

Tendon Injury

DNA Health Report

REPORT CATEGORY —



Sample Client

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Table of Contents

03 How this works

- 04 Impact
- 05 Evidence
- 06 Some things to keep in mind

07 Introduction

08 Your genetics

10 Your recommendations

36 Next Steps

- 36 Your Lab Results

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

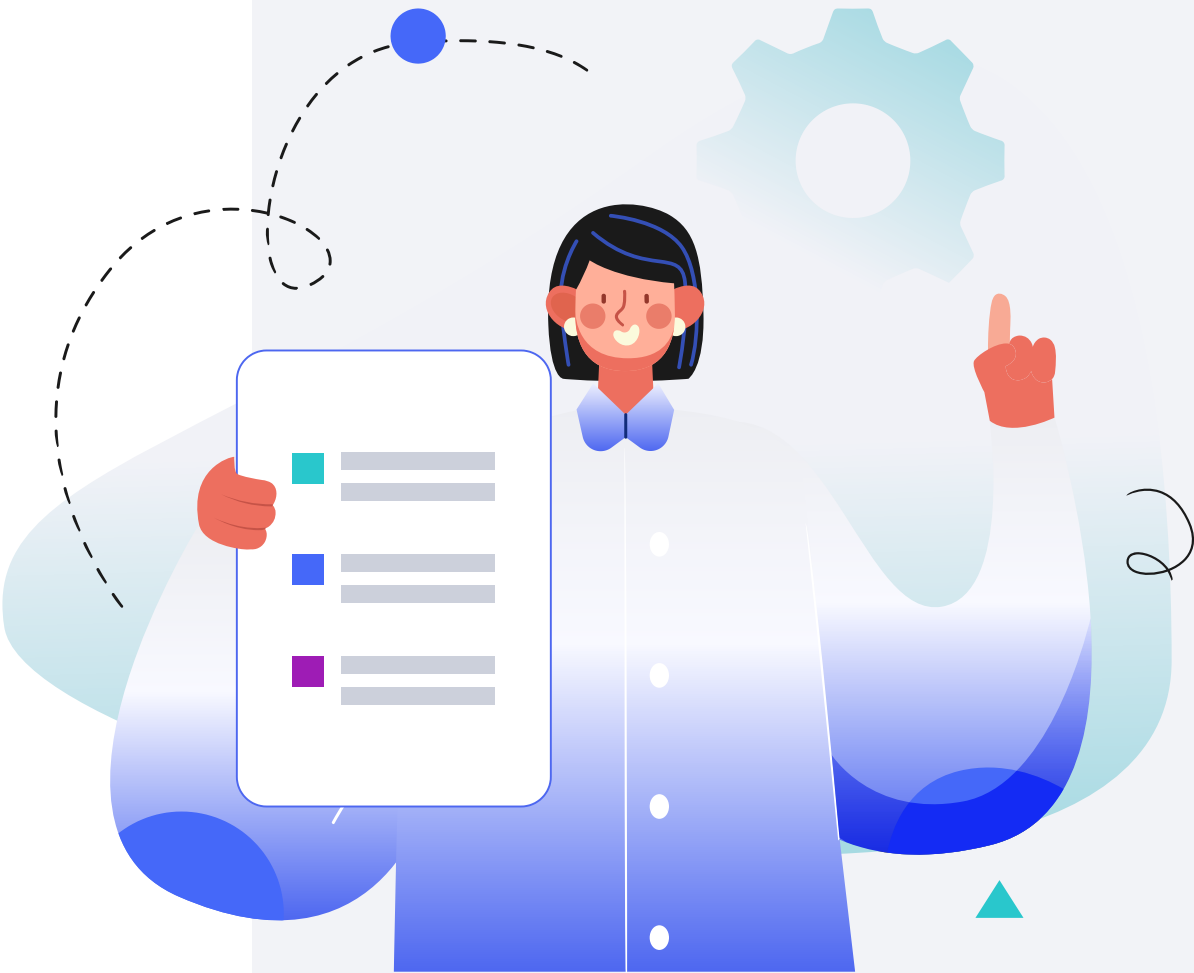
Male

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

Tendons are cords made of strong tissue. They attach muscle to bone. There are many tendons throughout the body [\[R\]](#), [\[R\]](#).

Conditions in which tendons become inflamed and painful are called **tendinopathies** [\[R\]](#).

Other signs and symptoms of tendinopathies include [\[R\]](#):

- Difficulty moving the affected part of the body
- Weakness or stiffness
- Swelling, burning, or redness

There are two main types of tendinopathies [\[R\]](#):

- **Tendinitis:** Inflammation of the tendon
- **Tendinosis:** Breakdown of a structural protein called collagen

Some of the most common tendinopathies affect the [\[R\]](#), [\[R\]](#):

- Lower back of the leg (Achilles tendinitis)
- Knee (patellar tendinitis)
- Shoulder (rotator cuff tendinitis)
- Elbow (tennis elbow or golfer’s elbow)

Treatment options for tendinopathy include [\[R\]](#):

- Resting
- Icing
- Massage
- Braces
- Painkillers
- Special injections

Risk Factors for Tendon Injuries

 PERSONALIZED TO GENES

Based on the gene variants we looked at, you may be less likely to develop a tendon injury. However, your lifestyle and environment may also influence your likelihood.

