ 3 / 5

People with a high BMI may have higher homocysteine levels [R, R].

Losing weight through diet and exercise may help lower homocysteine levels. However, the evidence is mixed [R, R, R, R, R, R, R].

Excess body fat may increase homocysteine levels by causing inflammation and impairing homocysteine removal by the liver [R].

Varicose Veins

IMPACT ○○○○○ 0 / 5   EVIDENCE ○○○○○ 0 / 5

Lipoprotein(a)

IMPACT 1 / 5   EVIDENCE 2 / 5

Heart Rate

IMPACT 4 / 5   EVIDENCE 3 / 5

Obese people tend to have higher heart rates [R].

Losing weight may reduce heart rate by up to **9 bpm** in obese people [R, R, R].

High Cholesterol

IMPACT 4 / 5   EVIDENCE 5 / 5

People who are overweight are more likely to have high cholesterol. Most experts say to aim for a **BMI below 25** for heart health [R, R, R].

Getting to a healthy weight can decrease your total and "bad" (LDL) cholesterol [R, R].

Some people may need to lose at least **5%** of their starting weight to see a drop in cholesterol. This is especially true for obese people or those with diabetes [R, R, R].

PERSONALIZED TO YOUR GENES

Your FTO **variant has been linked to a higher risk of obesity. In people with this variant, weight loss may decrease cholesterol more [R, R].**

Maintaining a healthy weight can help prevent high cholesterol by targeting many of your gene variants at once [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs9939609**	/	

LDL Particle Size

IMPACT 4 / 5   EVIDENCE 3 / 5

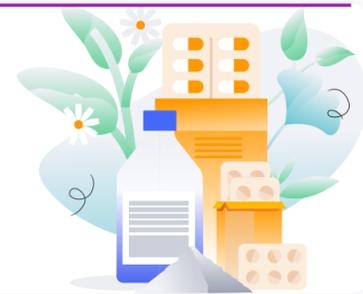**Obese people may have smaller LDL particles** [R].

In line with this, losing weight through exercise or diets may help increase LDL particle size. **Diets low in carbohydrates may be more effective than those low in fat** [R, R, R, R, R, R, R, R, R, R, R].

Weight loss may help by enhancing fat breakdown [R].

2 Vitamin D

Helps with the following

Triglycerides

IMPACT ●●○○○ 2 / 5   EVIDENCE ●●●○○ 3 / 5

Low vitamin D levels have been linked to higher blood triglycerides [R, R].

Vitamin D supplements (1000-2,000 IU/day for up to 6 months) may help lower triglycerides. However, it may only help in people who are deficient, and some people may require larger amounts. In addition, several studies did not find a clear benefit [R, R, R, R, R, R, R, R, R, R, R, R].

Vitamin D combined with calcium may also help [R].

Vitamin D may help the body make less triglycerides and increase their breakdown [R].

Please note: Experts recommend getting 600-800 IU of vitamin D per day. Medical bodies recommend against taking more than 4000 IU per day [R].

TMAO

IMPACT ●○○○○ 1 / 5   EVIDENCE ●○○○○ 1 / 5

Vitamin D (1,200 IU/day for 1 year) may decrease TMAO levels. Combining vitamin D with B vitamins may further decrease TMAO [R].

Please note: Experts recommend getting 600-800 IU of vitamin D per day. Medical bodies recommend against taking more than 4,000 IU per day [R].

HDL Cholesterol

IMPACT ○○○○○ 0 / 5   EVIDENCE ○○○○○ 0 / 5

Artery Hardening

IMPACT ●●○○○ 2 / 5   EVIDENCE ●●●○○ 3 / 5

Vitamin D deficiency is associated with artery hardening [R, R, R].

In line with this, vitamin D (2,000-4,000 IU/day for at least 12 weeks) may help with artery hardening by improving blood vessel function [R, R].

However, not all studies found this benefit [R, R].

Please note: Experts recommend getting 600-800 IU of vitamin D per day. Medical bodies recommend against taking more than 4,000 IU per day [R].

ApoB

IMPACT ●●○○○ 2 / 5   EVIDENCE ●●●○○ 3 / 5

Low vitamin D is associated with higher ApoB levels. However, one study did not find an association [R, R, R, R, R, R, R].

In line with this, vitamin D may help reduce ApoB levels, especially in people with vitamin D deficiency. One study did not find this benefit [R, R, R].

Please note: Experts recommend getting 600-800 IU of vitamin D per day. Medical bodies recommend against taking more than 4,000 IU per day [R].

Homocysteine

IMPACT **2** / 5   EVIDENCE **2** / 5

Low vitamin D levels may increase the risk of elevated homocysteine levels. In line with this, vitamin D sufficiency may be protective [R, R].

Supplementation with vitamin D (up to 4,000 IU/day or 28,000 IU/week) may lower homocysteine levels [R, R, R].

Vitamin D may also help in combination with exercise [R].

Please note: *Experts recommend getting 600-800 IU of vitamin D per day. Medical bodies recommend against taking more than 4,000 IU per day* [R].
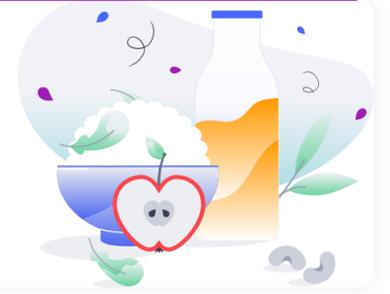
Total Cholesterol

IMPACT **0** / 5   EVIDENCE **0** / 5

LDL Cholesterol

IMPACT **0** / 5   EVIDENCE **0** / 5

High Cholesterol

IMPACT **0** / 5   EVIDENCE **0** / 5

3

Pistachios

TMAO

IMPACT		EVIDENCE	
●○○○○○	1 / 5	●○○○○○	1 / 5

Pistachios (60 g/day for 4 months) may reduce TMAO levels [R].

HDL Cholesterol

IMPACT		EVIDENCE	
○○○○○○	0 / 5	○○○○○○	0 / 5

Triglycerides

IMPACT		EVIDENCE	
○○○○○○	0 / 5	○○○○○○	0 / 5

Heart Rate Variability

IMPACT		EVIDENCE	
●○○○○○	1 / 5	●○○○○○	1 / 5

Recommendation References: [R]

High Blood Pressure

IMPACT		EVIDENCE	
○○○○○○	0 / 5	○○○○○○	0 / 5

Total Cholesterol

IMPACT		EVIDENCE	
○○○○○○	0 / 5	○○○○○○	0 / 5

LDL Cholesterol

IMPACT		EVIDENCE	
○○○○○○	0 / 5	○○○○○○	0 / 5

High Cholesterol

IMPACT		EVIDENCE	
○○○○○○	0 / 5	○○○○○○	0 / 5

4 🌱

Tomato
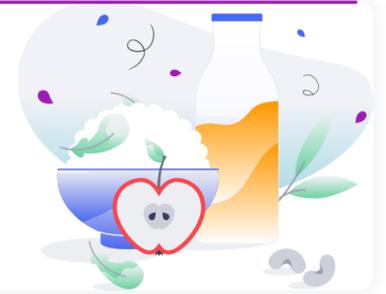
Helps with the following

😣 Triglycerides

IMPACT	EVIDENCE
⬤⬤⬤⚫⚫ 3 / 5	⬤⬤⬤⚫⚫ 3 / 5

Recommendation References: [R, R, R, R, R, R]

😣 TMAO

IMPACT	EVIDENCE
⬤⚫⚫⚫⚫ 1 / 5	⬤⚫⚫⚫⚫ 1 / 5

Recommendation References: [R]

😣 HDL Cholesterol

IMPACT	EVIDENCE
⚫⚫⚫⚫⚫ 0 / 5	⚫⚫⚫⚫⚫ 0 / 5

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.*

😐 LDL Cholesterol

IMPACT	EVIDENCE
⬤⬤⬤⚫⚫ 3 / 5	⬤⬤⬤⚫⚫ 3 / 5

Recommendation References: [R, R, R, R, R, R]

😐 Total Cholesterol

IMPACT	EVIDENCE
⬤⬤⬤⚫⚫ 3 / 5	⬤⬤⬤⚫⚫ 3 / 5

Recommendation References: [R, R, R, R, R, R]

😐 Heart Health

IMPACT	EVIDENCE
⬤⬤⚫⚫⚫ 2 / 5	⬤⬤⬤⚫⚫ 3 / 5

Recommendation References: [R, R]

😐 Artery Hardening

IMPACT	EVIDENCE
⬤⬤⚫⚫⚫ 2 / 5	⬤⬤⬤⚫⚫ 3 / 5

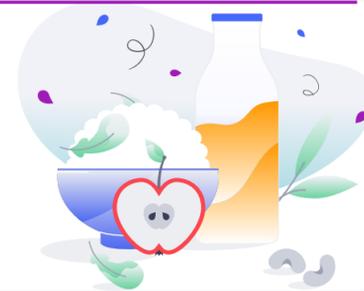Tomatoes may help with artery hardening by [R, R]:

- Maintaining healthy blood vessel function
- Lowering "bad" cholesterol

Lycopene found in tomatoes may also help by reducing blood pressure. Higher blood levels of lycopene are also linked to a lower risk of artery hardening [R, R].

5

Paleo Diet

TMAO

	IMPACT		EVIDENCE	
		0 / 5		0 / 5

Recommendation References: [R]

HDL Cholesterol

	IMPACT		EVIDENCE	
		0 / 5		0 / 5

Triglycerides

	IMPACT		EVIDENCE	
		0 / 5		0 / 5

Total Cholesterol

	IMPACT		EVIDENCE	
		3 / 5		3 / 5

Recommendation References: [R, R, R, R]

High Blood Pressure

	IMPACT		EVIDENCE	
		0 / 5		0 / 5

LDL Cholesterol

	IMPACT		EVIDENCE	
		0 / 5		0 / 5

High Cholesterol

	IMPACT		EVIDENCE	
		0 / 5		0 / 5

Exercise

Helps with the following

☹ **Triglycerides**

IMPACT ●●●○○ 3 / 5   EVIDENCE ●●●●● 5 / 5
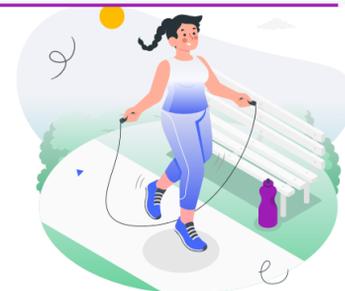
Inactive people tend to have higher triglycerides [R, R, R].

Regular exercise is one of the best ways to decrease triglycerides. It helps burn calories and helps your body break down triglycerides. **Experts recommend at least 30 minutes of physical activity a day, on all or most days of the week** [R, R, R].

Types of exercise that may help include:

- **Cardio** (at least 150 min/week) [R, R, R, R, R, R]
- **Resistance training** [R, R, R]
- **Yoga** [R, R, R, R, R, R]
- **Tai chi** [R, R]

Vigorous cardio may work better than moderate cardio. For example, running may help more than brisk walking [R, R, R].

Combining exercise with diet changes may produce even better results [R, R].

⚕ PERSONALIZED TO YOUR GENES

Cardio may reduce triglycerides more in people with your LPL gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs283**	/	●●●○○

HDL Cholesterol

IMPACT	EVIDENCE
●●●○○ 3 / 5	●●●●● 5 / 5

Exercise is an easy and effective way to raise HDL cholesterol. Experts recommend getting 30 minutes of exercise 5 times a week for optimal results [R, R].

Cardio, strength training, and aquatic exercise may all help raise HDL cholesterol [R, R, R, R].

Not all studies found this benefit [R, R, R].

PERSONALIZED TO YOUR GENES

Exercise is a great way to balance your cholesterol by targeting many of your gene variants at once [R, R].

Exercise may raise HDL cholesterol more in people with your ACADS **gene variant** [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2014355**	/	●●●●○

Heart Rate Variability

IMPACT	EVIDENCE
●●●●○ 4 / 5	●●●●● 5 / 5

Regular exercise is associated with a higher HRV [R, R].

Different exercise types may help increase HRV, including [R, R, R, R]:

- Aerobic exercise
- High-intensity interval training (HIIT)
- Medium-intensity interval training (MIIT)
- Strength training

Aerobic exercise may offer the greatest benefit and strength training the smallest one [R, R]

People that may benefit the most from exercise are those who are [R, R, R, R]:

- Young
- Sedentary

HRV may increase the most by exercising at least 3x/week for at least 12 weeks [R, R, R].

Exercise is a great way to lower your blood pressure. A single exercise session can lower your blood pressure for up to 24 hours. These benefits also add up over time [R].

The type of exercise is less important. Aquatic exercise, stretching, brisk walking, tai chi, etc. are all effective [R, R, R, R, R]. **In general, choose something that you like, because you'll be more likely to stick to it!**

🧬 PERSONALIZED TO YOUR GENES

Many of your genetic variants influence blood pressure. Exercising is a great way for you to target many of them at the same time [R].

