SelfDecode™

Knee Pain

DNA Health Report

REPORT CATEGORIES

JOINT & TENDON HEALTH

PAIN

Sample Client

Report date: 15 January 2026

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Table of Contents

Personal information

NAME

Sample Client

SEX AT BIRTH

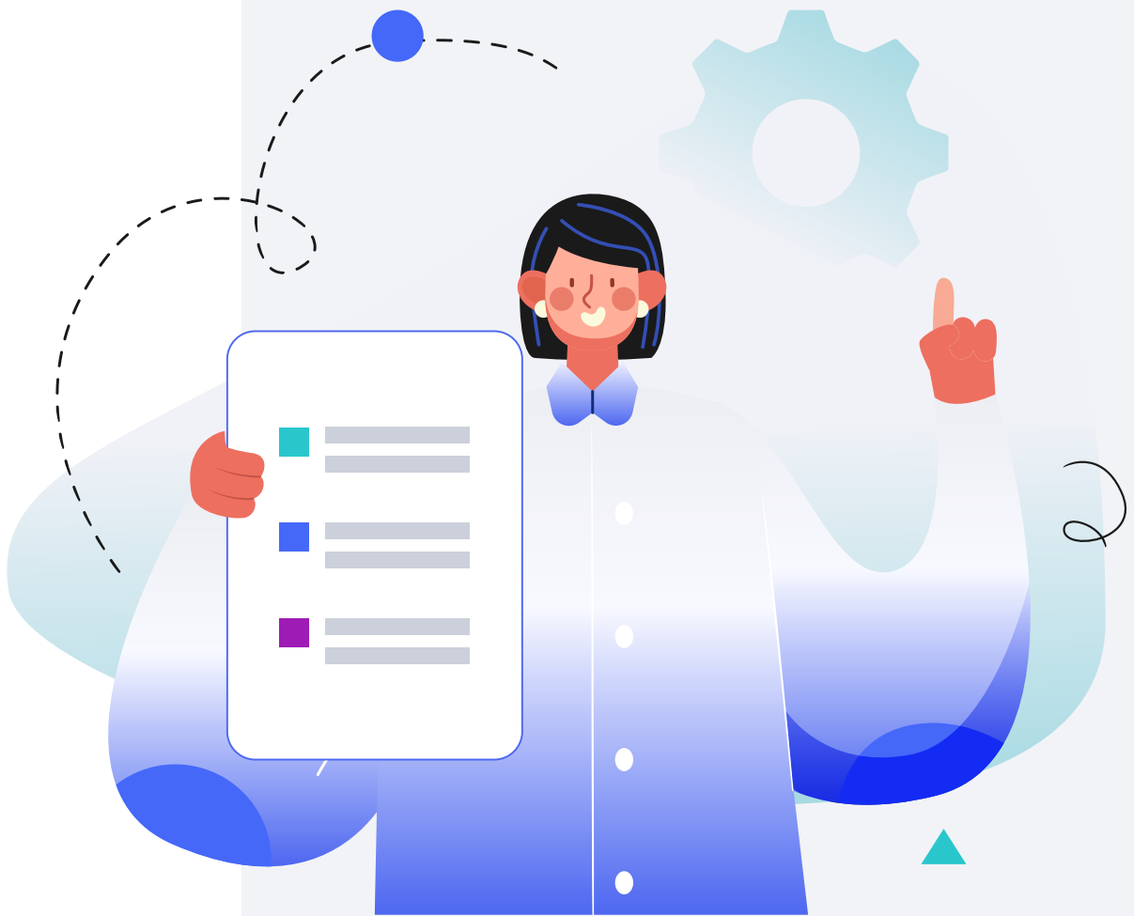
Male

HEIGHT

5ft 5" 165cm

WEIGHT

137lb 62kg

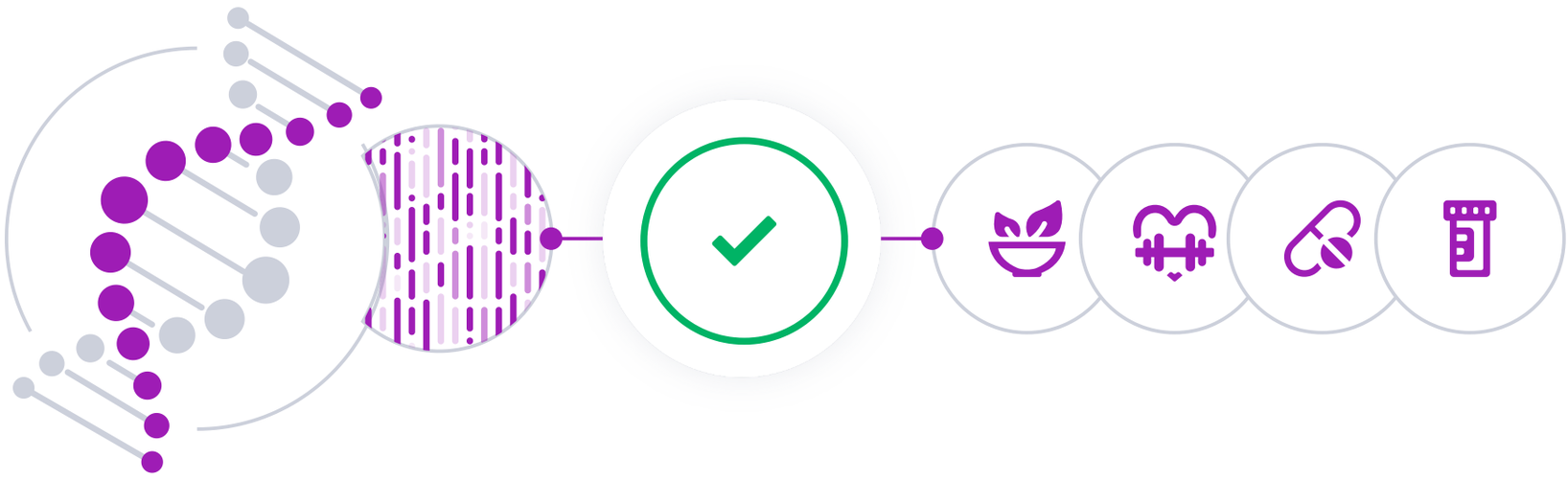


DISCLAIMER

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

How this works

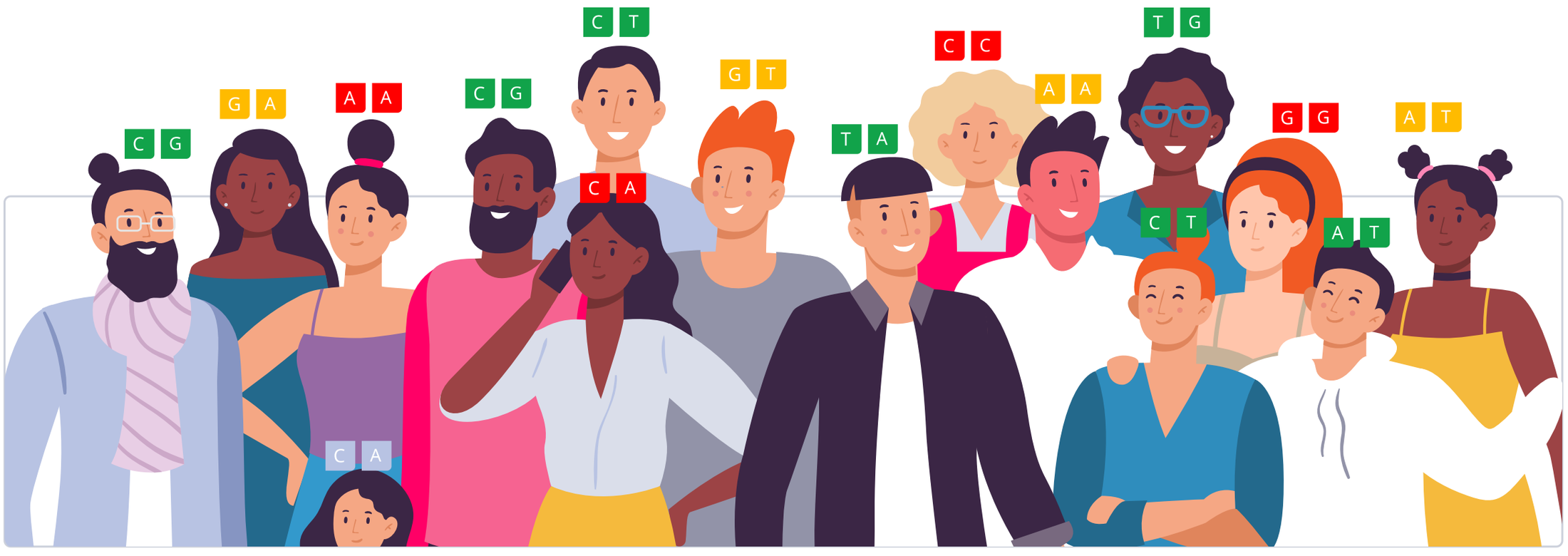
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.



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

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

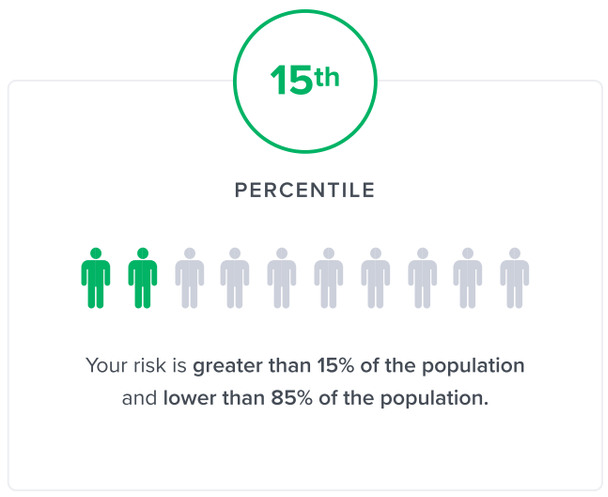
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.



