Knee Osteoarthritis

Scan this QR Code to access a detailed video that enhances the information in this handout. It includes explanations for all the various treatments for knee osteoarthritis.

What is osteoarthritis?

Osteoarthritis happens when the cartilage—the smooth cushion between your bones—gradually wears down over time. Without this protective cushion, the joint can become irritated, leading to pain, stiffness, and swelling. The good news? While osteoarthritis cannot be completely "cured," it is highly manageable. By taking an active role in your treatment, you can significantly reduce your pain, protect your knee, and get back to the activities you enjoy.

How does it occur?

There are several factors that contribute to osteoarthritis. Some are out of your control, such as age, genetics, and past joint injuries. However, many risk factors are entirely within your control. Things like high blood pressure, elevated blood sugar, high cholesterol, and excess body weight can create extra inflammation in the body. Over time, this constant, low-grade inflammation weakens the joint. By taking steps to manage your overall health, you can actively slow this process down and help your knee feel better.

Your Action Plan: How to Treat Osteoarthritis

The best way to treat osteoarthritis is to focus on actively protecting the joint and preventing further irritation. You can improve your symptoms by focusing on these three pillars:

- **Keep Moving (Aerobic Exercise):** Activities like walking or riding a stationary bike act like lotion for your joints—movement actually increases the natural lubrication inside your knee, helping it move smoothly.
    - *Action Step:* Aim for at least 30 minutes of aerobic exercise daily.
- **Build Your "Internal Brace" (Strength Training):** Resistance training and rehabilitation exercises strengthen the leg muscles surrounding your knee. Strong muscles absorb shock and take pressure off the joint itself.
    - *Action Step:* Complete your strength training exercises 2 to 3 times a week.
- **Eat to Fight Inflammation:** What you eat directly impacts the swelling in your joints. Focusing on healthy nutrition gives your body the tools it needs to heal.
    - *Action Step:* Limit added sugars and ultra-processed foods, which can trigger joint inflammation.

Knee Osteoarthritis Rehabilitation Exercises

Consistent strengthening exercises can decrease pain and improve function. Perform the following program **2-3 times per week for 6-8 weeks**. After this initial phase, continue doing these exercises just 1-2 times per week to maintain your knee health.

How to Perform Your Strengthening Exercises

Go SLOW: Perform every movement with control—take 3 seconds to lift the weight, hold for 1 second, and take 3 seconds to lower it. Moving slowly improves your muscle's ability to handle weight, leading to much better long-term strength and stability for your knee joint.

The 8-10 Progression Rule: Start with a weight you can lift for 3 sets of 8 reps (mild pain up to 4/10 is acceptable and safe). Each time you do this workout, try to add 1 repetition per set if your knee tolerates it. Once you successfully work up to 3 sets of 10 reps, increase your weight slightly and drop back down to 8 reps. By repeating this cycle, you will safely increase your weight every 1 to 2 weeks to keep building strength.

How many sets? If you are performing this program 2 times per week, complete 3 sets of each exercise. If you are performing this program 3 times per week, complete 2 sets of each exercise. Either option gives your muscles enough weekly volume to build strength — choose the schedule that fits your lifestyle.

Active Warm Up

- March in place - Alternate lifting each knee towards your chest. 15 per leg.
- Leg swings - Swing one leg forward and backward. 10 to 15 per leg.
- Butt kicks - Stand tall and kick the heel towards the glutes. 10 to 15 per leg.

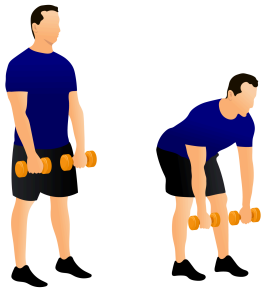
Squats (with or without dumbbells)

- Objective: strengthen the quadriceps, hamstrings, glutes, and calves
- Stand shoulder width apart. Lower until your thighs are parallel to the floor. Start with a chair squat or a half squat if you have pain.
- Perform 2-3 sets of 8-10 repetitions.