People with your NOS3 gene variant may see a bigger reduction in blood pressure from cardio [R].

People with your SCAP gene variant may have a higher blood pressure if they don't exercise [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs1799983**	/	●●●○○
/	**rs12487736**	/	●●●○○

Heart Health

IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●● 5 / 5

Experts agree that exercising helps reduce the risk of heart disease [R, R, R].

It likely helps control [R, R, R, R, R, R]:

- Weight
- Blood sugar
- Cholesterol
- Blood pressure
- Inflammation

Guidelines recommend a combination of [R, R, R]:

- **Cardio**: at least 150 min/week of moderate activity or 75 min/week of intense activity
- **Strength training:** 2 times/week

Strength and endurance training may help by improving heart function. Other forms of exercise that tend to help include cycling and tai chi [R, R, R, R].

In people who already have heart disease, exercise may prevent complications and hospital visits. It may even boost the quality of life [R, R, R, R, R].

Please note: *If you have heart disease, speak to your doctor before changing your exercise regimen.*

PERSONALIZED TO YOUR GENES

Exercise is a great way to prevent heart disease. It targets many of your gene variants at once [R].

Varicose Veins

IMPACT ●●●○○ 3 / 5 | EVIDENCE ●●●○○ 3 / 5

Regular exercise may prevent varicose veins from developing [R].

Experts recommend getting more exercise to help prevent and improve varicose veins. Walking more may be a good option [R, R, R, R].

Exercise may also help in combination with compression therapy. These two strategies may reduce chronic vein problems and improve quality of life. They may also help heal skin wounds [R, R, R].

However, the benefits of exercise for chronic vein problems need more research [R, R].

Exercise may help by promoting blood flow in the legs [R, R, R, R, R].

PERSONALIZED TO YOUR GENES

Your PIEZO1 gene variant is linked to higher odds of varicose veins. This gene likely affects blood flow. Exercise may help by improving blood flow in the legs [R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2911463**	/	●○○○○

LDL Cholesterol

IMPACT ●●●○○ 3 / 5   EVIDENCE ●●●●● 5 / 5

Exercise is one of the best things you can do to lower LDL cholesterol. Experts say you should get 150 minutes of exercise a week to help lower cholesterol [R, R, R, R].

Many types of exercise may help lower LDL cholesterol. These include:

- Aerobic exercise [R, R, R, R]
- Strength training [R, R]
- Aquatic exercise [R]
- Low-intensity exercise, such as tai chi and yoga [R, R, R]

Working out for longer and doing harder exercises may help with LDL cholesterol even more [R, R, R, R].

Exercise may also be more effective when combined with a healthy diet [R, R].

Exercise may help lower LDL cholesterol by helping your muscles use fat as energy [R].

🧬 PERSONALIZED TO YOUR GENES

Exercise is a great way to reduce your LDL cholesterol by targeting many of your gene variants at once [R, R].

Exercise may reduce LDL cholesterol more in people with your PPARGC1A **gene** [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs8192678**	/	●●●○○

People who don't move a lot may have a higher risk of artery hardening. On the other hand, **all types of exercise, from light to vigorous, are linked to better blood vessel function** [R].

Experts agree that regular exercise is one of the best ways to reduce the risk of artery hardening. **They recommend being active for at least 30 minutes, at least 5 days per week** [R, R, R].

Exercise may also help people at high risk for artery hardening. In these people, resistance training or cardio may help improve [R, R, R]:

- Blood flow
- Levels of fat in the blood
- Blood pressure
- Heart function

PERSONALIZED TO YOUR GENES

Your EDNRA **gene variant may be linked to artery hardening, but only in people who don't exercise** [R].

Your EDNRB **gene variant may be linked to artery hardening, but only in people who don't exercise** [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs5333**	/	●●●○○
/	**rs5351**	/	●●●○○

Low Blood Pressure

IMPACT ●●○○○ 2 / 5   EVIDENCE ●●○○○ 2 / 5

Walking after eating may prevent blood pressure drops after meals [R, R].

Regular exercise, especially cardio, may also help people whose blood pressure drops when standing up [R, R, R].

Exercise may help by increasing heart rate [R, R].

Please note: *Avoid exercising when it is hot or humid. Exercises that require you to quickly change positions may trigger symptoms of low blood pressure. Talk to your doctor before starting a new exercise regimen* [R].

🧬 PERSONALIZED TO YOUR GENES

People with your LRRTM1 gene variant may be more prone to drops in blood pressure when they stand up. Regular exercise may help with these drops [R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs6736587**	/	●○○○○

Total Cholesterol

IMPACT ●●●○○ 3 / 5   EVIDENCE ●●●●● 5 / 5

Exercise is an effective way to improve your heart health. Experts recommend 150 minutes of exercise a week to help lower cholesterol [R, R, R, R].

Many types of exercise may help lower total cholesterol. These include:

- Cardio [R, R, R, R]
- Strength training [R, R]
- Water exercise [R]
- Low-intensity exercise, such as tai chi and yoga [R, R, R, R]

Exercising for longer and doing harder exercises may help with total cholesterol even more [R, R, R, R].

Exercise may also be more effective when combined with a healthy diet [R, R].

Exercise may help lower total cholesterol by helping your muscles use fat as energy [R].

🧬 PERSONALIZED TO YOUR GENES

Exercise is a great way to reduce your cholesterol by targeting many of your gene variants at once [R, R].

Exercise may reduce cholesterol more in people with your PPARGC1A gene [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs8192678**	/	●●●○○

ApoB

IMPACT ●●●●○ 4 / 5   **EVIDENCE** ●●●○○ 3 / 5

People who exercise and are fitter tend to have lower ApoB levels [R, R, R, R, R, R, R, R, R, R, R].

Increasing physical activity, even by standing or walking instead of sitting may reduce ApoB levels [R, R].

From brisk walking to high-intensity training, **all types of exercise (for 2-9 months) may lower ApoB levels**. Combining aerobic and strength training may offer a greater benefit than aerobic exercise alone [R, R, R, R, R, R, R, R, R, R, R, R, R].

Hemorrhoids

IMPACT ○○○○○ 0 / 5   **EVIDENCE** ○○○○○ 0 / 5

Lipoprotein(a)

IMPACT ●○○○○ 1 / 5   **EVIDENCE** ●●○○○ 2 / 5

Heart Rate Recovery

IMPACT ●●●●● 5 / 5   **EVIDENCE** ●●●●○ 4 / 5

While all types of exercise help improve HRR, **cardio may be most effective** [R, R, R, R].

Physically fit people also have better HRR after psychological stress [R, R].

PERSONALIZED TO YOUR GENES

Exercise may offer greater HRR improvements in people with your CHRM2 gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs324640**	/	●●●○○

Heart Rate

IMPACT ●●●●○ 4 / 5   **EVIDENCE** ●●●●● 5 / 5

The following types of exercise can help reduce heart rate:

- **Yoga** (by 5-7 bpm) [R, ,R, R, R]
- **Cardio** (by 3-7 bpm) [R, R, R, R, R]
- **Recreational sports** (by 5-6 bpm) [R, R, R]
- **HIIT** (by 3 bpm) [R, R]
- **Strength training** (by 2 bpm, in women only) [R]
- **Stretching** (by 1 bpm) [R]

Moderate exercise may also reduce heart rate in the following groups of people:

- Pregnant women [R]
- Women with PCOS [R, R]
- People recovering from bariatric surgery [R, R, R]
- Older people [R, R]
- People with high blood pressure and heart disease [R, R, R, R, R]
- People with type 2 diabetes (but not type 1) [R, R, R]

High Cholesterol

IMPACT	EVIDENCE
●●●○○ 3 / 5	●●●●● 5 / 5

Exercise is one of the best things you can do to lower cholesterol [R, R, R].

Exercise can help you burn fat and boost HDL or "good" cholesterol [R, R].

People who exercise for at least 150 minutes per week tend to have lower cholesterol. All types of exercise are helpful. In fact, strength and endurance training have about the same effect on cholesterol [R, R, R, R].

Low-intensity exercise, such as tai chi and yoga, may reduce cholesterol as well [R, R, R, R].

Exercise works especially well if you also eat a healthy diet [R, R, R, R].

PERSONALIZED TO YOUR GENES

Exercise is a great way to reduce your cholesterol by targeting many of your gene variants at once [R, R].

Exercise may reduce cholesterol more in people with your PPARGC1A gene [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs8192678**	/	●●●○○

LDL Particle Size

IMPACT	EVIDENCE
●●●○○ 3 / 5	●●●○○ 3 / 5

Physical inactivity is associated with smaller LDL particles [R].

Similarly, **regular exercise reduces the amount of small LDL particles while increasing the average LDL particle size** [R].
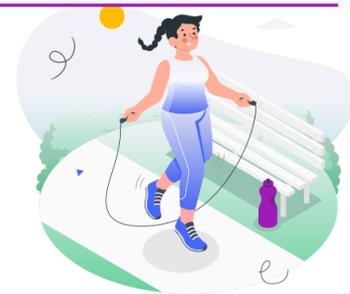
Aerobic exercise may be most effective at increasing LDL particle size in the long term. However, a single bout of exercise may be ineffective [R, R, R].

Other exercise types that may help include:

- Walking [R]
- Tai chi [R]

Exercise may help by modifying fat metabolism to produce fewer small LDL particles [R].

Avoid Cigarette Smoke

Helps with the following

Triglycerides

IMPACT **2** / 5   EVIDENCE **3** / 5

Smokers may have higher triglycerides. Studies show that triglyceride levels rise when people smoke more [R, R, R].

This may be because triglyceride breakdown is impaired in smokers [R].

HDL Cholesterol

IMPACT **4** / 5   EVIDENCE **5** / 5

Smoking cigarettes is linked to lower HDL cholesterol. This may be because smoking lowers HDL cholesterol production [R, R, R, R, R].

Experts recommend quitting smoking to help raise HDL cholesterol and improve heart health. This is especially true if weight gain is prevented after quitting [R, R, R].

Quitting can raise HDL cholesterol in just 3-6 weeks [R].

PERSONALIZED TO YOUR GENES

Smoking may reduce HDL cholesterol more in people with your ABCG8 **gene variant** [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs4148217**	/	

High Blood Pressure

IMPACT ●●●●● 5 / 5 **EVIDENCE** ●●●●● 5 / 5

Smoking narrows your blood vessels and increases your blood pressure [R, R, R, R].

Electronic cigarettes with nicotine may also raise blood pressure, but to a lesser extent [R, R].

Even passive smoke exposure may increase blood pressure in children and adolescents [R].

PERSONALIZED TO YOUR GENES

Cigarette smoke may have a stronger effect on blood pressure in people with your MN1 variant [R]. **Take special care to avoid cigarette smoke.**

Your *MTHFR* gene variant may be linked to higher blood pressure in smokers [R]. **Do your best to avoid cigarette smoke.**

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs133980**	/	●●●●○
MTHFR	**rs1801133**	/	●●●○○

Varicose Veins

IMPACT ●●○○○ 2 / 5 **EVIDENCE** ●●●○○ 3 / 5

Some experts recommend avoiding cigarettes to help with varicose veins [R].

Cigarette smoke can increase inflammation and damage blood vessels. **Smoking may increase the risk of chronic vein problems, such as varicose veins and open skin sores** [R, R, R, R, R, R].

However, the evidence is mixed. Many studies didn't find a link between cigarettes and chronic vein problems [R, R, R, R, R].

PERSONALIZED TO YOUR GENES

Your CASZ1 gene variant is linked to higher odds of varicose veins. It likely affects blood vessel function. Cigarette smoke may impair blood vessel function, so make sure to avoid it [R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs11121615**	/	●○○○○

Heart Health

IMPACT ●●●●● 5 / 5   EVIDENCE ●●●●● 5 / 5

Experts agree that tobacco increases the risk of heart disease [R, R, R, R, R].

This is because nicotine and other harmful substances in tobacco [R, R, R]:

- Damage blood vessels
- Promote blood clots
- Decrease blood flow
- Increase blood pressure

In fact, smoking as little as **1 cigarette per day** may increase the risk of heart disease by about **50%**. Secondhand smoke likely increases the risk by **up to 35%** [R, R, R, R, R, R, R].

Therefore, one of the best things you can do to prevent heart disease is to quit smoking. Once diagnosed with heart disease, quitting smoking may prevent a heart attack and early death [R, R, R, R, R].

Smokeless tobacco and e-cigarettes are likely bad for your heart, too. Smokeless tobacco in particular is linked to higher odds of dying from heart disease, especially in Europeans [R, R].

🧬 PERSONALIZED TO YOUR GENES

Your ADAMTS7 gene variant is linked to better heart health. Smoking may reduce this protective effect [R].

Cigarette smoke may contribute to heart disease by targeting many of your gene variants at once [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs7178051**	/	●●●●●

Palpitations

IMPACT ●●●○○ 3 / 5   EVIDENCE ●●●●○ 4 / 5

Tobacco product use is linked to an increased risk of palpitations. This may be because nicotine can cause fast and irregular heartbeats [R, R, R, R, R, R, R].

