

HDL Cholesterol in Pregnancy

DNA Health Report

REPORT CATEGORIES —



HEART & BLOOD
VESSELS



REPRODUCTIVE
HEALTH

Sample Client

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DISCLAIMER

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

Personal information

NAME

Sample Client

SEX AT BIRTH

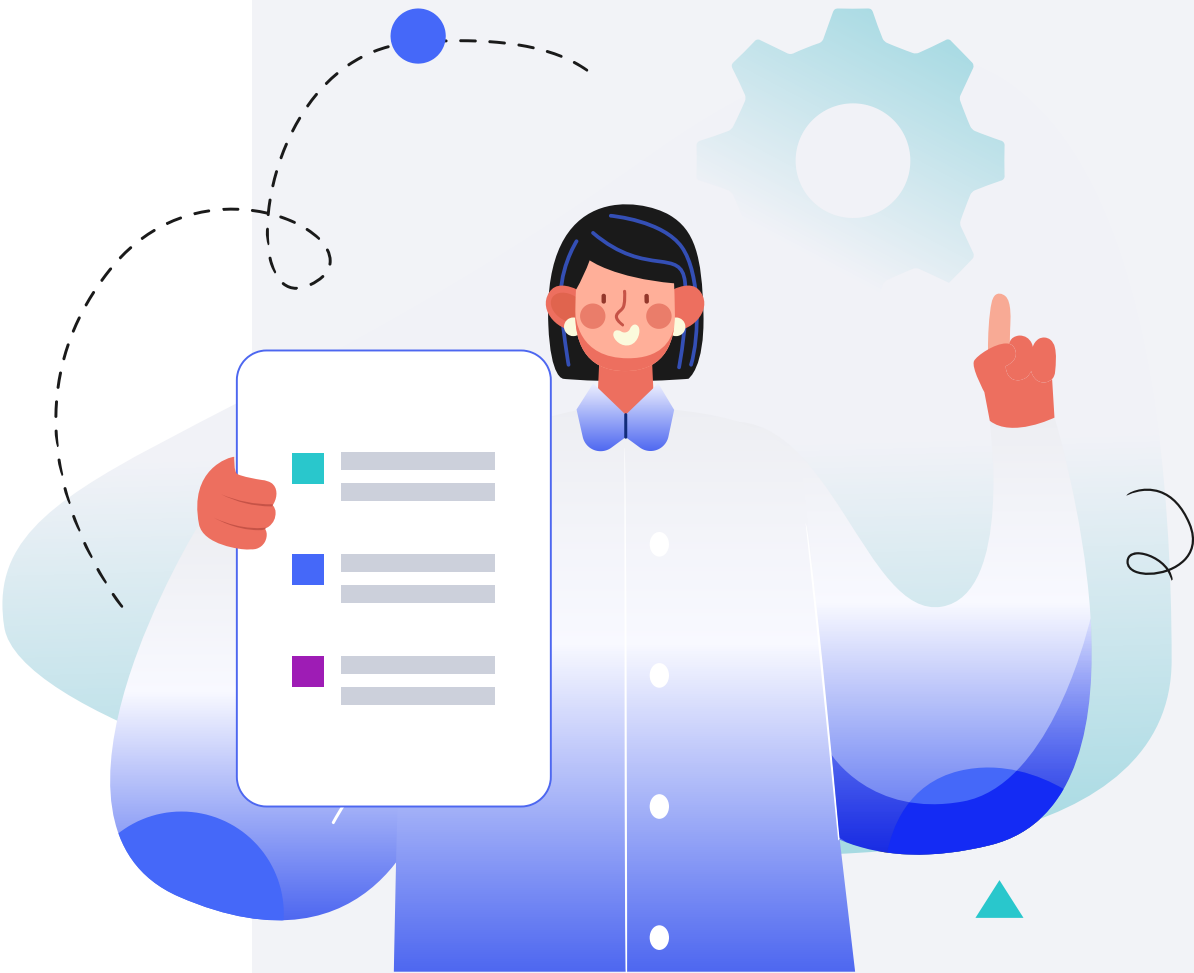
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg



How this works

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



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



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

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



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

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

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



Genotype color info:

AA

You don't have any risk alleles

AA

You have 1 risk allele

AA

You have 2 risk alleles

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

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

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

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



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

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



Impact

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

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

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

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

Recommendation Evidence

- 5 / 5
- Recommendations that are considered effective and generally recommended by experts and medical bodies.
-
- 4 / 5
- Recommendations that are considered likely effective and that have multiple independent meta-analyses and a great many studies supporting them.
-
- 3 / 5
- Recommendations that are considered possibly effective and have many studies supporting them
-
- 2 / 5
- Recommendations that have insufficient evidence, with two or several clinical trials supporting them, or many studies but with ambiguous results.
-
- 1 / 5
- Recommendations that have insufficient evidence, with a single clinical trial, or with many studies most of which didn't find support for the recommendation.
-
- 0 / 5
- No evidence in humans.