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

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

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



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

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

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

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

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

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

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

Impact

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

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

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

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

Recommendation Evidence

5 / 5

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

4 / 5

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

3 / 5

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

2 / 5

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

1 / 5

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

0 / 5

No evidence in humans.

Genotype-specific Evidence

High-quality

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

Medium-quality

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

Low-quality

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

Indirect

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

In theory

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

Some things to keep in mind:

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

Introduction

You're probably picturing creaky, pained knees of an elderly man struggling to get up from his lounge chair... However, knee pain is pretty common among young people and adolescents, as well!

Knee pain is a common complaint. It can be a consequence of many different conditions, including [R]:

- Arthritis
- ACL injury
- Soft tissue injury
- Tendon or joint inflammation
- Fractures
- Gout

The type and severity of knee pain can vary depending on the cause. Besides pain, symptoms and signs may include [R]:

- Swelling and stiffness
- Redness
- Warmth to the touch
- Weakness or instability
- Limited movement
- Popping, crunching, or grinding noises

Risk Factors

Knee pain is a common complaint with many potential causes, including injuries, overuse, and arthritis.

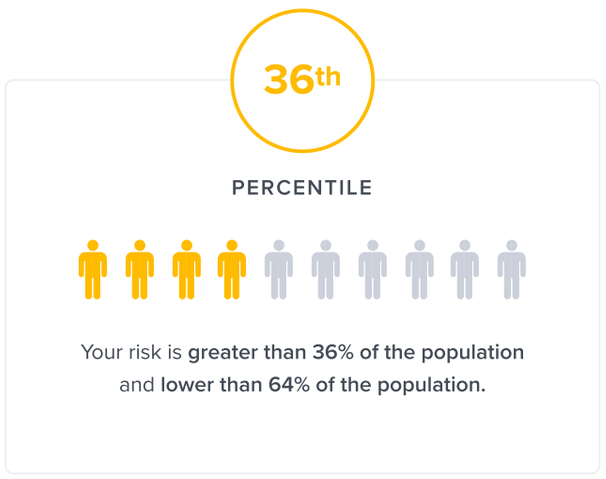
A number of factors can increase your risk of having knee pain, including [R]:

- Excess weight
- Poor flexibility and strength
- High-impact sports or occupations
- Previous injury
- Older age (for arthritis)
- Genetics

Genetics plays a role in many conditions that cause knee pain, such as injuries and osteoarthritis. Involved genes may affect inflammation, bone density, cartilage function, and more [R, R, R].

TYPICAL LIKELIHOOD

Typical likelihood of knee pain based on 947,637 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
COL27A1	rs919642	AA
EPHA5	rs201194999	CC
COL11A1	rs2622873	TT
ICA1L	rs62182810	AA
BRINP3	rs72727240	TT
MAB21L3	rs79678808	AA
CDC42BPA	rs56339347	AA
/	rs567271467	GG
CDC42BPA	rs573881227	CC
CPNE1	rs6120946	AA
CPNE1	rs143384	AA
COL27A1	rs2808772	GG
PARD6G	rs1039257158	CC
SCUBE1	rs528981060	GG
SLC39A8	rs13107325	CC
TGFB1	rs75621460	GG
TGFA	rs3771501	GG
H4C8	rs115740542	TT
GPR37L1	rs74136729	AA
PTPRC	rs79211001	AA
SGIP1	rs74810564	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
1	Physical Therapy	30 minutes
2	Exercise At Least One Hour a Day	1 hour
3	Reduce Knee Strain	
4	Aquatic Exercise	1 hour
5	Running	
6	Turmeric	
7	Aerobic Exercise (Cardio)	1 hour
8	Curcumin	500 mg
9	Topical Capsaicin	
10	Hot and Cold Applications	15 minutes
11	Blood Flow Restriction Training	15 minutes
12	Acupuncture	1 hour
13	Tai Chi	1 hour
14	Topical Cabbage Leaf	
15	Avocado/Soybean Unsaponifiables (ASU)	300 mg
16	Chondroitin	800 mg
17	Bromelain Enzyme Blends	500 mg
18	Stability Training	30 minutes
19	Yoga	30 minutes
20	Core-Strengthening Exercises	20 minutes
21	Glucosamine	1500 mg
22	Collagen Peptides	10 g
23	Devil's Claw	100 mg
24	Fennel	100 mg
25	Topical Black Seed Oil	
26	Topical Ginger	
27	Backward Walking	10 minutes
28	Rose Hip	500 mg
29	Pycnogenol	100 mg
30	Collagen (Non-Hydrolyzed)	5 g
31	Boswellia	350 mg
32	Ginger	500 mg

33	Osteopathic Manipulation		34	Omega-3 (Fish Oil)	500 mg
35	N-Acetyl-Glucosamine (NAG)	500 mg	36	Guava	
37	L-Serine and EPA	15 g	38	Clove	500 mg
39	Meditation	30 minutes	40	Tamarind	500 mg
41	Low-Carbohydrate Diet		42	Cetyl Myristoleate (CMO)	540 mg
43	N-Acetyl-Glucosamine (NAG) And Chondroitin	1500 mg	44	Hydroxytyrosol	5 mg
45	Mediterranean Diet		46	Cucumber Extract (Q-Actin™)	
47	High-Intensity Laser Therapy	10 minutes	48	Stretching	15 minutes
49	Glucosamine + Chondroitin	500 mg	50	Dry Needling	30 minutes
51	Tart Cherries		52	Pomegranate	
53	Apply Heat	15 minutes	54	Compression Therapy	
55	Cold Applications	15 minutes	56	Balance And Mobility Training	30 minutes
57	Pilates	30 minutes	58	Methylsulfonylmethane (MSM)	1 g
59	L-Serine	500 mg	60	Low-Level Laser Therapy (LLLT)	30 seconds
61	Acupressure	1 minute	62	Walking	30 minutes
63	Manual Therapy		64	Aquatic Therapy	30 minutes
65	Kinesio Taping		66	Avoid Sugary Foods & Drinks	
67	Flexibility Training	20 minutes	68	Low-Intensity Exercise	1 hour
69	Exercise Therapy	1 hour	70	Strawberries	
71	EPA (Omega-3)	500 mg	72	Good Posture	

73	Vitamin K	90 mcg
74	Massage	30 minutes

1

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

If leg muscles and tendons are weak and out of shape, the risk of knee injury is high. Physical therapy includes different techniques and equipment that may [R, R]:

- Strengthen the muscles and tendons
- Correct movement techniques
- Reduce pressure on the knees
- Protect and support the knee joint

Exercise therapy targeting the knees and hips may be the best choice for knee pain from different causes, including [R, R, R, R, R, R]:

- Overuse
- Injuries
- Arthritis

Taping may be added to exercise therapy to help reduce pain in the short term (up to 4 weeks) [R, R, R].

Massage therapy and **laser therapy** (LLLT and HILT) may relieve pain from knee osteoarthritis, but they may not help with knee pain from other causes. Experts recommend **against laser therapy** for knee pain [R, R, R, R, R, R, R, R, R, R, R].

Experts recommend **against dry needling** for knee pain [R].

2

Exercise At Least One Hour a Day

IMPACT 4 / 5

EVIDENCE 4 / 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

A lack of physical activity may contribute to knee pain. If muscles and tendons are weak and out of shape, the risk of knee injury is high [R, R].

Regular **stretching and low-impact exercise** offer the best protection against knee injuries and pain. On the other hand, high-impact activities and some sports may contribute to knee pain [R, R, R].

Educating people about proper exercise programs may reduce knee pain due to osteoarthritis [R].

Please note: *High-impact exercise may increase the risk of knee pain. Be careful with lifting heavy weights, intense running, and high-impact sports like skiing or basketball* [R, R].

3

Reduce Knee Strain

IMPACT 4 / 5

EVIDENCE 4 / 5

How to implement

Avoid activities that put excessive stress on your knees, such as jumping and running on hard surfaces. Opt for low-impact exercises like swimming or cycling. When engaging in activities that involve knee bending, ensure proper form and use supportive footwear. Aim to strengthen your leg muscles through exercises such as leg lifts and squats, doing these 2-3 times per week.

Description

The knee bears a great deal of stress from everyday activities. This makes it one of the most easily injured joints. Reducing knee strain can be achieved by maintaining proper alignment during physical activities and incorporating strength training exercises to support the knee joint. These practices promote knee health and reduce the risk of injuries.

The knee is a very complex joint that connects the bones of the thigh and the lower leg. It allows the leg to bend and straighten, which is required to sit, squat, jump, and run [R].

The knee bears a great deal of stress from everyday activities. This makes it one of the most easily injured joints [R, R].

Knee injuries usually occur during sports that involve sudden stops, aggressive twisting and pivoting of the knee, jumping, and landing. Sports most commonly associated with knee injuries include [R, R, R, R, R, R]:

- Soccer
- Basketball
- Football
- Rugby
- Gymnastics
- Lacrosse
- Alpine skiing
- Volleyball
- Tennis
- Running
- Golf

Working an intense job that requires you to jump, pivot, or climb may increase the risk of ACL injury. On the other hand, kneeling, squatting, climbing stairs, and lifting or carrying heavy weights at work may increase the risk of meniscus tears [R, R, R].

