

Hyperparathyroidism

Disease Report

REPORT CATEGORY —



BONE HEALTH

Sample Client

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Personal information

NAME

Sample Client

SEX AT BIRTH

Male

HEIGHT

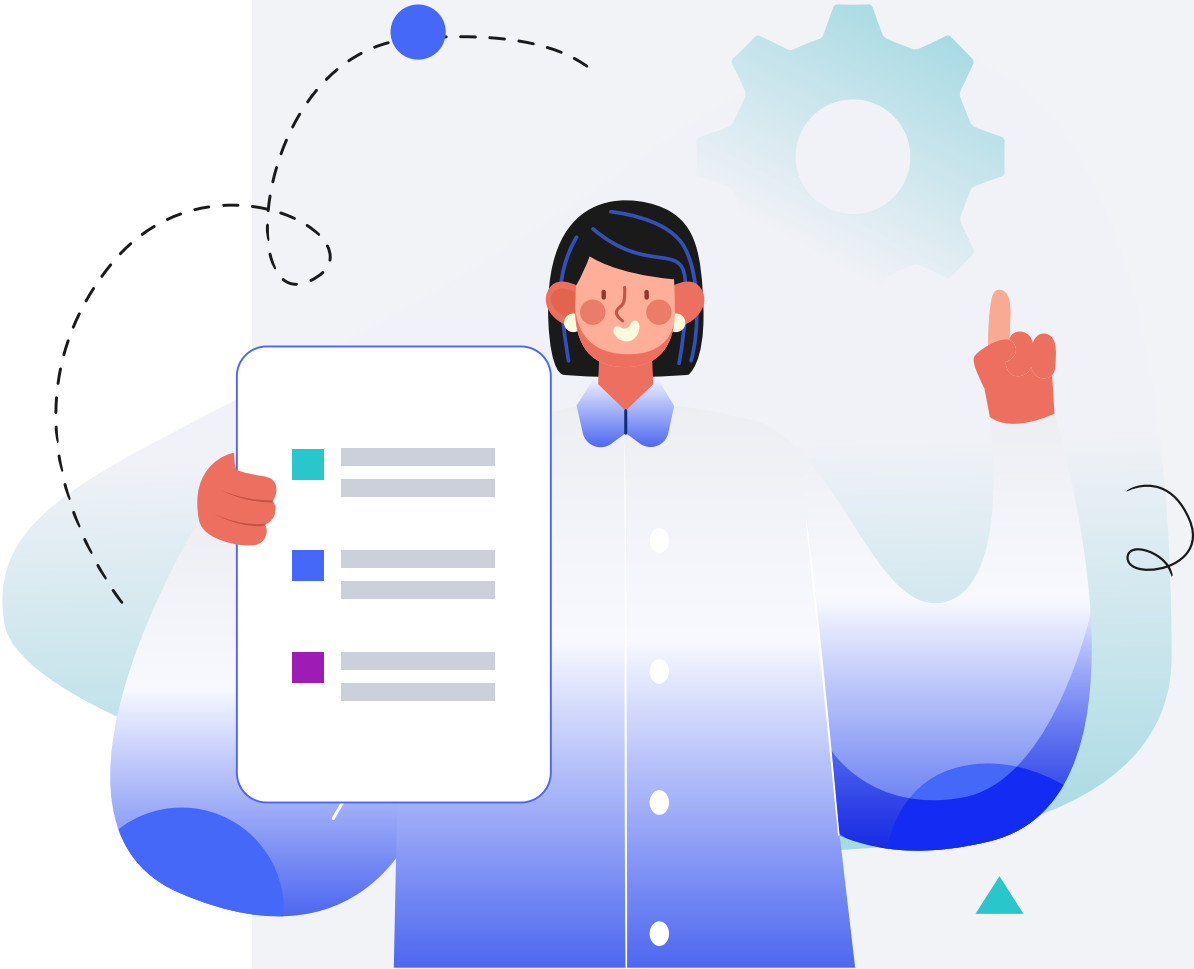
