

Achilles Tendon Injury

DNA Health Report

REPORT CATEGORIES



INJURIES



JOINT & TENDON
HEALTH

Sample Client

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DISCLAIMER

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

Personal information

NAME

Sample Client

SEX AT BIRTH

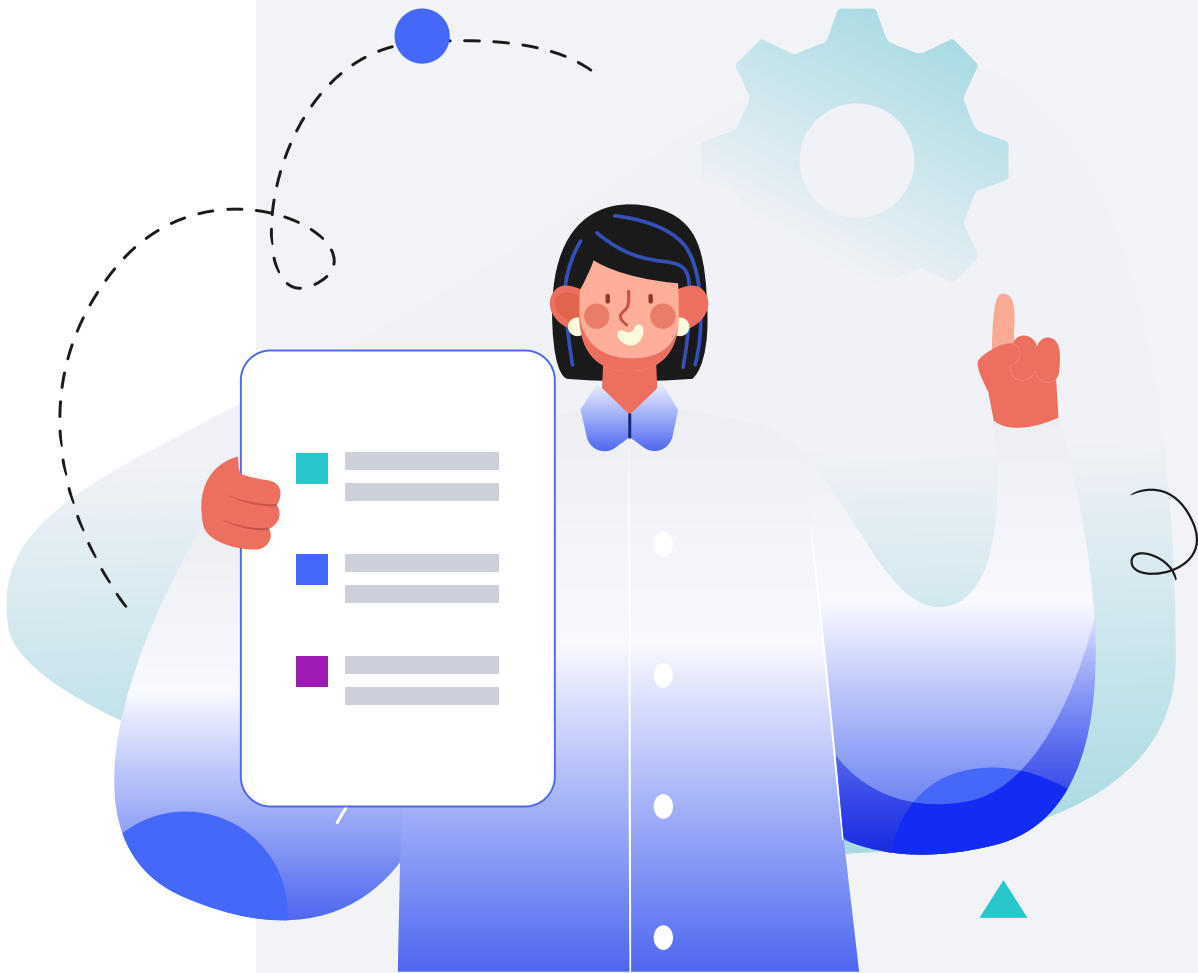
Male

HEIGHT

5ft 5" 165cm

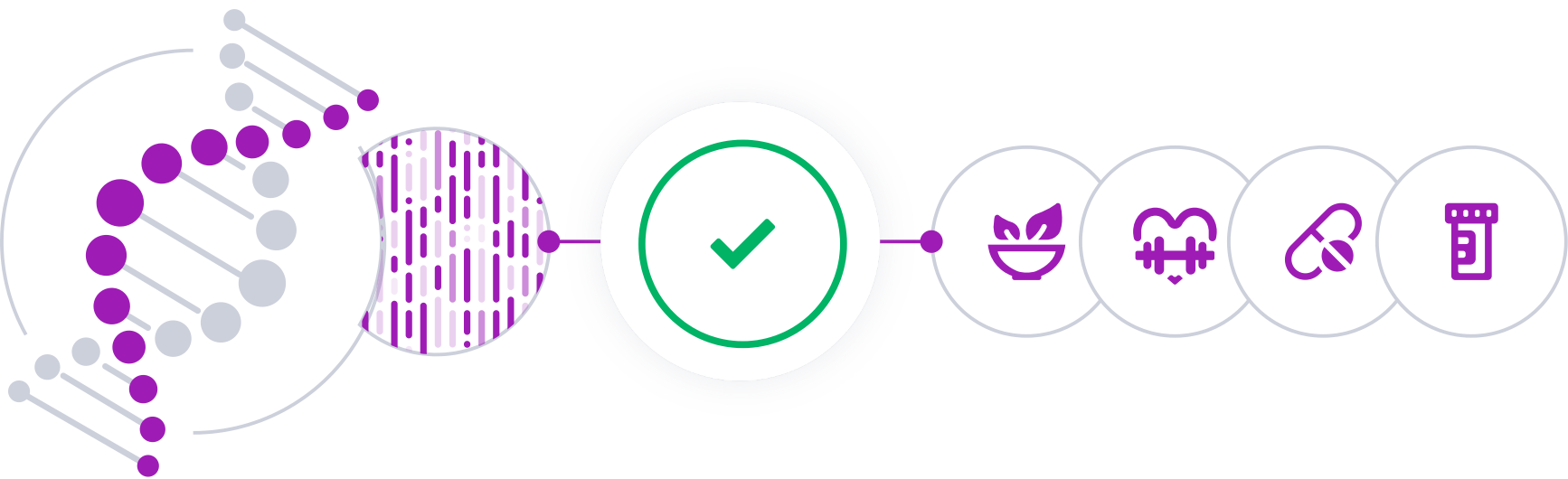
WEIGHT

137lb 62kg



How this works

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

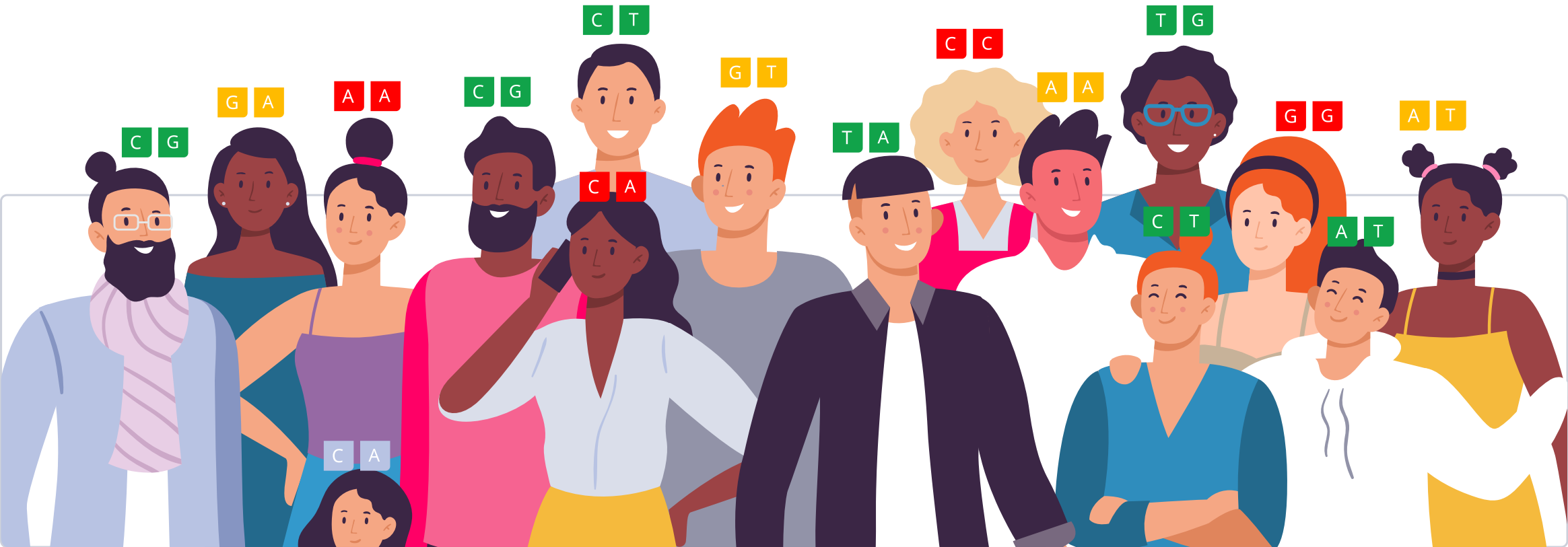


Similarly, our Trait Reports look at how your DNA influences your traits.



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

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



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

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

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



Genotype color info:

AA

You don't have any risk alleles