How it helps

The following activities may put more strain on your knees, increasing the risk of injuries and pain [R, R, R]:

- High-impact sports (e.g., skiing, basketball, sprinting)
- Certain jobs like construction or farming
- Lifting heavy objects

Running can cause knee pain, especially in people who don’t use proper technique (rearfoot-strike runners). The following may help reduce the risk of knee injuries and pain [R, R, R, R]:

- Reducing running intensity
- Learning a proper (forefoot-strike) technique
- Wearing orthopedic shoes or foot orthoses

4

Aquatic Exercise

IMPACT 3 / 5

EVIDENCE 4 / 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

A lack of physical activity may contribute to knee pain. If muscles and tendons are weak and out of shape, the risk of knee injury is high [R, R].

Aquatic exercise such as **swimming and water aerobics** may improve pain and other symptoms in people with **knee osteoarthritis**. Aquatic and land-based exercise may be similarly effective at reducing knee pain, but people seem to prefer aquatic exercise [R, R].

5

Running

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

To implement running into your routine, start with shorter distances and gradually increase as your endurance improves. Aim for 3 to 5 sessions per week, each lasting 20 to 30 minutes. Wear appropriate running shoes to prevent injuries and choose varied routes to keep the activity engaging. Incorporate warm-up exercises before running and cool down with stretches afterward to enhance flexibility and recovery.

Description

Running is a versatile and accessible form of aerobic exercise that improves cardiovascular health, strengthens muscles, and enhances mental well-being. It requires minimal equipment, can be done almost anywhere, and is effective for weight management. Regular running can increase endurance, reduce stress, and boost overall physical fitness, making it a popular choice for maintaining an active lifestyle.

How it helps

A lack of physical activity may contribute to knee pain. If muscles and tendons are weak and out of shape, the risk of knee injury is high [R, R].

Regular **stretching and low-impact exercise** offer the best protection against knee injuries and pain. On the other hand, high-impact activities and some sports may contribute to knee pain [R, R, R].

Educating people about proper exercise programs may reduce knee pain due to osteoarthritis [R].

Please note: *High-impact exercise may increase the risk of knee pain. Be careful with lifting heavy weights, intense running, and high-impact sports like skiing or basketball* [R, R].

6

Turmeric

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

Incorporate 500-1000 mg of turmeric into your daily diet, either by adding ground turmeric spice to your food, such as in curries, soups, and smoothies, or by taking a dietary turmeric supplement. This should be done daily for at least 8 weeks to observe potential health benefits.

Description

Turmeric is a bright yellow spice derived from the root of the Curcuma longa plant. It contains curcumin, a potent antioxidant and anti-inflammatory compound. Turmeric is used for various health conditions, including reducing inflammation, alleviating joint pain, and supporting digestive health.

How it helps

Curcumin supplementation (1-2 g/day for up to 4 months) may improve knee pain and other symptoms of osteoarthritis. It may help by reducing inflammation and oxidative stress [R, R].

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

7

Aerobic Exercise (Cardio)

IMPACT 3 / 5

EVIDENCE 3 / 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

A lack of physical activity may contribute to knee pain. If muscles and tendons are weak and out of shape, the risk of knee injury is high [R, R].

Regular **stretching and low-impact exercise** (including walking or cycling) offer the best protection against knee injuries and pain. On the other hand, high-impact activities and some sports may contribute to knee pain [R, R, R].

Educating people about proper exercise programs may reduce knee pain due to osteoarthritis [R].

Please note*: High-impact exercise may increase the risk of knee pain. Be careful with lifting heavy weights, intense running, and high-impact sports like skiing or basketball* [R, R].

8

Curcumin

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

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

TYPICAL STARTING DOSE

500 mg

Description

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

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

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

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

How it helps

Curcumin supplementation (1-2 g/day for up to 4 months) may improve knee pain and other symptoms of osteoarthritis. It may help by reducing inflammation and oxidative stress [R, R].

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

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

9

Topical Capsaicin

IMPACT 3 / 5

EVIDENCE 3 / 5

How to implement

Apply a capsaicin cream or gel to the affected area 3 to 4 times daily. Make sure the skin is clean and intact before application. Avoid contact with eyes, mouth, and other sensitive areas. Use consistently for several weeks to see improvement.

Description

Capsaicin is a compound found in chili peppers and is used topically in creams and patches for its potential to alleviate pain related to conditions like arthritis, neuropathy, and muscle soreness.

Capsaicin is the compound that makes chili peppers spicy [R].

People use topical capsaicin to relieve pain and oral capsaicin to aid weight loss [R, R].

In the short term, capsaicin causes pain. However, **if you're exposed to a lot of capsaicin over a long period of time, it can reduce your pain sensitivity** [R, R].

***Please note**: Capsaicin may irritate the skin. Consult your doctor if the irritation is severe or lasts longer than 4 weeks. If capsaicin gets in your eyes, flush them with water immediately and consult your doctor* [R, R, R].

How it helps

Topical capsaicin may significantly reduce knee pain from osteoarthritis. It may help by increasing blood flow and blocking pain signals [R].

Please note: *Capsaicin may irritate the skin. Consult your doctor if the irritation is severe or lasts longer than 4 weeks. If capsaicin gets in your eyes, flush them with water immediately and consult your doctor* [R, R, R].

10

Hot and Cold Applications

IMPACT 3 / 5

EVIDENCE 2 / 5

How to implement

Alternate applying a warm compress for 15-20 minutes, then a cold pack for 15-20 minutes to the affected area. Repeat this cycle 3-4 times per day for up to one week or until symptoms improve.

TYPICAL STARTING DOSE

15 minutes

Description

Alternating hot and cold applications, such as hot and cold packs, can help reduce pain and inflammation in sore muscles and joints. This method, known as contrast therapy, can promote muscle relaxation and improve circulation.

People use hot and cold applications to **relieve pain, improve blood flow, and more** [R, R].

Types of hot applications include [R, R]:

- Heating pads
- Hot baths
- Saunas

Types of cold applications include [R, R]:

- Ice packs
- Ice baths

How it helps

Applying heat or cold to a painful knee may provide short-term relief. Potential options include [R, R, R, R, R, R, R]:

- Ice pack wrapped in a towel
- A bag of frozen vegetables
- Heat pack (20 minutes, 2x/day, 3-5 days/week)
- Heat-retaining sleeve (at least 12 h/day for 4 weeks)
- Hot-water bottle

Make sure not to apply ice for longer than 20 minutes at once to avoid nerve and skin damage [R]!

Hot and cold applications relieve joint pain in different ways [R, R]:

- Hot applications increase blood flow to the affected area. **This relaxes muscles and eases stiffness**.
- Cold applications decrease blood flow to the affected area. **This lowers swelling and inflammation, and has a numbing effect**.

11

Blood Flow Restriction Training

IMPACT 2 / 5

EVIDENCE 3 / 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 people recovering from knee injuries, BFR training improves muscle strength and reduces pain according to a meta-analysis of 9 studies and 273 patients [R].

12

Acupuncture

IMPACT 2 / 5

EVIDENCE 3 / 5

How to implement

Visit a licensed acupuncturist for a session, typically lasting between 30 to 60 minutes, once or twice a week. Depending on your specific condition, a course of treatment might range from a few weeks to several months.

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 relieve pain and allergies, as well as reduce nausea and improve sleep.

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

Acupuncture may improve knee pain from osteoarthritis. However, most studies are of low quality, and the benefits may be limited to the short term [R, R, R, R, R, R].

In line with this, experts say that acupuncture may help improve knee pain, but they also warn about limited evidence. According to them, acupuncture should only be applied as part of physical therapy [R, R].

Acupuncture may help by blocking pain signals [R, R, R].

Please note: *Acupuncture is generally 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].

13

Tai Chi

IMPACT 2 / 5

EVIDENCE 3 / 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

A lack of physical activity may contribute to knee pain. If muscles and tendons are weak and out of shape, the risk of knee injury is high [R, R].

Practicing tai chi may provide short-term relief from pain and other symptoms of **knee osteoarthritis** [R, R, R, R].

14 Topical Cabbage Leaf

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Apply a fresh, clean cabbage leaf directly to the affected area. Leave it in place for at least an hour or overnight if possible, securing it with a loose bandage. Repeat daily until symptoms improve.

Description

Cabbage leaf compresses are a natural remedy involving cabbage leaves placed on the skin. They are used topically to relieve breast engorgement in breastfeeding women and reduce swelling and inflammation.

How it helps

Topical cabbage leaves have anti-inflammatory properties, which can help reduce knee pain by decreasing swelling and inflammation. This, connected with the cooling effect of the cabbage, can also soothe the aching area.

A study divided participants into three groups: cooling gel pad (20 mins/day), diclofenac gel (4 times/day), and cabbage leaf (1 hour/day). Cabbage leaf and cooling gel pad were equally effective in reducing OA symptoms, outperforming diclofenac gel [R].

In a study with 81 patients (42 women, average age 65.9), after 4 weeks, those using cabbage leaf wraps (CLW) for at least 2 hours daily reported significantly less pain compared to the UC group but not compared to the TPG group [R].

15 Avocado/Soybean Unsaponifiables (ASU)

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take 300 milligrams of avocado/soybean unsaponifiables (ASU) supplement once daily with food. This supplementation should be continued daily for a minimum of three to six months to observe potential benefits in joint health.

TYPICAL STARTING DOSE

300 mg

Description

Avocado/soybean unsaponifiables are natural extracts derived from avocados and soybeans. They are used as dietary supplements and are believed to support joint health, reduce inflammation, and alleviate symptoms of osteoarthritis.

Avocado/soybean unsaponifiables (ASU) are extracts from avocados and soybean oil [R].

These extracts **support joint health** [R].

How it helps

Taking ASU (300-600 mg/day for at least 3 months) may reduce pain and improve joint function in people with knee osteoarthritis [R, R, R, R, R, R].