It's a good idea to avoid tobacco products to help with palpitations [R].

Artery Hardening

IMPACT	EVIDENCE
●●●●○ 4 / 5	●●●●● 5 / 5

Smoking is linked to artery hardening. Smokers may be up to three times more likely to develop the condition [R, R, R, R].

Smoking is a major risk factor for [R, R, R]:

- Plaque buildup
- Thickened blood vessel walls
- Narrowed arteries

Secondhand smoke can also damage the arteries [R, R].

Experts strongly recommend quitting to prevent artery hardening and heart disease [R, R, R, R, R].

Quitting may help by reducing oxidative stress [R].

🧬 PERSONALIZED TO YOUR GENES

People with your NOS3 gene variant may be more prone to heart disease due to artery hardening. This variant may have a stronger effect in smokers [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs1799983**	/	●●●○○

ApoB

IMPACT	EVIDENCE
●●●○○ 3 / 5	●●●○○ 3 / 5

Smokers tend to have higher ApoB levels than non-smokers, especially if they [R, R, R, R, R, R, R, R, R, R, R]:

- Are overweight
- Smoke over 20 cigarettes/day
- Have smoked for over 5 years

Secondhand smoke is also associated with higher ApoB levels [R].

Heart Rate Variability

IMPACT	EVIDENCE
●●○○○ 2 / 5	●●○○○ 2 / 5

Nicotine, a chemical in cigarettes, may reduce HRV by decreasing vagus nerve activity [R, R].

In line with this, **smoking cessation (for at least 1 month) may increase HRV** [R, R].

Homocysteine

IMPACT	EVIDENCE
●●●○○ 3 / 5	●●●○○ 3 / 5

Smokers may have higher homocysteine levels, especially heavy smokers or those smoking for longer periods [R, R, R, R, R, R, R].

Secondhand exposure to cigarette smoke may also increase homocysteine levels, especially when combined with air pollution exposure [R, R, R, R].

Giving up smoking may lower homocysteine levels. However, simply smoking less may be ineffective [R].

Total Cholesterol

IMPACT	EVIDENCE
○○○○○ 0 / 5	○○○○○ 0 / 5

LDL Cholesterol

IMPACT ⬜⬜⬜⬜⬜ 0 / 5 | EVIDENCE ⬜⬜⬜⬜⬜ 0 / 5

Lipoprotein(a)

IMPACT 🟣⬜⬜⬜⬜ 1 / 5 | EVIDENCE 🟣⬜⬜⬜⬜ 1 / 5

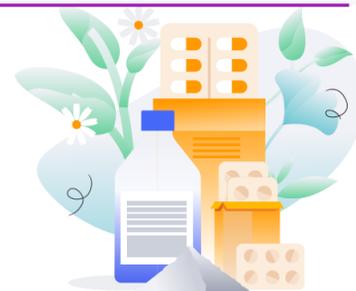**Heart Rate**

IMPACT 🟣🟣🟣🟣⬜ 4 / 5 | EVIDENCE 🟣🟣🟣🟣⬜ 4 / 5

Smoking **over 20 cigarettes/day** can increase heart rate by **7 bpm.** Even smoking just 1 cigarette/day may slightly raise heart rate [R].

E-cigarette and waterpipe smoking may have similar effects. Replacing classical cigarettes with them may not benefit heart rate [R, R, R, R, R].

Krill Oil

Helps with the following

		IMPACT	EVIDENCE
😠	**TMAO**	0 / 5	0 / 5
😠	**HDL Cholesterol**	0 / 5	0 / 5
😠	**Triglycerides**	3 / 5	3 / 5
😐	**LDL Cholesterol**	0 / 5	0 / 5

Salmon

Helps with the following

Triglycerides

IMPACT 1 / 5   EVIDENCE 1 / 5
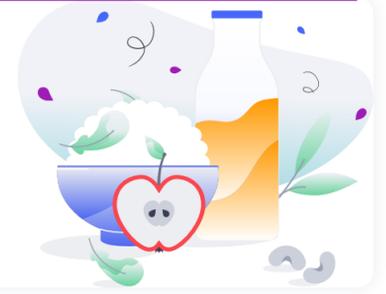
Recommendation References: [R, R, R, R, R]

HDL Cholesterol

IMPACT 1 / 5   EVIDENCE 1 / 5

Recommendation References: [R]

Heart Rate

IMPACT 1 / 5   EVIDENCE 1 / 5

Recommendation References: [R]

10 Aerobic Exercise (Cardio)
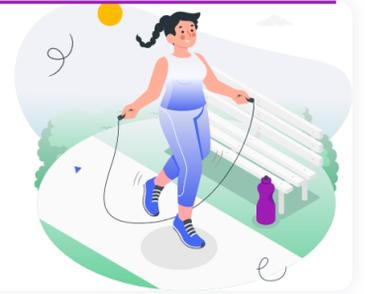
Helps with the following

	IMPACT	EVIDENCE
HDL Cholesterol	0 / 5	0 / 5
Triglycerides	0 / 5	0 / 5
ApoB	0 / 5	0 / 5
Heart Health	4 / 5	4 / 5
Artery Hardening	3 / 5	3 / 5
High Blood Pressure	0 / 5	0 / 5
Heart Rate Variability	0 / 5	0 / 5
Total Cholesterol	0 / 5	0 / 5
LDL Cholesterol	0 / 5	0 / 5

Heart Rate Recovery

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●●○ 4 / 5

While all types of exercise help improve HRR, **cardio may be most effective** [R, R, R, R].

It may improve HRR in healthy people and those with certain health conditions, including [R, R, R, R, R, R]:

- Coronary artery disease (by 5.5 bpm)
- Heart failure (by 6 bpm)
- Lung disease (COPD)

PERSONALIZED TO YOUR GENES

Cardio may offer greater HRR improvements in people with your CHRM2 gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs324640**	/	●●●○○

Heart Rate

IMPACT ●●●●○ 4 / 5   EVIDENCE ●●●●○ 4 / 5

Regular cardio exercise can reduce heart rate **by 3-7 bpm**. It may help both alone and in combination with strength training. Helpful cardio workouts include [R, R, R]:

- Running
- Swimming
- Nordic and brisk walking

Moderate cardio may also reduce heart rate in the following groups [R, R]:

- Older people [R, R]
- People with high blood pressure [R, R]
- People with heart disease [R, R]

*Please note: Your heart rate **temporarily increases** while you work out. Some types and levels of cardio may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen [R].*

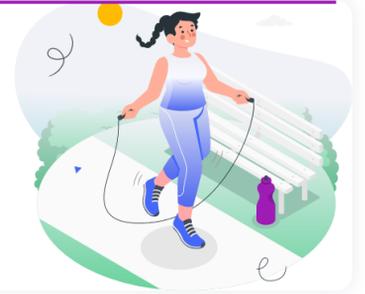## High Cholesterol

IMPACT ●●●●● 0 / 5   EVIDENCE ●●●●● 0 / 5

LDL Particle Size

IMPACT ●●●●● 0 / 5   EVIDENCE ●●●●● 0 / 5

11 High-Intensity Interval Training (HIIT)

Helps with the following

Triglycerides

IMPACT	EVIDENCE
0 / 5	0 / 5

HDL Cholesterol

IMPACT	EVIDENCE
3 / 5	2 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R, R]

Artery Hardening

IMPACT	EVIDENCE
4 / 5	3 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R, R]

High Blood Pressure

IMPACT	EVIDENCE
3 / 5	4 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R, R, R, R, R]

Total Cholesterol

IMPACT	EVIDENCE
3 / 5	2 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R, R]

LDL Cholesterol

IMPACT	EVIDENCE
3 / 5	2 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R, R]

Heart Rate Recovery

IMPACT	EVIDENCE
1 / 5	1 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R]

Heart Health

IMPACT ●●○○○ 2 / 5   **EVIDENCE** ●●●○○ 3 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R, R, R]

High Cholesterol

IMPACT ●●●○○ 3 / 5   **EVIDENCE** ●●○○○ 2 / 5

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].
Recommendation References: [R], [R]

Heart Rate

IMPACT ●●●○○ 3 / 5   **EVIDENCE** ●●●○○ 3 / 5

Practicing HIIT may reduce heart rate by **3 bpm** in healthy people [R, R].

It may also be beneficial in overweight people and those with a high blood pressure [R, R].

Please note: *Your heart rate **temporarily increases** while you work out. Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].

Mediterranean Diet

Helps with the following

😣 Triglycerides

IMPACT ●●○○○ **2** / 5 | EVIDENCE ●●●○○ **3** / 5
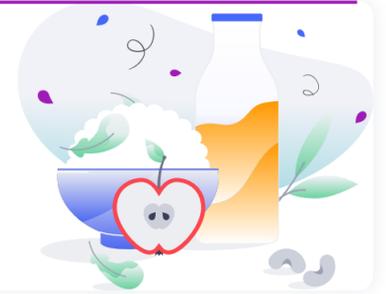
The Mediterranean diet may lower triglycerides because it is [R, R, R, R]:

- High in fiber
- High in omega-3s
- Low in sugar

Combining the Mediterranean diet with exercise may work even better [R].

🧬 **PERSONALIZED TO YOUR GENES**

Your FTO gene variant is linked to higher blood sugar. Following the Mediterranean diet may cancel out the effects of this variant on blood sugar [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs9939609**	/	●●●●○

😣 HDL Cholesterol

IMPACT ●●○○○ **2** / 5 | EVIDENCE ●●●○○ **3** / 5

Experts recommend a healthy diet to help improve cholesterol levels and heart health. The Mediterranean diet is one good option [R, R].

The Mediterranean diet contains healthy fats and fiber-rich foods that may help improve HDL cholesterol. Although smaller studies had mixed results, a very large review suggests that this diet may increase HDL cholesterol. However, the effects are modest [R, R, R, R].

This diet gets extra points for also lowering "bad" cholesterol (LDL) and greatly decreasing the risk of heart disease [R, R, R, R, R, R, R, R].

The Mediterranean diet may help even more when combined with exercise [R].

😐 High Blood Pressure

IMPACT ●●○○○ **2** / 5 | EVIDENCE ●●●○○ **3** / 5

The Mediterranean diet is well-known as a "heart-healthy" diet. Studies have shown it can help decrease blood pressure and prevent heart disease [R, R, R].

😐 Total Cholesterol

IMPACT ●●○○○ **2** / 5 | EVIDENCE ●●●●○ **4** / 5

The Mediterranean diet may be one of the most helpful diets to lower total cholesterol [R, R, R, R, R, R].

This diet may be a great choice because it is:

- Low in saturated fat [R]
- Focused on healthy fat sources like olive oil and fish [R, R]

Heart Health

	IMPACT	EVIDENCE
	🟣🟣🟣🟣⚪ 4 / 5	🟣🟣🟣🟣⚪ 4 / 5

European experts recommend the Mediterranean diet for heart disease [R].

Following the Mediterranean diet may reduce your chances of getting heart disease by **about 30%** [R, R, R, R, R].

The Mediterranean diet limits foods that can contribute to heart disease. Instead, it promotes the intake of healthy fats and fiber. As a result, this type of diet may **reduce inflammation and protect the heart** [R, R].

LDL Cholesterol

	IMPACT	EVIDENCE
	🟣🟣⚪⚪⚪ 2 / 5	🟣🟣🟣⚪⚪ 3 / 5

The Mediterranean diet may help lower LDL cholesterol. However, the evidence is mixed [R, R, R, R, R, R].

The Mediterranean diet may be a good choice because it is:

- Low in saturated fat [R]
- Focused on healthy fat sources like olive oil and fish [R]
- Rich in fiber [R]

Experts agree that the Mediterranean diet may help reduce the risk of heart disease [R, R, R].

Artery Hardening

	IMPACT	EVIDENCE
	🟣🟣🟣🟣⚪ 4 / 5	🟣🟣🟣🟣⚪ 4 / 5

Following the Mediterranean diet may decrease the risk of artery hardening. It may also improve blood vessel function in those with the condition. This diet may help alone or enriched with nuts [R, R, R, R, R, R].

A healthy diet that contains fresh fruit, vegetables, whole grains, and nuts may help [R, R, R, R, R, R, R, R]:

- Reduce plaque build-up
- Lower blood pressure
- Maintain a healthy weight
- Decrease levels of fat in the blood
- Reduce inflammation and oxidative stress

ApoB

	IMPACT	EVIDENCE
	🟣🟣⚪⚪⚪ 2 / 5	🟣🟣🟣⚪⚪ 3 / 5

Following the Mediterranean diet (for 4-12 weeks) may lower ApoB levels [R, R, R, R, R].

Adding olive oil (4-10 g/day for 2-12 weeks), one of the important ingredients of the Mediterranean diet, may also help [R, R, R].