Key Takeaways:

- Up to **40%** of the differences in people's chances of developing tendinopathy may be due to genetics.
- Other risk factors include intense physical activity or certain sports, using improper training technique or equipment, doing repetitive tasks, age (over 40), being female, some chronic health conditions and medications.
- About 16 million tendon and ligament injuries occur in the U.S. each year.
- If you have a high genetic risk, you may lower your overall risk by taking action on those factors that you can change.

Tendons are cords made of strong tissue. They attach muscle to bone. There are many tendons throughout the body. Conditions in which tendons become inflamed and painful are called **tendinopathies** [\[R\]](#), [\[R\]](#).

Risk factors for tendinopathies include [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Taking part in intense physical activity or certain sports (e.g., baseball, golf)
- Using improper training technique or equipment
- Doing repetitive tasks (e.g., gardening, painting, typing)
- Age (over 40)
- Gender (women may be at a higher risk)
- Some chronic health conditions (e.g., obesity, diabetes)
- Some medications
- **Genetics**



LESS LIKELY

Less likely to have tendinopathy based on 6 genetic variants we looked at



PERCENTILE



Your risk is greater than 18% of the population and lower than 82% of the population.

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
POLE2	rs3218791	GT
/	rs11232681	AG
GJA1	rs11154027	CC
KLHL1	rs59988404	GG
TRIML1	rs60713544	GG
CERS5	rs57224706	AA

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

Up to **40%** of the differences in people's chances of developing tendinopathy may be due to genetics. Involved genes may influence tendon function [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#).

Interestingly, one study that examined the impact of genetics on tendon injuries was conducted on elite athletes from FC Barcelona [\[R\]](#).

Tips to help prevent a tendon injury include [\[R\]](#), [\[R\]](#):

- Stretching and strengthening your 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., protective gloves, well-fitting 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	Physical Therapy	30 minutes	2	Eccentric Exercise	
3	Exercise Therapy	1 hour	4	Reduce Tendon Strain	
5	Stretching	15 minutes	6	Shock Wave Therapy	
7	Vitamin C	2000 mg	8	Strength Training	1 hour
9	Good Posture		10	Low-Level Laser Therapy (LLLT)	30 seconds
11	Aquatic Therapy	30 minutes	12	Manual Therapy	
13	Deep Friction Massage		14	Kinesio Taping	
15	Dietary Protein		16	Low-Intensity Pulsed Ultrasound	
17	Acupuncture	1 hour	18	Compression Therapy	
19	Myofascial Release	5 minutes	20	Collagen Peptides	10 g
21	Blood Flow Restriction Training	15 minutes	22	Tai Chi	1 hour
23	Inositol	2 g	24	Alpha-Ketoglutarate (AKG)	1 g
25	Contrast Water Therapy		26	Methylsulfonylmethane (MSM)	1 g

1

Physical Therapy

IMPACT

4 / 5

EVIDENCE

5 / 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 say exercise therapy is the most effective strategy to improve pain, physical function, and quality of life in people with tendon injuries. Exercise therapy may help with injuries in the [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Achilles tendon [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Rotator cuff [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Lateral elbow tendons [\[R\]](#), [\[R\]](#)
- Kneecap [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#)
- Glutes [\[R\]](#)

The following physical therapy techniques may also help with rotator cuff tendon injuries:

- Manual therapy [\[R\]](#), [\[R\]](#)
- Kinesio taping [\[R\]](#), [\[R\]](#)

2

Eccentric Exercise

IMPACT

4 / 5

EVIDENCE

4 / 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

Meta-analyses across various studies indicate that eccentric exercise is more effective than concentric exercise, stretching, splinting, frictions, and ultrasound for improving pain, function, and patient satisfaction in chronic tendinopathy. For subacromial impingement syndrome, eccentric exercise shows a slight reduction in pain. In Achilles tendinopathy, it improves pain and function more effectively than controls and concentric exercise but is not superior to heavy slow resistance exercise or stretching. Combining physical modalities with eccentric exercise does not offer additional benefits in treating Achilles tendinopathy [R, R, R, R].

3

Exercise Therapy

IMPACT

4 / 5

EVIDENCE

4 / 5

How to implement

Begin by consulting with a physical therapist to assess your condition and create a personalized exercise plan. Follow the prescribed exercises consistently, focusing on areas needing improvement, such as strength, flexibility, or mobility. Start with gentle exercises, gradually increasing the intensity as you build strength. Ensure you perform the exercises correctly to avoid injury. Regularly check in with your therapist to adjust the plan based on your progress and feedback. Stay committed to the routine for the best results.