16

Chondroitin

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take 400 mg of chondroitin sulfate orally, three times a day or 800 mg once daily. This supplement regimen is typically followed for up to 6 months to support joint health.

TYPICAL STARTING DOSE

800 mg

Description

Chondroitin is often used as a supplement to support joint health and reduce the symptoms of osteoarthritis. It may help improve joint mobility and reduce discomfort in individuals with joint-related issues.

Chondroitin is a major component of cartilage. It helps keep cartilage healthy, and it provides the building blocks for the body to produce new cartilage.

People often combine chondroitin with glucosamine as supplements for joint health [R, R].

How it helps

Chondroitin sulfate (800-1200 mg/day for 13-52 weeks) may improve pain in people with knee osteoarthritis. It's important to take a pharmaceutical-grade product, because lower-quality supplements may not be effective [R, R, R, R, R, R].

Due to mixed evidence, some experts recommend taking chondroitin sulfate for osteoarthritis, while others recommend against it [R, R].

17

Bromelain Enzyme Blends

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take a 500 mg bromelain enzyme blend supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

500 mg

Description

Bromelain enzyme blends, derived from pineapples, are often used as dietary supplements for their potential anti-inflammatory and digestive benefits.

Bromelain is an extract from pineapples. It's rich in enzymes that break down proteins [R].

Bromelain is anti-inflammatory and may prevent blood clotting. People use it to [R]:

- Improve joint health
- Heal burns
- Manage heart conditions

How it helps

Bromelain (200-500 mg/day for 1-4 months) may reduce knee pain, mainly from osteoarthritis, However, one study didn't find this benefit [R, R, R].

Blends containing bromelain and other enzymes like trypsin and rutoside may significantly reduce knee pain from osteoarthritis [R, R, R, R].

Bromelain and other enzymes may help by reducing inflammation [R, R].

18

Stability Training

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Integrate stability exercises into your workout routine 2-3 times per week. These exercises include activities such as using a stability ball, performing balance exercises on a balance board, or doing body-weight exercises that focus on balance and core strength, such as planks and single-leg stands. Spend approximately 20-30 minutes per session focusing on these exercises.

TYPICAL STARTING DOSE

30 minutes

Description

Stability training is a form of exercise that focuses on enhancing core strength and balance through targeted movements and exercises, often incorporating equipment like stability balls, balance boards, or resistance bands. It helps improve overall stability and posture while reducing the risk of falls and injury.

How it helps

A study of 42 volunteers with patellofemoral pain syndrome found that adding postural stabilization exercises to therapeutic knee exercises further improved pain, flexibility, function, strength, endurance, and postural control [R].

In an 8-week trial of 31 women, hip muscle strengthening and movement control exercises improved pain, function, kinematics, and muscle strength better than quadriceps-strengthening exercises alone [R].

In a study of 31 female athletes with patellofemoral pain, a functional stabilization training program improved lower limb and trunk kinematics [R].

Stability training may help by improving joint support and mobility.

19

Yoga

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Practice yoga for at least 20 to 30 minutes a day, most days of the week. Choose a style that matches your fitness level and goals, and consider attending a class or using online resources to guide your practice.

TYPICAL STARTING DOSE

30 minutes

Description

Yoga is a mind-body practice that combines physical postures, breathing exercises, and meditation. It enhances flexibility, strength, and mental well-being and is used for stress reduction, relaxation, and overall health improvement.

Yoga combines breathing, stretching, and relaxation techniques. Practicing yoga may help [R, R, R]:

- Reduce stress
- Improve fitness
- Lower blood pressure and heart rate
- Manage pain

How it helps

People experiencing job stress may have **2 times** higher rates of knee pain [R].

Yoga combines relaxation and gentle exercise. It may improve pain and other symptoms of knee osteoarthritis [R, R, R].

20

Core-Strengthening Exercises

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Incorporate exercises like planks, bridges, abdominal crunches, and leg lifts into your daily routine. Aim to do these exercises for 20-30 minutes, 3 times a week. Each exercise should be performed in sets of 10-15 repetitions.

TYPICAL STARTING DOSE

20 minutes

Description

Core-strengthening exercises target the muscles of the abdomen, lower back, and pelvis, helping improve posture, stability, and reduce the risk of back pain. Regular core workouts support a strong and balanced musculoskeletal system.

The core, or trunk, includes several groups of muscles in your abdomen, back, and pelvis. Keeping these muscles strong helps stabilize your body, twist and bend your back, protect your back from injuries, and enhance your overall fitness [R].

Some exercises that help strengthen the core include [R]:

- Crunches
- Planks
- Bridges
- Supine toe taps
- Bird dogs

The core can also be strengthened by practicing Pilates, kettlebell training, and some types of yoga [R, R, R].

How it helps

In 3 non-placebo-controlled trials of 959 patients with patellofemoral pain, practicing core strengthening exercises, both alone and as an add-on to physiotherapy, for 4-6 weeks improved pain, function, and strength. Patients with more pain, better function, greater lateral core endurance, and less anterior core endurance were more likely to obtain benefits. The combination of these exercises with whole-body vibration further improved pain and lower limb functionality in a non-placebo-controlled trial of 50 subjects with this condition. In a non-placebo-controlled trial of 113 patients with osteoarthritis of the knee, practicing core strengthening exercises 3x/week for 12 weeks as an add-on to conventional exercises further reduced pain in the short term [R, R, R, R, R].

Core-strengthening exercises may help by enhancing your body's overall stability and reducing the pressure on your knees.

21

Glucosamine

IMPACT 2 / 5

EVIDENCE 2 / 5

How to implement

Take glucosamine as a dietary supplement, commonly available in capsules or liquid form. The standard dose is 1500 mg per day, which can be taken all at once or divided into multiple doses throughout the day. It's often recommended to continue taking glucosamine for at least 3 to 4 months to evaluate its effectiveness in relieving joint pain or osteoarthritis symptoms.

TYPICAL STARTING DOSE

1500 mg

Description

Glucosamine is a supplement commonly used to support joint health and may help alleviate symptoms of osteoarthritis. It's believed to promote cartilage health and reduce joint discomfort, but individual responses can vary.

Glucosamine is a compound naturally made by the body. It helps keep the connective tissues, such as the cartilage in the joints, strong and elastic [R].

Many people use glucosamine supplements to support joint health [R, R, R].

How it helps

Glucosamine may improve pain and other symptoms of knee osteoarthritis. However, some experts recommend **against taking glucosamine for osteoarthritis** due to weak evidence [R, R, R, R, R].

Glucosamine sulfate (1000-2000 mg/day for 2-3 months) may improve knee pain from other causes, but the evidence is mixed [R, R, R].

It may also improve knee pain in combination with other ingredients like **chondroitin, collagen, and curcumin**. However, it’s not sure if and how much glucosamine contributes to these benefits [R, R, R, R].

22

Collagen Peptides

IMPACT 2 / 5

EVIDENCE 2 / 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

Collagen Peptides stimulate your body's natural production of collagen, a protein that helps maintain the health of your joints and reduces joint pain, including knee pain. Ingesting these over time may improve knee joint comfort and potentially alleviate knee pain.

Collagen peptides (5 g/day for 3 months) may reduce exercise-induced knee pain [R, R].

Taking collagen supplements (10 mg/day) may improve osteoarthritis [R].

You can get either whole collagen or collagen that has been broken down (hydrolyzed). Both types may help with joint pain and stiffness [R, R].

23

Devil’s Claw

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Take 600-2000 mg of devil’s claw supplement daily, preferably with a meal to help with absorption and to minimize potential digestive discomfort.

TYPICAL STARTING DOSE

100 mg

Description

Devil's claw is an herbal remedy traditionally used to manage conditions like arthritis and pain. Some studies suggest it may have anti-inflammatory and analgesic effects, making it a natural option for pain relief.

Devil’s claw (*Harpagophytum procumbens*) is an herb used in traditional medicine. Its name comes from its hooked appearance [R].

People take devil’s claw to potentially help with pain [R].

How it helps

Supplementing with devil’s claw extract (2,400 mg/day for 2-3 months) may improve knee pain and stiffness from osteoarthritis [R, R, R].

It may have similar effects when combined with stinging nettle and rosehip [R].

Devil’s claw may help by reducing inflammation [R].

24

Fennel

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Take a fennel supplement in doses ranging from 100 to 600 mg per day, divided into two or three doses. It is recommended to start with a lower dose to assess tolerance. Continue taking the supplement for up to three months to evaluate its effectiveness.

TYPICAL STARTING DOSE

100 mg

Description

Fennel is a flavorful herb and vegetable with potential digestive and anti-inflammatory properties. It can be used in cooking to add flavor to dishes while potentially offering digestive support.

Fennel (*Foeniculum vulgare*) is an herb belonging to the carrot family. Fennel shoots, bulbs, leaves, and seeds are edible and used in food. Parts of the plant are also used in soaps and perfumes [R, R, R].

As an herbal remedy, fennel may help with period cramps and anxiety [R, R].

How it helps

Fennel has anti-inflammatory properties that may help in relieving the inflammation and pain associated with certain types of knee pain. It's also rich in antioxidants that protect body tissues from damage, thereby promoting healing.

In a randomized, double-blind trial with 66 patients with knee osteoarthritis, powdered fennel extract (800 mg, 2x/day for 2 weeks) **reduced pain and disability** [R].

25

Topical Black Seed Oil

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Apply a thin layer of black seed oil to the affected area of the skin. Gently massage it in until fully absorbed. Repeat this application twice daily, in the morning and at night before bed, for a period of 1 to 2 months to observe beneficial effects.

Description

Black seed oil is a topical application derived from the seeds of the Nigella sativa plant. It contains the compound thymoquinone and is used for its potential anti-inflammatory and antioxidant properties, making it beneficial for skin health and wound healing.