Lipoprotein(a)

	IMPACT	EVIDENCE
	🟣⚪⚪⚪⚪ 1 / 5	🟣⚪⚪⚪⚪ 1 / 5

High Cholesterol

	IMPACT	EVIDENCE
	🟣🟣🟣⚪⚪ 3 / 5	🟣🟣🟣🟣⚪ 4 / 5

The Mediterranean diet may lower total and "bad" cholesterol (LDL) [R, R, R].

Overweight or obese men may reap the most benefits from this type of diet [R].

Studies suggest that the Mediterranean diet may be better than a low-fat, vegetarian, or Paleo diet at improving cholesterol [R, R, R].

What makes the Mediterranean diet a great choice?

- It's low in saturated fat [R]
- It focuses on healthy fat sources like olive oil and fish [R]
- It's rich in fiber [R]

LDL Particle Size

Eating a Mediterranean diet may slightly reduce small LDL levels and increase average LDL particle size. This diet may be more effective if it's enriched in extra virgin olive oil or nuts [R, R, R, R].

The Mediterranean diet may be a good choice because it is:

- Low in saturated fat [R]
- Focused on healthy fat sources like olive oil and fish [R]
- Rich in fiber [R]

13 Strength Training
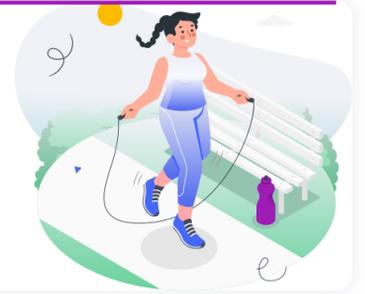
Helps with the following

	IMPACT	EVIDENCE
HDL Cholesterol	0 / 5	0 / 5
Triglycerides	0 / 5	0 / 5
Heart Health	4 / 5	4 / 5
Homocysteine	3 / 5	3 / 5

Acute exercise may slightly increase homocysteine levels in the short term. In contrast, **regular strength (but not cardio) training may lower homocysteine levels in the long term** [R, R].

	IMPACT	EVIDENCE
Artery Hardening	0 / 5	0 / 5
High Blood Pressure	0 / 5	0 / 5
ApoB	0 / 5	0 / 5
Total Cholesterol	0 / 5	0 / 5
LDL Cholesterol	0 / 5	0 / 5
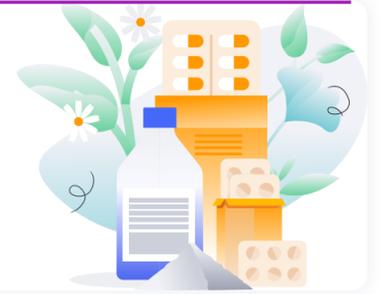
14 Niacin

Helps with the following

HDL Cholesterol

IMPACT ●●●●● 5 / 5 EVIDENCE ●●●●● 5 / 5

Niacin can increase HDL cholesterol. Studied forms include [R, R, R, R, R, R, R, R, R, R, R, R, R, R]:

- **Niacin:** 500-3,000 mg/day for 2-5 months
- **Extended-release niacin:** 500-3,000 mg/day for 2-5 months

Side effects may be more common with doses above 1,000-2,000 mg/day [R, R, R].

Niacin may help by reducing HDL clearance from the body [R, R].

Although niacin increases HDL cholesterol, this doesn't seem to benefit heart health. Niacin provides no additional benefits when added to statins [R, R, R, R].

Please note: *Niacin has been linked to liver damage and strokes. It may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking niacin unless a person can't take statins and has close medical supervision. Talk to your doctor before taking niacin [R, R, R, R, R].*

Triglycerides

IMPACT ●●●●● 0 / 5 EVIDENCE ●●●●● 0 / 5

Heart Health

IMPACT ●●●●● 1 / 5 EVIDENCE ●●●●● 1 / 5

Please note: *Niacin has been linked to liver damage and strokes. It may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking niacin unless a person can't take statins and has close medical supervision. Talk to your doctor before taking niacin [R, R, R, R, R].*

Recommendation References: [R, R, R, R]

Artery Hardening

IMPACT ●●●●● 2 / 5 EVIDENCE ●●●●● 3 / 5

Niacin (1-3 g/day for at least 6 months) may help with artery hardening by slowing down plaque build-up in the arteries [R].

Niacin may also help reduce the risk of heart disease. However, not all studies found this benefit [R, R].

Please note: *Niacin has been linked to liver damage and strokes. It may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking niacin unless a person can't take statins and has close medical supervision. Talk to your doctor before taking niacin [R, R, R, R, R].*

Total Cholesterol

IMPACT ●●●●● 3 / 5 EVIDENCE ●●●●● 3 / 5

Niacin may help reduce total cholesterol. Studied forms include:

- **Niacin:** 150-4,500 mg/day for 2-12 months [R]
- **Extended-release niacin:** 500-3,000 mg/day for 1.5-12 months [R, R, R, R]

Niacin may help by:

- Reducing how much fat is made by the liver [R, R, R]
- Increasing cholesterol removal from the blood [R, R, R]

Please note: *Niacin supplements have been linked to liver damage and strokes. They may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking them unless a person can't take statins and has close medical supervision. Talk to your doctor before supplementing [R, R, R].*

LDL Cholesterol

IMPACT ●●●○○ 3 / 5 | **EVIDENCE** ●●●●○ 4 / 5

Niacin may help reduce LDL cholesterol. Studied forms include:

- **Niacin:** 150-4,500 mg/day for 2-12 months [R, R, R, R]
- **Extended-release niacin:** 500-3,000 mg/day for 1.5-24 months [R, R, R, R, R, R, R, R, R]

Niacin may help by:

- Reducing how much fat is produced by the liver [R, R, R]
- Increasing cholesterol removal from the blood [R, R, R]

Please note: *Niacin has been linked to liver damage and strokes. It may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking niacin unless a person can't take statins and has close medical supervision. Talk to your doctor before taking niacin* [R, R, R, R, R].

ApoB

IMPACT ●●●○○ 3 / 5 | **EVIDENCE** ●●●○○ 3 / 5

Niacin (1-3 g/day for 3-12 months) may decrease ApoB levels by increasing ApoB clearance [R, R, R, R].

Please note: *Niacin has been linked to liver damage and strokes. It may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking niacin unless a person can't take statins and has close medical supervision. Talk to your doctor before taking niacin* [R, R, R, R, R].

Lipoprotein(a)

IMPACT ●●●○○ 3 / 5 | **EVIDENCE** ●●●○○ 3 / 5

LDL Particle Size

IMPACT ●●●○○ 3 / 5 | **EVIDENCE** ●●○○○ 2 / 5

Niacin greatly reduced small LDL levels in a study. However, **the treatment wasn't well tolerated by 1 out of 5 patients** [R].

Combining niacin (1000-2000 mg/day) with statins may lower small LDL levels more than statins alone [R].

Niacin may help by:

- Reducing how much fat is produced by the liver [R, R, R]
- Increasing cholesterol removal from the blood [R, R, R]

Please note: *Niacin has been linked to liver damage and strokes. It may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking niacin unless a person can't take statins and has close medical supervision. Talk to your doctor before taking niacin* [R, R, R, R, R].

High Cholesterol

IMPACT ●●○○○ 2 / 5 | **EVIDENCE** ●●●●○ 4 / 5

This vitamin may slightly lower "bad" (LDL) cholesterol levels by preventing fat buildup in your blood. **However, it is much better at raising "good" (HDL) cholesterol** [R].

Niacin supplements (500 mg/day for 3-12 months) may lower cholesterol in some people. Combining them with statins may work better than either alone [R, R, R, R].

Note: *Niacin supplements have been linked to liver damage and strokes. They may also cause flushing, bruises, and bleeding. Most doctors do not recommend taking them unless a person can't take statins. Talk to your doctor before supplementing* [R, R, R].

15 🌱

Alpha-Linolenic Acid (ALA)
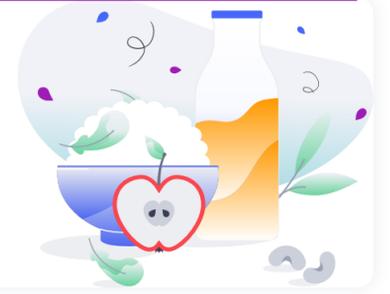
Helps with the following

		IMPACT	EVIDENCE
😦	**Triglycerides**	1 / 5	1 / 5
😐	**Heart Health**	0 / 5	0 / 5
😐	**Artery Hardening**	0 / 5	0 / 5
😐	**Total Cholesterol**	1 / 5	1 / 5
😐	**LDL Cholesterol**	1 / 5	1 / 5
😐	**High Blood Pressure**	1 / 5	1 / 5
😦	**Heart Health**	0 / 5	0 / 5

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.*
Genetically higher levels of ALA may be associated with a lower risk for ischemic heart disease [R].

		IMPACT	EVIDENCE
😊	**High Cholesterol**	1 / 5	1 / 5

16 L-Carnitine

Helps with the following

HDL Cholesterol

IMPACT 1 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R, R, R, R, R]

Triglycerides

IMPACT 0 / 5   EVIDENCE 0 / 5

High Blood Pressure

IMPACT 1 / 5   EVIDENCE 1 / 5

Recommendation References: [R, R]

Heart Health

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R, R]

LDL Cholesterol

IMPACT 2 / 5   EVIDENCE 3 / 5

L-carnitine (500-3,000 mg/day for at least 5 weeks) may help lower LDL cholesterol [R, R, R, R, R, R, R, R].

However, the evidence is mixed [R, R, R].

L-carnitine may help by increasing fat breakdown [R].

Total Cholesterol

IMPACT 2 / 5   EVIDENCE 3 / 5

L-carnitine (2,000-3,000 mg/day for 3-6 months) may help lower total cholesterol [R, R, R, R, R].

However, patients with kidney disease may not benefit [R, R, R, R].

L-carnitine may help by increasing fat breakdown [R].

ApoB

IMPACT 1 / 5   EVIDENCE 2 / 5

L-carnitine (2-3 g/day for 1-12 months) may lower ApoB levels [R, R].

However, two studies did not find this benefit [R, R].

Lipoprotein(a)

IMPACT 3 / 5   EVIDENCE 3 / 5

L-carnitine (2-3 g/day for 2-12 months) may lower total and "bad" (LDL) cholesterol levels [R, R, R].
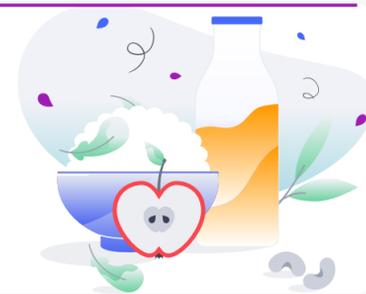
L-carnitine probably works by helping the body burn fats for energy [R].

It may also be helpful for people with health issues like diabetes and kidney problems [R, R, R].

17 Cocoa

Helps with the following

☹ HDL Cholesterol

	IMPACT	EVIDENCE
	●●○○○ 2 / 5	●●○○○ 2 / 5

Cocoa may increase HDL cholesterol when in the form of [R, R, R]:

- Dark chocolate
- Cocoa flavanol supplements

Around 150-500 mg cocoa flavanols/day for at least 3 weeks appear to be helpful [R, R, R].

However, some studies didn't find this benefit [R, R].

The antioxidants in cocoa may help by increasing HDL production [R].

Note that pure cocoa is likely a healthier choice than chocolate. If you eat chocolate, choose dark chocolate with more cocoa and less sugar and fat. People who consume less than 6 grams of cocoa fat per day may obtain greater benefits [R].

☹ Triglycerides

	IMPACT	EVIDENCE
	○○○○○ 0 / 5	○○○○○ 0 / 5

😐 Heart Health

	IMPACT	EVIDENCE
	●●●○○ 3 / 5	●●●○○ 3 / 5

Experts say that cocoa may improve major risk factors for heart disease. It may lower blood pressure and help control cholesterol [R, R, R, R, R].

Cocoa may also [R, R, R, R, R]:

- Improve blood vessel function
- Boost blood flow
- Reduce blood clots
- Prevent oxidative stress

Eating up to **100 g of chocolate per week** may also help prevent heart disease [R, R, R, R, R].

However, pure cocoa is likely a healthier choice. If you eat chocolate, choose dark chocolate with more cocoa and less sugar and fat.