5ft 5" 165cm

WEIGHT

137lb 62kg

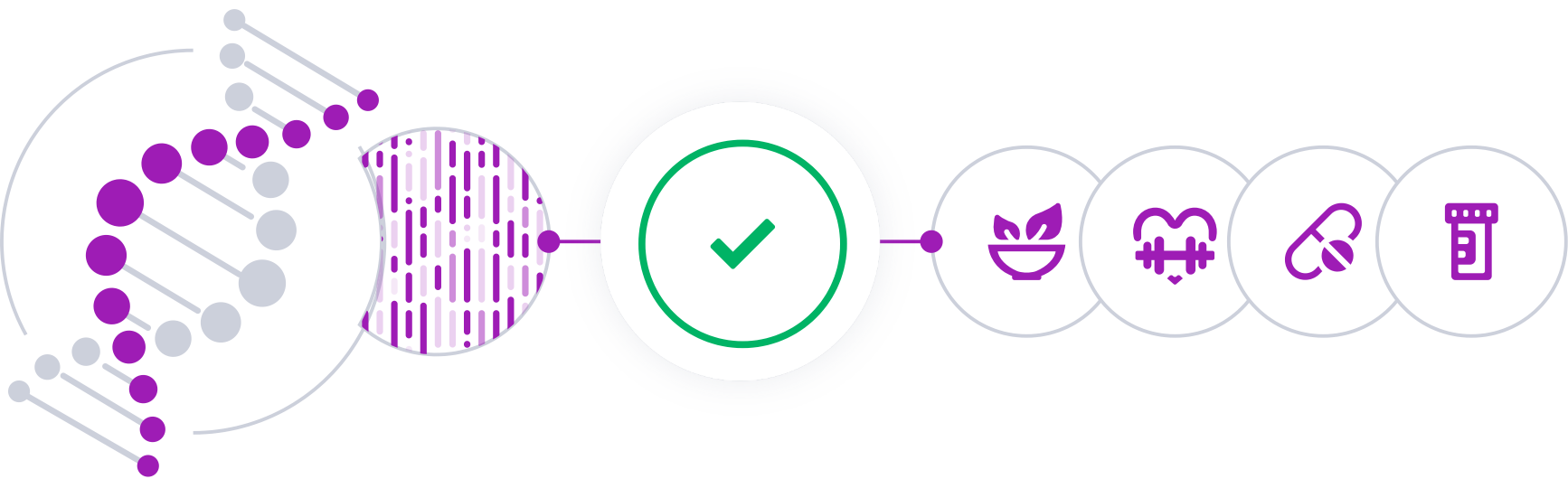
DISCLAIMER

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.

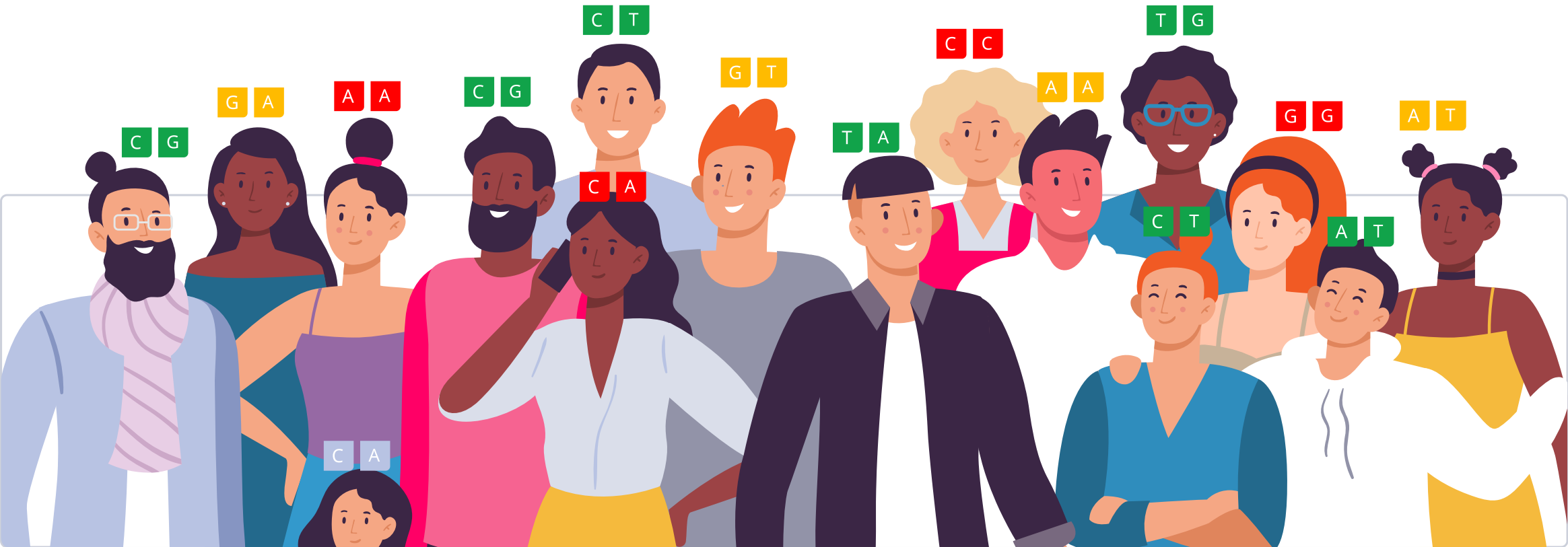


Similarly, our Trait Reports look at how your DNA influences your traits.