Black seed (black cumin) and its oil are used in cooking and traditional medicine [R].

People use black seed for [R, R, R, R, R]:

- Asthma
- High blood sugar
- High blood pressure
- Allergies
- Joint pain

How it helps

Applying black seed oil on the knee (3x/day for 3 weeks) may reduce knee pain from osteoarthritis. Black seed oil may help by reducing inflammation [R, R].

26

Topical Ginger

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Apply a thin layer of ginger extract or gel directly to the affected area of skin. Use up to two times daily, massaging gently into the skin for absorption. Continue this routine for at least 3-4 weeks to evaluate effectiveness.

Description

Ginger topical applications, often in the form of gels or oils, utilize the anti-inflammatory and antioxidant properties of gingerol, the main compound in ginger root. They are used for soothing sore muscles, reducing joint pain, and supporting circulation. Extracts from pink and blue ginger are used topically for their potential antioxidant and anti-aging benefits. They may be included in skincare products to support skin health and combat signs of aging.

Ginger root is a cooking spice and a traditional remedy. People mostly use it to relieve [R]:

- Nausea
- Menstrual cramps
- Joint pain

Applying topical ginger products on painful areas may also help.

How it helps

Applying **ginger extract (4%)** for 3 months may significantly reduce knee pain due to osteoarthritis [R].

Massaging the knee with **ginger essential oil** (2x/week for 3 weeks) may also help [R].

Ginger may help by reducing inflammation [R, R].

27

Backward Walking

IMPACT 2 / 5

EVIDENCE 1 / 5

How to implement

Engage in backward walking for 10-15 minutes daily, preferably in a safe, obstacle-free environment to minimize the risk of falls. This can be done in a straight line or in a loop. Ensure to start slowly to maintain balance and gradually increase your pace as you become more comfortable with the movement.

TYPICAL STARTING DOSE

10 minutes

Description

Backward walking, also known as retro walking, can provide unique benefits for balance, coordination, and muscle engagement compared to forward walking. It's used as a form of exercise to improve motor skills and lower-body strength.

How it helps

Backward walking may improve isokinetic muscular function, reduce low back pain index, and decrease the lumbosacral angle in unilateral exercise athletes [R].

There is evidence that backward walking can be a useful adjunct to conventional physiotherapy to improve pain, knee function, and strength of the quadriceps muscles, which may indirectly benefit back pain associated with knee pathology [R].

Walking interventions, including backward walking, showed similar improvements in pain, disability, quality of life, and fear-avoidance in chronic low back pain when compared to other physical exercises [R].

28

Rose Hip

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Take a 500 mg rose hip supplement daily, preferably with a meal to aid absorption.

TYPICAL STARTING DOSE

500 mg

Description

Rose hip is the fruit of the wild rose plant and is commonly used in various forms, such as oil or extract. It's rich in nutrients like vitamin C, antioxidants, and essential fatty acids, making it valuable for skincare and immune health.

Rose hips are round fruits found on rose plants [R].

They’re a **good source of vitamin C and other antioxidants**. Some compounds in rose hips are also **anti-inflammatory** [R, R, R].

How it helps

Supplementation with rose hip powder (5 g/day for 3 months) may reduce knee pain from osteoarthritis [R, R].

It may have similar effects when combined with stinging nettle and devil’s claw [R].

29

Pycnogenol

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Take 100 mg of pycnogenol supplement daily. This can be taken in a single dose or divided into two doses of 50 mg each, one in the morning and one in the evening.

TYPICAL STARTING DOSE

100 mg

Description

Pycnogenol (pine bark extract) is derived from the bark of the maritime pine (Pinus pinaster). It has been used in traditional n European folk medicine for centuries, and more recently as a supplement. The extract contains a group of bioactive compounds known as proanthocyanidins, which may be beneficial in supporting cardiovascular health, promoting skin health, and aiding in the management of various conditions related to inflammation and oxidative stress.

Pycnogenol comes from the bark of pine trees that grow in the Mediterranean [R, R].
It may improve [R, R, R, R, R, R]:

- Athletic performance
- Seasonal allergies
- Cognitive function
- Joint health
- Varicose veins

How it helps

Pycnogenol supplementation (100-200 mg/day for 3 months) may relieve knee pain from osteoarthritis. It may help by reducing inflammation and protecting the cartilage [R, R, R, R].

30

Collagen (Non-Hydrolyzed)

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Take 5 grams of non-hydrolyzed collagen supplement daily. You can mix it with a beverage of your choice, such as water or juice, for easier consumption.

TYPICAL STARTING DOSE

5 g

Description

Collagen is a protein that plays a crucial role in maintaining skin, joint, and connective tissue health. Collagen supplements are believed to support skin elasticity, joint mobility, and overall skin and joint 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

Supplementation with collagen (10 mg/day for 3-6 months) may reduce pain from knee osteoarthritis, especially in people with the greatest joint damage [R, R, R].

Collagen peptides (5 g/day for 3 months) may reduce exercise-induced knee pain [R, R].

However, one study found no benefits of collagen for knee pain [R].

31

Boswellia

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Take a 350 mg Boswellia supplement daily, ideally with a meal to enhance absorption.

TYPICAL STARTING DOSE

350 mg

Description

Boswellia is an herbal remedy derived from the resin of certain trees. It's known for its potential anti-inflammatory properties and is often used to support joint health.

Boswellia, also known as frankincense, is the hardened sap of the *Boswellia serrata* tree [R].

In traditional medicine, boswellia is used for joint pain and gut conditions [R].

Today, some people use boswellia for [R, R, R, R, R]:

- Osteoarthritis
- IBD
- Skin aging
- Asthma
- Gum health

How it helps

Boswellia extract (50-340 mg/day for 1-2 months) may improve knee pain from osteoarthritis. It may help by reducing inflammation [R, R, R, R, R, R].

32

Ginger

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Take a 500 mg ginger supplement daily, preferably with a meal to enhance absorption and minimize potential stomach discomfort.

TYPICAL STARTING DOSE

500 mg

Description

Ginger is a versatile spice known for its potential anti-inflammatory and digestive benefits. It may help alleviate nausea, reduce muscle soreness, and support gastrointestinal comfort when consumed as part of a balanced diet.

Ginger root is a cooking spice and a traditional remedy. People mostly use it to relieve [R]:

- Nausea
- Menstrual cramps
- Joint pain

How it helps

Ginger extract (255-500 mg, 2x/day) may reduce knee pain due to osteoarthritis. However, some studies found that it may help only in the short term, if at all [R, R, R, R, R, R, R].

Ginger may also relieve knee osteoarthritis when combined with other ingredients, such as glucosamine, chondroitin, MSM, and boswellia. However, it's not sure if and how much ginger contributes to these benefits [R, R].

Ginger may help by reducing inflammation [R, R].

33

Osteopathic Manipulation

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Schedule an appointment with a licensed osteopathic physician (DO) who specializes in osteopathic manipulative treatment (OMT). Initially, you might need to go for treatment once a week for 4-6 weeks, depending on your condition's severity and response to treatment. After the initial period, the frequency may be reduced based on your physician's advice.

Description

Osteopathic manipulation is a hands-on medical approach used by osteopathic physicians to diagnose, treat, and prevent medical conditions. It involves techniques like stretching, pressure, and resistance to support musculoskeletal health and overall well-being.

Osteopathic manipulation involves applying pressure to different parts of the body. A practitioner will move your muscles and joints to relieve pain and other health issues [R].

How it helps

Osteopathic manipulation (at least 6 sessions) may improve knee pain in people with chronic pain and those recovering from knee surgery. It may help by reducing knee tension [R, R, R].

34

Omega-3 (Fish Oil)

IMPACT 1 / 5

EVIDENCE 2 / 5

How to implement

Take 1-2 g of omega-3 (fish oil) supplement daily, preferably with a meal to enhance absorption.

TYPICAL STARTING DOSE

500 mg

Description

Omega-3 fatty acids are essential fats found in fatty fish like salmon, flaxseeds, and walnuts. They are known for their potential cardiovascular and brain health benefits, including reducing the risk of heart disease and supporting cognitive function.

Omega-3 fatty acids are some of the healthiest fats we can eat. They help lower inflammation and protect the heart, brain, and eyes. Our bodies produce less omega-3s than we need for optimal health, so it's important to get enough through food or supplements [R, R, R].

There are three major types of omega-3s: ALA, EPA, and DHA [R, R].

Fatty fish are rich in EPA and DHA. They include [R]:

- Salmon
- Tuna
- Herring
- Sardines

For optimal protection, try to get at least **two servings of fatty fish per week.** Fish oil supplements are available for those who don't eat fish regularly [R].

How it helps

In people with knee osteoarthritis, lower omega-3 levels may be linked to increased pain [R].

Supplementation with **fish oil** (0.5-1 g/day for 2 years) may reduce knee pain due to osteoarthritis. Higher doses may not be more effective.

Krill oil (4 g/day) may provide similar benefits [R, R, R].

However, omega-3s failed to improve chronic knee pain in one study [R].

35

N-Acetyl-Glucosamine (NAG)

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 500-1000 mg of N-acetyl-glucosamine (NAG) orally with a glass of water, preferably with meals to minimize digestive discomfort. This should be done once daily for at least 2-6 months to evaluate its effectiveness on the intended condition.

TYPICAL STARTING DOSE

500 mg

Description

NAG is a compound derived from glucose and is often used in dietary supplements for its potential joint health benefits, particularly in combination with other compounds like chondroitin and glucosamine.

How it helps

A placebo-controlled trial to test the efficacy of a polymer of N-acetyl-D-glucosamine (NAG), or POLY-Nag concluded that POLY-Nag may be useful in treating patients with osteoarthritis [R].

