SelfDecode™

PPARGC1A (Fitness/Blood Sugar)

Gene Report

REPORT CATEGORIES

BLOOD SUGAR CONTROL

FITNESS

Sample Client

Report date: 15 January 2026

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Personal information

NAME

Sample Client

SEX AT BIRTH

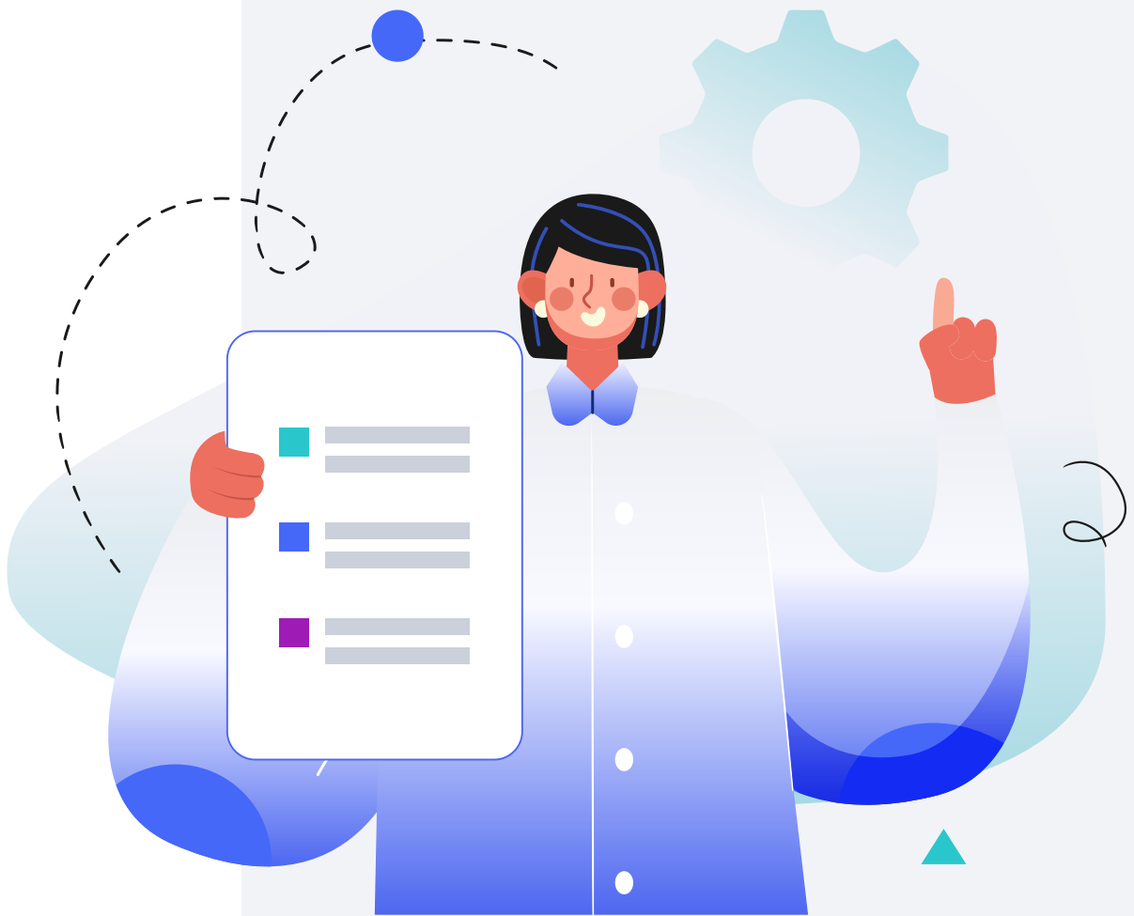
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg

