

Hip Fractures

DNA Health Report

REPORT CATEGORY —



INJURIES

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

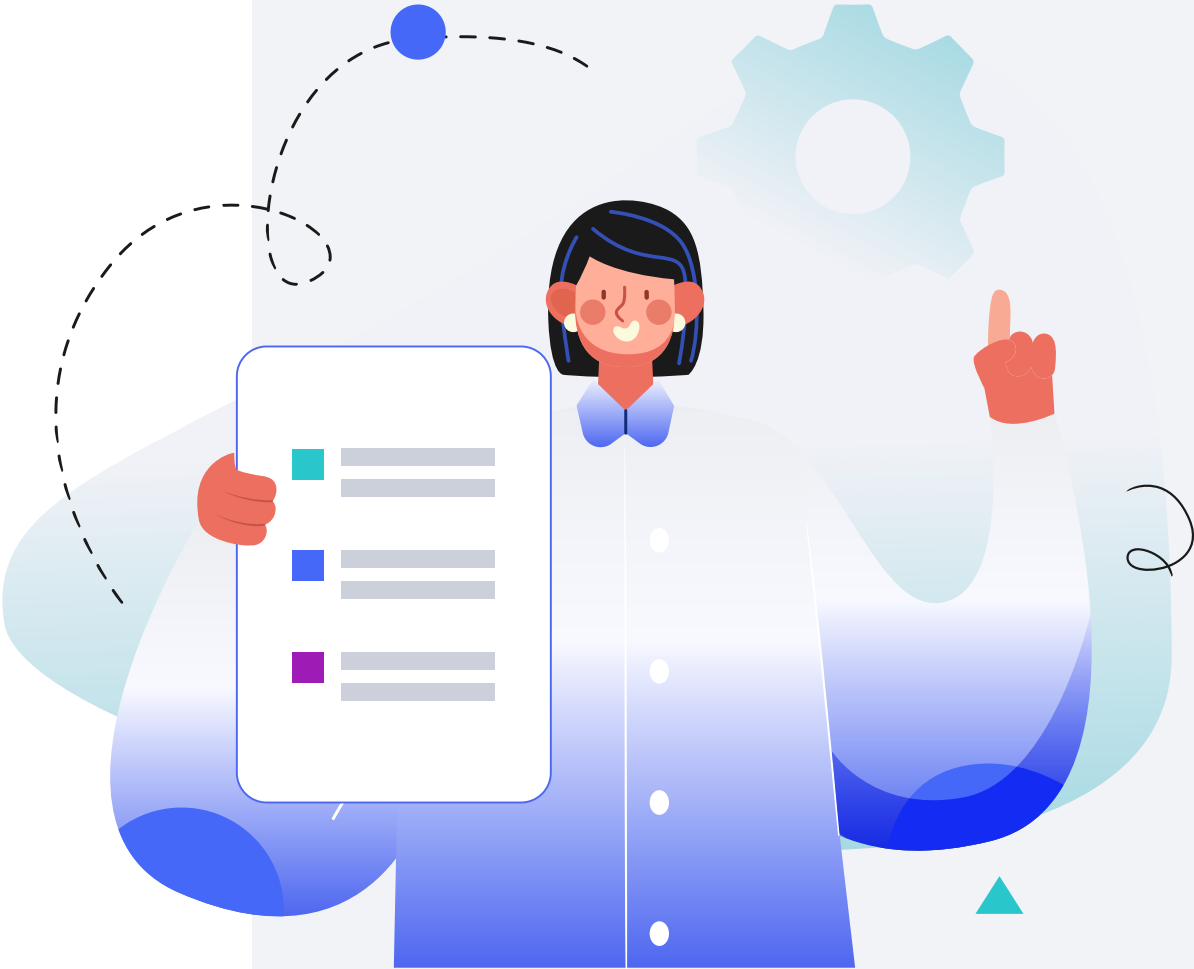
Male

HEIGHT

5ft 5" 165cm

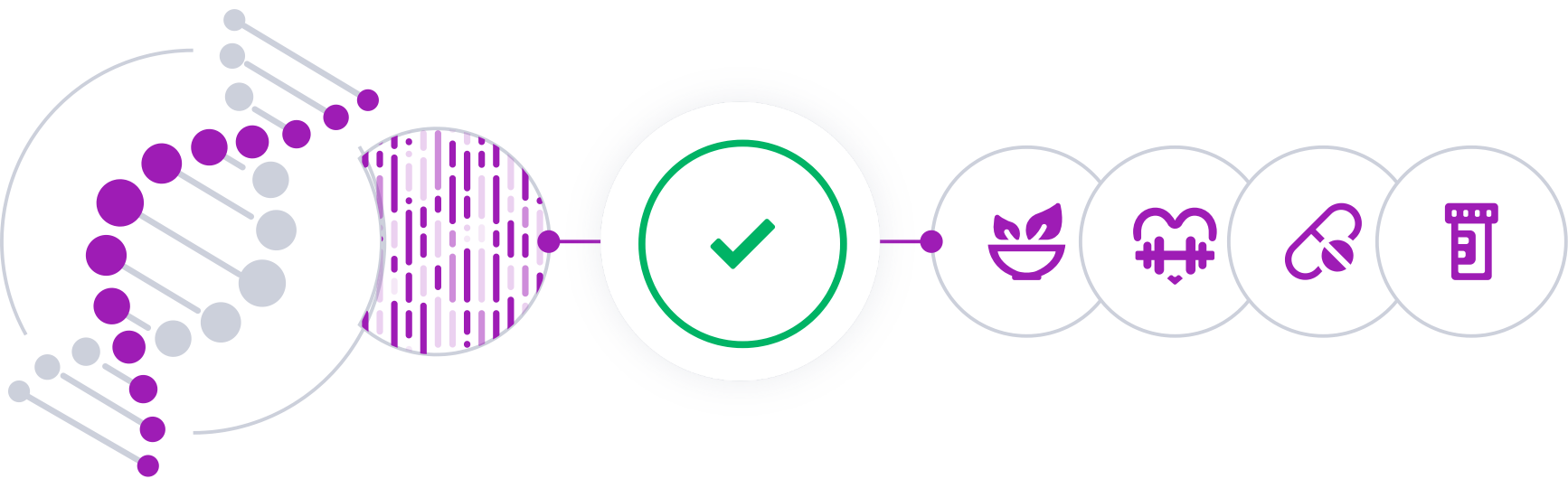
WEIGHT

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

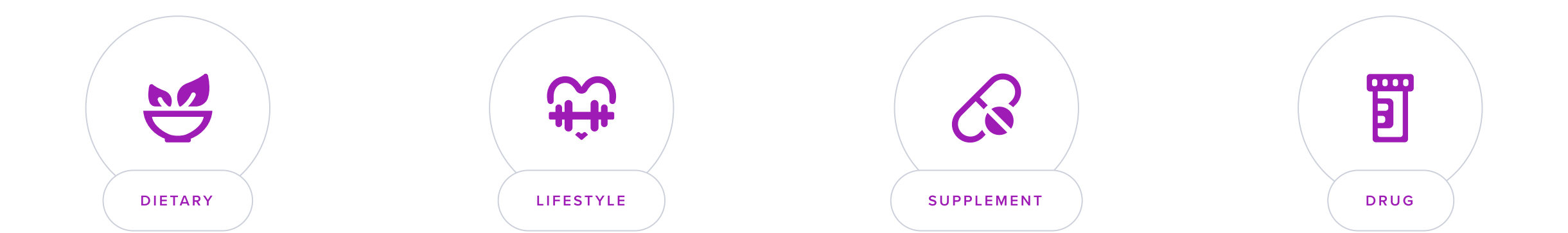
You have 2 risk alleles

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

Hip fractures are serious injuries that occur in the upper part of the femur (thighbone), typically resulting from a fall or a direct blow to the side of the hip. These injuries are particularly common in elderly individuals due to factors such as decreased bone density (osteoporosis) and balance problems, although they can occur at any age as a result of high-impact trauma like car accidents.

Hip fractures are generally classified based on their location:

- Femoral neck fractures: These occur in the neck of the femur, just below the ball part (femoral head) that fits into the hip socket. This type is especially common among the elderly and can affect blood supply to the femoral head.
- Intertrochanteric fractures: These fractures occur between the neck of the femur and a lower bony prominence called the lesser trochanter. They are typically easier to repair because they do not disrupt blood supply to the bone.
- Subtrochanteric fractures: These occur just below the lesser trochanter and can be caused by traumatic events or stress injuries in younger people.

Symptoms of a hip fracture include:

- Severe pain in the hip or groin area
- Inability to bear weight on the leg on the side of the injured hip
- Stiffness, bruising, and swelling in and around the hip area
- The leg on the side of the injured hip may turn outward or appear shorter than the other leg

Treatment and Prevention

Treatment for hip fractures usually involves surgery, which is often required to repair the fracture and allow patients to return to their normal level of activity:

- **Surgical repair:** Depending on the type and severity of the fracture, surgery may involve the use of metal screws, plates, or rods to hold the bones in place.
- **Hip replacement surgery:** In cases where the blood supply to the femoral head is compromised or the joint is severely damaged, a partial or total hip replacement may be necessary.
- **Nonsurgical treatment:** In very rare cases, or where surgery is too risky due to other health problems, treatment may involve extended bed rest and pain management. However, prolonged immobility can increase the risk of complications like blood clots and bedsores.