AA

You have 1 risk allele

AA

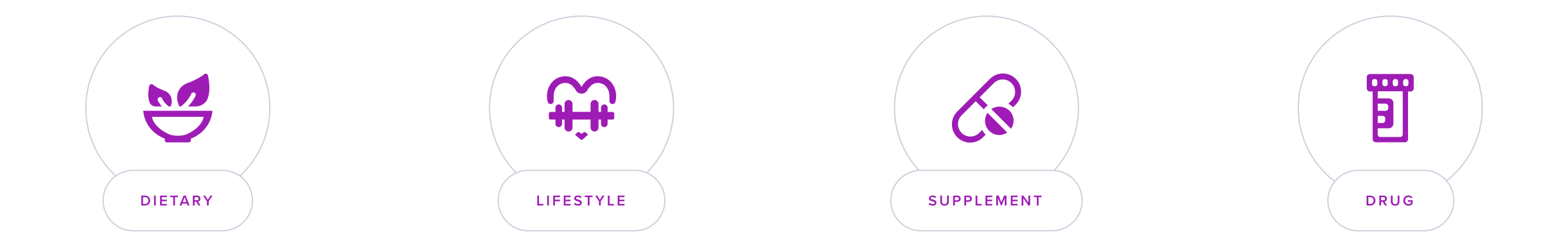
You have 2 risk alleles

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

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

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

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



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

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



Impact

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

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

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

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

Recommendation Evidence

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

Genotype-specific Evidence

- High-quality
- Direct evidence that a recommendation helps more in people with your gene variant (many clinical trials, a few large clinical trials, or a meta-analysis).
-
- Medium-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a few clinical trials or one large clinical trial).
-
- Low-quality
- Direct evidence that a recommendation helps more in people with your gene variant (a single clinical trial or more trials with inconsistent results).
-
- Indirect
- A recommendation may help more in people with your gene variant because it targets a specific gene or protein affected by your variant (e.g., MTHFR, dopamine).
-
- In theory
- A recommendation may help more in people with your gene variant because it targets a specific mechanism affected by your variant (e.g., inflammation, oxidative stress).

Some things to keep in mind:

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

Introduction

The **Achilles tendon** is a cord made of strong tissue. It is found in the lower back leg and connects the calf muscles to the heel bone. The Achilles tendon helps you move around [\[R\]](#).