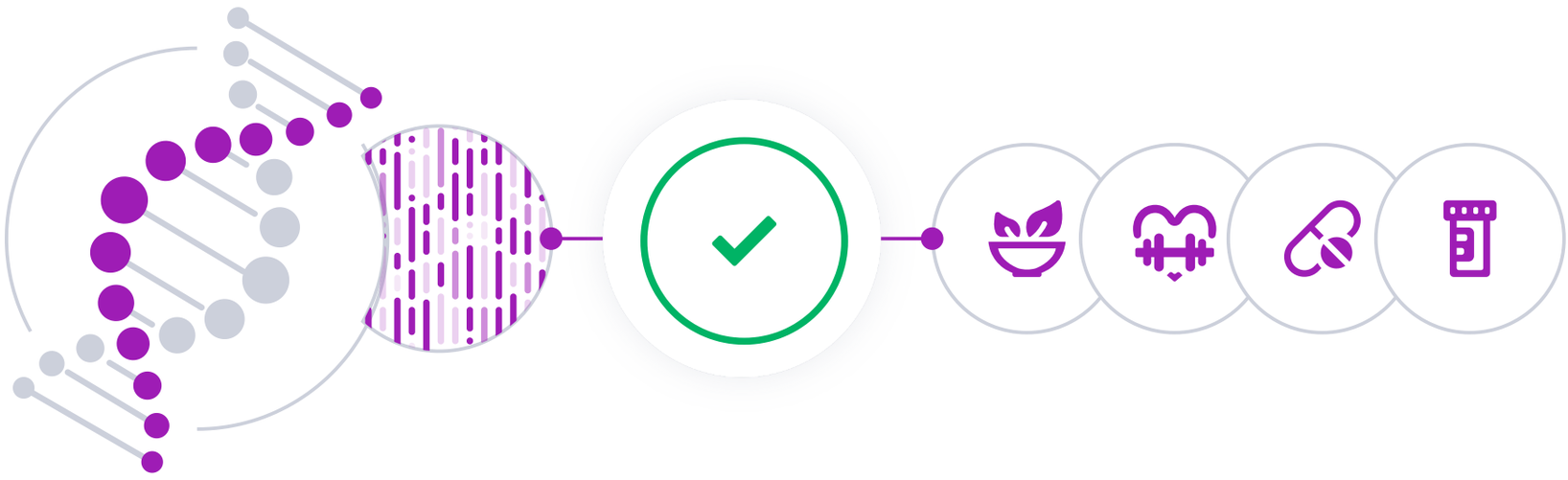


DISCLAIMER

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.

How this works

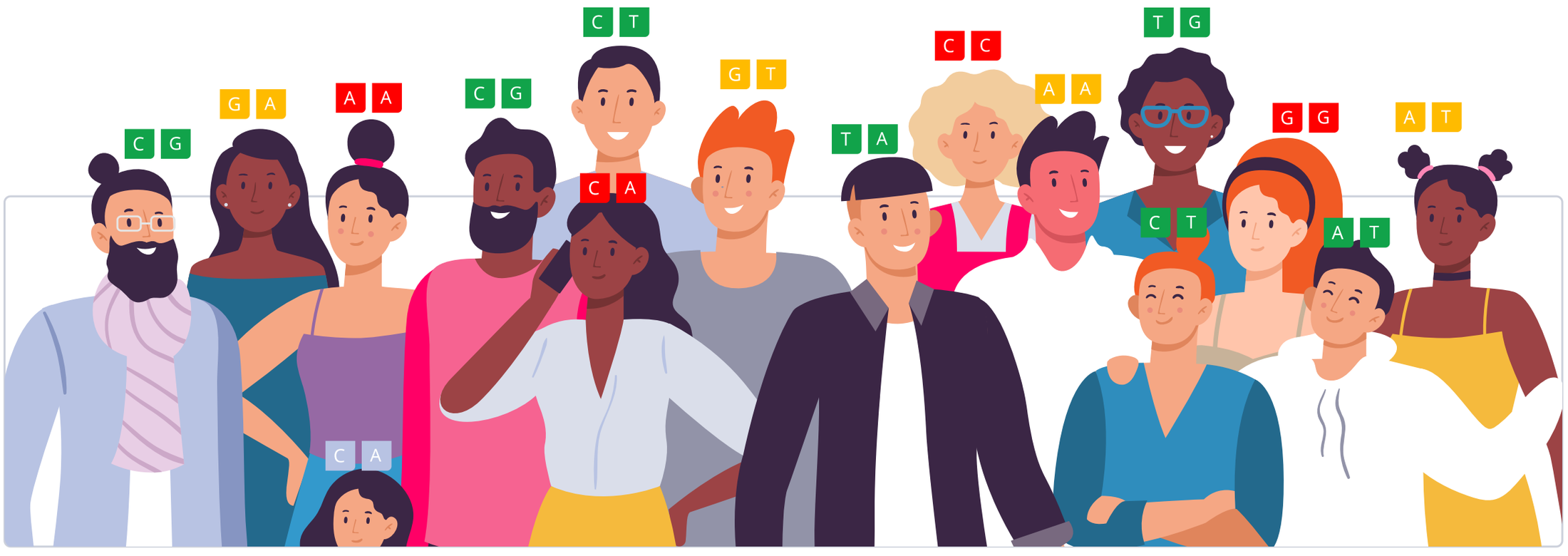
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