😐 High Blood Pressure

	IMPACT	EVIDENCE
	○○○○○ 0 / 5	○○○○○ 0 / 5

😐 Artery Hardening

	IMPACT	EVIDENCE
	●●○○○ 2 / 5	●●○○○ 2 / 5

Cocoa may help with artery hardening by [R, R, R, R, R]:

- Reducing inflammation
- Lowering blood cholesterol
- Maintaining healthy blood vessel function

Studied forms include [R, R, R, R]:

- Cocoa powder (12-40 g/day for 4 weeks)
- Cocoa drink (450-900 mg/day of flavonols for 6 weeks)

High Blood Pressure

IMPACT **0** / 5   EVIDENCE **0** / 5

Total Cholesterol

IMPACT **0** / 5   EVIDENCE **0** / 5

LDL Cholesterol

IMPACT **0** / 5   EVIDENCE **0** / 5

18

Extra Virgin Olive Oil (EVOO)
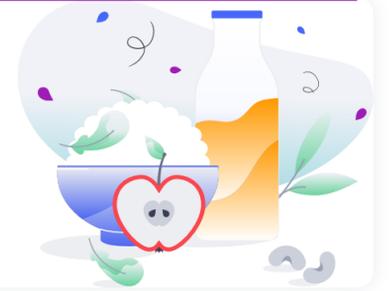
Helps with the following

	IMPACT	EVIDENCE
HDL Cholesterol	0 / 5	0 / 5
Triglycerides	0 / 5	0 / 5
Heart Health	0 / 5	0 / 5
ApoB	0 / 5	0 / 5
Total Cholesterol	0 / 5	0 / 5
High Blood Pressure	0 / 5	0 / 5
Artery Hardening	2 / 5	2 / 5
High Cholesterol	0 / 5	0 / 5

Vegan Diet

19
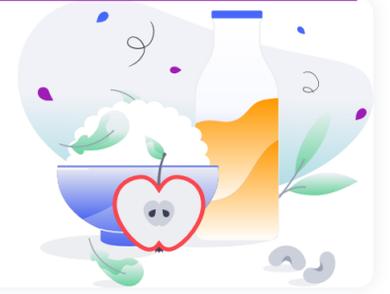
Helps with the following

Triglycerides

IMPACT		EVIDENCE	
●●●●○	4 / 5	●●●●○	4 / 5

Recommendation References: [R, R, R, R, R]

TMAO

IMPACT		EVIDENCE	
○○○○○	0 / 5	○○○○○	0 / 5

Total Cholesterol

IMPACT		EVIDENCE	
●●●●○	4 / 5	●●●●○	4 / 5

Recommendation References: [R, R, R, R, R]

ApoB

IMPACT		EVIDENCE	
●●●●○	4 / 5	●●●●○	4 / 5

Recommendation References: [R, R, R, R, R]

High Blood Pressure

IMPACT		EVIDENCE	
●●●○○	3 / 5	●●●●○	4 / 5

Recommendation References: [R, R, R, R, R]

Heart Health

IMPACT		EVIDENCE	
●●○○○	2 / 5	●●●○○	3 / 5

Recommendation References: [R]

LDL Cholesterol

IMPACT		EVIDENCE	
○○○○○	0 / 5	○○○○○	0 / 5

High Cholesterol

IMPACT		EVIDENCE	
●●●●○	4 / 5	●●●●○	4 / 5

Recommendation References: [R, R, R, R, R]

20

Red Yeast Rice

Helps with the following

😖 HDL Cholesterol

IMPACT ●○○○○ 1 / 5 | EVIDENCE ●●○○○ 2 / 5

Red yeast rice extract (200-4,800 mg/day for 6-24 weeks) may increase HDL cholesterol. However, not all studies found this benefit, and when they did, the effects were modest. Red yeast rice has been mainly studied for lowering LDL cholesterol [R, R, R, R R].

Red yeast rice may help by increasing how much HDL cholesterol is made [R, R, R].

Please note: Using supplements to target HDL in isolation is not recommended. You should target your overall cholesterol levels instead. Talk to your doctor to see if red yeast rice could improve your overall cholesterol levels. The FDA does not allow the sale of products containing monacolin K in the United States. Additionally, experts warn about the safety and variable efficacy of red yeast rice supplements. Products containing monacolin K may cause muscle and liver damage. Red yeast rice should not be used during pregnancy or breastfeeding. Talk to your doctor before taking red yeast rice [R, R, R].

😫 Triglycerides

IMPACT ○○○○○ 0 / 5 | EVIDENCE ○○○○○ 0 / 5

😐 Heart Health

IMPACT ●●○○○ 2 / 5 | EVIDENCE ●●○○○ 2 / 5

Red yeast rice may help prevent heart disease by reducing cholesterol levels [R, R, R].

A red yeast rice extract **(600 mg for 4-8 weeks)** may be especially helpful [R].

A blend of red yeast rice, coenzyme Q10, and other ingredients may also help [R, R].

Please note: The FDA does not allow the sale of products containing monacolin K in the United States. Thus, red yeast rice supplements sold in the USA probably don't contain enough monacolin K to affect cholesterol. Monacolin K itself may cause muscle and liver damage. It may also interact with medications for cholesterol. Talk to your doctor before taking red yeast rice [R, R, R].

🙂 LDL Cholesterol

IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●○ 4 / 5

Red yeast rice (200-4,800 mg/day for 4-24 weeks) may help lower LDL cholesterol [R, R, R, R, R].

Red yeast rice contains monacolin K, which works in a similar way as the cholesterol drug lovastatin. It may help by reducing how much cholesterol the liver makes [R, R].

Please note: The FDA does not allow the sale of products containing monacolin K in the United States. Additionally, experts warn about the safety and variable efficacy of red yeast rice supplements. Products containing monacolin K may cause muscle and liver damage. Red yeast rice should not be used during pregnancy or breastfeeding. Talk to your doctor before taking red yeast rice [R, R].

🙂 Total Cholesterol

IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●●○ 4 / 5

Red yeast rice (200-4,800 mg/day for 4-24 weeks) may help lower total cholesterol [R, R, R, R, R].

It may help by reducing the amount of cholesterol the liver makes [R, R].

Please note: The FDA does not allow the sale of products containing monacolin K in the United States. Additionally, experts warn about the safety and variable efficacy of red yeast rice supplements. Products containing monacolin K may cause muscle and liver damage. Red yeast rice should not be used during pregnancy or breastfeeding. Talk to your doctor before taking red yeast rice [R, R].

ApoB

Red yeast rice (200-2,400 mg/day for 4-12 weeks) may lower ApoB levels. However, one study found no effect of red yeast rice on ApoB [R, R, R, R].

Red yeast rice may help by reducing ApoB production [R].

Please note: *The FDA does not allow the sale of products containing monacolin K in the United States. Additionally, experts warn about the safety and variable efficacy of red yeast rice supplements. Products containing monacolin K may cause muscle and liver damage. Red yeast rice should not be used during pregnancy or breastfeeding. Talk to your doctor before taking red yeast rice* [R, R].

Lipoprotein(a)

High Cholesterol

Red yeast rice contains monacolin K, which works in a similar way as the cholesterol drug lovastatin [R, R, R, R].
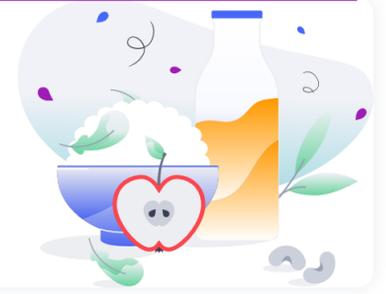
Red yeast rice may work well in combination with berberine and policosanol. This combination may lower total and "bad" (LDL) cholesterol and raise "good" (HDL) cholesterol [R, R].

Most experts agree that red yeast rice can affect cholesterol levels. However, not many of these supplements are of good quality. It's also hard to tell whether they are safe [R, R].

Please note: *The FDA regulates lovastatin. It does not allow the sale of products containing monacolin K in the United States. Thus, red yeast rice supplements sold in the USA probably don't contain enough monacolin K to affect cholesterol. Monacolin K itself may cause muscle and liver damage. Talk to your doctor before taking red yeast rice* [R, R].

21

Cranberry

Helps with the following

	IMPACT	EVIDENCE
HDL Cholesterol	3 / 5	3 / 5
Triglycerides	3 / 5	3 / 5
High Blood Pressure	3 / 5	3 / 5
LDL Cholesterol	3 / 5	3 / 5
Heart Health	1 / 5	1 / 5
Homocysteine	1 / 5	1 / 5
Artery Hardening	1 / 5	1 / 5

22

Avoid Exposure to Heavy Metals

Helps with the following

HDL Cholesterol

	IMPACT	EVIDENCE
	1 / 5	0 / 5

Recommendation References: [R]

Triglycerides

	IMPACT	EVIDENCE
	1 / 5	0 / 5

Recommendation References: [R]

High Blood Pressure

	IMPACT	EVIDENCE
	1 / 5	1 / 5

Recommendation References: [R, R, R]

Total Cholesterol

	IMPACT	EVIDENCE
	1 / 5	0 / 5

Recommendation References: [R]

LDL Cholesterol

	IMPACT	EVIDENCE
	1 / 5	0 / 5

Recommendation References: [R]

Heart Health

	IMPACT	EVIDENCE
	1 / 5	2 / 5

Recommendation References: [R, R, R]

Artery Hardening

	IMPACT	EVIDENCE
	3 / 5	1 / 5

People who are exposed to a lot of arsenic are more likely to have hardened arteries within 10 years [R].

Arsenic may contribute to artery hardening by increasing oxidative stress [R, R].

Magnesium

Helps with the following

		IMPACT	EVIDENCE
😞	**HDL Cholesterol**	0 / 5	0 / 5

		IMPACT	EVIDENCE
😖	**Triglycerides**	0 / 5	0 / 5

		IMPACT	EVIDENCE
😐	**Artery Hardening**	2 / 5	2 / 5

Magnesium (300-1,200 mg/day for 1-6 months) may help support healthy blood vessel function and slow the progression of artery hardening. In people with hardened arteries, it may help maintain healthy blood sugar levels and reduce oxidative stress [R, R, R].

PERSONALIZED TO YOUR GENES

Your MT2A **gene variant may be linked to lower magnesium levels and artery hardening** [R]. **Take special care to get enough magnesium.**

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs10636**	/	

		IMPACT	EVIDENCE
😐	**High Blood Pressure**	0 / 5	0 / 5

		IMPACT	EVIDENCE
😐	**Total Cholesterol**	0 / 5	0 / 5

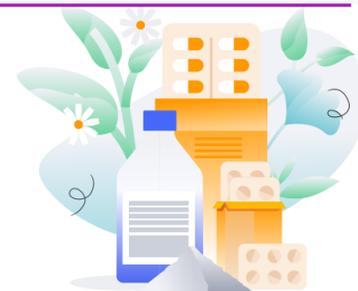|		IMPACT	EVIDENCE
😐	**LDL Cholesterol**	2 / 5	2 / 5

Genetically higher magnesium levels may be associated with a lower risk of heart disease [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*

Heart Health

Genetically higher magnesium levels may be associated with a lower risk of heart disease [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*

24

Probiotics

Helps with the following

☹ TMAO

IMPACT ●○○○○ **1** / 5   EVIDENCE ●●●○○ **3** / 5

Probiotics (taken for at least 3 months) may lower TMAO levels. Studied probiotics include:

- Lactobacillus rhamnosus [R]
- L. acidophilus [R]
- Bifidobacterium lactis [R]

However, some studies found **no effect** of probiotics on TMAO levels [R, R].

☹ Triglycerides

IMPACT ○○○○○ **0** / 5   EVIDENCE ○○○○○ **0** / 5

😐 Total Cholesterol

IMPACT ●●●○○ **3** / 5   EVIDENCE ●●●●○ **4** / 5

Probiotics (taken for at least 8 weeks) may help lower total cholesterol. Probiotic products that may help with total cholesterol include [R, R, R, R, R, R, R, R, R]:

- Fermented milk products like yogurt and kefir
- Probiotic supplements
- Synbiotic supplements (probiotic + prebiotic) with oligo-fructose as a prebiotic

Fermented dairy products containing probiotics may offer a greater benefit than supplements in capsule form [R, R].

Helpful probiotics include [R, R, R, R, R]:

- *Lactobacillus* (e.g. *Lactobacillus acidophilus* and *L. plantarum*)
- *Bifidobacterium* (e.g. *Bifidobacterium animalis*)

Products containing multiple probiotics or probiotics at higher concentrations (at least 1 billion CFU*) may help more [R, R, R].

Probiotics may help by:

- Reducing how much cholesterol is made and absorbed [R, R, R, R, R, R, R, R]
- Increasing cholesterol clearance [R]
- Reducing fat storage and increasing fat breakdown [R, R]

CFU (colony forming units) = the number of active bacteria in one probiotic serving

LDL Cholesterol

IMPACT **2** / 5   EVIDENCE **2** / 5

Probiotics (for 2-3 months) may help lower LDL cholesterol. Probiotic products that may help with LDL cholesterol include [R, R, R, R, R, R, R, R, R]:

- Fermented milk products like yogurt and kefir
- Probiotic supplements
- Synbiotic supplements with oligo-fructose as a prebiotic

However, not all studies found this benefit [R, R, R, R, R, R].

Fermented dairy products containing probiotics may offer a greater benefit than supplements in capsule form [R, R, R].