The tendon is named after the hero Achilles. According to Greek mythology, Achilles’ mother attempted to make him immortal by dipping him into the Styx River. When doing so, she held onto his left heel, leaving him with one weak spot. Achilles died after Paris, the Trojan prince, hit him with an arrow in this exact spot [\[R\]](#), [\[R\]](#).

Some common injuries to the tendon include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- **Tendonitis:** Inflammation of the tendon, usually due to overuse or damage
- **Rupture:** A partial or complete tear of the tendon

Any sudden stress on the tendon can cause it to rupture. Examples include abrupt or intense jumping, falling, and even stepping [\[R\]](#), [\[R\]](#).

Symptoms of Achilles tendon injuries include [\[R\]](#), [\[R\]](#):

- Pain in the leg or heel
- Swelling
- A “pop” sound (from a rupture)
- Trouble pointing the foot toward the floor

Sometimes, an Achilles tendon injury doesn’t lead to any symptoms [\[R\]](#), [\[R\]](#).

Depending on how severe the injury is, treatment can involve [\[R\]](#):

- Resting and icing the tendon
- Painkillers
- Physical therapy
- Surgery

Achilles Tendon Injury Genetics

PERSONALIZED TO GENES

Based on the genetic variants we looked at, you may have a typical likelihood of developing an Achilles tendon injury.

Try to take preventative measures to potentially decrease your risk. These include stretching and strengthening your calf muscles, warming up, and wearing proper sports shoes.

The **Achilles tendon** is a cord made of strong tissue. It is found in the lower back leg and connects the calf muscles to the heel bone. The Achilles tendon helps you move around. Some common injuries to this tendon include **tendonitis** (inflammation of the tendon, usually due to overuse or damage) and **rupture** (partial or complete tear of the tendon) [R, R, R].

Some people may be more prone to Achilles tendon injuries than others. Risk factors include [R, R, R, R, R]:

- A “weekend warrior” exercise pattern (i.e. taking part in physical activity intermittently)
- Age (the risk tends to increase between age 30 and 40)
- Male sex
- Taking part in activities that include a lot of running, jumping, or sudden changes in movement (e.g., soccer, basketball, and tennis)
- Wearing improper shoes
- Lack of a warmup or cooldown
- Some medications
- Obesity
- **Genetics**

In fact, about 50% of differences in people’s chances of developing an Achilles tendon injury may be attributed to genetics [R].

Tips to help prevent an Achilles tendon injury include [R, R]:

- Stretching and strengthening your calf muscles



TYPICAL LIKELIHOOD

Typical likelihood of Achilles tendon injury based on 23 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MMP1	rs650108	AA
COL1A1	rs1800012	AC
MMP1	rs591058	CC
CPNE1	rs143383	AA
VEGFA	rs699947	AC
SOAT1	rs113435565	CA
FCN2	rs1134170	TT
COL5A1	rs12722	TC
MPP7	rs6481512	TT
MPP7	rs1249269	TT
MRPL43	rs4919510	CG
TNF	rs1800629	GG
CEP295NL	rs4789932	GG
TMEM158	rs183364169	CC
DPP6	rs4067493	CC
/	rs11960097	TT
TRIML1	rs60713544	GG
ZNF648	rs57104447	TT
MPP7	rs1937810	TT
SOX21	rs4454832	GG

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

- Alternating high-impact sports with low-impact ones (e.g., alternating running with walking)
- Avoiding running on hard, uneven, or slippery surfaces
- Using proper equipment (e.g., well-fitting, cushioned running shoes)
- Slowly increasing the intensity of the activity

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	Reduce Leg Strain	2	Physical Therapy30 minutes
3	Eccentric Exercise	4	Vitamin C2000 mg
5	Strength Training1 hour	6	Avoid High-Impact Exercise
7	Compression Therapy	8	Low-Intensity Exercise1 hour
9	Collagen Peptides10 g	10	Dietary Glycine
11	Methylsulfonylmethane (MSM)1 g		

1



Reduce Leg Strain

IMPACT

5 / 5

EVIDENCE

5 / 5

How to implement

Avoid standing or sitting in one position for prolonged periods. Every hour, make a point to stand if you've been sitting, or sit or walk if you've been standing, for at least 5-10 minutes. Incorporate leg stretches or gentle exercises into your daily routine, especially if your job involves long periods of sitting or standing.