TYPICAL STARTING DOSE

1 hour

Description

Exercise therapy is a tailored approach to physical activity designed to improve mobility, strength, and overall health. It is often used to rehabilitate injuries, manage chronic conditions, and promote cardiovascular fitness.

How it helps

Experts say exercise therapy is the most effective strategy to improve pain, physical function, and quality of life in people with tendon injuries. Exercise therapy may help with injuries in the [R, R, R, R]:

- Achilles tendon [R, R, R]
- Rotator cuff [R, R, R]
- Lateral elbow tendons [R, R]
- Kneecap [R, R, R, R, R]
- Glutes [R]

4



Reduce Tendon Strain

IMPACT4 / 5

EVIDENCE4 / 5

How to implement

To reduce tendon strain, modify your daily activities to avoid motions that cause discomfort or pain. If you engage in repetitive tasks or sports, take regular breaks, approximately every 30 minutes, to rest or gently stretch the affected tendon. Additionally, ensure to properly warm up before any physical activity and cool down afterwards.

Description

Repetitive or intense strain on the tendons of the upper and lower limbs can cause their inflammation or breakdown. Reducing tendon strain entails avoiding repetitive movements or overuse of specific muscles and tendons, which can help prevent injuries such as tendinitis and support overall musculoskeletal health.

Repetitive or intense strain on the tendons of the upper and lower limbs can cause their inflammation or breakdown. Certain sports, especially if practiced using improper technique or equipment, are most commonly associated with tendon injuries. These include [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Baseball
- Basketball
- Bowling
- Golf
- Running
- Swimming
- Tennis
- Gymnastics

On the other hand, tendon injuries can also occur in the workplace. Works involving repetitive movements, awkward positions, forced movements, using vibrating tools, and overhead reaching may lead to tendon injuries. Examples of tasks that increase the risk include [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Gardening
- Lifting
- Landscaping
- Painting
- Scrubbing
- Shoveling
- Typing
- Woodworking

Working on a chair, keyboard, or desktop that are positioned incorrectly for your height, arm length, and the tasks may also lead to tendon injuries [\[R\]](#), [\[R\]](#).

How it helps

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

- Limiting repetitive activities, especially if performed for long periods of time
- Making sure the workplace is ergonomically adjusted
- Stretching and strengthening the muscles
- Alternating high-impact sports with low-impact ones (e.g., alternating running with walking)
- Avoiding exercising on hard, uneven, or slippery surfaces
- Using proper equipment (e.g., well-fitting, cushioned running shoes)
- Slowly increasing the intensity of the activity

5



Stretching

IMPACT4 / 5

EVIDENCE3 / 5

How to implement

Incorporate stretching exercises into your daily routine, dedicating at least 10-15 minutes each day. Focus on major muscle groups such as the neck, shoulders, chest, back, hips, and legs. For best results, stretch both before and after other physical activities, holding each stretch for 15-30 seconds without bouncing.

TYPICAL STARTING DOSE

15 minutes

Description

Stretching involves gently elongating the muscles to improve flexibility, reduce muscle tension, and enhance joint mobility. Regular stretching can help prevent injuries, promote better posture, and increase overall physical comfort.

Stretching is a form of physical exercise that involves moving a muscle or group of muscles to their maximum range of motion. The most common types are **dynamic** (involving movement) and **static** stretching.

Stretching can help **improve flexibility, range of motion, and posture**. It may also relieve stress, reduce muscle soreness and tension, increase blood flow, and reduce the risk of injuries.

To get the most out of stretching, try to do it regularly, breathe deeply, and ease into the stretches.

How it helps

Regular stretching can improve flexibility and reduce the risk of stiffness, aiding the healing process of injured tendons.

Research suggests that stretching and flexibility training can reduce muscle damage, increase tendon stiffness, decrease passive muscle stiffness, and improve range of motion, which may contribute to lower injury rates such as hamstring strains.

Below are some of the key findings:

- Flexibility training led to a significant increase in tendon stiffness (31.2%) and a decrease in passive muscle stiffness (-14.6%) [\[R\]](#).
- Using standard stretching protocol (SSP) is significantly related to lower hamstring strain rates in professional football clubs [\[R\]](#).
- Intensive stretching programs lead to shorter times of regaining normal range of motion and rehabilitation periods for hamstring injuries [\[R\]](#).
- Modified eccentric heel-drop program reported high patient satisfaction, reduced pain, and successful return to pre-morbid activity levels. This indicates that eccentric stretching exercises can be particularly beneficial for mid-substance rather than insertional tendinopathies [\[R\]](#).
- Combining eccentric training with static stretching exercises was superior in reducing pain and improving function compared to eccentric training alone [\[R\]](#).

6



Shock Wave Therapy

IMPACT3 / 5

EVIDENCE3 / 5

How to implement

Schedule and attend sessions for extracorporeal shock wave therapy (ESWT) with a qualified healthcare provider. Typically, treatments may involve 1 to 3 sessions a week over a span of 3 to 4 weeks, depending on the condition being treated and the severity of symptoms.