Helpful probiotics include [R, R, R]:

- *Lactobacillus* (e.g. *Lactobacillus acidophilus*, *L. plantarum*, and *L. reuteri*)
- *Bifidobacterium* (e.g. *Bifidobacterium animalis*)

Products containing more probiotic strains or probiotics at higher concentrations (at least one billion CFU*) may help more [R, R].

Probiotics may help by:

- Reducing how much cholesterol is made and absorbed [R, R, R, R]
- Increasing cholesterol clearance [R]

CFU (colony forming units) = the number of active bacteria in one probiotic serving

ApoB

IMPACT **2** / 5   EVIDENCE **2** / 5

Probiotics may help lower ApoB levels by reducing how much cholesterol is made and absorbed [R, R, R, R].

Probiotic products that may help include fermented milk products like [R, R]:

- Yogurt with L. reuteri (2,3 x 10^9 CFU/day for 6 weeks)
- Kefir (180 mL/day for 12 weeks)

Homocysteine

IMPACT **2** / 5   EVIDENCE **2** / 5

Supplementation with probiotic mixes may lower homocysteine levels. Tested strains include [R, R, R]:

- Bifidobacterium longum
- B. breve
- B. bifidum
- B. animalis
- Lactobacillus acidophilus
- L. delbrueckii
- L. paracasei
- L. plantarum
- L. brevis
- L. casei
- L. salivarius
- Streptococcus thermophilus
- Lactococcus lactis

Similarly, milk or kefir fermented with some of the above probiotics may lower homocysteine levels [R, R, R, R].

LDL Particle Size

IMPACT **2** / 5   EVIDENCE **1** / 5

Taking a supplement with two Lactobacillus strains (L. plantarum KY1032 and *L. curvatus* HY7601) may increase LDL particle size [R].

Probiotics may help by:

- Reducing how much cholesterol is made and absorbed [R, R, R, R]
- Increasing cholesterol clearance [R]

Heart Rate

IMPACT ●●●●● 1 / 5   EVIDENCE ●●●●● 2 / 5

Probiotics may reduce heart rate **by 1-3 bpm** but only in the following cases [R]:

- People with a heart rate **above 75 bpm**
- Supplement doses of at least **10^10 CFU/day**
- Supplements combining **more probiotics**

CFU (colony forming units) = the number of active bacteria in one probiotic serving
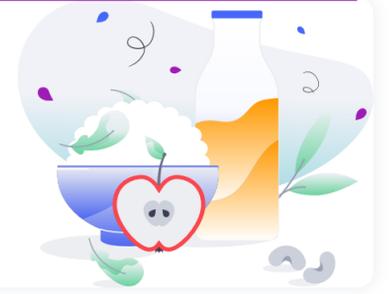
High Cholesterol

IMPACT ●●●●● 0 / 5   EVIDENCE ●●●●● 0 / 5

25

Dietary Garlic

Helps with the following

☹ HDL Cholesterol

IMPACT ●●●●● 1 / 5   EVIDENCE ●●●●● 1 / 5

Garlic may help increase HDL cholesterol. Studied forms include [R, R]:

- **Garlic powder**: 600–5,600 mg/day
- **Garlic oil**: 9–18 mg/day
- **Aged garlic extract**: 1,000–7,200 mg/day
- **Raw garlic**: 4–10 g/day

However, the majority of studies didn't find significant effects. They showed that garlic was much better at decreasing "bad" cholesterol than increasing "good" cholesterol [R, R, R, R, R].

If garlic does affect HDL cholesterol, it may do so by reducing its breakdown [R, R].

Please note: Using supplements to target HDL in isolation is not recommended. You should target your overall cholesterol levels instead. Talk to your doctor to see if garlic could improve your overall cholesterol levels. Garlic can interact with blood thinners (such as aspirin, Plavix, and Coumadin). In addition, garlic can irritate the stomach in some people. Talk to your doctor before taking garlic [R, R].

☹ Triglycerides

IMPACT ●●●●● 0 / 5   EVIDENCE ●●●●● 0 / 5

Garlic (taken for at least 8 weeks) may help lower LDL cholesterol. Studied forms include [R, R, R, R]:

- **Raw garlic**: 4–10 g/day
- **Garlic powder**: 600–5,600 mg/day
- **Garlic oil**: 9–18 mg/day
- **Aged garlic extract**: 1,000–7,200 mg/day

However, many studies didn't find this benefit [R, R, R, R].

The effects may be greater for garlic powder [R].

Garlic seems to help by reducing the:

- Production and storage of cholesterol [R, R, R, R, R]
- Amount of cholesterol absorbed from the gut [R]

Please note: *Garlic can interact with blood thinners (such as aspirin, Plavix, and Coumadin). In addition, garlic can irritate the stomach in some people. Talk to your doctor before taking garlic* [R, R].

⬚ PERSONALIZED TO YOUR GENES

Your HMGCR gene variant is linked to higher LDL cholesterol levels. It may increase the activity of an enzyme that makes cholesterol. Garlic may help by blocking this enzyme [R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3846663**	/	●●○○○

Total Cholesterol 😐

IMPACT ●●●○○ 3 / 5 | **EVIDENCE** ●●●●○ 4 / 5

Garlic (taken for at least 8 weeks) may help lower total cholesterol. Studied forms include [R, R, R, R, R, R, R, R, R]:

- **Raw garlic**: 4–10 g/day
- **Garlic powder**: 600–5,600 mg/day
- **Garlic oil**: 9–18 mg/day
- **Aged garlic extract**: 1,000–7,200 mg/day

The effects may be greater for garlic powder or aged garlic extract [R].

Garlic may help by reducing the amount of cholesterol:

- The body makes and stores [R, R, R, R, R]
- Absorbed from the gut [R]

Please note: Garlic can interact with blood thinners (such as aspirin, Plavix, and Coumadin). In addition, garlic can irritate the stomach in some people. Talk to your doctor before taking garlic [R, R].

🧬 **PERSONALIZED TO YOUR GENES**

Your HMGCR gene variant is linked to higher cholesterol levels. It may increase the activity of an enzyme that makes cholesterol. Garlic may help by blocking this enzyme [R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3846663**	/	●●○○○

ApoB 😐

IMPACT ●○○○○ 1 / 5 | **EVIDENCE** ●○○○○ 1 / 5

Garlic (800-1,400 mg/day, equivalent to 8-15,6 mg of allicin, for 11-24 weeks) may lower ApoB levels. Studied forms include [R]:

- Raw
- Powder
- Tablets

However, some studies found **no effect** of garlic on ApoB [R].

Please note: Garlic can interact with blood thinners (such as aspirin, Plavix, and Coumadin). In addition, garlic can irritate the stomach in some people. Talk to your doctor before taking garlic [R, R].

Artery Hardening 😐

IMPACT ○○○○○ 0 / 5 | **EVIDENCE** ○○○○○ 0 / 5

Garlic (600-900 mg/day for 3-6 months) may help lower total and "bad" (LDL) cholesterol [R, R, R, R, R].

Garlic may help lower cholesterol by blocking its production [R, R, R].

Please note: Garlic can interact with blood thinners (like aspirin, Plavix, Coumadin). If you are on blood thinners, consult your doctor before supplementing with garlic [R].

🧬 PERSONALIZED TO YOUR GENES

Your HMGCR gene variant is linked to higher cholesterol levels. This gene helps make an enzyme that produces cholesterol. Garlic may help by blocking this enzyme [R, R, R, R].
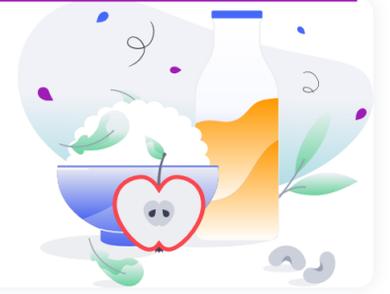
YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3846663**	/	●●○○○

Hazelnuts

HDL Cholesterol

IMPACT	EVIDENCE
1 / 5	1 / 5

Recommendation References: [R, R]

Triglycerides

IMPACT	EVIDENCE
1 / 5	1 / 5

Recommendation References: [R, R]

Artery Hardening

IMPACT	EVIDENCE
1 / 5	1 / 5

Recommendation References: [R, R]

ApoB

IMPACT	EVIDENCE
0 / 5	0 / 5

Total Cholesterol

IMPACT	EVIDENCE
0 / 5	0 / 5

LDL Cholesterol

IMPACT	EVIDENCE
0 / 5	0 / 5

High Cholesterol

IMPACT	EVIDENCE
0 / 5	0 / 5

27 Astaxanthin
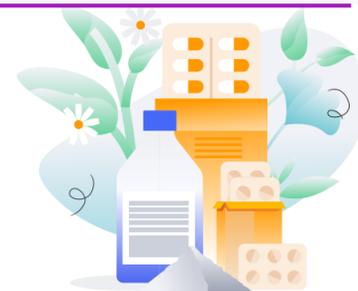
Helps with the following

Triglycerides

	IMPACT	EVIDENCE
	0 / 5	0 / 5

HDL Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

ApoB

	IMPACT	EVIDENCE
	1 / 5	1 / 5

According to a single study, astaxanthin **supplementation (20 mg/day for 12 weeks) may reduce apoB in overweight people**. It may be more effective when combined with other ingredients like berberine, policosanol, and red yeast rice [R, R, R].

LDL Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

Total Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

Berberine

Helps with the following

☹ Triglycerides

IMPACT ●●●○○ 3 / 5 | EVIDENCE ●●●○○ 3 / 5

Berberine (500-1,500 mg/day for 2-4 months) may help lower triglycerides [R, R, R, R].

Berberine may work better when combined with other supplements such as silymarin (milk thistle extract). These other compounds may help the body absorb berberine [R, R, R, R, R].

Barberry, a natural source of berberine, may also help. However, other berberine-rich herbs may not have the same effect [R, R].

Berberine seems to help by [R, R]:

- Helping the body break down and remove fats
- Increasing "good" gut bacteria

🧬 **PERSONALIZED TO YOUR GENES**

A supplement with berberine may reduce blood fats more in people with your LDLR gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs14158**	/	●●○○○

☹ HDL Cholesterol

IMPACT ●●●○○ 3 / 5 | EVIDENCE ●●●○○ 3 / 5

Berberine (1,000-1,500 mg/day for 4-24 weeks) may increase HDL cholesterol [R, R, R, R].

Berberine may also help when combined with other supplements, such as milk thistle. Milk thistle may help the body absorb berberine [R].

However, not all studies found a significant benefit for HDL cholesterol [R, R]. In fact, berberine has mainly been studied for lowering "bad" (LDL) cholesterol [R, R, R, R].

At this point, we don't know the exact mechanism of how berberine affects HDL cholesterol levels.

Please note: Using supplements to target HDL in isolation is not recommended. You should target your overall cholesterol levels instead. Talk to your doctor to see if berberine could improve your overall cholesterol levels.

Berberine (1,000-1,500 mg/day for 1-6 months) may help lower total cholesterol [R, R, R, R, R].

Berberine or its source, tree turmeric, may also help when combined with other supplements, such as milk thistle. Milk thistle may help the body absorb berberine [R, R].

Berberine may help by [R, R, R]:

- Clearing cholesterol from the blood
- Reducing how much fat is made by the liver

⬡   PERSONALIZED TO YOUR GENES

A supplement with berberine may reduce cholesterol more in people with your PCSK9 **gene variant** [R].

A supplement with berberine may reduce cholesterol more in people with your LDLR **gene variant** [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2149041**	/	●●○○○
GENE	SNP	GENOTYPE	EVIDENCE
/	**rs14158**	/	●●○○○

LDL Cholesterol

IMPACT ●●●○○ 3 / 5   **EVIDENCE** ●●●○○ 3 / 5

Berberine (1,000-1,500 mg/day for 1-6 months) may help lower LDL cholesterol [R, R, R, R, R].

Berberine or its source, tree turmeric, may also help when combined with other supplements, such as milk thistle. Milk thistle may help the body absorb berberine [R, R].

Berberine seems to help by [R, R, R]:

- Clearing cholesterol from the blood
- Reducing how much fat is produced by the liver

PERSONALIZED TO YOUR GENES

A supplement with berberine may reduce LDL cholesterol more in people with your PCSK9 **gene variant** [R].

A supplement with berberine may reduce LDL cholesterol more in people with your LDLR **gene variant** [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2149041**	/	●●○○○
/	**rs14158**	/	●●○○○

ApoB

IMPACT ●○○○○ 1 / 5   **EVIDENCE** ●○○○○ 1 / 5

According to a single study, berberine **supplementation may reduce apoB in people with high cholesterol**. It may be more effective when combined with other ingredients like policosanol, red yeast rice, and astaxanthin [R, R].

High Blood Pressure

IMPACT ○○○○○ 0 / 5   **EVIDENCE** ○○○○○ 0 / 5

Berberine (0.9-1.5 g/day for 2-6 months) may lower total and "bad" (LDL) cholesterol while raising "good" (HDL) cholesterol [R, R, R, R].