Description

Leg strain is caused by too much pressure being placed on the legs. Reducing leg strain involves avoiding overexertion and implementing proper techniques during physical activities, as well as wearing properly fitted clothing. It can help prevent muscle fatigue and promote overall leg strength.

Leg strain is caused by too much pressure being placed on the legs. Examples of things that can lead to leg strain include [\[R\]](#):

- Wearing clothing that’s too tight
- Standing or sitting for long periods of time
- Excess weight

Leg strain can block the flow of blood from the legs to the heart. This can lead to varicose veins [\[R\]](#), [\[R\]](#).

People with certain professions may be more prone to leg strain and varicose veins. This may be because their professions require them to stand for longer periods of time. These include:

- Nurses [\[R\]](#), [\[R\]](#)
- Customer service workers (e.g., hairdressers, salespeople, caterers) [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Teachers [\[R\]](#)

How it helps

Experts recommend reducing strain to prevent Achilles tendon injuries. Strategies that may help include [\[R\]](#), [\[R\]](#):

- Stretching and strengthening your calf muscles
- Alternating high-impact sports with low-impact ones (e.g., alternating running with walking)
- Avoiding running on hard, uneven, or slippery surfaces
- Using proper equipment (e.g., well-fitting, cushioned running shoes)
- Slowly increasing the intensity of the activity

2

Physical Therapy

IMPACT

4 / 5

EVIDENCE

4 / 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

Experts recommend stretching and strengthening exercises for Achilles tendon injuries. Particularly, eccentric weight bearing exercises (slowly letting down of a weight after raising it) may help reduce pain and recover function [\[R\]](#), [\[R\]](#), [\[R\]](#).

Physical therapists may also prescribe orthotic devices. These are shoe inserts or wedges that slightly elevate the heel to relieve strain and amount of force on the Achilles tendon. However, the evidence about their effectiveness is mixed and experts don’t recommend their use [\[R\]](#), [\[R\]](#).

In people recovering from Achilles tendon surgery, early weight bearing is more effective and satisfactory to patients than ankle immobilization [\[R\]](#), [\[R\]](#).

3



Eccentric Exercise

IMPACT3 / 5

EVIDENCE3 / 5

Description

Eccentric exercise is a type of exercise where the muscle lengthens as it contracts. It has been shown to have a number of health benefits, including increased muscle strength, improved bone density, and reduced risk of injury.

How it helps

A meta-analysis of 22 studies and 1137 participants found moderate evidence that eccentric exercise improves pain and function in Achilles tendinopathy better than controls and reduces pain more than concentric exercise. However, it was not superior to heavy slow resistance exercise or stretching for pain or quality of life. No significant benefit was found in comparing combined protocols, high-dose vs. low-dose training, or adding night splints to eccentric exercises versus controls for pain and function [R].

Another meta-analysis (8 studies) concluded that combining physical modalities with eccentric exercise wasn’t better than eccentric exercise alone at improving Achilles tendinopathy [R].

4



Vitamin C

IMPACT

2 / 5

EVIDENCE

3 / 5

How to implement

Take 500-2000 mg of vitamin C supplement daily. It can be taken at any time of the day, with or without food, according to personal preference or tolerance.

TYPICAL STARTING DOSE

2000 mg

Description

[Vitamin C](#) is an essential nutrient. This means that our bodies can’t produce it on their own, so we have to get it from food or supplements [\[R\]](#).

Foods rich in Vitamin C include: [\[R\]](#)

- Citrus Fruits
- Peppers
- Brussel sprouts
- Kiwi
- Broccoli
- Tomato
- Cantaloupe
- Cauliflower
- Spinach

Vitamin C has antioxidant properties. It supports immunity, heart health, and wound healing [\[R\]](#), [\[R\]](#).

Vitamin C deficiency is called *scurvy*. In the past, many sailors suffered from it [\[R\]](#).