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.

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

Parathyroid hormone or PTH is a hormone made by the parathyroid glands. Most people have 4 pea-sized parathyroid glands embedded in the back of the thyroid gland [\[R\]](#).

PTH controls calcium and phosphorus levels in the blood and plays a crucial role in bone formation and breakdown [\[R\]](#).

PTH’s main function is to increase calcium levels when they are too low, by [\[R\]](#), [\[R\]](#):

- Promoting the release of calcium from the bones
- Decreasing the loss of calcium through the urine
- Increasing calcium absorption in the gut

High PTH (hyperparathyroidism) means that parathyroid glands are producing too much PTH. It causes **elevated calcium levels** in the blood and a range of signs and symptoms, including [\[R\]](#):

- Weak bones (osteoporosis)
- Bone and joint pain
- Kidney stones
- Frequent urination
- Fatigue and weakness
- Nausea and vomiting

Interestingly, people with **genetically higher PTH** levels may be **less likely to have osteoarthritis** [\[R\]](#).

Risk Factors and Causes

Parathyroid hormone or PTH is a hormone made by the parathyroid glands. **High PTH (hyperparathyroidism)** can increase blood calcium levels and cause a range of signs and symptoms.

The most common cause of high PTH is **primary hyperparathyroidism**. It happens due to an **enlargement** in one or more parathyroid glands. Risk factors include [R](#), [R](#), [R](#)]:

- Menopause (in women)
- Radiation treatment in the neck area
- Taking lithium (a drug for bipolar disorder)
- Genetics

High PTH can also be caused by conditions that reduce calcium levels. In that case, it’s called **secondary hyperparathyroidism**. Risk factors include [R](#)]:

- Severe calcium or vitamin D deficiency
- Chronic kidney disease



TYPICAL LIKELIHOOD

Typical likelihood of having high PTH based on 44,946 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FIBIN	rs375264315	CC
MRPS31	rs141641942	CC
LRFN5	rs117828799	AG
MED13L	rs139671128	GA
SPON1	rs185432762	AG
LDLRAD3	rs2956325	CC
RASSF3	rs190001302	TT
SFTPA1	rs146467844	AA
TEX26	rs73165078	AA
HMX3	rs80212821	CC
TRHDE	rs117792731	CC
CCDC179	rs116901664	AA
CCDC179	rs78033659	AA
ANKRD30A	rs182083216	CC
UBL3	rs148955645	TT
CLEC12A	rs117564390	TT
TTC6	rs146985994	CC
CPXM2	rs78588830	CC
RIC3	rs77193115	CC
UBAC2	rs140018682	GG
PPHLN1	rs138646204	TT
/	rs116936362	GG
SLC16A9	rs116848603	GG
CYSLTR2	rs112063839	TT
CCDC179	rs143400164	AA
LRFN5	rs142449134	CC
CUL2	rs140499091	TT
GPR183	rs17575384	AA
TMTC4	rs116880223	TT
SMIM2	rs73178960	AA
HMX3	rs138502426	GG
FZD4	rs144806437	CC

GENE	SNP	GENOTYPE
PIP4K2A	rs185622763	CC
CYSLTR2	rs117226215	AA
SMIM2	rs73178985	AA
MED13L	rs148788830	GG
TMTC4	rs75499525	AA
GDPD4	rs150119332	CC
TAF3	rs183659978	CC
SLC35F4	rs141109822	GG
GPR26	rs139771696	GG
ADAMTS20	rs143606795	TT
PAK1	rs139847224	TT
CCDC196	rs184749281	CC
PAK1	rs190492480	CC
PAK1	rs144527614	AA
FAM155A	rs117416683	CC
FOXO1	rs144759647	CC
MSRB3	rs117523829	CC
NPS	rs146056230	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.

	DOSAGE		DOSAGE		
1	Maintain Optimal Vitamin D Levels	1000 iu	2	Vitamin D and Calcium	
3	Dietary Calcium		4	Calcium Supplements	1000 mg
5	Aerobic Exercise (Cardio)	1 hour	6	Exercise At Least One Hour a Day	1 hour
7	Drink at Least 8 Glasses of Water a Day		8	Aquatic Exercise	1 hour
9	Magnesium	250 mg	10	Avoid Organochlorine Pesticide Exposure	
11	Calcium Magnesium Citrate	300 mg	12	Jumping	15 minutes
13	Running		14	Avoid Lead Exposure	
15	Lactobacillus Helveticus	10 billion CFU	16	Avoid Cadmium Exposure	
17	Bath Therapy	20 minutes	18	Avoid Mercury Exposure	
19	High-Impact Exercise	30 minutes	20	Strength Training	1 hour
21	Milk		22	Dairy Products	
23	Avoid Aluminum Exposure		24	Limit Protein Intake	
25	Dietary Magnesium				

1

Maintain Optimal Vitamin D Levels

IMPACT

5 / 5

EVIDENCE

4 / 5

How to implement

Check your vitamin D levels, they should ideally be in the 30-66 ng/mL range. If your levels are lower than that, take a vitamin D supplement, 1000-4000 IU daily, to reach an optimal range.