Split Squat (with or without dumbbells)

- Objective: strengthen quadriceps, hamstrings, and glutes
- Begin in a staggered stance with one foot forward and the other stepped back. Keep your torso upright as you lower your hips straight down until your back knee hovers just above the floor. Push through your front heel to return to the starting position.
- Perform 2-3 sets of 8-10 repetitions on each side.

Romanian Deadlift (with or without dumbbells)



- Objective: strengthen the hamstrings, glutes, and lower back
- Stand holding dumbbells, slightly bend your knees, and hinge at the hips. Keep the back straight. Lower until you feel a stretch in your hamstrings, then drive through the hips to stand back up.
- Perform 2-3 sets of 8-10 repetitions.

Calf Raise (with or without dumbbells)

- Objective: strengthen the calves which help with knee flexion and stability
- Stand with feet shoulder-width apart, and raise your heels as high as possible, keeping the body upright and engaging the calves. Hold briefly at the top, then slowly lower the heels back to the ground.
- Perform 2-3 sets of 8-10 repetitions.

Glute Hip Bridge (with or without weights on lap)

- Objective: strengthen gluteus maximus, hamstrings, pelvis, torso
- Lie on your back with knees bent. Lift your hips to form a straight line from shoulders to knees, squeeze your glutes, hold briefly, then lower back down.
- Perform 2-3 sets of 8-10 repetitions.

Side Lying Leg Raise (with or without resistance band around thigh)

- Objective: strengthen hip abductors
- Lie on your side with your legs straight. Raise the upper leg while maintaining a straight line with your body. Lift it to about 45 degrees, hold it briefly at the top, then gently lower back down.
- Perform 2-3 sets of 8-10 repetitions on each side.

How to Perform Your Stretching Exercises

Listen to your body. If your range of motion is limited, move only as far as comfortable. Do not force any position that causes sharp pain. A stretch should feel like a gentle pull, never sharp pain. If a position is uncomfortable, use a towel for reach or perform a smaller version of the movement—consistency is more important than depth.

Standing Quadriceps Stretch

- Objective: increase mobility of the quadriceps muscle
- Stand on the unaffected leg. Bend the knee of your injured leg bringing your heel towards the glutes. Grasp the ankle with your hand. You should feel a stretch along your thigh muscle.
- Hold this for 30 seconds, repeat on the other side.

Standing Calf Stretch

- Objective: alleviate tension in the calves to improve mobility
- Face a wall and step your unaffected foot forward, keeping your back leg straight. Lean forward towards the wall until you feel a stretch in the calf of your back leg.
- Hold this for 30 seconds, repeat on the other side.

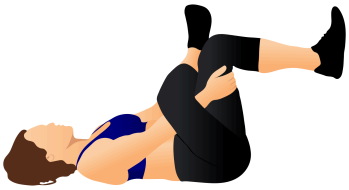
Standing IT Band Stretch

- Objective: improve flexibility along the outer thigh and hip
- Stand on the affected leg and cross your other leg in front of it. Gently allow the hip of the affected leg to drop outwards away from your body. Lean your upper body slightly towards the opposite side to increase the stretch. You should feel a stretch along the hip and side of the affected leg.
- Hold this for 30 seconds, repeat on the other side.

Sitting Hamstring Stretch

- Objective: improve flexibility of the hamstrings
- Straighten out the affected leg and bend your other leg inwards. Hinge forward at the hips and reach towards the toes. Try to keep the leg as straight as possible.
- Hold this for 30 seconds, repeat on the other side.

Lying Figure 4 Stretch



- Objective: stretch the piriformis and gluteal muscles
- While lying on your back, lift one foot and put the ankle over your other thigh, just above the knee, forming a figure 4 shape with your legs. Clasp your hands behind your thigh and gently pull it toward your chest. You should feel a stretch in your hip and in the glutes.
- Hold this for 30 seconds, repeat on the other side.