Oral N-acetyl glucosamine (100 mg/day) and chondroitin sulfate (180 mg/day) supplementation for 12 weeks or longer improved knee function and household physical activity in middle-aged and older Japanese adults with knee pain/stiffness, aligning with studies from Europe and the US [R].

NAG aids in the production and repair of cartilage, the protective tissue that cushions your joints. By improving joint health, it may reduce inflammation and discomfort associated with conditions like osteoarthritis.

36

Guava

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate fresh guava into your diet by consuming 1-2 whole fruits daily or adding sliced guava to salads, smoothies, or yogurts. This can be continued as a regular part of your daily dietary intake to obtain its nutritional benefits.

Description

Guava is a nutritious fruit rich in vitamins, minerals, and dietary fiber. Consuming guava can support immune health, digestive regularity, and overall well-being.

Guava (*Psidium guajava* L.) is a tropical fruit found from India to Indonesia, and the Caribbean to Latin America. The fruit and leaves of the guava plant have been used medicinally for centuries.

People use guava fruit and leaf extracts to potentially help with [R, R]:

- Diabetes
- Digestive issues
- Weight control
- Joint health

How it helps

According to a single study, supplementation with guava leaf extract (1 g/day for 3 months) may reduce knee pain from osteoarthritis [R].

37

L-Serine and EPA

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take an L-serine supplement at a dose of 15 grams per day, and an EPA (eicosapentaenoic acid) supplement at a dose of 2 grams per day. These supplements can be taken with or without food, but taking them with food may help minimize any potential gastrointestinal discomfort. Continue this regimen daily for at least 6 months to evaluate its beneficial effects.

TYPICAL STARTING DOSE

15 g

Description

L-serine is an amino acid that is important for the production of proteins and neurotransmitters. EPA is an omega-3 fatty acid that is important for heart health, brain health, and joint health.

How it helps

In a placebo-controlled trial of 120 participants experiencing pain in the back and/or knee for at least 3 months, supplementation with L-serine (594 mg/day) and EPA (149 mg/day) for 8 weeks **improved the Japan Low Back Pain Evaluation Questionnaire and Japanese Knee Osteoarthritis Measure scores**, as well as **reducing wort pain, average pain, and pain during moving by 11-27%**. [R]

38

Clove

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take a clove supplement in capsule form, following the manufacturer's recommended dosage, usually ranging from 500 mg to 1000 mg daily with meals. Continue as long as needed or as directed by a healthcare provider.

TYPICAL STARTING DOSE

500 mg

Description

Clove is a spice known for its strong flavor and potential health benefits. It contains compounds like eugenol that have antioxidant and anti-inflammatory properties, making it a valuable addition to herbal remedies and culinary dishes.

How it helps

A prospective pilot study with 20 people found that a polyherbal formulation of Eezpain spray (containing Gaultheria oil, Eucalyptus oil, Turpentine oil, Clove Oil, Menthol, and Camphor) helped with muscular pain relief in the affected areas: knee and wrist joints, back of neck and shoulder, forearms and lower back. The herbs included are known for having analgesic and anti-inflammatory activity [R].

Clove may provide relief for knee pain due to its anti-inflammatory and analgesic properties, which help to reduce inflammation and manage pain. But remember, it may just ease symptoms and is not a definitive cure for underlying causes of knee pain.

39

Meditation

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Set aside 10-20 minutes each day in a quiet space without distractions to practice meditation. Focus on your breath or perform guided meditation using an app or audio track.

TYPICAL STARTING DOSE

30 minutes

Description

Meditation is a mindfulness practice that can reduce stress, improve mental clarity, and promote relaxation. Regular meditation is associated with numerous mental and emotional health benefits, including reduced anxiety and enhanced emotional well-being.

Meditation is a relaxation technique that trains your mind to focus and redirect your thoughts. Some of the main types of meditation are [R]:

- Mindfulness
- Focused
- Transcendental
- Mantra
- Moving

People use meditation to improve [R, R]:

- Stress and anxiety
- Mood
- Sleep disturbances
- Pain

How it helps

People experiencing job stress may have **2 times** higher rates of knee pain [R].

Meditation is a popular relaxation technique. According to limited evidence, it may reduce pain from knee osteoarthritis [R, R, R].

40

Tamarind

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 500 mg of tamarind extract as a supplement daily, with or without food. This can be continued for up to 12 weeks, after which you should consult your healthcare provider for further guidance.

TYPICAL STARTING DOSE

500 mg

Description

Tamarind is a tropical fruit native to Africa but is now grown in many tropical regions. Tamarind is rich in nutrients like vitamins C and B-vitamins, minerals such as potassium and magnesium, and dietary fiber. The main compounds in tamarind include tartaric acid and various antioxidants, which contribute to its distinctive taste and potential health benefits.

How it helps

Tamarind is rich in anti-inflammatory properties that can help reduce inflammation and pain in your knees. Additionally, it is high in antioxidants which may help repair any damaged tissues in the knee.

TamaFlexTM, a synergistic anti-inflammatory formula with Tamarindus indica seed and Curcuma longa rhizome extracts, improved knee pain and joint discomfort in 90 adults during a 12-week study. It increased the six-minute walk distance and average walking speed as early as 14 days into the trial [R].

41

Low-Carbohydrate Diet

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Limit your daily intake of carbohydrates to less than 26% of your total daily calories. For a standard 2000-calorie diet, this means consuming no more than 130 grams of carbohydrates per day. Focus on including non-starchy vegetables, lean proteins, and healthy fats in your meals while minimizing the intake of sugars, bread, pasta, and other high-carb foods.

Description

Low-carbohydrate diets can promote weight loss, improve blood sugar control, and support heart health. They may also be beneficial for individuals with certain medical conditions, such as epilepsy or metabolic syndrome.

How it helps

A low-carbohydrate diet can help manage knee pain by facilitating weight loss, as excess weight can put strain on your knees and cause pain. Additionally, some studies show a low-carb diet reduces inflammation, which can also reduce knee pain.

In a non-placebo-controlled trial of 242 patients with type 2 diabetes and knee pain, eating a carbohydrate-restricted diet for 2 years **improved knee pain and function** [R].

A low-carb diet followed for 12 weeks **reduced pain intensity, unpleasantness in some functional pain tasks, and self-reported pain better than a low-fat diet** in a non-placebo-controlled trial of 21 patients with knee osteoarthritis [R].

42

Cetyl Myristoleate (CMO)

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take cetyl myristoleate (CMO) supplements orally, typically available in capsule form. The suggested dosage can vary, but a common recommendation is 540 mg to 600 mg per day, taken in divided doses, for a period of one to two months. Always follow the specific dosage instructions on the supplement's label or as directed by a healthcare provider.

TYPICAL STARTING DOSE

540 mg

Description

Cetyl-myristoleate is a fatty acid compound found in certain dietary supplements and topical creams, believed by some to support joint health and reduce inflammation.

Cetyl myristoleate (CMO) belongs to a chemical group called **cetylated fatty acids**.

People mainly use it as an anti-inflammatory supplement, often in combination with other fatty acids [R].

How it helps

According to one small study, supplementation with CMO (at least 156 mg/day for 3 months) may improve knee pain from osteoarthritis [R].

43

N-Acetyl-Glucosamine (NAG) And Chondroitin

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take 500 mg of N-acetyl-glucosamine (NAG) along with 400 mg of chondroitin sulfate three times a day with meals. This combination should be consumed daily for at least two months to evaluate its effects on joint health.

TYPICAL STARTING DOSE

1500 mg

Description

NAG is a compound derived from glucose and is often used in dietary supplements for its potential joint health benefits, particularly in combination with other compounds like chondroitin and glucosamine. Chondroitin is a natural substance found in the cartilage of joints. It is commonly used in dietary supplements to support joint health and reduce symptoms of osteoarthritis.

How it helps

A placebo-controlled trial to test the efficacy of a polymer of N-acetyl-D-glucosamine (NAG), or POLY-Nag concluded that POLY-Nag may be useful in treating patients with osteoarthritis [R].

Oral N-acetyl glucosamine (100 mg/day) and chondroitin sulfate (180 mg/day) supplementation for 12 weeks or longer improved knee function and household physical activity in middle-aged and older Japanese adults with knee pain/stiffness, aligning with studies from Europe and the US [R].

NAG and chondroitin may help by restoring the cushioning fluid and cartilage in your knee joints. They also play a key role in controlling the body's inflammatory response, thus reducing swelling and increasing mobility.

44

Hydroxytyrosol

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take a hydroxytyrosol supplement at a dose of 5 to 10 mg per day, with or without food. This supplement should be taken daily for at least 8 to 12 weeks to observe potential health benefits.

TYPICAL STARTING DOSE

5 mg

Description

Hydroxytyrosol is a natural phenolic compound found in extra virgin olive oil. It is known for its antioxidant properties and may contribute to the health benefits associated with the Mediterranean diet.

How it helps

In a placebo-controlled trial of 25 patients with gonarthrosis, supplementation with hydroxytyrosol for 4 weeks improved pain (the Japanese Orthopedic Association score) and visual analog scale score [R].

In another double-blind clinical trial, hydroxytyrosol or placebo was administered to adult patients with gonarthrosis for 4 weeks. The group administered hydroxytyrosol showed significant improvement in the Japanese Orthopedic Association score (pain measurement index) and the visual analog scale score compared to the placebo group [R].

Hydroxytyrosol may help by reducing inflammation and swelling in the knee joint.

45

Mediterranean Diet

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Incorporate a variety of primarily plant-based foods, such as fruits, vegetables, whole grains, nuts, and legumes, into every meal. Choose healthy fats, like olive oil, over saturated fats and consume fish and poultry at least twice a week. Limit red meat to a few times a month and include a moderate amount of dairy products. Opt for water and red wine in moderation as your beverages.