TYPICAL STARTING DOSE

1000 iu

Description

Vitamin D, often referred to as the "sunshine vitamin," can be synthesized by the skin when exposed to sunlight, as well as being found in fish, eggs, and fortified milk. It helps regulate calcium absorption, promoting strong bones and a healthy immune system. Vitamin D deficiency can lead to conditions like rickets in children and osteoporosis in adults.

Your body needs [vitamin D](#) for strong bones. Vitamin D also plays a role in [\[R\]](#):

- Mood
- Immunity
- Heart health
- Blood sugar control

[Sunlight](#) is our main source of vitamin D. Experts recommend getting at least **5-15 minutes of midday sun, 2-3 times per week**. People with darker skin and those living at high latitudes may need longer periods of sun exposure [\[R\]](#), [\[R\]](#).

Foods like fish, eggs, and fortified milk provide small amounts of vitamin D. **People lacking vitamin D should consider taking a supplement** [\[R\]](#).

How it helps

Vitamin D deficiency can increase PTH levels [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

In line with this, supplementation with **vitamin D (1,000-4,000 IU/day for at least 1 month)** may reduce PTH levels by maintaining appropriate calcium levels in the blood. Vitamin D may help the most when taken for at **least 12 months** [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

People with **low vitamin D levels** and those who are **obese or overweight** may get the greatest benefit from vitamin D supplementation [\[R\]](#), [\[R\]](#), [\[R\]](#).

Vitamin-D-fortified products and vitamin D in combination with calcium (600-1,200 mg/day) may also lower PTH levels [\[R\]](#), [\[R\]](#), [\[R\]](#).

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

PERSONALIZED TO YOUR GENES

Supplementation with vitamin D may lower PTH levels more in people with your [VDR](#) gene variant [\[R\]](#).

YOUR GENETIC VARIANTS			
GENE	SNP	GENOTYPE	EVIDENCE
VDR	rs1544410	CT	

2



Vitamin D and Calcium

IMPACT4 / 5

EVIDENCE4 / 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

Vitamin D deficiency can increase PTH levels [\[R, R, R, R\]](#).

PTH levels also rise in response to calcium deficiency [\[R, R\]](#).

Vitamin D in combination with calcium (600-1,200 mg/day) may lower PTH levels better than either of these supplements alone [\[R, R, R, R\]](#).

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

3



Dietary Calcium

IMPACT

4 / 5

EVIDENCE

4 / 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 deficiency](#) may increase PTH levels. Eating a low-calcium diet for 1-6 weeks may already be enough to cause negative effects [\[R, R, R, R, R\]](#).

In line with this, a **high calcium intake (about 1,000 mg/day)** may reduce the risk of high PTH **by half**. Calcium sources that may help include [\[R, R, R, R, R, R, R, R, R, R, R, R\]](#):

- Milk (at least 250 mL/day for at least 1 month)
- Milk powder (40-50 g/day for 12 months)
- Calcium-fortified dairy products (providing 300-1,600 mg/day of calcium for at least 1 month)

According to experts, adults should consume **1,300 mg/day of calcium** [\[R\]](#).

 PERSONALIZED TO YOUR GENES

Increased calcium intake may reduce PTH more in people with your [ME1](#) gene variant [\[R\]](#).

YOUR GENETIC VARIANTS			
GENE	SNP	GENOTYPE	EVIDENCE
ME1	rs1112482	CC	

4

Calcium Supplements

IMPACT4 / 5

EVIDENCE4 / 5

How to implement

Take 500-600 mg of calcium supplement twice daily with food. For best absorption, do not exceed 600 mg at one time and ensure a total daily intake of 1000-1200 mg from all sources, including diet. Continue indefinitely for ongoing support of bone health.

TYPICAL STARTING DOSE

1000 mg

Description

Calcium supplements are commonly used to support bone health and prevent conditions like osteoporosis. Adequate calcium intake is essential for maintaining strong bones and teeth.

[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

PTH levels rise in response to calcium deficiency [\[R\]](#), [\[R\]](#).