Description

Extracorporeal shockwave therapy is a medical treatment that uses shockwaves to stimulate healing and reduce pain in various musculoskeletal conditions. It is often used for conditions such as plantar fasciitis and tendinitis.

In extracorporeal shockwave therapy, sound waves are emitted and passed through parts of the body. Doctors use it to help reduce pain and stimulate tissue recovery in people [\[R\]](#), [\[R\]](#).

How it helps

Two meta-analyses (the largest one with 29 trials) concluded that extracorporeal shock wave therapy **(especially high-dosage focused) improves pain and disability in people with low-limb tendinopathy, including greater trochanteric pain syndrome, patellar tendinopathy, and Achilles tendinopathy** [\[R\]](#), [\[R\]](#).

Another meta-analysis (19 trials) found that extracorporeal shock wave therapy **improves treatment success rate, pain, and ROM** in people with knee tendinopathies and other soft tissue disorders [\[R\]](#).

In people with calcific tendinitis of the shoulder, shock wave therapy **(especially high-energy) increases shoulder function, reduces pain, and is effective in dissolving calcifications** according to 2 meta-analyses (the largest one with 6 studies) [\[R\]](#), [\[R\]](#).

7



Vitamin C

IMPACT

3 / 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

Research on the role of Vitamin C in the management and recovery of tendinopathies suggests that it can be potentially useful, particularly due to its involvement in collagen synthesis and antioxidative properties. Here's a summary based on the findings:

- A scoping review concluded that Vitamin C supplementation could be useful as a therapeutic approach for tendinopathy recovery. It highlighted that Vitamin C, alone or in combination with other products, increases collagen synthesis, which could improve the condition of the patient. Vitamin C deficiency was associated with decreased procollagen synthesis and reduced hydroxylation of proline and lysine residues, hindering the tendon repair process [\[R\]](#).
- A study focusing on the management of tendinopathy highlighted the role of nutraceuticals, such as Type I collagen, mucopolysaccharides, and Vitamin C, in tendinopathy management. Clinical data suggests that this combination promotes endogenous synthesis of collagen type I, avoiding the accumulation of collagen type III and aggrecan, thus interfering with the degeneration of tendon tissue and improving the structural evolution of different types of tendinopathies [\[R\]](#).
- A randomized, placebo-controlled study evaluated the efficacy and safety of a dietary supplement containing mucopolysaccharides, collagen type I, and Vitamin C in the management of different tendinopathies. The study showed significant improvement in clinical symptoms and structural evolution of injured tendons, suggesting the dietary supplement as a safe and effective option [\[R\]](#).

These findings indicate that Vitamin C, particularly when used in combination with other supplements, may offer benefits in the recovery and management of tendinopathies by enhancing collagen synthesis and potentially improving tendon structure. However, further research, especially human studies, is necessary to confirm these effects and establish optimal dosages and treatment protocols.

8

Strength Training

IMPACT3 / 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, when done correctly, can help rebuild muscle and tendon strength around the injury.

Studies suggest that resistance training generally increases tendon stiffness and may improve tendon properties, which could be beneficial for tendon health, although some forms of resistance training may not alter certain tendon characteristics immediately or in all populations.

Below are some of the key findings:

- Both eccentric and heavy slow resistance training yield positive, equally good, lasting clinical results in patients with Achilles tendinopathy [R].
- Resistance training can impact opposite ends of the patella tendon force-elongation relationship in each sex, potentially minimizing tendon injuries [R].
- Resistance training improved muscle strength and cross-sectional area equally in old and very old subjects but **did not** affect tendon mechanical properties or dimension [R].
- Resistance training leads to increased muscle force and a 7% increase in tendon cross-sectional area [R].

9



Good Posture

IMPACT3 / 5

EVIDENCE2 / 5

How to implement

Ensure your back is straight, shoulders pulled back but relaxed, and your head is aligned above your shoulders when sitting or standing. When sitting, keep your feet flat on the ground, and use a chair that supports your lower back. Do this continuously throughout the day, reminding yourself to adjust your posture whenever you notice it lapsing.

Description

Maintaining good posture helps prevent musculoskeletal problems, reduces the risk of back and neck pain, and supports overall spinal health. Proper posture can also enhance self-confidence and improve breathing and digestion.

Good posture may help lessen strain on your body. It involves keeping your head, shoulders, and hips aligned [\[R\]](#).

Forward head posture is a type of poor posture in which the head is pushed forward or tilted down toward the chest. This posture is common when using computers or smartphones [\[R\]](#).

Poor posture may lead to [\[R\]](#), [\[R\]](#):

- Muscle pain
- Headaches
- Breathing problems

How it helps

Maintaining good posture reduces unnecessary strain on tendons, which can aid in the prevention of further injury.