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

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

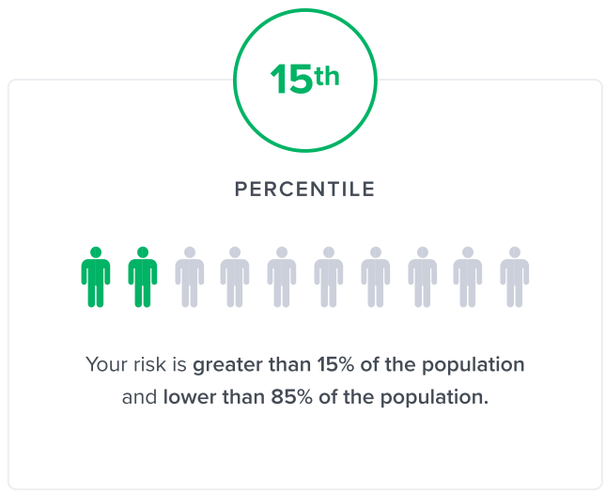
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



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

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

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



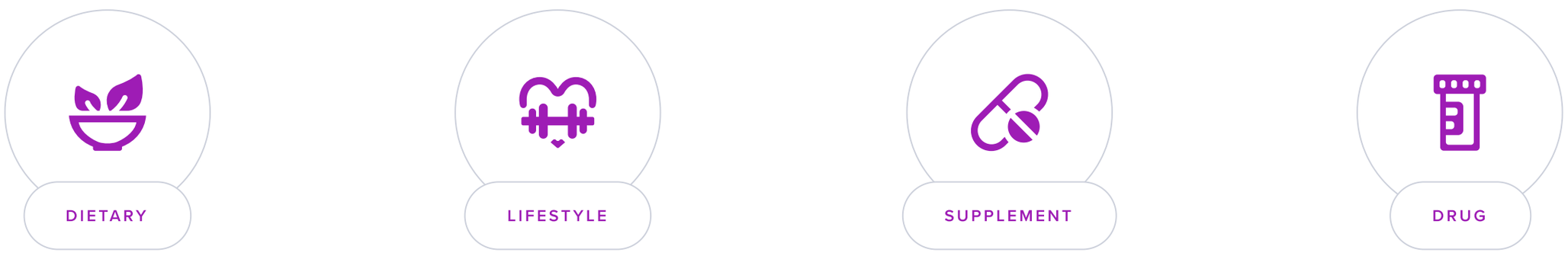
Genotype color info:	AA You don't have any risk alleles	AA You have 1 risk allele	AA You have 2 risk alleles

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

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

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

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



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

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

Impact

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

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

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

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

Recommendation Evidence

5 / 5

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

4 / 5

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

3 / 5

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

2 / 5

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

1 / 5

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

0 / 5

No evidence in humans.

Genotype-specific Evidence

High-quality

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

Medium-quality

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

Low-quality

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

Indirect

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

In theory

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

Some things to keep in mind:

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

Introduction

The *PPARGC1A* gene encodes a protein called PPARG coactivator 1 alpha, or PGC-1α. PGC-1α regulates the expression of genes that help produce energy in the cell. It is involved in the production of new mitochondria, as well as in the function of existing mitochondria. Along with *UCP3*, *PPARGC1A* helps your body stay warm by converting energy into heat [R, R].

PGC-1α increases PPARG and thyroid hormone levels. It also affects how energy metabolism changes over a 24-hour cycle (following a circadian rhythm) [R].

The expression of this gene is affected by physiological stimuli such as exercise, fasting, and cold exposure [R, R].

PPARGC1A Genetics, Athletic Performance, and Blood Sugar

The most well-researched *PPARGC1A* polymorphism is **rs8192678**. Its minor 'T' allele decreases *PPARGC1A* expression and PGC-1α levels in the muscles [R, R, R].

This variant has been associated with a decreased overall athletic ability and sports performance, especially in endurance sports such as long-distance running and cycling. Moreover, carriers may benefit less from aerobic exercise for improving their aerobic capacity, gaining muscle mass, and lowering LDL cholesterol [R, R, R].

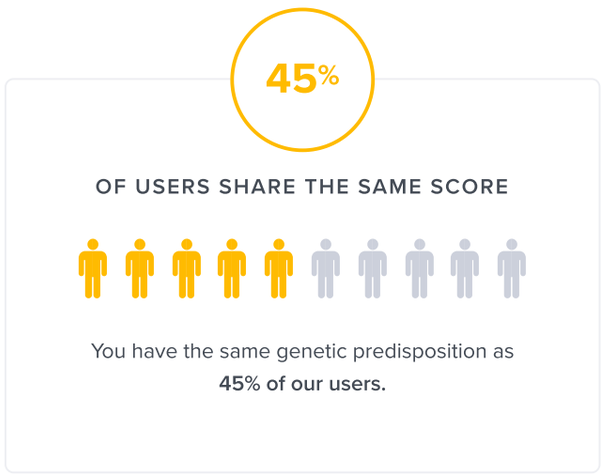
This variant has been associated with an increased risk of type 2 diabetes in European, Indian, and Chinese populations, as well as with higher blood pressure in individuals younger than 50 years old [R, R, R, R].