Supplementing with calcium (500-1,000 mg/day) may **reduce PTH levels**. People who take calcium supplements may be **2.5 times** less likely to have high PTH [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Combination with vitamin D may offer greater benefits [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Please note: *Calcium supplements are better absorbed when taken with food. If you experience bloating or constipation, consider switching to a supplement containing a different form of calcium, taking a smaller dose, or taking it with meals. Talk to your doctor before using or switching calcium supplements or dosage [\[R\]](#).*

Please note: *calcium competes with iron for absorption in the intestines, potentially exacerbating anemia or making it harder to manage. If you have anemia, consult your healthcare provider before using calcium supplements.*

PERSONALIZED TO YOUR GENES

Calcium supplementation may reduce PTH more in people with your [ME1](#) gene variant [\[R\]](#).

YOUR GENETIC VARIANTS			
GENE	SNP	GENOTYPE	EVIDENCE
ME1	rs1112482	CC	

5



Aerobic Exercise (Cardio)

IMPACT2 / 5

EVIDENCE3 / 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

People who exercise may be less likely to have high PTH levels. Intense exercise may reduce the risk by up to **50%** [\[R\]](#).

Aerobic exercise modalities that may lower PTH levels include:

- Aquatic exercise (50-60 min, 3x/week for 6 months) [\[R\]](#)
- High-impact exercise, such as running (3x/week for 12 months) [\[R\]](#)

Exercise may help by increasing bone formation [\[R\]](#), [\[R\]](#).

6



Exercise At Least One Hour a Day

IMPACT

2 / 5

EVIDENCE

3 / 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

People who exercise may be less likely to have high PTH levels. Intense exercise may reduce the risk by up to **50%** [\[R\]](#).

Exercise modalities that may lower PTH levels include:

- Aquatic exercise (50-60 min, 3x/week for 6 months) [\[R\]](#)
- High-impact exercise, such as running or jumping (3x/week for 12 months) [\[R\]](#)

Exercise may help by increasing bone formation [\[R\]](#), [\[R\]](#).

7



Drink at Least 8 Glasses of Water a Day

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Consume a total of at least 64 ounces (or approximately 1.9 liters) of water over the course of the day. This can be divided into 8 glasses, each containing 8 ounces of water. Aim to drink evenly throughout the day to avoid dehydration.

Description

Water is an essential nutrient for nearly every process in your body, helping to mainting brain and gut function, maintain a health weight, as well as energy and performance levels, among others.

Water is essential for life. It supports nearly every process in your body [\[R\]](#).

Water helps maintain [\[R\]](#):

- Energy and performance levels
- Brain function
- Gut function
- Healthy weight

Most experts recommend drinking **around 8 glasses (64 oz. or 2 L) of water daily**. You might need more or less than this, depending on how active you are, where you live, or what your overall health is like [\[R\]](#).

How it helps

Hydration is a **crucial part of the therapy for high PTH** [\[R\]](#), [\[R\]](#), [\[R\]](#).

Most experts recommend drinking **around 8 glasses (64 oz. or 2 L) of water daily** [\[R\]](#).

8



Aquatic Exercise

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Participate in aquatic exercise sessions, such as swimming or water aerobics, for 60 minutes, 3 to 5 times per week. Ensure the exercise intensity is moderate, allowing you to talk but not sing during the activity. Consistency over time is key, so aim to incorporate this into your weekly routine for at least 3 to 6 months to observe benefits.

TYPICAL STARTING DOSE

1 hour

Description

Aquatic exercise involves physical activity performed in water, such as swimming, water aerobics, or aquatic therapy. It is gentle on the joints, making it suitable for individuals with mobility issues, and can help improve cardiovascular fitness and muscle strength.

Aquatic exercise is any type of low-impact physical activity performed in a pool. In this type of cardio exercise, water helps the body float, which reduces gravity and makes the practice more comfortable and tolerable [\[R\]](#), [\[R\]](#).

Compared to land-based exercise, aquatic exercise may be better by [\[R\]](#):

- Reducing the stress and impact on joints
- Lowering fracture risk

Hence, it is usually **recommended for the elderly**. Aquatic exercise is also suitable for people who don't know how to swim [\[R\]](#).

How it helps

People who exercise may be less likely to have high PTH levels. Intense exercise may reduce the risk by up to **50%** [\[R\]](#).

Aquatic exercise (50-60 min, 3x/week for 6 months) may reduce PTH levels by increasing bone formation [\[R\]](#), [\[R\]](#).