It may also improve cholesterol when it's combined with other ingredients, such as:

- Milk thistle [R, R]
- Red yeast rice [R, R]
- Policosanol [R, R]
- Coenzyme Q10 [R]

Berberine may help remove cholesterol from the blood and reduce its production [R, R].

🧬 PERSONALIZED TO YOUR GENES

A supplement with berberine may reduce cholesterol more in people with your PCSK9 gene variant [R].

A supplement with berberine may reduce cholesterol more in people with your LDLR gene variant [R].

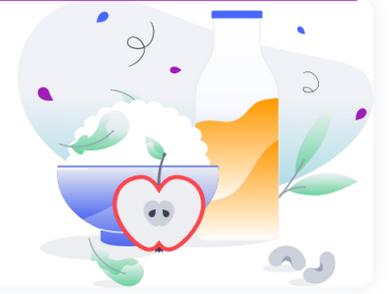### YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2149041**	/	●●○○○
/	**rs14158**	/	●●○○○

Blueberries

Helps with the following

HDL Cholesterol

IMPACT	EVIDENCE
2 / 5	3 / 5

[R, R, R, R]

Triglycerides

IMPACT	EVIDENCE
0 / 5	0 / 5

High Blood Pressure

IMPACT	EVIDENCE
1 / 5	2 / 5

[R, R, R, R]

Total Cholesterol

IMPACT	EVIDENCE
2 / 5	3 / 5

[R, R, R, R]

LDL Cholesterol

IMPACT	EVIDENCE
2 / 5	3 / 5

[R, R, R, R]

Artery Hardening

IMPACT	EVIDENCE
2 / 5	3 / 5

[R, R, R, R, R, R]

High Cholesterol

IMPACT	EVIDENCE
2 / 5	3 / 5

[R, R, R, R]

Black Seed (Black Cumin)
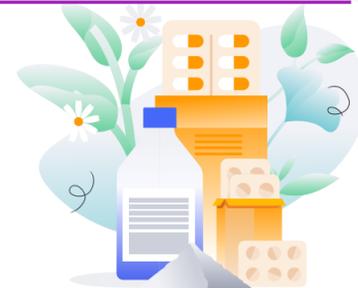
Helps with the following

HDL Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

Triglycerides

IMPACT 2 / 5   EVIDENCE 3 / 5

Black seed (200-3,000 mg/day for 1-12 months) may help lower blood triglycerides. It may help the body break down and clear triglycerides [R].

PERSONALIZED TO YOUR GENES

Your LIPC **gene variant is linked to higher triglycerides. This gene helps break down triglycerides. Black seed may help increase the breakdown of triglycerides** [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2070895**	/	

LDL Cholesterol

IMPACT ●●●○○ 3 / 5   **EVIDENCE** ●●●○○ 3 / 5

Black seed may help lower LDL cholesterol. Studied forms include [R, R, R, R, R, R, R, R]:

- **Black seed powder**: 200-2,000 mg/day for 2 weeks-12 months
- **Black seed oil**: 100-2,000 mg/day for 2 weeks-12 months

However, not all studies found this benefit [R].

The oil may have a greater impact on LDL cholesterol than the powder [R, R].

Black seed may help by [R, R, R]:

- Increasing cholesterol clearance from the body
- Reducing how much cholesterol is made by the liver

Please note: Black seed may interact with some medications. Consult your doctor before taking black seed [R].

PERSONALIZED TO YOUR GENES

Your HMGCR gene variant is linked to higher LDL cholesterol levels. It may increase the activity of an enzyme that makes cholesterol. Black seed may help by blocking this enzyme [R, R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3846663**	/	●●○○○

High Blood Pressure

IMPACT ○○○○○ 0 / 5   **EVIDENCE** ○○○○○ 0 / 5

Heart Health

IMPACT ○○○○○ 0 / 5   **EVIDENCE** ○○○○○ 0 / 5

Black seed may help lower total cholesterol. Studied forms include [R, R, R, R, R]:

- **Black seed powder**: 200-2,000 mg/day for 2 weeks-12 months
- **Black seed oil**: 100-2,000 mg/day for 2 weeks-12 months

However, not all studies found this benefit [R].

Black seed oil may have a greater impact on total cholesterol than black seed powder [R, R].

Black seed may help by [R, R, R]:

- Increasing cholesterol clearance from the body
- Lowering how much cholesterol is made

Please note: *Black seed may interact with some medications. Consult your doctor before taking black seed* [R].

PERSONALIZED TO YOUR GENES

Your HMGCR **gene variant is linked to higher cholesterol levels. It may increase the activity of an enzyme that makes cholesterol. Black seed may help by blocking this enzyme** [R, R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3846663**	/	●●○○○

High Cholesterol

Black seed supplements may lower total and "bad" (LDL) cholesterol. The antioxidants and healthy fats in black seed may explain these effects [R, R, R].

Studied doses include [R, R, R]:

- **Powder**: 0.5-2 g/day for 1-2 months
- **Oil**: up to 5 g/day for 1-3 months
- **Extract**: 0.7-1 g/day for 2 months

It is sometimes combined with turmeric, garlic, or fenugreek in supplements for high cholesterol [R, R, R].

Black seed may also increase "good" (HDL) cholesterol. However, the evidence for this effect is mixed [R, R, R].

PERSONALIZED TO YOUR GENES

Your HMGCR gene variant is linked to higher cholesterol levels. This gene helps make an enzyme that produces cholesterol. Black seed may help by blocking this enzyme [R, R, R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3846663**	/	●●○○○

Hydroxytyrosol

Helps with the following

	IMPACT	EVIDENCE
HDL Cholesterol	0 / 5	0 / 5
Triglycerides	0 / 5	0 / 5
Heart Health	0 / 5	0 / 5
Artery Hardening	0 / 5	0 / 5
LDL Cholesterol	0 / 5	0 / 5
High Blood Pressure	0 / 5	0 / 5

Gamma-Linolenic Acid (GLA)

Helps with the following

Triglycerides

	IMPACT	EVIDENCE
	0 / 5	0 / 5

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.*

HDL Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

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.*

High Blood Pressure

	IMPACT	EVIDENCE
	1 / 5	1 / 5

Total Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

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.*

ApoB

	IMPACT	EVIDENCE
	0 / 5	0 / 5

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.*

Heart Health

	IMPACT	EVIDENCE
	0 / 5	0 / 5

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.*

Genetically higher DGLA levels may be associated with a reduced risk of heart disease. [R]

Red Clover

33

Helps with the following

Triglycerides

IMPACT 0 / 5   EVIDENCE 0 / 5

HDL Cholesterol

IMPACT 2 / 5   EVIDENCE 3 / 5

Recommendation references: [R, R, R]

Lipoprotein(a)

IMPACT 1 / 5   EVIDENCE 1 / 5

Total Cholesterol

IMPACT 2 / 5   EVIDENCE 3 / 5

Recommendation References: [R, R, R]

LDL Cholesterol

IMPACT 2 / 5   EVIDENCE 3 / 5

Recommendation references: [R, R, R]

High Blood Pressure

IMPACT 1 / 5   EVIDENCE 1 / 5

Recommendation references: [R]

High Cholesterol

IMPACT 2 / 5   EVIDENCE 3 / 5

Recommendation references: [R, R, R]

Cinnamon
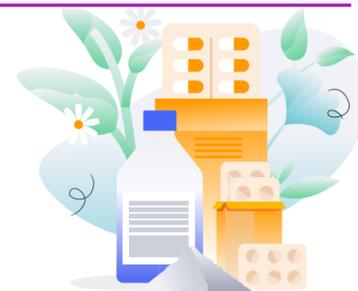
Helps with the following

☹ Triglycerides

IMPACT	EVIDENCE
●●●○○ 3 / 5	●●●○○ 3 / 5

Cinnamon (up to 6 g/day for up to 5 weeks) may help lower triglycerides. It may be especially helpful in people with high blood sugar [R, R].

Cinnamon may help the body clear triglycerides. It may also reduce their production by supporting healthy blood sugar levels [R, R].

Please note: Cassia cinnamon is high in coumarin. This substance may harm the liver in large amounts. Consult your doctor before supplementing with high amounts of Cassia cinnamon [R, R, R].

☒ PERSONALIZED TO YOUR GENES

People with your PPARG gene variant may have higher triglycerides. This gene plays a role in sugar and fat metabolism. Cinnamon may help by improving *PPARG* activity and blood sugar control [R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs3103310**	/	●●○○○

☹ HDL Cholesterol

IMPACT	EVIDENCE
○○○○○ 0 / 5	○○○○○ 0 / 5

😐 Total Cholesterol

IMPACT	EVIDENCE
○○○○○ 0 / 5	○○○○○ 0 / 5

😐 LDL Cholesterol

IMPACT	EVIDENCE
○○○○○ 0 / 5	○○○○○ 0 / 5

😐 Heart Health

IMPACT	EVIDENCE
○○○○○ 0 / 5	○○○○○ 0 / 5

Buckwheat

35

Triglycerides

	IMPACT	EVIDENCE
	1 / 5	1 / 5

Recommendation References: [R]

Triglycerides

	IMPACT	EVIDENCE
	0 / 5	0 / 5

High Blood Pressure

	IMPACT	EVIDENCE
	1 / 5	1 / 5
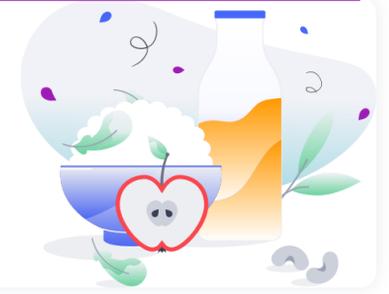
Recommendation References: [R]

Varicose Veins

	IMPACT	EVIDENCE
	1 / 5	1 / 5

Recommendation References: [R]

Total Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

High Cholesterol

	IMPACT	EVIDENCE
	0 / 5	0 / 5

Hibiscus

Helps with the following

Triglycerides

IMPACT   0 / 5   EVIDENCE   0 / 5

High Blood Pressure

IMPACT   3 / 5   EVIDENCE   3 / 5

Hibiscus may help lower blood pressure in two ways. For one, it increases urination, helping remove excess salt and water. Second, hibiscus helps relax the blood vessels [R].

Many studies have shown that hibiscus extracts can help reduce blood pressure. These extracts contain about 4-10 mg of active components called *anthocyanins* [R, R, R, R, R, R, R, R].

Hibiscus tea (4-10 g/day) may also reduce blood pressure, but has a weaker effect compared to hibiscus extracts [R, R, R].

PERSONALIZED TO YOUR GENES

Your NPR3 gene variant is linked to high blood pressure. This gene influences salt levels. Hibiscus may help by removing excess salt [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
NPR3	**rs1173771**	/	

Total Cholesterol

IMPACT   2 / 5   EVIDENCE   2 / 5

Please note: *Hibiscus may interact with painkillers and anti-inflammatory drugs such as diclofenac and drugs for high cholesterol such as simvastatin. Make sure to consult your doctor before consuming hibiscus* [R, R].

LDL Cholesterol

IMPACT   2 / 5   EVIDENCE   2 / 5

Please note: *Hibiscus may interact with painkillers and anti-inflammatory drugs such as diclofenac and drugs for high cholesterol such as simvastatin. Make sure to consult your doctor before consuming hibiscus* [R, R].
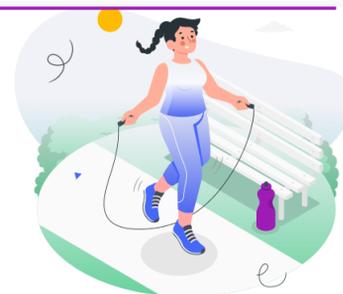

Heart Rate

IMPACT   1 / 5   EVIDENCE   1 / 5

Please note: *Hibiscus may interact with painkillers and anti-inflammatory drugs such as diclofenac and drugs for high cholesterol such as simvastatin. Make sure to consult your doctor before consuming hibiscus* [R, R].

Tai Chi

Helps with the following

	IMPACT	EVIDENCE
HDL Cholesterol	0 / 5	0 / 5
Triglycerides	0 / 5	0 / 5
Heart Health	0 / 5	0 / 5
High Blood Pressure	0 / 5	0 / 5
Total Cholesterol	0 / 5	0 / 5
High Cholesterol	0 / 5	0 / 5

38

Avocado
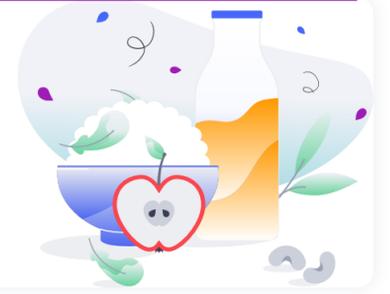
Helps with the following

Triglycerides

IMPACT	EVIDENCE
3 / 5	3 / 5

HDL Cholesterol

IMPACT	EVIDENCE
0 / 5	0 / 5

High Blood Pressure

IMPACT	EVIDENCE
3 / 5	3 / 5

LDL Cholesterol

IMPACT	EVIDENCE
3 / 5	3 / 5

Heart Rate Recovery

IMPACT	EVIDENCE
1 / 5	1 / 5

High Cholesterol

IMPACT	EVIDENCE
1 / 5	3 / 5

Eating avocado (135-500 g/day) may help lower total and "bad" (LDL) cholesterol [R].