How it helps

Vitamin C, particularly when used in combination with other supplements, may offer benefits for tendinopathies and connective tissue injuries by [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Enhancing collagen production
- Reducing inflammation
- Improving tendon healing

Some studies observed the above benefits for Achilles tendon injury in particular [\[R\]](#), [\[R\]](#).

5



Strength Training

IMPACT2 / 5

EVIDENCE2 / 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 and gait retraining may reduce Achilles tendon injury risk [\[R\]](#).

Strength training, particularly heavy-load eccentric calf muscle training (for 12 weeks), may help with Achilles tendon injury by [\[R\]](#), [\[R\]](#):

- Improving strength
- Reducing pain
- Reducing injury risk

6



Avoid High-Impact Exercise

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Opt for low-impact activities such as swimming, cycling, or walking instead of running or jumping exercises. Engage in these alternative exercises for at least 150 minutes per week, spread out over several days to ensure rest periods between sessions.

Description

For individuals with certain medical conditions or joint issues, avoiding high-impact exercise can help prevent injuries and joint strain. Choosing lower-impact activities like swimming or cycling can provide similar cardiovascular benefits while minimizing the risk of overuse injuries.

How it helps

Some studies suggest that certain types of high-impact training, such as running on stiffer surfaces and specific mechanical loading exercises, may strengthen the Achilles tendon and reduce injury risk [\[R\]](#).

However, during recovery from Achilles tendon injury, it's preferable to reduce the pace of recovery runs and avoid soft surfaces [\[R\]](#).

High propulsive forces and fast training sessions may increase stress on the tendon and potentially lead to injury [\[R, R\]](#).

7

Compression Therapy

IMPACT2 / 5

EVIDENCE2 / 5

How to implement

Wear compression stockings or sleeves daily, especially during long periods of standing or sitting. Choose a compression level appropriate for your condition (mild, moderate, or high), as advised by a healthcare professional. Start wearing them in the morning before swelling occurs and keep them on until bedtime.

Description

Compression therapy involves wearing specialized garments that apply pressure to the limbs, promoting better circulation and reducing swelling. It is commonly used to manage conditions like venous disorders and can help alleviate symptoms, improve vascular health, and enhance overall well-being.

In compression therapy, different methods are used to apply pressure to the legs. These methods include [\[R\]](#):

- Bandages
- Wraps
- Compression stockings
- Pneumatic pressure devices

Compression therapy supports blood flow. It may help [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Prevent blood clots and deep vein thrombosis (DVT)
- Reduce some kinds of swelling
- Reduce symptoms of restless legs syndrome

How it helps

Compression therapy, particularly when combined with ultraportable negative pressure wound therapy (NPWT), may help manage postoperative wounds and promote healing following Achilles tendon repair. People showed wound closure and no adverse effects were noted during treatment [\[R\]](#).

Intermittent pneumatic compression (IPC) may counteract the deficits caused by immobilization after tendon rupture. A study found that IPC improved biomechanical properties and facilitated proliferative repair of the tendon, suggesting a potential benefit in using compression to support tendon healing [\[R\]](#).

Studies have indicated that compression therapy combined with cryotherapy may also help. This combination may enhance microcirculation in the midportion of the Achilles tendon. This results in better oxygenation and reduced postcapillary venous filling pressures, which may aid in reducing inflammation and promoting healing [\[R\]](#).

8



Low-Intensity Exercise

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Incorporate 60 minutes of low-intensity activities, such as walking or gentle yoga, into your daily routine. Aim to do this 5 days a week to achieve the best results.

TYPICAL STARTING DOSE

1 hour

Description

Low-intensity exercise, such as walking or gentle yoga, provides numerous health benefits, including improved cardiovascular health, stress reduction, and enhanced overall fitness without the strain of high-intensity workouts.

How it helps

Regular recreational exercise at low intensities, such as running and jumping, may increase Achilles tendon stiffness by 28% [\[R\]](#).

Moreover, low-intensity exercise with blood flow restriction may reduce Achilles tendon thickness. Tendon thickness may occur due to the use of certain drugs, inflammatory conditions such as rheumatoid arthritis, or after surgery [\[R\]](#).