Tendinitis is more common in people whose jobs involve [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Repetitive motions
- Awkward positions
- Frequent overhead reaching
- Vibration
- Forceful exertion
- Prolonged sitting

If possible, get an ergonomic assessment of your workspace and adjust your chair, keyboard, and desktop as recommended for your height and arm length. This will help protect all your joints and tendons from excessive stress [\[R\]](#).

You may also be more likely to develop tendinitis if you participate in certain sports that involve repetitive motions, especially if your technique isn't optimal.

10



Low-Level Laser Therapy (LLLT)

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Use a low-level laser therapy device, as directed by its manual or a healthcare professional, on the affected area. Generally, treatment involves applying the laser for a specified duration, often between 30 seconds to several minutes, per treatment area. Sessions can be conducted 2-3 times per week for a period of 4-12 weeks, depending on the condition being treated and the device used.

TYPICAL STARTING DOSE

30 seconds

Description

Low-level laser therapy (LLLT), also known as photobiomodulation, is a type of light therapy that uses low-intensity lasers to promote healing. It has been shown to be effective in treating a variety of conditions, including pain, inflammation, and wound healing.

How it helps

Low-Level Laser Therapy (LLLT) helps promote healing in tendon injuries by delivering non-heat light waves directly into the tissue, stimulating cell regeneration and reducing inflammation. This process decreases pain and improves mobility in the affected area.

A meta-analysis of 17 randomized controlled trials on shoulder tendinopathy found that low-level laser therapy (LLLT) significantly reduced pain as monotherapy and with exercise, and showed greater improvement when part of physiotherapy treatment. LLLT was ineffective with inadequate doses, also improving shoulder function when used alone [\[R\]](#).

A meta-analysis of trials on lower extremity tendinopathy and plantar fasciitis revealed that low-level laser therapy (LLLT) reduced pain and disability compared to placebo, other interventions, and as an add-on treatment, with no reported adverse events [\[R\]](#).

A meta-analysis of 4 studies (119 participants) on low-level laser therapy for Achilles tendinopathy found low-certainty evidence that laser therapy with eccentric exercises didn't significantly improve pain or function compared to eccentric exercises and sham treatment. The results don't support routine laser therapy use for this condition due to limited evidence [\[R\]](#).

11



Aquatic Therapy

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Participate in aquatic therapy sessions 2-3 times a week for at least 30 minutes. These sessions should be guided by a professional therapist who specializes in aquatic therapy, and the program should be tailored to your specific health condition and physical capabilities.

TYPICAL STARTING DOSE

30 minutes

Description

Aquatic therapy involves performing exercises and rehabilitation activities in a water environment. It is particularly beneficial for individuals recovering from injuries, surgeries, or certain medical conditions, as the buoyancy of water reduces the impact on joints, eases pain, and improves mobility and muscle strength.

How it helps

Aquatic therapy provides a low-impact environment for exercise, which can reduce strain on injured tendons while promoting mobility and strength.

Aquatic therapy has shown promise in aiding the healing of tendon injuries. Key findings from research include:

- A study highlights aquatic therapy's role in the rehabilitation of athletic injuries, indicating its usefulness in early resumption of rehabilitation activities due to the supportive properties of water. This suggests aquatic therapy can be an essential part of the rehabilitation process for tendon injuries among athletes [R].
- Additionally, aquatic-based rehabilitation and training were examined for their efficacy in elite athletes, demonstrating the utility of aquatic exercise in expedited recovery from overuse injuries. This underscores the potential of aquatic therapy in treating tendon injuries, offering an effective cardiovascular and musculoskeletal training platform [R].
- The principles of aquatic therapy, such as reduced load on tendons due to buoyancy and the resistance provided by water for strengthening exercises, suggest potential benefits for tendon rehabilitation. These properties make aquatic therapy a versatile rehabilitation option that could be applied to tendon injuries as well [R].
- In one study, decreased muscle activation during aquatic physical therapy allows for earlier active motion in the postoperative period without compromising patient safety [R].

These studies indicate that aquatic therapy can be an effective treatment modality for tendon injuries, providing benefits such as improved healing, enhanced functional recovery, and a supportive environment for rehabilitation. However, further research is needed to fully understand its potential and application in tendon injury rehabilitation specifically.

12



Manual Therapy

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Schedule a session with a certified manual therapist, such as a physical therapist or chiropractor, once a week for at least 3 to 6 weeks. During these sessions, allow the therapist to apply hands-on techniques to manipulate muscles and joints aiming to improve mobility and reduce pain.

Description

Manual therapy encompasses various hands-on techniques used by healthcare professionals, including physical therapists and massage therapists, to alleviate pain, improve mobility, and promote overall musculoskeletal health. It can be effective for addressing a wide range of conditions, from muscle tension to joint disorders.

How it helps

Manual therapy involves manipulating the tissues and joints to relieve pain and improve mobility. In the case of a tendon injury, it aids in reducing inflammation, improving blood circulation and accelerating the healing process of the damaged tissues.

According to research, manual therapy may help with rotator cuff tendon injuries [\[R\]](#), [\[R\]](#).