9



Magnesium

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Take up to 350 mg of magnesium daily as a supplement, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

250 mg

Description

Magnesium is an essential mineral involved in various bodily functions, including muscle contractions, nerve signaling, and bone health. Maintaining adequate magnesium levels through diet or supplements can support overall well-being and reduce the risk of magnesium deficiency-related health issues.

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

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

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

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

How it helps

Supplementation with magnesium may **lower PTH levels in people with kidney disease**. Magnesium may help by supporting calcium metabolism [\[R\]](#), [\[R\]](#).

Please note: *Magnesium supplements should not exceed 350 mg/day of elemental magnesium. Higher doses may cause diarrhea, nausea, and abdominal cramps. In addition, magnesium supplements may interact with some medications, including antibiotics and "water pills" (diuretics)* [\[R\]](#).

10



Avoid Organochlorine Pesticide Exposure

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Minimize exposure by choosing organic fruits and vegetables, thoroughly washing produce before consumption, and avoiding areas where organochlorine pesticides are applied. Consider using air purifiers in homes close to agricultural areas to reduce indoor pesticide levels.

Description

Reducing organochlorine pesticide exposure involves minimizing contact with pesticides like DDT, which can accumulate in the body and potentially lead to adverse health effects, including disruption of hormonal functions and carcinogenicity.

How it helps

Avoiding organochlorine pesticide exposure can help with high PTH (parathyroid hormone) levels as these pesticides can disrupt endocrine function, leading to hormonal imbalances. Overexposure can potentially stimulate abnormal parathyroid activity, leading to increased levels of PTH.

A [study of 51,395 participants](#) associated the organochlorine pesticides **hexachlorobenzene, transnonachlor, oxychlordane, and p,p'-DDE with elevated PTH** [R].

11



Calcium Magnesium Citrate

IMPACT

2 / 5

EVIDENCE

1 / 5

How to implement

Take a combined calcium magnesium citrate supplement daily with a meal. The typical dose is around 300-500 mg of magnesium and 500-700 mg of calcium, but you should refer to the product's label for the exact dosage. It is important to divide the doses if the daily amount is high, taking half in the morning and half in the evening with meals to enhance absorption and reduce the risk of gastrointestinal side effects.

TYPICAL STARTING DOSE
300 mg

Description

Calcium magnesium citrate is a dietary supplement that combines calcium and magnesium, two essential minerals for bone health and muscle function. It can help support strong bones and reduce the risk of muscle cramps and spasms.

How it helps

In a crossover study of Stage 3 and Stage 5D CKD patients, effervescent calcium magnesium citrate increased T50 by 63% in Stage 5D CKD, with a non-significant drop in serum phosphorus and octacalcium phosphate saturation. It also lowered PTH levels and increased serum bicarbonate in Stage 5D CKD [R].

Calcium magnesium citrate may help by ensuring well-regulated levels of the minerals calcium and magnesium. An imbalance in these minerals may cause the parathyroid glands to overproduce PTH.

How to implement

TYPICAL STARTING DOSE

15 minutes

Description

How it helps

Exercise may help by increasing bone formation [[R](#), [R](#)].

How to implement

Description

How it helps

Exercise may help by increasing bone formation [[R](#), [R](#)].

14



Avoid Lead Exposure

IMPACT1 / 5

EVIDENCE2 / 5

How to implement

Prevent lead exposure by using cold water for drinking and cooking, regularly cleaning dust from windowsills and floors, and ensuring that your home's paint is not chipping if it was built before 1978. For occupations involving potential lead exposure, use protective gear and follow safety protocols. Test your home for lead if it's old or you're concerned about contamination.

Description

Lead is a heavy metal. It is naturally found in the environment in small amounts [\[R\]](#), [\[R\]](#).

Exposure to lead can cause it to build up in the body. A buildup of lead can contribute to oxidative stress and cell damage. This is called **lead poisoning** [\[R\]](#), [\[R\]](#).

Lead is no longer used in the manufacturing of some products like gasoline and paint. However, it can still be found in some pipes, batteries, and the wall paint of older homes [\[R\]](#), [\[R\]](#), [\[R\]](#).

How it helps

In a meta-analysis of 11 studies including 837 lead-exposed individuals and 739 controls, the lead-exposed group had elevated parathyroid levels compared to controls [\[R\]](#).

A study examined blood cadmium and lead levels in 9400 adults from the US population. Lead showed a positive non-linear association with PTH [\[R\]](#).

Lead can interrupt the body's natural regulation of calcium and phosphate, increasing PTH levels.

15



Lactobacillus Helveticus

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take a supplement containing Lactobacillus helveticus, usually available in capsule or powder form. Follow the manufacturer's instructions, commonly involving taking one to two capsules daily, preferably with a meal or as directed by a healthcare provider. Continue this regimen daily for at least 8 to 12 weeks to potentially see benefits.