9



Collagen Peptides

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Take 10-20 grams of collagen peptides daily, mixing the powder into a glass of water, juice, or a smoothie. It is recommended to consume this supplement on an empty stomach to improve absorption, ideally first thing in the morning or right before bedtime for a period of at least 8-12 weeks to observe beneficial effects.

TYPICAL STARTING DOSE

10 g

Description

Collagen peptides are a form of collagen that is broken down into smaller, more easily absorbed molecules. They are commonly used in supplements and skincare products for their potential to promote skin elasticity, hair strength, and nail health.

[Collagen](#) is a protein that helps build skin, bones, and joints [\[R, R\]](#).

People use collagen supplements for [\[R, R, R, R\]](#):

- Joint pain
- Skin health
- Hair growth

How it helps

Taking collagen peptides (5 g/day for 3 months) may speed up the recovery process in people with Achilles tendinopathy engaged in a calf-strengthening program. Collagen may increase the thickness of the Achilles tendon, as well as the lower leg muscles [\[R, R\]](#).

10



Dietary Glycine

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

To follow a glycine-rich diet, include foods that are high in glycine in your daily meals. Such foods include skin-on chicken, gelatin, bone broth, and various types of fish. Aim to consume these glycine-rich foods at least once a day to ensure you're getting a sufficient amount of glycine in your diet.

Description

Make sure you are getting enough glycine in your diet. This amino acid is found in bones (gelatin) and vegetables like spinach, kale, cauliflower, cabbage, and pumpkin. Bananas and kiwi are also rich in glycine.

How it helps

Please note: *There is no evidence from controlled clinical trials to support this recommendation. It is included based on uncontrolled clinical trials, animal or cell studies, or non-scientific criteria. Please take this recommendation with a grain of salt until more research is available.*

Glycine may improve the biochemical and biomechanical properties of the Achilles tendon following inflammation. Animal research indicates that a glycine-enriched diet (5% glycine diet) may enhance tendon repair by restructuring collagen molecules more rapidly, which is beneficial for tendon recovery and strength after injury [\[R\]](#).

11



Methylsulfonylmethane (MSM)

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take 1 to 3 grams of Methylsulfonylmethane (MSM) per day, divided into three doses. This can be in the form of capsules or powder that is mixed with water. It is recommended to start with a lower dose to assess tolerance, then gradually increase to the desired dose over a period of 1 to 2 weeks.

TYPICAL STARTING DOSE
1 g

Description

MSM is a naturally occurring sulfur compound found in foods and used in dietary supplements. It has anti-inflammatory properties and may be used to support joint health and reduce exercise-related muscle soreness.

A molecule of MSM is broken down in the body into a sulfate (sulfur) group and two methyl groups.

The following may increase people’s needs for sulfur and methyl groups: physical activity, recovery from injuries, inflammation, infections/sickness, toxins, etc.

People also need more sulfur when taking hormones (DHEA, pregnenolone, etc.), drugs (Aspirin, Tylenol, NSAIDs, birth control, etc.) or supplements (flavonoids & polyphenols - resveratrol, quercetin, curcumin, etc.) that undergo sulfation.

How it helps

Please note: *There is no evidence from controlled clinical trials to support this recommendation. It is included based on uncontrolled clinical trials, animal or cell studies, or non-scientific criteria. Please take this recommendation with a grain of salt until more research is available.*

MSM is known for its anti-inflammatory properties, which might be beneficial for tendon health. It may help in reducing inflammation and pain associated with tendon inflammation or injury.

Additionally, MSM is believed to improve the flexibility and strength of tendons by supporting the production of collagen, a key component of tendon tissue. This may aid in the healing process and potentially reduce the risk of future tendon injuries.

MSM may also support tendon health by improving joint and muscle recovery [\[R\]](#), [\[R\]](#).

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.

✓	Zinc	17.12 umol/L	7.659.1812.2419.89	9 Nov 2025
✓	Creatine Kinase	173 IU/L	44196	9 Nov 2025