13



Deep Friction Massage

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Schedule an appointment with a skilled physiotherapist experienced in deep friction massage. The therapist will begin with a brief assessment to identify the specific muscle or tendon requiring treatment. During the session, they will apply targeted pressure using their fingers, thumbs, or elbows directly across the affected tissue. The movement is slow and precise, designed to penetrate deeply without sliding on the skin. Throughout the process, the therapist will adjust the pressure based on feedback to ensure effectiveness while maintaining comfort. The technique focuses on breaking down scar tissue and promoting healing in the targeted area.

Description

Deep friction massage is a specific technique within the field of therapeutic massage that targets muscle and tendon injuries. It is designed to promote healing by increasing blood flow and breaking down scar tissue. The massage applies pressure across the grain of muscles and tendons, using deep, penetrating movements. This method is particularly beneficial for chronic muscular pain, tendinitis, and areas with dense scar tissue, helping to restore mobility and relieve discomfort.

How it helps

Deep friction massage (DFM) is a therapeutic technique used to treat tendinopathies. Here's what the research says about its efficacy:

- A study found that deep friction massage (DFM) induces an immediate reduction in pain intensity upon palpation in athletes with patellar tendinopathy, regardless of the pressure applied during the DFM application. This suggests that DFM can be effective in reducing pain associated with tendinopathy in the short term [\[R\]](#).
- A study compared deep friction massage to cortisone injections for treating lateral epicondylitis (tennis elbow) and found that at 6-month follow-up, only patients in the deep friction massage group demonstrated significant improvement in all outcome measures, including pain score, function, and grip strength. This suggests that DFM may offer long-term benefits for tendinopathy treatment compared to cortisone injections [\[R\]](#).
- A study compared the effects of a combination of modalities and transverse friction massage to iontophoresis for infrapatellar tendinitis treatment. It found **limited benefits** of DFM [\[R\]](#).

14



Kinesio Taping

IMPACT

2 / 5

EVIDENCE

2 / 5

How to implement

Apply kinesio tape directly to the skin over the affected muscle or joint area. The tape should be stretched slightly to create tension after being applied over the pre-cleaned skin. Typically, kinesio tape can be worn for 3 to 5 days, including during showering, before it needs to be replaced.

Description

Kinesio taping involves the application of special tape to support injured muscles and joints. It can help reduce pain, improve circulation, and enhance overall mobility when used correctly.

Kinesio Taping is a physical therapy technique that uses special tapes to help support muscles and tendons. People use Kinesio Taping to help with [R](#), [R](#):

- **Musculoskeletal injuries**
- Swelling due to lymph fluid buildup (lymphedema)
- Muscle stiffness

How it helps

Kinesio Taping provides external support to the injured tendon, thereby helping reduce pain and inflammation. It also aids in the recovery process by enhancing stability and proprioceptive feedback, quickening the healing process of the tendon.

According to research, kinesio taping may help with rotator cuff tendon injuries [R](#), [R](#).

15



Dietary Protein

IMPACT1 / 5

EVIDENCE2 / 5

How to implement

Include a variety of protein sources such as meat, fish, eggs, dairy, beans, and nuts in your diet every day, aiming for at least 0.8 grams of protein per kilogram of body weight. For more active individuals or those looking to build muscle, increase intake to 1.2 to 2.0 grams per kilogram of body weight daily, spread out over all meals to maximize absorption.

Description

Protein is essential for building and repairing tissues, supporting muscle growth, and maintaining overall bodily functions. Adequate protein intake is crucial for overall health and well-being.

Foods that are high in protein include:

- Eggs
- Nuts
- Beef
- Chicken
- Fish
- Yogurt
- Tofu
- Pork
- Cottage cheese

How it helps

Adequate protein intake is essential for the repair of tissue, including tendons, and aids the recovery process.

Studies suggest that dietary protein, particularly from specific supplements and animal sources, may aid in the management and prevention of tendon injuries and related musculoskeletal conditions. Key findings from the research include:

- Nutritional interventions, including protein and amino acids like leucine, arginine, and glutamine, may be beneficial for tendon growth and healing. This suggests that a diet rich in these nutrients could support tendon health and potentially prevent injuries [\[R\]](#).
- Mechanical loading, such as exercise, promotes collagen synthesis in tendons, indicating that tendons adapt to increased demands, which could be supported by adequate protein intake [\[R\]](#).
- Whey protein supplementation was found to augment muscle and tendon hypertrophy following resistance training, suggesting that protein supplementation can support the structural integrity of tendons in addition to muscle growth [\[R\]](#).

Nutritional Considerations for Injury Prevention and Recovery in Combat Sports discusses protein and amino acid intake as a strategy to reduce muscle loss and accelerate healing during tendon injury recovery [\[R\]](#).