It may also be linked to **worse cold adaptation** due to reduced PGC-1α levels and impaired mitochondrial function.

In contrast, a study of 161 Caucasian athletes from Russia and Lithuania found an increased prevalence of the 'TT' genotype among powerlifters [R].

TYPICAL ACTIVITY

Likely typical PPARGC1A activity based on the genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PPARGC1A	rs8192678	TC

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	Avoid Sugary Foods & Drinks		2	Eat More Protein and Less Carbs	
3	Exercise At Least One Hour a Day	1 hour	4	Practice Exercise Snacks	1 minutesute
5	Berberine	1000 mg	6	Resistant Starch	40 g
7	Aerobic Exercise (Cardio)	1 hour	8	Mediterranean Diet	
9	Intermittent Fasting		10	Dietary Zinc	
11	Zinc	15 mg	12	Eat Fiber-Rich Foods	
13	Whole Grains		14	Cinnamon	1 g
15	Sleep for 7+ Hours		16	L-Carnitine	1 g
17	Curcumin	500 mg	18	American Ginseng	200 mg

1

Avoid Sugary Foods & Drinks

IMPACT 5 / 5

EVIDENCE 5 / 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 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

Sugary foods can spike your blood sugar and insulin. **Over time, this can lead to insulin resistance and increase the risk of type 2 diabetes** [R, R, R].

All health experts recommend avoiding sugary foods to people at risk of diabetes [R, R, R].

Diets that limit sugary foods and help lower blood sugar include:

- The Mediterranean diet [R, R, R]
- The keto diet [R, R]
- The Paleo diet [R, R]

2

Eat More Protein and Less Carbs

IMPACT 5 / 5

EVIDENCE 4 / 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

Most weight loss experts recommend following a diet that’s high in protein but lower in carbs or fat [R, R].

This is because protein [R, R]:

- Boosts your metabolism
- Makes you feel more full
- Helps control your appetite

In contrast, carbs and fats make you crave junk food by activating the reward areas of your brain [R, R].

Simple carbs can also spike your insulin, which is linked to a higher risk of obesity [R].

Some low-carb diets that may help you lose weight include:

- **Keto diet**: low-carb and high-fat diet [R, R, R]
- **Atkins diet**: low-carb diet [R, R, R, R, R]
- **Paleo diet**: hunter-gatherer diet (limited carbs, dairy products, and legumes) [R, R, R]
- **Zone diet**: meals consist of 40% complex carbs, 30% protein, and 30% fat [R]

Sticking to a low-fat diet for 2-12 months may also support weight loss [R, R, R, R, R]. However, a **low-carb diet may be more effective** [R, R, R, R, R].

Note: *In the long run, high-protein diets may contribute to heart disease, calcium loss, constipation, and other health problems. If you have problems with kidneys or bones, consult your doctor or dietitian before adopting a high-protein diet* [R, R].

3

Exercise At Least One Hour a Day

IMPACT 4 / 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

Exercise is a great way to control blood sugar levels. When you exercise, your muscles use up sugar for energy. Exercise also makes your cells more sensitive to insulin [R, R, R, R, R].

Try a mix of cardio and strength training for at least 150 min/week [R, R, R].

All health experts recommend exercise to reduce blood sugar levels. However, you may need to combine it with diet for optimal results [R, R, R, R, R].

4

Practice Exercise Snacks

IMPACT 4 / 5

EVIDENCE 5 / 5

How to implement

Integrate short bursts of physical activity, each lasting about 1 to 2 minutes, into your daily routine at least two to three times a day. These 'exercise snacks' can include activities like doing a set of stairs, rapid bodyweight exercises, pull-ups, push-ups, sit-ups, or brisk walking.

TYPICAL STARTING DOSE

1 minutesute

Description

Staying physically active is essential for maintaining overall health and well-being. **Exercise snacks** are brief, frequent bursts of physical activity integrated into daily routines, helping combat the health risks associated with prolonged sitting and sedentary behavior, such as obesity and cardiovascular issues. Examples include taking the stairs or doing quick exercises during work breaks.

Staying active can do wonders for your health. It can help you lose weight, improve your heart health, boost your mood, and more [R].

Exercise snacks are short, quick bursts of physical activity performed throughout the day, designed to break up prolonged periods of sitting or inactivity. These brief bouts of exercise can be as short as a few minutes and are incorporated into daily routines to boost overall physical activity levels.