Recovery often involves a combination of physical therapy, mobility aids (like walkers or canes), and a gradual increase in activity. The goals are to restore mobility, strengthen the muscles around the hip, and prevent future falls by improving balance and flexibility.

Preventive measures are crucial, especially for the elderly. They include:

- Maintaining bone health through adequate calcium and vitamin D intake
- Regular exercise to strengthen bones and muscles
- Home safety assessments to reduce fall risks, such as removing tripping hazards and installing grab bars in bathrooms



TYPICAL LIKELIHOOD

Typical likelihood of hip fractures based on 219,744 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MARCO	rs115242848	CC
HLA-DQA1	rs2071805	CC
VAR2	rs9262558	CC
SP7	rs144680237	CC
CPED1	rs3779381	AA
ZBTB40	rs34414754	AA
WLS	rs2566755	TT
NTNG1	rs76259395	AA
CTNBL1	rs6063547	GG
CPED1	rs10242100	AA
MRPL20	rs12408050	GA
INKA2	rs6658723	TT
FKBP11	rs3741619	GA
ETS2	rs11088458	AG
HBZ	rs10794639	GA
SMOC1	rs3742909	AG
/	rs2431108	CT
TSHZ3	rs2111530	AG
LGR4	rs11030084	TC
TSPAN4	rs28672671	GA
RPL10L	rs12884871	CT
HOXC6	rs7308105	TC
/	rs67174662	AG
DRD1	rs2471020	TC

GENE	SNP	GENOTYPE
ARL14EP	rs494221	GA
MN1	rs139959245	CC
TRERF1	rs72857666	CC
FHIT	rs7616516	GG
SPP1	rs33983260	DEL(AG)DEL(AG)
GAL	rs880610	GG
GAL	rs56154705	CC
CTNNB1	rs389264	CC
RSPO3	rs9482772	CC
ZNF536	rs28633123	CC
/	rs2709062	GG
CCDC170	rs4869744	TT
BCL11A	rs974135	CC

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	Transcutaneous Electrical Nerve Stimulation (TENS)	30 minutes	2	Walking	30 minutes
3	Dietary Calcium		4	Balance And Mobility Training	30 minutes
5	Physical Therapy	30 minutes	6	Exercise At Least One Hour a Day	1 hour
7	Strength Training	1 hour	8	Vitamin D and Calcium	

1



Transcutaneous Electrical Nerve Stimulation (TENS)

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Apply TENS unit electrode pads around the area in pain; begin with the device set to a low setting and gradually increase intensity to a comfortable level. Use the device for 15-30 minutes per session for pain relief, and it can be used multiple times a day as needed.

TYPICAL STARTING DOSE

30 minutes

Description

TENS is a therapy that uses low-level electrical currents to relieve pain by stimulating the nerves. It's commonly used as a non-invasive method to manage various types of pain, such as musculoskeletal pain or chronic pain conditions.

How it helps

Perioperative TENS may improve early mobilization and physical function after hip fracture surgery [R].

2



Walking

IMPACT0 / 5

EVIDENCE0 / 5

How to implement

Incorporate at least 30 minutes of brisk walking into your daily routine, aiming for a minimum of five days a week. This can be done in one continuous session or broken into shorter periods, such as three 10-minute walks throughout the day.

TYPICAL STARTING DOSE

30 minutes

Description

Walking is a low-impact form of exercise that can contribute to cardiovascular fitness, weight management, and improved overall health. It is used to support physical activity goals, enhance mood, and promote better cardiovascular health.

How it helps

Walking is a weight-bearing exercise that helps maintain bone density and muscle strength, reducing the risk of hip fractures.

3



Dietary Calcium

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Consume 1,000-1,200 mg of calcium daily through dietary sources such as dairy products (milk, yogurt, cheese), green leafy vegetables (kale, broccoli), and fortified foods (orange juice, plant-based milks). Adults under 50 need 1,000 mg per day, while those over 50 should aim for 1,200 mg per day.

Description

Dietary calcium is a mineral found in dairy products, leafy greens, and fortified foods. It is essential for bone health, muscle function, and nerve transmission.

[Calcium](#) is the most abundant mineral in the human body. It is vital for the bones, heart, muscles, and nervous system [\[R\]](#).