Note that the evidence is mixed. Some studies show that avocado only improves HDL cholesterol [R].

Avocado contains a compound that stops your gut from absorbing too much cholesterol. It's also high in monounsaturated fat, which is a great replacement for saturated fat [R, R].

39

Barberry

Helps with the following

HDL Cholesterol

IMPACT 3 / 5   EVIDENCE 3 / 5

Recommendation References: [R, R, R, R, R, R, R]

Triglycerides

IMPACT 3 / 5   EVIDENCE 3 / 5

Recommendation References: [R, R, R, R, R, R, R]

Total Cholesterol

IMPACT 3 / 5   EVIDENCE 3 / 5

Recommendation References: [R, R, R, R, R, R, R]

LDL Cholesterol

IMPACT 3 / 5   EVIDENCE 3 / 5

Recommendation References: [R, R, R, R, R, R, R, R]

High Blood Pressure

IMPACT 1 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R]

High Cholesterol
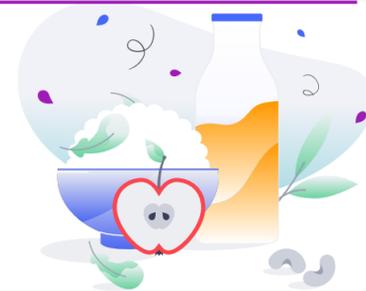
IMPACT 3 / 5   EVIDENCE 3 / 5

Recommendation References: [R, R, R, R, R, R, R, R, R]

40

Fenugreek

Helps with the following

HDL Cholesterol
IMPACT 0 / 5　　EVIDENCE 0 / 5

Triglycerides
IMPACT 0 / 5　　EVIDENCE 0 / 5

LDL Cholesterol
IMPACT 2 / 5　　EVIDENCE 3 / 5

The following fenugreek products may help lower LDL cholesterol [R, R, R]:

- Seed powder
- Seed extract
- Leaf powder

Fenugreek may make it harder to absorb cholesterol from food. It's also high in healthy fats and dietary fiber, which help lower cholesterol [R, R].

Total Cholesterol
IMPACT 0 / 5　　EVIDENCE 0 / 5

High Cholesterol
IMPACT 2 / 5　　EVIDENCE 3 / 5

Fenugreek may lower total and LDL cholesterol. Different forms of fenugreek have been used, including [R, R, R, R]:

- Leaf powder
- Seed extract
- Seed powder

Fenugreek contains active compounds that may help you absorb less cholesterol from food. It's also high in healthy fats and dietary fiber, which help lower cholesterol [R, R, R].

41
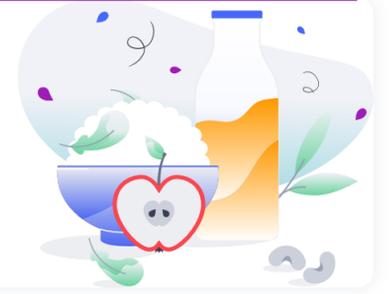
Ginger

Helps with the following

	IMPACT	EVIDENCE
Triglycerides	0 / 5	0 / 5
HDL Cholesterol	2 / 5	3 / 5
High Blood Pressure	3 / 5	3 / 5
Total Cholesterol	2 / 5	3 / 5
LDL Cholesterol	2 / 5	3 / 5
High Cholesterol	0 / 5	0 / 5

42

Myo-inositol

Helps with the following

Triglycerides

IMPACT 0 / 5   EVIDENCE 0 / 5

HDL Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

LDL Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

Recommendation References: [R, R, R]

Total Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

43

Saffron

Helps with the following

Triglycerides

IMPACT　●●●●● **0** / 5　EVIDENCE　●●●●● **0** / 5

HDL Cholesterol

IMPACT　●●●●● **0** / 5　EVIDENCE　●●●●● **0** / 5

LDL Cholesterol

IMPACT　●●●●● **0** / 5　EVIDENCE　●●●●● **0** / 5

Total Cholesterol

IMPACT　●●●●● **0** / 5　EVIDENCE　●●●●● **0** / 5

44

Spirulina

Helps with the following

☹ Triglycerides

IMPACT ●●●◯◯ 3 / 5 | EVIDENCE ●●◯◯◯ 2 / 5

Spirulina (1-10 g/day for at least 2 months) may help lower triglycerides by [R]:

- Increasing the breakdown of triglycerides
- Reducing inflammation

Please note: Use caution when buying spirulina supplements. Buy these products only from trusted providers. Some spirulina products may contain toxic contaminants [R].

🧬 **PERSONALIZED TO YOUR GENES**

Your LIPC gene variant is linked to higher triglycerides. This gene helps break down triglycerides. Spirulina may help increase the breakdown of triglycerides [R, R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
/	**rs2070895**	/	●◯◯◯◯

☹ HDL Cholesterol

IMPACT ●●●◯◯ 3 / 5 | EVIDENCE ●●●◯◯ 3 / 5

Spirulina (1-10 g/day for 8-16 weeks) may increase HDL cholesterol levels [R, R, R].

However, some studies didn't find this benefit [R, R].

Spirulina may help by increasing HDL-raising gut bacteria [R].

Please note: Using supplements to target HDL in isolation is not recommended. You should target your overall cholesterol levels instead. Talk to your doctor to see if spirulina could improve your overall cholesterol levels. Use caution when buying spirulina supplements. Buy these products only from trusted providers. Some spirulina products may contain toxic contaminants [R].

😐 LDL Cholesterol

IMPACT ●●●◯◯ 3 / 5 | EVIDENCE ●●●◯◯ 3 / 5

Spirulina (1-10 g/day for 6-16 weeks) may help lower LDL cholesterol. Longer supplementation may offer a greater benefit [R, R, R, R, R].

Spirulina may help by reducing how much cholesterol is absorbed from the gut [R, R].

Please note: Use caution when buying spirulina supplements. Buy these products only from trusted providers. Some spirulina products may contain toxic contaminants [R].

Total Cholesterol

IMPACT ●●●○○ 3 / 5

EVIDENCE ●●●○○ 3 / 5

Spirulina (1-10 g/day for 6-16 weeks) may help lower total cholesterol. Longer supplementation may offer a greater benefit [R, R, R, R, R, R].

Spirulina may help by [R, R]:

- Reducing how much cholesterol is absorbed from the gut
- Improving the composition of gut bacteria

Please note: Use caution when buying spirulina supplements. Buy these products only from trusted providers. Some spirulina products may contain toxic contaminants [R].

High Blood Pressure

IMPACT ○○○○○ 0 / 5

EVIDENCE ○○○○○ 0 / 5

High Cholesterol

IMPACT ●●●○○ 3 / 5

EVIDENCE ●●●○○ 3 / 5

Spirulina supplements (1-10 g/day for 2-12 months) may reduce "bad" (LDL) cholesterol and raise "good" (HDL) cholesterol [R].

Spirulina may stop your gut from absorbing too much cholesterol from food. It may also prevent some of the toxic effects of LDL cholesterol [R, R, R].

Spirulina may be especially helpful for people with [R, R, R, R]:

- Obesity
- High blood pressure
- High blood sugar

45

Brewer's Yeast

Helps with the following

	IMPACT	EVIDENCE
Triglycerides	1 / 5	1 / 5
HDL Cholesterol	1 / 5	1 / 5
LDL Cholesterol	1 / 5	1 / 5
High Blood Pressure	1 / 5	1 / 5
Total Cholesterol	1 / 5	1 / 5
High Cholesterol	0 / 5	0 / 5

Chinese Rhubarb

Helps with the following

HDL Cholesterol

IMPACT **1** / 5   EVIDENCE **1** / 5

Please note: *Be careful with rhubarb if you are prone to allergies. High doses of rhubarb may cause diarrhea and abdominal cramps. Avoid long-term use due to dependence risk. Rhubarb is not safe for people with gut conditions, women who are pregnant or breastfeeding, and children under 12 years of age. Make sure to consult your doctor before taking rhubarb* [R, R].

Triglycerides

IMPACT **1** / 5   EVIDENCE **1** / 5

Please note: *Be careful with rhubarb if you are prone to allergies. High doses of rhubarb may cause diarrhea and abdominal cramps. Avoid long-term use due to dependence risk. Rhubarb is not safe for people with gut conditions, women who are pregnant or breastfeeding, and children under 12 years of age. Make sure to consult your doctor before taking rhubarb* [R, R].

Artery Hardening

IMPACT **1** / 5   EVIDENCE **1** / 5

Please note: *Be careful with rhubarb if you are prone to allergies. High doses of rhubarb may cause diarrhea and abdominal cramps. Avoid long-term use due to dependence risk. Rhubarb is not safe for people with gut conditions, women who are pregnant or breastfeeding, and children under 12 years of age. Make sure to consult your doctor before taking rhubarb* [R, R].

LDL Cholesterol

IMPACT **1** / 5   EVIDENCE **1** / 5

Please note: *Be careful with rhubarb if you are prone to allergies. High doses of rhubarb may cause diarrhea and abdominal cramps. Avoid long-term use due to dependence risk. Rhubarb is not safe for people with gut conditions, women who are pregnant or breastfeeding, and children under 12 years of age. Make sure to consult your doctor before taking rhubarb* [R, R].

High Blood Pressure

IMPACT **1** / 5   EVIDENCE **1** / 5

Please note: *Be careful with rhubarb if you are prone to allergies. High doses of rhubarb may cause diarrhea and abdominal cramps. Avoid long-term use due to dependence risk. Rhubarb is not safe for people with gut conditions, women who are pregnant or breastfeeding, and children under 12 years of age. Make sure to consult your doctor before taking rhubarb* [R, R].

Rutin
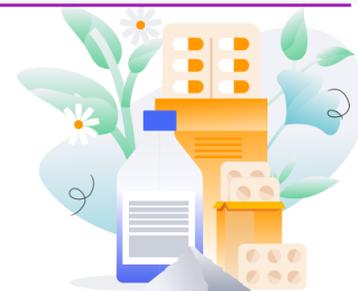
47

Helps with the following

Triglycerides

IMPACT	EVIDENCE
1 / 5	1 / 5

HDL Cholesterol

IMPACT	EVIDENCE
1 / 5	1 / 5

Total Cholesterol

IMPACT	EVIDENCE
1 / 5	1 / 5

LDL Cholesterol

IMPACT	EVIDENCE
1 / 5	1 / 5

Varicose Veins

IMPACT	EVIDENCE
0 / 5	0 / 5

48

Cashews
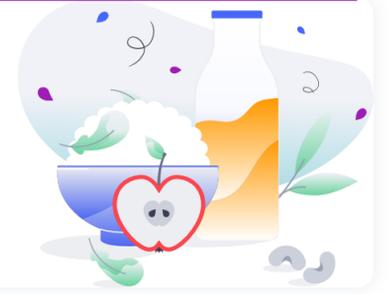
Helps with the following

HDL Cholesterol

IMPACT 1 / 5

EVIDENCE 3 / 5

Recommendation References: [R, R, R]

Triglycerides

IMPACT 0 / 5

EVIDENCE 0 / 5

Recommendation References: [R, R, 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.*

Total Cholesterol

IMPACT 0 / 5

EVIDENCE 0 / 5

Recommendation References: [R, R, 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.*
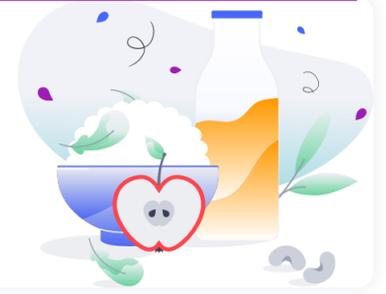

LDL Cholesterol

IMPACT 0 / 5

EVIDENCE 0 / 5

Recommendation References: [R, R, 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.*

High Blood Pressure

IMPACT 0 / 5

EVIDENCE 0 / 5

49

Fasting Mimicking Diet

Helps with the following

HDL Cholesterol

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation references: [R, R, R, R, R]

Triglycerides

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R]

High Blood Pressure

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R]

Total Cholesterol

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R]

LDL Cholesterol

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R]

Pilates

Helps with the following

HDL Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

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.*
Recommendation References: [R, R, R]

Triglycerides

IMPACT 0 / 5   EVIDENCE 0 / 5

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.*
Recommendation References: [R, R, R, R]

High Blood Pressure

IMPACT 2 / 5   EVIDENCE 2 / 5

Recommendation References: [R, R, R, R, R, R]

Total Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

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.*
Recommendation References: [R, R, R, R]

LDL Cholesterol

IMPACT 0 / 5   EVIDENCE 0 / 5

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.*
Recommendation References: [R, R, R]