Genotype-specific Evidence

- High-quality
- Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, 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:

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

Introduction

Cholesterol, while often perceived negatively, is essential for various physiological functions. It helps in [\[R\]](#):

- Maintaining cell membrane integrity.
- Synthesis of vitamin D and hormones.
- Bile production.

Cholesterol is classified into two primary types: LDL and HDL. **HDL, often termed "good cholesterol," facilitates the removal of excess cholesterol by transporting it to the liver for processing.** Normal to high levels of HDL cholesterol are linked to a lower risk of heart disease [\[R, R\]](#).

Conversely, elevated levels of LDL cholesterol can accumulate in the walls of blood vessels, contributing to atherosclerosis and increasing the risk of cardiovascular disease [\[R, R\]](#).

Factors Affecting HDL Cholesterol During Pregnancy

HDL cholesterol increases during the first trimester of pregnancy and **peaks during the second and third trimesters, correlated with estrogen levels**. A failure to increase HDL cholesterol levels during pregnancy has been associated with [\[R\]](#), [\[R\]](#):

- Pregnancy loss [\[R\]](#)
- Aberrant fetal growth [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Gestational diabetes [\[R\]](#)
- Dyslipidemia and cardiovascular disease after pregnancy [\[R\]](#)

Risk factors for low HDL cholesterol in pregnancy include [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Being overweight or obese
- Smoking
- Low physical activity
- Certain ethnicities
- Genetics

Up to **65%** of differences in cholesterol levels may be attributed to genetics. Genes that may affect HDL cholesterol during pregnancy influence [\[R\]](#):

- Cholesterol production ([LPL](#), [LIPC](#), [FADS2](#))
- Cholesterol transport ([APOC1](#))
- HDL and LDL cholesterol balance ([CETP](#))

Managing HDL cholesterol levels primarily involves lifestyle interventions, as medication use is generally limited during pregnancy due to potential risks to the fetus. Doctors may recommend [\[R\]](#), [\[R\]](#), [\[R\]](#):

- A balanced diet rich in fruits, vegetables, whole grains, and healthy fats
- Regular, moderate-intensity exercise such as walking or prenatal yoga



Predisposed to typical HDL cholesterol levels in pregnancy based on 37 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ABCA1	rs4149307	CC
ABCA1	rs4149310	AA
DUS2	rs16942887	GG
LPL	rs12678919	AA
AKT1	rs4983559	AA
SORT1	rs646776	TT
SORT1	rs629301	TT
RRNAD1	rs12145743	TT
PLTP	rs6065906	TC
RBM6	rs2013208	CC
PLTP	rs4465830	AG
LPL	rs894210	GA
TRIB1	rs2980885	GA
SNX13	rs4142995	GT
PGS1	rs4969178	GA
LILRA5	rs103294	TC
ADAM10	rs261342	CG
MAP3K1	rs9686661	TC
FANCL	rs17615494	GT
SNTB1	rs4871137	GT
TRANK1	rs6777217	AG
HNF4A	rs1800961	CC
CETP	rs5880	GG
HERPUD1	rs11076175	AA
NLRC5	rs247617	AA
NLRC5	rs183130	TT
NLRC5	rs247616	TT
NLRC5	rs3764261	AA
TTC39B	rs686030	AA
GLUL	rs1689797	CC
GLUL	rs1689800	AA

- Regular monitoring of lipid profiles as part of prenatal care, especially if there is a history of lipid disorders.

Consumer Summary

- HDL cholesterol, or "good cholesterol," helps your body by removing excess cholesterol and protecting against heart disease. During pregnancy, HDL levels naturally rise, especially in the second and third trimesters, thanks to higher estrogen levels.
- If HDL levels don’t increase as expected during pregnancy, it might raise the risk of complications like gestational diabetes, poor baby growth, or even pregnancy loss.
- Factors like being overweight, smoking, or low physical activity can lead to lower HDL cholesterol levels during pregnancy. Genetics is a major factor, affecting how your body makes and processes cholesterol.
- You can boost your HDL levels by eating a healthy diet with fruits, vegetables, whole grains, and good fats, like those found in nuts and fish. Staying active with regular exercises, such as walking or yoga, can also help.
- Your doctor may check your cholesterol levels during pregnancy, especially if you have a history of cholesterol issues. Making small, healthy changes now can protect both you and your baby.