16



Low-Intensity Pulsed Ultrasound

IMPACT1 / 5

EVIDENCE2 / 5

Description

Low-Intensity Pulsed Ultrasound (LIPUS) is a non-invasive therapeutic modality that utilizes sound waves to promote healing in various body tissues. Unlike traditional ultrasound therapy, which is continuous and used primarily for diagnostic purposes, LIPUS delivers pulsed waves at lower intensities, making it suitable for stimulating biological processes without causing thermal damage.

People mainly use LIPUS to treat non-union fractures where the bones fail to heal naturally after a break. LIPUS may also help with:

- Orthodontic treatments
- Periodontal tissue regeneration
- Wounds
- Spinal cord injuries

How it helps

A systematic review of 24 studies found that LIPUS may improve tendon injuries. However, the positive effects observed in animals haven't always been replicated in human trials [\[R\]](#).

How to implement

TYPICAL STARTING DOSE

1 hour

Description

Acupuncture is a part of traditional Chinese medicine. It involves **inserting thin needles at specific points on the body**. People use it to [R, R, R, R, R]:

- Relieve pain
- Improve sleep quality
- Relieve allergies
- Reduce nausea

How it helps

Please note: Acupuncture is safe for most people. However, it may come with extra risks for pregnant women, people with pacemakers, and people with bleeding disorders. Consult your doctor or a licensed acupuncturist for more information [R].

18

Compression Therapy

IMPACT

1 / 5

EVIDENCE

1 / 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

Studies suggest that various forms of compression therapy, including intermittent pneumatic compression, compression sleeves, and other techniques, can aid in reducing pain, swelling, and stiffness, and improve blood circulation and recovery in tendon injuries [\[R, R, R\]](#).

Compression can reduce swelling and provide support to the injured tendon, aiding the recovery process.

19

Myofascial Release

IMPACT1 / 5

EVIDENCE1 / 5

How to implement

Incorporate myofascial release into your routine by using tools like foam rollers or massage balls, focusing on tense areas for about 5-20 minutes daily. You can also seek professional myofascial release therapy sessions, which typically last about 30-60 minutes, 1-2 times per week for targeted treatment.

TYPICAL STARTING DOSE

5 minutes

Description

Myofascial release is a type of massage therapy that can help to improve range of motion, reduce pain, and increase circulation. It can also help to improve posture and reduce stress.

How it helps

Myofascial release can help alleviate tension and tightness in the muscles and fascia surrounding a tendon injury.

Some studies suggest that myofascial release can improve pain symptoms, function, and clinical severity in various conditions, including tendon injuries, and may enhance wound healing in bioengineered tendons, while other studies indicate that there is no good evidence of efficacy for treating tendon injuries and that the quality of studies is mixed [\[R\]](#), [\[R\]](#), [\[R\]](#).

20



Collagen Peptides

IMPACT1 / 5

EVIDENCE1 / 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 [\[R, R\]](#).

21



Blood Flow Restriction Training

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Wrap a blood flow restriction (BFR) band or cuff around the upper portion of your limbs (arms or legs) at a pressure that feels tight but not painful, aiming for a perceived tightness of 7 out of 10. Engage in low-intensity resistance training, such as lifting weights that are 20% to 30% of your one-rep max, or perform bodyweight exercises. Do this for 15-30 minutes, 2-3 times a week. Always release the bands after each exercise set to restore normal circulation.

TYPICAL STARTING DOSE

15 minutes

Description

Blood flow restriction (BFR) training is a specialized fitness and rehabilitation technique that involves applying pressure to restrict blood flow to specific muscles during exercise. This is typically achieved using cuffs or wraps placed on the limbs and then inflated to a controlled pressure. By temporarily reducing blood flow while allowing arterial inflow, BFR training creates a unique physiological response. It induces metabolic stress and muscle fatigue, leading to muscle growth and strength gains, even with lighter weights.

BFR is widely used in rehabilitation settings to aid in the recovery of injured individuals, helping them rebuild muscle strength without overloading compromised areas. It also has applications in improving muscular endurance and may have potential cardiovascular benefits, such as lowering blood pressure and enhancing vascular function. However, it should be performed under the guidance of a trained professional, as it's not suitable for everyone and has specific safety considerations.

How it helps

In a placebo-controlled trial of 46 patients with lateral elbow tendinopathy, low-load resistance training with BFR for 12 weeks improved pain intensity, pain-free grip strength ratio, and odds of recovery [\[R\]](#).

22



Tai Chi

IMPACT

1 / 5

EVIDENCE

1 / 5

How to implement

Practice Tai Chi for 30 to 60 minutes at least twice a week. Choose a quiet, spacious area and follow along with a qualified instructor, either in person at a class or through an online video tutorial, to ensure proper technique and maximum benefit.

TYPICAL STARTING DOSE

1 hour

Description

Tai Chi is a traditional Chinese mind-body practice involving slow, flowing movements and deep breathing. It is known for its potential to reduce stress, improve balance, and enhance overall physical and mental well-being.