Your body gets calcium from food and needs vitamin D to help absorb it. Calcium can be found in a variety of foods, including [\[R\]](#):

- Dairy products
- Green, leafy vegetables
- Fish with edible soft bones (e.g., sardines)
- Calcium-fortified foods and beverages

How it helps

Calcium is essential for bone health. It helps to maintain bone density and strength, reducing the risk of fractures.

4



Balance And Mobility Training

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate balance and mobility exercises into your routine three to four times per week. Each session should last approximately 30 minutes and include activities such as standing on one foot, walking heel to toe, and tai chi or yoga. Start with simple exercises and gradually increase difficulty as your balance improves.

TYPICAL STARTING DOSE

30 minutes

Description

Balance and mobility training exercises, such as yoga or tai chi, can improve stability and reduce the risk of falls, particularly among older adults. These exercises enhance overall physical function.

How it helps

Balance and mobility training enhance stability and coordination, which can help prevent falls and subsequent hip fractures.

5



Physical Therapy

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Attend physical therapy sessions 2-3 times per week for a duration of 4-6 weeks, depending on your specific condition and the advice of your healthcare provider. Each session typically lasts about 30-60 minutes, where a licensed therapist will guide you through targeted exercises, stretches, and possibly other treatments like electrical stimulation or ultrasound therapy.

TYPICAL STARTING DOSE

30 minutes

Description

Physical therapy is a therapeutic practice focused on optimizing physical function and mobility through specialized exercises, manual techniques, and therapeutic modalities. It helps individuals recover from injuries, manage chronic conditions, and improve overall physical well-being by enhancing strength, flexibility, and pain management.

Physical therapy (physiotherapy) helps people regain or maintain their ability to move [\[R\]](#).

Physical therapy can involve [\[R\]](#):

- Joint or muscle exercises
- Corrective movements
- Massage
- Education and advice

People mainly use physical therapy to help with [\[R\]](#), [\[R\]](#):

- Pain and injury
- Stroke recovery
- Chronic health conditions
- Headaches

Mirror therapy uses a mirror placed between the arms or legs. The image of a moving arm or leg gives the illusion of normal movement in the affected one. This therapy stimulates different brain regions and aims to improve mobility [\[R\]](#).

Constraint-induced movement therapy is another type of physical therapy. It consists of restraining the healthy leg or arm to increase the use of the affected one [\[R\]](#).

How it helps

Physical therapy helps in building muscle strength and improving mobility, which can be crucial for preventing falls and maintaining bone health after a fracture.

6



Exercise At Least One Hour a Day

IMPACT

0 / 5

EVIDENCE

0 / 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 strengthens bones and muscles, improving overall physical function and reducing the risk of fractures.

7



Strength Training

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Engage in strength training exercises, such as weight lifting or bodyweight exercises, for 60 minutes per session, 2 to 3 times per week. Ensure you work all major muscle groups and rest each muscle group for at least 48 hours before exercising it again.

TYPICAL STARTING DOSE

1 hour

Description

Strength training, also called resistance or *anaerobic* training, contracts the muscles against an external resistance for short periods of time. This helps gain muscle strength, tone, and mass. This can include activities like weight lifting, pushups, and crunches.

Strength training, also known as resistance training, is a type of physical exercise that uses resistance to build strength, anaerobic endurance, and size [R]. Some of the most common strength training methods include [R]:

- Weight lifting
- Bodyweight exercises like push-ups, pull-ups, squats, and lunges.
- Resistance bands
- Plyometrics or explosive force exercises

The benefits of strength training are numerous, and include [R]:

- Increased muscle strength
- Improved bone health
- Reduced risk of injury
- Improved balance and coordination
- Enhanced mood
- Boost metabolism

Consult with a doctor before starting any new exercise program, especially if you have any health conditions.

How it helps

Strength training increases muscle mass and bone density, helping to prevent fractures by making the bones stronger and more resilient.

8



Vitamin D and Calcium

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take 600 IU of vitamin D and 1000 mg of calcium daily. For adults over 70 years, the vitamin D intake should be increased to 800 IU daily. These supplements can be taken together or separately, usually with a meal to enhance absorption, and it is advisable to continue this regimen as part of your daily routine indefinitely unless advised otherwise by a healthcare provider.

Description

Vitamin D plus calcium supplements typically combine vitamin D, often sourced from sunlight exposure or dietary sources, with calcium, primarily found in dairy products and leafy greens. This combination is used to promote bone health, reduce the risk of osteoporosis, and support overall musculoskeletal well-being.

How it helps

This combination is proven to improve bone density and reduce fracture risk by ensuring that the body has both necessary components for optimal bone health and repair.

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 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.