Exercise snacks are crucial for health because they combat the negative effects of sedentary behavior, such as prolonged sitting, which is associated with an increased risk of obesity, cardiovascular diseases, diabetes, and musculoskeletal issues. They help improve blood circulation, regulate blood sugar levels, and enhance mood and cognitive function.

Examples of exercise snacks include taking the stairs instead of the elevator, doing a few minutes of bodyweight exercises (e.g., squats or push-ups) during work breaks, or walking briskly for a few minutes after meals. These short, frequent bursts of activity contribute to a more active lifestyle and can significantly benefit overall health by reducing the risks associated with excessive sitting.

How it helps

Sedentary people have an approximately 50% higher risk of being obese [R].

In line with this, **most experts agree that getting 150-300 minutes of exercise per week can help you control your weight.** For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

Exercise helps by burning calories and boosting your metabolism. It may also lower your appetite [R, R].

5

Berberine

IMPACT 4 / 5

EVIDENCE 5 / 5

How to implement

Take 500 mg of berberine two times a day before meals. Continue this regimen for up to three months, then evaluate its effects with your healthcare provider.

TYPICAL STARTING DOSE

1000 mg

Description

Berberine is a compound found in certain plants, known for its potential to support blood sugar control and heart health.

Berberine is an active compound of some plants used in traditional medicine, such as [R]:

- European barberry
- Oregon grape
- Goldenseal
- Chinese goldthread
- Tree turmeric

Berberine is also available as a supplement. People use it to help with [R, R, R]:

- Diabetes
- High cholesterol
- High blood pressure
- PCOS

How it helps

Berberine (0.5-1.5 g/day for 2-6 months) may help control blood sugar. It likely boosts sensitivity to insulin and lowers inflammation [R, R, R].

The combination of berberine and milk thistle may provide similar benefits [R, R, R, R].

Importantly, berberine may boost GLP-1 [R].

6

Resistant Starch

IMPACT 4 / 5

EVIDENCE 4 / 5

How to implement

Incorporate 40g of Jo's resistant starch into your daily diet. This can be done by adding it to smoothies, yogurt, or baked goods. Ensure to spread the intake throughout the day for better tolerance.

TYPICAL STARTING DOSE

40 g

Description

Resistant starch is a type of starch that resists digestion in the small intestine, making it a prebiotic fiber that can benefit gut health. It can be found in foods like green bananas, legumes, and certain grains.

Resistant starch is starch that doesn't get digested in the small intestine [R, R].

Some types of resistant starch include [R]:

- **Type 1** occurs naturally in foods such as whole grains
- **Type 2** can be isolated from foods such as corn and green banana
- **Type 3** is created during the cooking and cooling process of starchy foods like potatoes

Resistant starch doesn't increase blood sugar like typical digestible starches do [R, R].

Instead, it feeds good bacteria in the colon that [R, R]:

- Support healthy gut function
- Support immunity
- Reduce inflammation

How it helps

Resistant starch supplements (10-30 g/day) may help reduce blood sugar and prevent diabetes [R, R, R].

Resistant starch **delays the absorption of sugar**, which prevents blood sugar spikes. It may even boost your response to insulin [R].

7

Aerobic Exercise (Cardio)

IMPACT 4 / 5

EVIDENCE 4 / 5

How to implement

Engage in at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity activity each week. Distribute this time over at least 3 days per week, avoiding consecutive days of vigorous exercise to allow for recovery.

TYPICAL STARTING DOSE

1 hour

Description

Engaging in regular aerobic exercise, such as running, swimming, or cycling, offers numerous health benefits, including improved cardiovascular fitness, weight management, and mood enhancement. It supports overall physical and mental well-being while reducing the risk of chronic diseases.

Cardio, short for cardiovascular exercise, is any type of physical activity that temporarily increases your heart rate. Examples include **running, cycling, swimming, and brisk walking**.

Regular cardio exercise has many benefits for your overall health. It can help lower your risk of heart disease and diabetes, support weight loss, and improve your mood and energy levels. To get the most out of cardio, try to do it for at **least 30 minutes, 3-5 times a week**.

Interval training is a type of cardio that combines periods of high-intensity training with brief rest periods.

How it helps

Exercise training is the most effective strategy to increase VO2 max in both adults and children [R, R, R].

Aerobic training may increase VO2 max. You can start with lower-impact workouts such as walking or zumba and gradually incorporate higher-intensity exercise [R, R, R, R, R, R, R, R].

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].

For instance, aerobic exercise may lower LDL cholesterol by 4-12 mg/dL according to several meta-analyses [R, R, R, R].