GENE	SNP	GENOTYPE
ALDH1A2	rs1532085	AA
MTARC1	rs2642438	GG
ABCA1	rs1883025	CC
DOCK6	rs737337	TT
DNAJC13	rs17404153	GG
FADS2	rs174546	CC
APOE	rs4420638	AA

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.

DOSAGE		DOSAGE			
1	Exercise At Least One Hour a Day	1 hour	2	Mind-Body Exercise	1 hour
3	Avoid Sugary Foods & Drinks		4	Mediterranean Diet	
5	Eat More Protein and Less Carbs		6	Omega-3 (Fish Oil)	2000 mg

1



Exercise At Least One Hour a Day

IMPACT

3 / 5

EVIDENCE

5 / 5

How to implement

Dedicate a minimum of 60 minutes to moderate-intensity activities such as brisk walking, swimming, or cycling. Do this most days of the week, aiming for at least 5 days to optimize benefits.

TYPICAL STARTING DOSE

1 hour

Description

[Exercise](#) can do wonders for your health. It can help you lose weight, improve your heart health, boost your mood, and more [\[R\]](#).

There are many ways you can be active. You can walk, run, swim, dance, or play team sports. **Everything counts, and it's never too late to start!**

Try to get at least **60 minutes of moderate physical activity on most days**, including walking. **Getting a mix of cardio (min 150 min/day) and strength training (min 2 times a week) may be optimal.**

How it helps

Regular exercise during pregnancy helps increase HDL while improving circulation, reducing swelling, and preparing the body for labor.

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 [\[R\]](#), [\[R\]](#), [\[R\]](#).

2



Mind-Body Exercise

IMPACT

3 / 5

EVIDENCE

3 / 5

How to implement

Incorporate mind-body exercises such as yoga, tai chi, or meditation into your daily routine. Allocate at least 30-60 minutes per day to these activities, aiming for consistency over intensity. Choose a quiet, comfortable space and make it a regular part of your day, ideally at the same time each day to establish a routine.

TYPICAL STARTING DOSE

1 hour

Description

Mind-Body exercises like yoga and Tai Chi combine physical movement with mindfulness, offering benefits such as improved flexibility, balance, and mental focus. These practices promote holistic well-being by enhancing both physical and mental health.

How it helps

Prenatal yoga helps maintain healthy HDL levels while reducing stress, improving flexibility, and preparing the body for labor.

Various studies indicate that a yoga-based lifestyle intervention can increase HDL cholesterol (by ~3 mg/dL) even over short periods. One study reported significant improvements in HDL levels after just a ten-day intervention, highlighting its potential for cardiovascular health benefits [\[R, R, R\]](#).

3



Avoid Sugary Foods & Drinks

IMPACT

2 / 5

EVIDENCE

3 / 5

How to implement

To avoid sugary foods, eliminate or significantly reduce consumption of foods and beverages high in added sugars such as sodas, candies, baked goods, and sugary cereals from your diet. Instead, opt for natural sugar sources like fruits. Aim to do this daily for ongoing health benefits.

Description

High-sugar foods like baked goods, sweets, and sugary drinks, can spike your blood sugar levels. Consuming a lot of these types of foods can contribute to health issues like diabetes, obesity, insomnia, and heart disease.

High-sugar foods and refined carbs have a high glycemic index (GI). This means they tend to spike your blood sugar levels. They include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Sugary drinks
- Baked goods
- Sweets
- White bread
- White rice
- Pasta

Eating a lot of sugary foods can contribute to:

- Diabetes [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Weight gain and obesity [\[R\]](#), [\[R\]](#)
- Insomnia [\[R\]](#)
- Heart disease [\[R\]](#)

You may also want to avoid processed sugars and sugary drinks. They may have a role in increasing IL-1B [\[R\]](#), [\[R\]](#).

How it helps

Limiting added sugars and refined carbohydrates is an effective way to prevent the reduction of **HDL** (good cholesterol) during pregnancy. These foods can cause blood sugar spikes and increase fat accumulation in the body, leading to lower **HDL** levels and a higher risk of metabolic disorders [\[R\]](#), [\[R\]](#).

Refined carbs (like white bread, pastries, and sugary drinks) and excess sugar intake can negatively affect lipid profiles. By reducing these types of foods, you can help maintain a healthier cholesterol balance, improve overall heart health, and support a healthier pregnancy [\[R\]](#).