Tai chi involves gentle movements and breathing to strengthen and relax the mind and body. Practicing tai chi may help [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Manage pain
- Improve fitness
- Increase well-being
- Improve sleep and mood

How it helps

Tai chi offers gentle movements that can improve circulation and flexibility, aiding tendon recovery. While there is no direct evidence specifically addressing the effectiveness of tai chi for tendinopathies, this technique has beneficial effects on various musculoskeletal and chronic pain conditions, which may indirectly suggest its potential utility for managing pain and improving physical function in individuals with tendinopathies [\[R\]](#), [\[R\]](#), [\[R\]](#).

23



Inositol

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take inositol as a daily supplement, usually available in powder or capsule form. The typical dosage ranges from 2 grams to 18 grams per day, divided into smaller doses taken with meals and water to aid absorption. It's important to start with a lower dose and gradually increase to avoid digestive side effects.

TYPICAL STARTING DOSE

2 g

Description

Inositol is a naturally occurring compound that plays a role in cell signaling and neurotransmitter function. It has been studied for its potential in promoting mental health and managing conditions like anxiety and depression when used as a supplement under the guidance of a healthcare professional.

Inositol is a type of sugar that our bodies need to function. It was considered a vitamin (vitamin B8) until it was discovered that our bodies can make it from another common sugar, glucose [\[R\]](#).

[Myo-inositol](#) is the most common form of inositol. It plays a role in [\[R\]](#), [\[R\]](#), [\[R\]](#), [\[R\]](#):

- Heart health
- Normal blood sugar levels
- Mental health
- Cognitive function
- Reproductive health

Myo-inositol can convert to [D-chiro-inositol](#) in the body. These two forms of inositol are often combined in supplements. People use them to improve blood sugar control and PCOS [\[R\]](#), [\[R\]](#), [\[R\]](#).

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.*

Inositol, a type of sugar that influences insulin and several neurotransmitter systems, might help with tendinopathy through its potential anti-inflammatory and insulin-regulating properties. These effects could aid in reducing inflammation and improving blood sugar control, potentially enhancing tendon healing and reducing pain.

However, specific research on inositol for tendinopathy is limited, so its effectiveness in this context isn't well-established. Always consult a healthcare professional before starting any new supplement, especially for specific conditions like tendinopathy.

24



Alpha-Ketoglutarate (AKG)

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

Take alpha-ketoglutarate (AKG) as a dietary supplement in a dose of approximately 1-2g per day, preferably with meals to aid in its absorption. The exact dosage may vary based on the specific product and individual health needs, so it's important to follow the label instructions or consult a healthcare provider for personalized advice. This supplementation can be ongoing, with periodic evaluations to assess its effects on your health.

TYPICAL STARTING DOSE

1 g

Description

Alpha-ketoglutarate (AKG) is a key molecule in the Krebs cycle, crucial for energy production in cells. It plays a role in amino acid synthesis and nitrogen transport. In supplement form, it's claimed to improve athletic performance and support recovery, but the scientific evidence for these benefits is limited.

How it helps

Alpha-ketoglutarate enhances bone formation. It regulates the synthesis of [collagen](#) possibly by increasing the number of molecules available for synthesis. Collagen is a major component of tendons.

Additionally, AKG may assist in reducing inflammation and oxidative stress in tendons, which are common causes of tendonitis and other tendon disorders.

In a randomized controlled trial of patients with rotator cuff repair, the use of a supplement containing arginine L-alpha-ketoglutarate, methylsulfonylmethane, bromelain, and hydrolyzed type I collagen for 3 months after repair decreased shoulder pain and improved repair integrity but had no effect on the objective functional outcomes [\[R\]](#).

25



Contrast Water Therapy

IMPACT

0 / 5

EVIDENCE

0 / 5

How to implement

To perform contrast water therapy, alternate between hot and cold water during your shower. Start with hot water for about 3-4 minutes, then switch to cold water for about 1 minute. Repeat this cycle 3-5 times, always ending with cold water. Do this daily or after intense physical activity for the best results.

Description

Contrast water therapy involves alternating between hot and cold water treatments, which may help reduce muscle soreness and promote recovery after intense physical activity. This therapy can support musculoskeletal health and improve circulation, contributing to overall physical well-being.

How it helps

Alternating hot and cold water baths can help reduce inflammation and improve circulation around the injured tendon.

Contrast water therapy has shown beneficial effects on recovery from exercise-induced muscle damage, which can provide insights into its potential benefits for tendon injury recovery [\[R\]](#), [\[R\]](#), [\[R\]](#).

While CWT appears to offer benefits in reducing muscle soreness and aiding recovery from exercise-induced muscle damage, **the direct evidence for its effectiveness in tendon injury recovery specifically is lacking**. Further research is required to fully understand the potential benefits of CWT in the management and recovery of tendon injuries.

26



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.

In a randomized controlled trial of patients with rotator cuff repair, the use of a supplement containing arginine L-alpha-ketoglutarate, MSM, bromelain, and hydrolyzed type I collagen for 3 months after repair decreased shoulder pain and improved repair integrity but had no effect on the objective functional outcomes [R].

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

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.