Description

The Mediterranean diet is based on the traditional cuisine from the Mediterranean regions. It moderates the intake of red meat and dairy, while being rich in fruits and vegetables, whole grains, and healthy fats (olive oil).

The Mediterranean diet focuses on traditional cuisine from the Mediterranean regions. It's rich in [R]:

- Olive oil
- Fruits and vegetables
- Whole grains
- Nuts and seeds
- Fish

This type of diet may **reduce inflammation and protect the brain and heart** [R, R, R, R].

Limited intake of animal products, saturated fat, and refined sugar likely contribute to the health benefits of the Mediterranean diet [R].

How it helps

A study of 4330 patients with knee osteoarthritis associated adherence to a Mediterranean diet with a lower risk of pain worsening [R].

The Mediterranean diet may help by decreasing inflammation.

46

Cucumber Extract (Q-Actin™)

IMPACT 1 / 5

EVIDENCE 1 / 5

How to implement

Take a supplement containing Cucumber extract (Q-Actin™) as per the manufacturer's guidelines, typically around 100-200mg daily, orally with water. It's important to follow the exact dosage recommended by the product you are using. Continue this regimen for a period as suggested by the product's guidelines or consult a healthcare provider for personalized advice.

Description

Cucumber extract is used in skincare products for its potential to soothe and hydrate the skin. It can provide a cooling sensation and may help reduce skin irritation.

How it helps

Q-Actin, or Cucumber Extract, helps with knee pain by reducing inflammation and swelling in and around the knee joint. This directly results in decreasing pain, improving joint mobility and flexibility.

There were 101 patients with knee OA enrolled for the 180-day study, with 91 patients completing it. Patients were grouped into a placebo group (PLBO), as well as a 20mg dose (Q-Actin 1) and 100 mg dose (Q-Actin 2) groups. There was a significant, dose dependent improvement in the pain-related parameters over time [R].

Another study was done with 122 patients who had knee problems. They were split into two groups. One group took glucosamine-chondroitin, and the other group took CSE. After 30 days, the CSE group felt 22.44% less pain, and after 180 days, they felt 70.29% less pain. In comparison, the group taking glucosamine-chondroitin felt 14.80% less pain after 30 days and 32.81% less pain after 180 days. No one had any bad reactions to the medicines during the study [R].

47

High-Intensity Laser Therapy

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Attend high-intensity laser therapy sessions at a certified clinic, with each session lasting approximately 5 to 10 minutes, targeting the affected area. It's typically recommended to undergo this therapy 2 to 3 times a week for a span of 4 to 6 weeks, depending on the condition being treated and the therapist's assessment.

TYPICAL STARTING DOSE

10 minutes

Description

High-Intensity Laser Therapy is a medical treatment that uses focused light to help heal and relieve pain. It targets damaged or injured parts of the body, promoting tissue repair and growth. It's important for overall health as it provides a non-invasive alternative for pain relief and accelerates the body's own healing process.

How it helps

High-Intensity Laser Therapy aids in relieving knee pain by using light to penetrate the skin and underlying tissues, stimulating cell regeneration and promoting healing. This reduces inflammation, improves blood circulation, and accelerates tissue repair, thereby alleviating pain and restoring normal function in the knee.

48

Stretching

IMPACT 0 / 5

EVIDENCE 0 / 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

Stretching the muscles in the legs can help relieve tightness and pressure on the knee joint, easing pain.

49

Glucosamine + Chondroitin

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take a combination of glucosamine and chondroitin supplement, each at a dose of 500 mg, three times a day with meals for a total daily dose of 1500 mg of each.

TYPICAL STARTING DOSE

500 mg

Description

Glucosamine and chondroitin are popular supplements for joint health. They are often available as a combination.

Glucosamine and chondroitin are popular supplements for joint health. They are often available as a combination [R, R].

People mostly use these supplements for joint pain [R, R].

How it helps

These supplements may support joint health and could improve knee pain symptoms linked to degenerative joint conditions by helping to maintain cartilage structure.

50

Dry Needling

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Schedule sessions with a certified physical therapist or healthcare professional trained in dry needling, typically once or twice a week, for a duration determined by your specific condition and response to treatment. Sessions usually last about 30 minutes.

TYPICAL STARTING DOSE

30 minutes

Description

Dry needling is a technique used by some healthcare professionals to alleviate muscle pain and tension. It involves inserting thin needles into trigger points in muscles, potentially helping to release tension and promote pain relief.

How it helps

Dry needling helps knee pain by releasing muscle tension and improving blood flow, which helps your body heal itself. It also disrupts pain signals being sent to your brain, thereby reducing your experience of pain.

51

Tart Cherries

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Consume about 200 grams (7 ounces) of tart cherries or drink 240 ml (8 ounces) of tart cherry juice daily. This can be done at any time of the day but consuming it in the evening might improve sleep quality. It is recommended to continue daily consumption for at least 4 weeks to observe benefits such as reduced muscle pain, improved sleep, and potential reduction in inflammation.

Description

Tart cherries, often available in the form of juice or supplements, has vitamin C, as well as anthocyanins and melatonin, known for their potential to reduce inflammation and improve sleep quality. They are rich in antioxidants and may aid in recovery from exercise-induced muscle soreness.

Cherries are stone fruits with numerous species. Tart or “sour” cherries (*Prunus cerasus*) are native to parts of Europe and Asia [R, R].

They are close to regular, sweet cherries (*Prunus avium*) but more acidic. Hence, people do not eat them fresh but dried or in syrups, salads, pies, or liqueurs.

People consume tart cherries to help with [R]:

- Gout
- Exercise recovery
- Blood sugar control
- Blood pressure

How it helps

Tart cherries are rich in antioxidants and anti-inflammatory compounds that can reduce inflammation and pain associated with knee pain. They may help decrease swelling and improve recovery of joint function.

52

Pomegranate

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Incorporate pomegranate into your diet by consuming fresh pomegranate seeds, drinking pure pomegranate juice, or adding pomegranate extract to smoothies or yogurts. Aim for at least one serving per day, which could be about half a cup of seeds or a glass (8 ounces) of juice, to gain its health benefits.

Description

Pomegranate is a fruit native to regions of the Middle East and Mediterranean. It is rich in antioxidants and nutrients such as vitamin C, vitamin K, and dietary fiber. It contains punicalagins, anthocyanins, and ellagic acid, which give it anti-inflammatory effects and potential heart health benefits.

Pomegranates are red fruits that contain seeds covered by edible sweet coats. They are rich in antioxidants [R, R].

Pomegranate may reduce inflammation and support heart health. People use pomegranate seed oil and peel in cosmetics and traditional medicine [R, R].

How it helps

Pomegranates are rich in antioxidants, which reduce inflammation in the body including your knee. They also help rebuild cartilage, thus reducing knee pain related to conditions like arthritis.

53

Apply Heat

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Place a warm, not hot, heating pad or a warm wet towel on the affected area for 15-20 minutes at a time. Do this several times a day, ensuring there's at least a 1-hour interval between sessions to avoid skin damage.

TYPICAL STARTING DOSE

15 minutes

Description

Applying heat, such as through heating pads or warm baths, can help relieve muscle tension and soothe pain. It is a common method for managing muscle aches, menstrual cramps, and minor injuries.

People use hot applications to relieve pain, improve blood flow, and more [R, R].

Types of hot applications include [R, R]:

- Heating pads
- Hot baths
- Saunas
- Hot water bottles

How it helps

Applying heat to the knee can increase blood flow, relax muscles, and decrease joint stiffness, providing pain relief.

54

Compression Therapy

IMPACT 0 / 5

EVIDENCE 0 / 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

Wearing compression garments can provide support and reduce swelling in the knee area, which may alleviate pain.

55

Cold Applications

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Apply a cold pack or a bag of frozen peas wrapped in a towel to the affected area for 15-20 minutes, every 2-3 hours during the first 48 hours of experiencing pain or swelling.

TYPICAL STARTING DOSE

15 minutes

Description

Cold applications, such as ice packs, can help reduce inflammation, alleviate pain, and promote muscle recovery after injuries or intense physical activity. Applying cold can provide temporary relief from discomfort and support the body's natural healing processes.

People use cold applications to relieve pain, reduce inflammation, and more [R, R].

Types of cold applications include [R, R]:

- Ice packs
- Ice baths
- Cryotherapy

How it helps

Cold therapy helps reduce inflammation and numbs the affected area, temporarily relieving pain in the knee.

56

Balance And Mobility Training

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

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

TYPICAL STARTING DOSE

30 minutes

Description

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

How it helps

This training can improve coordination and knee joint stability, which can decrease the risk of falls and subsequent knee injuries.

57

Pilates

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Engage in Pilates exercises for at least 20-30 minutes, 3 times a week. Focus on core strength, flexibility, and mindful breathing. It is suitable for both beginners and advanced individuals, adjusting the difficulty of exercises as necessary.

TYPICAL STARTING DOSE

30 minutes

Description

Pilates is a form of exercise that focuses on strengthening the core, improving flexibility, and enhancing overall body awareness through controlled movements and breathing techniques. Its health benefits include increased core strength, improved posture, enhanced flexibility, and better balance, making it a popular choice for those seeking a holistic approach to fitness.

Pilates is a type of exercise that emphasizes proper alignment, breathing techniques, and precise movements.

It involves a series of controlled movements performed on a mat or with specialized equipment, such as a reformer or Cadillac. Pilates helps strengthen the core muscles, improve flexibility, and promote mind-body awareness.

How it helps

Pilates strengthens the core and improves alignment, which can help reduce the strain on the knees and alleviate pain.