TYPICAL STARTING DOSE
10 billion CFU

Description

Lactobacillus helveticus is a beneficial probiotic strain that can support digestive health and contribute to a balanced gut microbiome. It may help improve gut function, enhance nutrient absorption, and bolster the immune system, promoting overall well-being.

How it helps

Lactobacillus Helveticus can potentially help the condition of High Parathyroid hormone (PTH) by aiding in calcium absorption in the body, which is necessary for bone health. When PTH levels are high, it indicates your body is not properly processing calcium, and the probiotic may assist with this.

In a placebo-controlled trial of 20 postmenopausal women, drinking milk fermented with *L. helveticus* reduced serum PTH (by 49.6 ng/L) and increased serum calcium (by 0.3 mmol/L) [R].

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Avoid Cadmium Exposure

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

To avoid cadmium exposure, refrain from smoking or exposure to secondhand smoke, reduce consumption of foods high in cadmium like shellfish, liver, kidney meats, and certain leafy vegetables, and use ceramic or glass containers instead of plastic when microwaving food. Limit intake of cadmium-contaminated workplace air by using protective gear if you work in battery manufacturing, welding, or metal refining industries.

Description

Avoiding cadmium exposure is essential to prevent potential health risks associated with this heavy metal, such as kidney damage and increased cancer risk. Reducing exposure to cadmium-containing products and contaminated foods is crucial.

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

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

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

- Lead
- Cadmium
- Arsenic
- Chromium
- Mercury

How it helps

Serum 1 alpha, 25 dihydroxy-vitamin D levels were lower and serum parathyroid hormone (PTH) levels were higher in cadmium-exposed subjects with renal damage than in non-exposed subjects in a study [\[R\]](#).

Cadmium can interfere with calcium absorption. This triggers the parathyroid glands to produce more PTH hormone, leading to elevated PTH levels.

17



Bath Therapy

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Submerge in a warm water bath, ideally between 92-100°F (33-38°C), for 15-20 minutes, three to four times a week. Avoid using very hot water to prevent skin dryness.

TYPICAL STARTING DOSE

20 minutes

Description

Balneotherapy (balneum, “bath” in Latin) is a type of therapy that involves using **water with minerals and salts**. The water used for balneotherapy is **at least at 20°C** and has a **mineral content of at least 1g/L**. Balneotherapy includes bathing in natural springs, mineral baths, or swimming pools with mineral-rich water

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Waters for balneotherapy contain a mixture of organic and inorganic compounds, such as hydrogen sulfide (H2S) [\[R\]](#), [\[R\]](#).

People use balneotherapy to help with [\[R\]](#), [\[R\]](#):

- Joint and back pain
- Fibromyalgia
- Skin conditions (e.g., psoriasis)

How it helps

Bath therapy (36-39°C, 15-20 min every other day) may help reduce PTH levels. Hydrogen sulfide in thermal waters may help by improving bone health [\[R\]](#).

18



Avoid Mercury Exposure

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Limit consumption of large fish such as shark, swordfish, king mackerel, and tilefish, which are known to have higher mercury levels. Opt for smaller fish like salmon, shrimp, pollock, and catfish, and limit seafood intake to 8-12 ounces (two to three servings) per week. Check and follow local advisories regarding the safety of fish caught by family and friends in your local lakes, rivers, and coastal areas.

Description

Avoiding exposure to mercury, a toxic heavy metal found in certain seafood and environmental sources, is essential to prevent adverse health effects, including neurological damage and developmental issues.

Mercury and other [heavy metals](#) are found in the soil, water, food, and some commonly-used household products. They adversely affect the environment and living organisms. According to some studies, mercury is considered **the most toxic heavy metal** in the environment [\[R\]](#), [\[R\]](#).

A major source of mercury exposure is seafood, especially large fish such as [\[R\]](#):

- Tuna
- Shark
- Swordfish

How it helps

Mercury can impair kidney function, potentially causing alterations in PTH levels due to the kidneys' role in calcium and phosphorus balance.

19



High-Impact Exercise

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Engage in high-impact exercises like jogging, skipping rope, or playing sports such as basketball or volleyball for at least 30 minutes, 3 to 4 times a week. Ensure to include a warm-up and cool-down period of 5 to 10 minutes to prevent injuries.

TYPICAL STARTING DOSE

30 minutes

Description

High-impact exercise, such as running or jumping, can help improve cardiovascular fitness, bone density, and overall strength. It's an effective way to burn calories and promote physical health when performed safely and in moderation.