4



Mediterranean Diet

IMPACT2 / 5

EVIDENCE3 / 5

How to implement

Incorporate a variety of primarily plant-based foods, such as fruits, vegetables, whole grains, nuts, and legumes, into every meal. Choose healthy fats, like olive oil, over saturated fats and consume fish and poultry at least twice a week. Limit red meat to a few times a month and include a moderate amount of dairy products. Opt for water and red wine in moderation as your beverages.

Description

The [Mediterranean diet](#) is based on the traditional cuisine from the Mediterranean regions. It moderates the intake of red meat and dairy, while being rich in fruits and vegetables, whole grains, and healthy fats ([olive oil](#)).

The [Mediterranean diet](#) focuses on traditional cuisine from the Mediterranean regions. It’s rich in [\[R\]](#):

- [Olive oil](#)
- Fruits and vegetables
- Whole grains
- Nuts and seeds
- Fish

This type of diet may **reduce inflammation and protect the brain and heart** [\[R, R, R, R\]](#).

Limited intake of animal products, saturated fat, and refined sugar likely contribute to the health benefits of the Mediterranean diet [\[R\]](#).

How it helps

The Mediterranean diet during pregnancy helps optimize HDL while providing essential nutrients for fetal development and reducing pregnancy complications.

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 [\[R\]](#).

5

Eat More Protein and Less Carbs

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Include a source of lean protein such as chicken, fish, beans, or tofu in each meal, aiming for 20-30 grams per serving, while reducing carbohydrate-rich foods like bread, pasta, and sweets, aiming to make proteins about 30-40% of your daily caloric intake. Replace at least one carbohydrate-heavy meal or snack with a high-protein option daily.

Description

A diet that includes more protein and fewer carbohydrates can promote weight management and satiety, potentially aiding in weight loss efforts. Protein-rich foods can help control hunger and support muscle maintenance.

Proteins, fats, and carbs are macronutrients. You need these nutrients in large (‘macro’) amounts. They provide your body with the energy it needs to function properly [\[R\]](#).

For a healthier diet, experts recommend eating foods that are higher in protein but lower in fat and carbs [\[R\]](#), [\[R\]](#).

This is because simple carbs can spike your blood sugar levels. Likewise, too much saturated fat can increase “bad” (LDL) cholesterol [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Eating a lot of high-carb or high-fat foods may lead to conditions like diabetes, obesity, and heart disease [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Meanwhile, protein boosts muscle mass and helps control your weight [\[R\]](#).

How it helps

Increasing protein intake while reducing refined carbohydrates can help support healthy HDL (good cholesterol) levels during pregnancy. Protein-rich foods like lean meats, legumes, and dairy help with lipid metabolism and prevent the reduction of HDL. At the same time, cutting back on carbs — especially refined carbs, such as sugary snacks, white bread, and sugary drinks — helps prevent blood sugar spikes and reduces fat accumulation [\[R\]](#), [\[R\]](#).

This combination supports a healthier cholesterol balance by promoting the production of HDL. By focusing on nutrient-dense foods that provide lean protein and moderate amounts of complex carbohydrates (like whole grains and vegetables), you can maintain a healthy weight, improve heart health, and support healthy cholesterol levels during pregnancy [\[R\]](#), [\[R\]](#).

6



Omega-3 (Fish Oil)

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Take 1-2 g of omega-3 (fish oil) supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

2000 mg

Description

Omega-3 fatty acids are essential fats found in fatty fish like salmon, flaxseeds, and walnuts. They are known for their potential cardiovascular and brain health benefits, including reducing the risk of heart disease and supporting cognitive function.

[Omega-3 fatty acids](#) are some of the healthiest fats we can eat. They help lower inflammation and protect the heart, brain, and eyes. Our bodies produce less omega-3s than we need for optimal health, so it's important to get enough through food or supplements [\[R\]](#), [\[R\]](#), [\[R\]](#).

There are three major types of omega-3s: ALA, EPA, and DHA [\[R\]](#), [\[R\]](#).

Fatty fish are rich in EPA and DHA. They include [\[R\]](#):

- Salmon
- Tuna
- Herring
- Sardines

For optimal protection, try to get at least **two servings of fatty fish per week**. Fish oil supplements are available for those who don't eat fish regularly [\[R\]](#).

How it helps

Regular consumption of omega-3 sources helps increase HDL while providing essential omega-3s for fetal brain development and reducing inflammation.

Salmon is a fatty fish that may particularly improve HDL [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).