8

Mediterranean Diet

IMPACT 4 / 5

EVIDENCE 4 / 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 may lower blood sugar levels in the long run. It's rich in foods that help reduce inflammation and insulin resistance [R, R, R, R, R, R].

People who stick to the Mediterranean diet may thus be less likely to have diabetes. Studies suggest this type of diet may be the best choice for people at risk of diabetes [R, R, R, R].

The Mediterranean diet is rich in olive oil. **Eating olive oil may lower blood sugar levels and reduce the risk of diabetes** [R].

9

Intermittent Fasting

IMPACT 4 / 5

EVIDENCE 4 / 5

How to implement

Limit your daily eating to a specific window of time, typically within an 8-hour period such as from 12 pm to 8 pm, and fast for the remaining 16 hours of the day. Repeat this daily or for at least 3-4 days per week.

Description

Intermittent fasting is an eating pattern that involves cycling between periods of fasting and eating. It may help with weight management, improve metabolic health, and offer potential benefits for certain health conditions when done under proper guidance.

Intermittent fasting (IF) is a pattern of eating that alternates between periods of eating and fasting. The most popular IF method is called the 16/8 method, where you fast for 16 hours and eat during an 8-hour window.

People mainly practice IF to lose weight. Besides benefits related to weight reduction, IF may help lower the risk of [R]:

- Alzheimer's disease
- Joint pain
- Asthma
- Multiple sclerosis
- Stroke

Some types of intermittent fasting, such as Ramadan fasting, are also practiced for religious reasons.

How it helps

Intermittent fasting may reduce weight, but not BMI, better than continuous calorie restriction. Short-term intermittent fasting may also reduce weight. Intermittent fasting may also improve fasting blood glucose and HOMA-IR. In four studies with 355 participants, intermittent fasting led to better weight loss (1.70 kg). In six studies, significant reductions in BMI (1.56 kg/m2), fat mass (1.35%), fat-free mass (0.63%), body weight (2.49 kg), and waist circumference (-3.06 cm) were observed. In seven studies, IF decreased body weight by -1.89 kg, with greater effects in heavier populations and shorter studies (≤ 4 months). However, intermittent fasting didn't significantly outperform other diets in a meta-analysis of 9 studies [R, R, R, R, R, R, R, R, R, R].

Eighty-five studies from 25 countries conducted between 1982 and 2019 found that Ramadan intermittent fasting led to a small but significant weight reduction (approximately 1.022 kg). Time-restricted feeding showed greater weight loss than control regimens, particularly in observational studies [R, R].

Intermittent fasting may help by reducing the amount of calories you consume and enhancing your body's fat-burning processes.

10

Dietary Zinc

IMPACT 4 / 5

EVIDENCE 3 / 5

How to implement

Incorporate foods high in zinc, such as beef, poultry, seafood (especially oysters), beans, nuts, and whole grains, into your daily diet. Aim for the recommended dietary allowance of zinc, which is 11 mg per day for adult men and 8 mg per day for adult women.

Description

Dietary zinc is essential for the body. It helps our immune system fight off bacteria and viruses, plays a role in healing wounds, and is essential for our sense of taste and smell. Without enough zinc, these systems may not work as effectively as they should.

How it helps

Zinc is an essential mineral, meaning that the body gets the zinc it needs through diet or supplements [R].

Generally speaking, the recommended daily intake of zinc is 8 mg for women and 11 mg for men. However, there may be benefits to higher zinc levels [R].

One study including over 46,000 participants who had an average daily zinc intake of about 14 mg found that higher zinc intake is correlated with lower blood glucose levels [R].

Some foods that are rich in zinc include [R]:

- Oysters
- Red meat
- Poultry
- Seafood

Just be aware that it is possible to consume too much zinc, which can have negative health effects. Zinc intake should not exceed 40 mg each day unless directed by a doctor [R].

11

Zinc

IMPACT 4 / 5

EVIDENCE 3 / 5

How to implement

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

TYPICAL STARTING DOSE

15 mg

Description

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

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

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

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

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

How it helps

In some people, the pancreas produces too much insulin, which can lead to insulin resistance. **Zinc may be able to prevent this and protect the pancreas from damage** [R, R].

Zinc-deficient people are more likely to have high blood sugar [R].

Supplementing with zinc (25-34 mg/day) may reduce blood sugar. It may also lower the odds of type 2 diabetes [R, R, R, R, R, R].

12

Eat Fiber-Rich Foods

IMPACT 3 / 5

EVIDENCE 4 / 5

How to implement

Incorporate foods high in fiber, such as fruits, vegetables, whole grains, and legumes, into your daily meals. Aim for a total dietary fiber intake of 25 to 30 grams per day, spread out over all meals.