58

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

MSM is thought to have anti-inflammatory and analgesic effects, which might lessen the severity of knee pain.

59

L-Serine

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take l-serine supplements orally, starting with a dose of 500 mg per day. If well tolerated and based on the desired effect, the dose can be gradually increased, but it should not exceed 2,000 mg per day without medical advice. It's best taken with meals to enhance absorption.

TYPICAL STARTING DOSE

500 mg

Description

L-serine is an amino acid essential for the production of proteins and other important molecules in the body. It plays a role in supporting brain health, immune function, and overall well-being.

How it helps

L-Serine helps in the production of phospholipids which are key components of your cell membranes, potentially aiding in joint health and reducing knee pain. However, more research is needed to fully substantiate these claims.

60

Low-Level Laser Therapy (LLLT)

IMPACT 0 / 5

EVIDENCE 0 / 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) can aid knee pain by stimulating cell repair and reducing inflammation in the afflicted area. This therapy essentially aids your body in healing itself, reducing the discomfort and stiffness associated with knee pain.

61

Acupressure

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Apply firm pressure on specific acupoints related to your condition using your fingers or a blunt object for 1-3 minutes. Repeat this process 2-3 times a day for several weeks to potentially observe improvements.

TYPICAL STARTING DOSE

1 minute

Description

Acupressure is a traditional Chinese healing technique that involves applying pressure to specific points on the body to promote relaxation, alleviate pain, and improve overall well-being.

How it helps

Acupressure can help alleviate knee pain by targeting specific pressure points to reduce pain and improve circulation.

62

Walking

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

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

TYPICAL STARTING DOSE

30 minutes

Description

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

How it helps

Regular walking can improve circulation, strengthen leg muscles, and promote overall knee health.

63

Manual Therapy

IMPACT 0 / 5

EVIDENCE 0 / 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 for knee pain involves hands-on techniques that move your joints and soft tissue to relieve pain and restore function. This can improve your movements, reduce knee stiffness, and lessen pain, making daily activities more comfortable.

64

Aquatic Therapy

IMPACT 0 / 5

EVIDENCE 0 / 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 allows for exercise with less stress on the knees due to water buoyancy, which reduces pain and improves function.

65

Kinesio Taping

IMPACT 0 / 5

EVIDENCE 0 / 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 support to your knee without restricting its movement, helping to minimize pain and inflammation. It can also aid in aligning the kneecap if it's off balance, contributing to pain relief and better knee functionality.

66

Avoid Sugary Foods & Drinks

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

To avoid sugary foods, eliminate or significantly reduce consumption of foods and beverages high in added sugars such as sodas, candies, baked goods, and sugary cereals from your diet. Instead, opt for natural sugar sources like fruits. Aim to do this daily for ongoing health benefits.

Description

High-sugar foods like baked goods, sweets, and sugary drinks, can spike your blood sugar levels. Consuming a lot of these types of foods can contribute to to health issues like diabetes, obesity, insomnia, and heart disease.

High-sugar foods and refined carbs have a high glycemic index (GI). This means they tend to spike your blood sugar levels. They include [R, R, R]:

- Sugary drinks
- Baked goods
- Sweets
- White bread
- White rice
- Pasta

Eating a lot of sugary foods can contribute to:

- Diabetes [R, R, R]
- Weight gain and obesity [R, R]
- Insomnia [R]
- Heart disease [R]

You may also want to avoid processed sugars and sugary drinks. They may have a role in increasing IL-1B [R, R].

How it helps

Sugary foods may contribute to inflammation and weight gain, potentially exacerbating knee pain. Reducing sugar intake could mitigate these effects.

67

Flexibility Training

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Incorporate flexibility training exercises, such as yoga or static stretching, into your routine for at least 20-30 minutes a day, three to five times a week. Focus on stretching all major muscle groups, holding each stretch for 10-30 seconds without bouncing, and breathing deeply to maximize benefits.

TYPICAL STARTING DOSE

20 minutes

Description

Flexibility training, such as yoga and stretching exercises, can improve joint range of motion, reduce the risk of injury, and promote better posture. Incorporating flexibility exercises into a fitness routine supports physical comfort and overall mobility.

How it helps

Flexibility training such as stretching can improve the range of motion and reduce tension in the muscles around the knee, decreasing discomfort.

68

Low-Intensity Exercise

IMPACT 0 / 5

EVIDENCE 0 / 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

Low-intensity exercises reduce stress on the knee joint while still promoting strength and mobility.

69

Exercise Therapy

IMPACT 0 / 5

EVIDENCE 0 / 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

Exercise therapy strengthens the muscles around your knee, improving stability and reducing pressure on the joint, thus helping to relieve knee pain. Additionally, it enhances joint mobility and flexibility, which can alleviate discomfort and aid in recovery.

70

Strawberries

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Incorporate a serving of strawberries, which is approximately eight medium-sized strawberries (about 1 cup or 150 grams), into your daily diet. You can enjoy them as a snack, add them to your breakfast cereal or oatmeal, blend them into smoothies, or use them as a topping for salads and desserts.

Description

Strawberries are a delicious fruit rich in vitamin C, antioxidants, and dietary fiber. They provide essential nutrients and are associated with various health benefits, including improved immune function and heart health.

Strawberries (*Fragaria ananassa*) are one of the most consumed berries, both fresh and processed in juices, jams, yogurts, and desserts [R].

Strawberries have a high content of antioxidants and vitamins, such as [R, R]:

- Vitamin C
- Folate
- Flavonoids

How it helps

Strawberries are rich in antioxidants and Vitamin C, which can help to reduce inflammation in the body, such as the inflammation often associated with knee pain. They also contribute to collagen production which is crucial for cartilage health in the knees.

71

EPA (Omega-3)

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take an EPA (Eicosapentaenoic acid) supplement in the form of fish oil or algae oil capsules, aiming for a dosage of 500-1000 mg per day. This should be taken with a meal to improve absorption, and continuous daily use is recommended for general heart health and to support mental well-being.

TYPICAL STARTING DOSE

500 mg

Description

EPA is an omega-3 fatty acid found in fish oil supplements and fatty fish like salmon. It is known for its anti-inflammatory properties and is associated with cardiovascular health, mood regulation, and cognitive function.

Omega-3 fatty acids are some of the healthiest fats we can eat. They help lower inflammation and protect the heart, brain, and eyes. Our bodies produce less omega-3s than we need for optimal health, so it's important to get enough through food or supplements [R, R, R].

There are three major types of omega-3s: ALA, EPA, and DHA. **EPA and DHA are vital for cognition and mental health** [R, R].

The body can produce eicosapentaenoic acid (EPA) from alpha-linolenic acid (ALA), another type of omega-3 fatty acid found in plants. We can also get EPA directly from food sources such as oily fish, shellfish, and algae. EPA helps make DHA. [R, R, R].

Please note: *Fish oil can interact with blood thinners (like aspirin, Plavix, Coumadin). Consult your doctor before taking fish oil* [R].

How it helps

In a placebo-controlled trial of 120 participants experiencing pain in the back and/or knee for at least 3 months, supplementation with L-serine (594 mg/day) and EPA (149 mg/day) for 8 weeks improved the Japan Low Back Pain Evaluation Questionnaire and Japanese Knee Osteoarthritis Measure scores, as well as reducing wort pain, average pain, and pain during moving by 11-27% [R].

72

Good Posture

IMPACT 0 / 5

EVIDENCE 0 / 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 the knee joints, which can alleviate pain and prevent further injury.

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Vitamin K

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Take a vitamin K supplement of around 90-120 micrograms daily with a meal that contains fat for optimal absorption. This dosage is appropriate for adult maintenance of health and should be adjusted based on individual healthcare provider advice.

TYPICAL STARTING DOSE

90 mcg

Description

Vitamin K encompasses two main forms: vitamin K1 (phylloquinone) and vitamin K2 (menaquinone). Vitamin K1 is primarily found in leafy green vegetables and plays a crucial role in blood clotting. Vitamin K2, sourced from animal products and fermented foods, is known for its potential to promote bone health and cardiovascular wellness.

Vitamin K is essential for blood clotting and bone formation [R].

Good sources of vitamin K include [R, R]:

- Green leafy vegetables, such as kale, spinach, and collards
- Soy products, such as natto, roasted soybeans, and edamame
- Carrot juice
- Pumpkin

Healthy adults should get **120 micrograms** of vitamin K per day [R].

How it helps

Vitamin K is important for bone health, and while you should avoid excessive supplements, dietary vitamin K from greens can support joint health.

Please note: *Vitamin K can interact with blood thinners (e.g., Coumadin). Make sure to consult your doctor before supplementing with vitamin K or drastically changing your dietary intake.*

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Massage

IMPACT 0 / 5

EVIDENCE 0 / 5

How to implement

Schedule a massage session, ideally with a licensed therapist, for 30-60 minutes, once a week. Choose a type of massage that suits your specific needs, such as Swedish for relaxation or deep tissue for muscle tension.

TYPICAL STARTING DOSE

30 minutes

Description

Massage therapy involves the manipulation of soft tissues to relax muscles, reduce stress, and alleviate pain. It can improve circulation, promote relaxation, and provide relief from various physical and mental health concerns.

If you've ever had a professional massage, then you probably know how much good it can do. Massages may help with [R, R, R]:

- Anxiety
- Pain
- Fatigue

Reflexology is a type of massage. It involves applying pressure to specific parts of your feet or hands. In theory, by pressing on these areas, you can relieve tension from other parts of the body [R].

Acupressure is a similar technique, in which pressure points are used to help with stress and pain [R, R].

How it helps

Massage can help relieve muscle tension around the knee, increase circulation, and reduce pain.

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.