Medical Treatments: Injections

Platelet rich plasma injection

- Utilizes your own blood cells, platelets, and growth factors for pain relief.
- Effective in ~80-90% of people with improvements lasting up to 1 year.
- Protects cartilage and may slow down the progression of osteoarthritis.
- Significantly better outcomes than hyaluronic acid and corticosteroid injections.
- Not covered by insurance, considered a self pay procedure.

Hyaluronic acid injection (gel shots)

- Naturally occurring substance in the body and provides lubrication to joints.
- Has anti-inflammatory properties and can protect cartilage.
- Effective in ~70% of people with improvements lasting up to 6 months.
- Covered by most insurances including medicare, requires prior authorization.

Corticosteroid injection

- Fast pain relief but short term, lasting about 6-8 weeks. No long term benefits.
- Can cause damage to and weaken cartilage, making arthritis worse over time.
- Covered by insurance. Use sparingly due to side effects.

Stem cells (Bone Marrow, Adipose Derived, Umbilical Cord)

- Current studies suggest these treatments contain little to no live stem cells
- Should be considered growth factor injections rather than ‘stem cell’ injections
- Have not been shown to outperform PRP injections
- Not covered by insurances and are very expensive

Knee Arthritis Supplements

I recommend purchasing supplements that are either NSF or USP certified. These labels mean the product has been independently tested for safety, purity, and quality. Thorne is a highly reputable brand that carries NSF certification, making it a safe and reliable choice.

Strongest evidence for reducing pain and stiffness:

- Turmeric & Curcumin 1000mg daily
- Boswellia Serrata extract 100mg daily, increase to 250mg daily as needed

Moderate evidence for reducing symptoms:

- Collagen supplementation
- Glucosamine 1500mg & Chondroitin 800-1200mg daily (must be taken together)
- Omega-3 & fish oil

Weak evidence:

- Vitamin D 2000 IU daily

Knee Osteoarthritis Treatments

Knee Osteoarthritis Treatment	Short term pain benefits	Mid to Long term pain benefits	Impact on Arthritis Progression	Risk of MAJOR side effects	Cost of Treatment	Dr Peng's Recommendation
Weight Management	Mild	High	Decreases	None	None	Highest
Exercise Therapy	Mild	High	Decreases	None	None	Highest
Anti-Inflammatory Diet	Mild	Mild - Moderate	May decrease	None	Minimal	Highest
Platelet Rich Plasma	Mild - Moderate	High	May decrease	None	$$	Moderate
Turmeric / Boswellia	Mild	Mild	None	None	Minimal	Low - Moderate
Hyaluronic Acid	Mild - Moderate	Moderate	None	Very low	$ - $$	Low
Trigger Point Injection	Mild - Moderate	Mild	None	None	$	Use as needed
Knee Braces	Mild	None	None	None	Minimal	Use as needed
Topical NSAIDs / Capsaicin	Mild	None	None	None	Minimal	Use as needed
Topical CBD	Mild	None	None	None	Minimal	Use as needed
Tylenol	Mild	None	None	Very low	Minimal	Use as needed
Oral NSAIDs	Mild	None	None	Low - Moderate	Minimal	Use sparingly
Corticosteroid Injection	Moderate	None	Increases	Low	$	Limit use
Knee replacement	Poor	High	N/A	Moderate	$$$$	Personal decision
Genicular Treatment	Mild - Moderate	None	None	None	$$	Consider prior to arthroplasty
Dextrose Prolotherapy	Mild - Moderate	None	None	None	$$	Consider prior to arthroplasty
Red Light Therapy (PBM)	Mild	None	None	None	$ - $$	Insufficient evidence
Opioids	Mild	None	None	High	Minimal	Not recommended
Knee arthroscopy	Mild	Mild	May Increase	Low - Moderate	$$$	Not recommended
Bone Marrow Stem Cells	Insufficient evidence	Insufficient evidence	Insufficient evidence	Low	$$$$	Not recommended
Adipose Tissue Stem Cells	Insufficient evidence	Insufficient evidence	Insufficient evidence	Low	$$$$	Not recommended
Umbilical Cord Stem Cells	Insufficient evidence	Insufficient evidence	Insufficient evidence	Low	$$$$	Not recommended