Description

Fiber is a type of carb that your body can't digest which supports digestion, heart health, and blood sugar control. You can get fiber by eating things like whole grains, fruits, nuts, seeds, and leafy greens.

Fiber is a type of carb that your body can't digest. It supports digestion, heart health, blood sugar control, and more [R, R].

Adults should get 28 g of fiber every day. Most people in the US don't get enough fiber [R, R].

You can get more fiber by eating [R, R]:

- Whole grains
- Fruits
- Leafy greens
- Nuts and seeds
- Beans
- Broccoli

Fiber supplements, such as psyllium husk, are available for people who don't get enough fiber from their diets [R, R].

How it helps

Dietary fiber may help reduce blood sugar levels. **People who eat more fiber may be at a lower risk of diabetes** [R, R, R].

This is because **fiber delays the absorption of sugar**, which prevents blood sugar spikes. It may even boost your response to insulin [R, R, R, R, R].

Mediterranean and vegetarian diets are rich in high-fiber foods that may help control blood sugar [R, R, R, R, R].

High-fiber foods that may benefit blood sugar include:

- Flaxseed [R, R]
- Chia seed [R, R, R]
- Fenugreek [R, R, R, R]

For people who don't get enough fiber from diet, potential supplements include:

- Resistant starch [R, R, R]
- Inulin [R, R, R]
- Psyllium husk [R, R, R, R]

Note that a diet high in sugary foods may cancel out the protective effects of dietary fiber [R].

13

Whole Grains

IMPACT 3 / 5

EVIDENCE 4 / 5

How to implement

Incorporate at least three servings of whole grains into your daily diet. This can include consuming foods such as whole grain bread, brown rice, whole grain pasta, and oats. Aim to replace refined grains with whole grains at each meal for optimal benefits.

Description

Whole grains encompass a variety of grains like wheat, oats, and quinoa, where the entire grain kernel is intact. They are rich in fiber, vitamins, minerals, and antioxidants, supporting heart health and reducing the risk of chronic diseases.

Unlike refined grains, whole grains contain nutritious parts of the grain like bran and germ.

Whole grains provide many crucial nutrients, including:

- Fiber
- B-vitamins
- Iron
- Magnesium
- Phosphorus

Due to their high fiber content, whole grains don't tend to spike blood sugar like refined grains do.

How it helps

Dietary fiber may help reduce blood sugar levels. **People who eat more fiber may be at a lower risk of diabetes** [R, R, R].

This is because **fiber delays the absorption of sugar**, which prevents blood sugar spikes. It may even boost your response to insulin [R, R, R, R, R].

As opposed to refined grains, which spike your blood sugar and insulin, refined grains are a rich source of fiber that may help manage blood sugar. **Note that a diet high in sugary foods may cancel out the protective effects of whole grains** [R].

14

Cinnamon

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

Take a 1 g cinnamon supplement once daily, ideally with a meal to aid absorption. This can be in the form of a capsule or tablet. Continue this regimen as long as it aligns with your health goals and under the guidance of a healthcare provider.

TYPICAL STARTING DOSE

1 g

Description

Cinnamon is a popular spice that may have various health benefits, including improving blood sugar control, reducing inflammation, and providing antioxidants. It's commonly used in both culinary and herbal applications.

Cinnamon is a spice made from the bark of *Cinnamomum* trees. Cinnamon can [R]:

- Decrease inflammation
- Fight oxidative stress
- Kill microbes

Cinnamon is mainly used in cooking and fragrances. **As a natural remedy, people use cinnamon to reduce blood sugar** [R].

There are two main types of cinnamon [R]:

- Ceylon or ‘true’ cinnamon (*Cinnamomum verum*)
- Chinese or Cassia cinnamon (*Cinnamomum cassia*)

How it helps

Cassia cinnamon (120-6,000 mg/day for 4-18 weeks) may improve blood sugar control [R, R, R, R].

It may help by [R, R, R]:

- Preventing oxidative stress
- Reducing insulin resistance

However, health experts say there’s not enough evidence to recommend cinnamon supplementation for diabetes [R].

Cinnamon may help by boosting GLP-1 [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 doses of Cassia cinnamon* [R, R, R].

15

Sleep for 7+ Hours

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

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

Description

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

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

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

Ways to sleep better include [R]:

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

How it helps

Adults who don't get enough sleep are 25-55% more likely to be overweight or obese. In fact, the risk of obesity may increase by 9% for every hour of sleep lost [R, R, R, R].

Disrupting the natural sleep cycle may also promote weight gain. **People who work night shifts are more likely to be obese** [R, R, R].