How it helps

High-impact exercises can help stimulate bone formation, which is crucial as High PTH often leads to leaching of calcium from the bones. Regular participation in these exercises may prevent the progression of this condition by maintaining healthy bone density.

20

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 aids in the maintenance of bone strength and density, and may influence PTH levels positively.

21



Milk

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate milk into your daily diet by drinking 1-2 glasses (around 8-16 ounces) each day, either as a beverage, mixed with cereal or coffee, or used in cooking and baking recipes. Choose a type of milk that suits your nutritional needs and dietary preferences, such as whole, skim, lactose-free, or plant-based alternatives.

Description

Milk is a nutrient-rich beverage that provides essential calcium, protein, and vitamins like vitamin D. It supports bone health, helps build and repair tissues, and can be a valuable part of a balanced diet.

How it helps

Milk is rich in calcium, a mineral that helps lower high levels of parathyroid hormone (PTH). Adequate calcium reduces the need for the parathyroid glands to release extra PTH, thus preventing any related health concerns.

22



Dairy Products

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Incorporate 2-3 servings of low-fat or fat-free dairy products into your daily diet. One serving could be 8 ounces of milk, 1 cup of yogurt, or 1.5 ounces of cheese. Choose options that are low in added sugars and consume as part of balanced meals or snacks throughout the day.

Description

Dairy products, such as milk, yogurt, and cheese, are rich sources of calcium and protein. They are essential for bone health, providing nutrients that support strong bones and teeth, as well as overall nutritional well-being.

Dairy products are made from milk. They include [\[R\]](#):

- Cheese
- Yogurt
- [Kefir](#)
- Butter
- Cream

Dairy products contain high levels of [calcium](#). Calcium helps build strong bones [\[R\]](#).

How it helps

Dairy products are rich in calcium, which is needed to counteract high levels of parathyroid hormone (PTH). When your body lacks calcium, PTH levels rise causing bone breakdown, thus intake of calcium from dairy helps stabilize PTH and strengthen bones.

23



Avoid Aluminum Exposure

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Use aluminum-free deodorants and avoid cooking or storing food in aluminum foil or aluminum cookware. Instead, opt for glass, stainless steel, or ceramic options for cooking and storing food. Check labels on over-the-counter medications, such as antacids, for aluminum compounds and choose aluminum-free alternatives. Aim to do this consistently for the long term to effectively minimize your aluminum exposure.

Description

Aluminum is a common metal used in manufacturing and food containers. Humans accidentally consume trace amounts of it on a daily basis. High levels can be found in the environment, certain workplaces (e.g., transportation industries), deodorants, and contaminated foods. Exposure to high levels of aluminum can potentially lead to aluminum toxicity.

Aluminum is a lightweight metal. It is **the most abundant metal in the Earth's crust** and is naturally found in the environment. It is usually used for food preservation, cans, cookware, and cars [R].

Aluminum-containing products are major sources of aluminum exposure including [R]:

- Antacids (heartburn drugs)
- Food additives
- Cosmetics (e.g., antiperspirants, makeup foundations, toothpaste)

Excessive aluminum exposure may increase [oxidative stress](#) and contribute to various health issues, such as [R, R, R, R, R, R, R]:

- Neurological disorders
- Cognitive problems
- Bone disorders
- Breast cancer

How it helps

Aluminum can interfere with phosphorous levels, thus indirectly affecting PTH levels since PTH plays a major role in phosphorous regulation.

24



Limit Protein Intake

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Limit your daily protein intake to 0.8 grams per kilogram of your body weight. For example, if you weigh 70 kilograms (about 154 pounds), aim to consume no more than 56 grams of protein per day. Adjust this goal based on your activity level and health status, reducing intake further if advised by a healthcare professional.

Description

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 [\[R\]](#).

You should choose high-quality foods that give you the “best” version of each macronutrient. For example, too much protein from certain animal sources may increase the risk of bone, kidney, and metabolic issues in some people [\[R\]](#), [\[R\]](#), [\[R\]](#).

How it helps

A low-protein diet can help manage high parathyroid hormone (PTH) levels because proteins often contain large amounts of phosphorous, which can exacerbate high PTH. Reducing protein intake helps maintain a balance of minerals in your body and prevent further increase of PTH levels.

25



Dietary Magnesium

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

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

Description

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

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

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

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

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

How it helps

Magnesium plays a role in PTH regulation. Adequate intake of dietary magnesium can help in managing high PTH levels.

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.

	Phosphorus	2 mg/dL		9 Nov 2025
	Vitamin D, 25-Hydroxy, Total	58.59 ng/mL		9 Nov 2025
	Creatinine	1.08 mg/dL		9 Nov 2025
	Calcium	9.2 mg/dL		9 Nov 2025