Sleep may be even more important for weight control in children. The good news is that every 1-hour increase in sleep may lower their risk of weight gain by a whopping 21% [R, R, R, R, R].

Sleep helps keep hunger hormones like ghrelin and leptin in balance. Thus, lack of sleep may increase junk food cravings and total food intake [R, R, R].

16

L-Carnitine

IMPACT 2 / 5

EVIDENCE 3 / 5

How to implement

Take 500 mg of L-carnitine supplement daily with a glass of water, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

1 g

Description

L-carnitine is an amino acid-like compound that plays a role in energy metabolism and helps prevent toxic substances from building up in cells. It is often used in dietary supplements for its potential to support muscle recovery, reduce fatigue, and enhance athletic performance.

L-carnitine is a compound that helps you burn fat. It also prevents toxic substances from building up in cells [R].

Your body can usually make enough carnitine to meet its needs. You can also get it from **meat and dairy products** [R].

People use L-carnitine for [R, R, R, R, R, R]:

- Heart problems
- Overactive thyroid
- Fertility problems
- Blood sugar control
- Weight control

How it helps

Carnitine activates AMPK and prevents insulin resistance [R, R].

L-carnitine may boost your sensitivity to insulin. It helps remove chemicals linked to insulin resistance from your cells [R].

L-carnitine (0.2-3 g/day for 1-12 months) may help reduce blood sugar levels [R, R, R].

17

Curcumin

IMPACT 2 / 5

EVIDENCE 3 / 5

How to implement

Take a 500 mg curcumin supplement daily with food. To enhance absorption, take it with a meal that contains fats or oils since curcumin is fat-soluble.

TYPICAL STARTING DOSE

500 mg

Description

Curcumin is a compound found in turmeric known for its anti-inflammatory and antioxidant properties. It has been studied for its potential to reduce inflammation, support joint health, and contribute to overall well-being.

Turmeric is a yellow spice from India. It may reduce inflammation and oxidative stress [R].

The most important active compound in turmeric is **curcumin.** People use curcumin for [R, R, R, R, R, R]:

- Joint pain
- Hay fever
- Mood
- High blood sugar
- Gut health
- Liver health

How it helps

Curcumin (up to 4 g/day for 4-12 weeks) may lower blood sugar and improve insulin resistance [R, R, R, R, R].

Curcumin may help by [R, R]:

- Protecting against oxidative stress
- Lowering inflammation

Note that curcumin is hard to absorb. Look for supplements with *bioavailable* curcumin, which is easier to absorb. Combining it with piperine (a compound in black pepper) may also help [R, R].

Health experts say there's not enough evidence to recommend curcumin supplementation for diabetes [R].

Please note: *curcumin may interfere with iron absorption due to its iron-chelating properties, potentially exacerbating anemia or making it harder to manage. If you have anemia, consult your healthcare provider before using curcumin or turmeric supplements* [R, R, R].

18

American Ginseng

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take 200-400 mg of American ginseng extract daily, preferably with a meal to enhance absorption. This regimen can be followed continuously for up to 12 weeks, after which a break or reassessment of the need to continue should be considered.

TYPICAL STARTING DOSE

200 mg

Description

American ginseng is a perennial herb native to North America, particularly regions of the United States and Canada. It is valued for its potential health benefits, including immune system support, stress reduction, and enhanced cognitive function, with the primary active compounds being ginsenosides.

Ginseng is a plant people use to improve [R, R, R, R]:

- Sexual function
- Immunity
- Fatigue
- Attention

There are many different types of ginseng. The most common ones are [R, R, R]:

- Korean red ginseng, also called Asian ginseng (*Panax ginseng*)
- American ginseng (*Panax quinquefolius*)
- Chinese notoginseng, also called Sanchi (*Panax notoginseng*)

How it helps

In 4 placebo-controlled trials of 45 healthy people, a dose of 1-9 g taken at least 40 minutes before a meal lowered glucose spikes and improved insulin sensitivity. In 3 placebo-controlled trials of 43 people with type 2 diabetes, American ginseng reduced blood glucose levels (both fasting and post-meal) and HbA1c [R, R, R, R, R, R, R].

A meta-analysis of 16 studies and 1688 participants concluded that ginseng (both Korean and American) modestly reduces fasting blood glucose but pointed out that the different ginseng types may differ in their effectiveness, making it necessary to conduct more clinical studies [R].

American ginseng may help by boosting GLP-1 [R].

Next Steps

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

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

Your lab results

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

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

HbA1c	30 mmol/mol	26 36 48	29 Dec 2025
Glucose, Fasting	97 mg/dL	55 65 80 95 100 126	9 Nov 2025
Insulin, Fasting	9.08 uU/mL	1 6 19.6 25	9 Nov 2025