

Knee Osteoarthritis

Osteoarthritis (OA) is a common condition that affects the cartilage in joints, causing pain, stiffness, and reduced mobility. Exercise is crucial in managing OA, as it strengthens muscles, supports the joint, and helps hydrate the cartilage.

Important Exercise Guidelines:

1. **Alignment:** Ensure proper joint alignment to avoid unnecessary strain and improve muscle activation.
2. **Pain vs. Harm:** It's normal to experience some soreness, but pain should stay within a 0-5/10 range, and soreness should settle within 24 hours.
3. **Progressive Loading:** Gradually increase the intensity of exercises to continue improving strength. Typically, significant changes in strength take 4-6 weeks.

Aim to start with 2-3 exercise sessions per week, gradually progressing to 4-5 sessions, and adjust intensity based on your progress.

Exercises are most effective when guided by a qualified professional, such as a physiotherapist, athletic therapist, or strength and conditioning coach. If you have any concerns, it's always a good idea to consult with an expert.

Level 1 Function

Potential inclusion criteria:





- Able to walk 0 to 15 min
- Able to sit to stand from chair without use of hands 0-10 times in 1 minute
- Slow walking speed with high reliance on gait aids
- Irritability - high

Goals

- Low impact aerobic exercise 150 min/week
- Daily stretching 2 x 20 sec/stretch
- Strength 2-3 x/week, 2-3 sets of 8-12 reps

Low impact aerobic exercise:

Ideas: walking, biking, swimming, water walking or aerobics, elliptical, tai chi

<div>1. Heel Slides</div> <div> <div>Sets: 2</div> <div>Hold: 20 seconds</div> <div>Frequency: daily</div> </div> <div> <div>Preparation:</div> <ul style="list-style-type: none"> • Lie on back with knee straight <div>Execution:</div> <ul style="list-style-type: none"> • Keeping the heel in contact with the floor, slowly slide heel up toward buttocks • Relax back to the start position. </div>	<div>  <div>Start Position</div> </div> <div>  <div>Slide heel up</div> </div>
<div>2. Quadriceps Stretch (Chair)</div> <div> <div>Sets: 2</div> <div>Hold: 20 seconds</div> <div>Frequency: daily</div> </div> <div> <div>Preparation:</div> <ul style="list-style-type: none"> • Stand tall with foot on the seat of a chair <div>Execution:</div> <ul style="list-style-type: none"> • Push your hip forwards and feel a a stretch in the front of your thigh </div>	<div>  <div>Push your hip forward and avoid arching through lower back</div> </div> <div>  <div>Maintain straight alignment, thighs are parallel</div> </div>

3. Gastrocs Stretch (Wall)

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Stand in front of a wall with one leg forward and one leg back

Execution:

- Keeping your back leg straight and heel on ground, lean forward bending your front knee



Eyes and head forward, hands relaxed on wall, belly button pulled in



Bend elbows to move closer to the wall to stretch the back leg, keep front knee behind toes

4. Hamstring Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Sit on the edge of a chair

Execution:

- Put one leg out front
- Keep your knee locked
- Lean forward from the hips
- You should feel a stretch in the back of your leg



Eyes and head forward, hands resting on thigh, toes toward the ceiling



Hinge at hips to feel stretch in the back of the thigh

5. Piriformis Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Sit with good posture
- Have one knee crossed over the other as shown

Execution:

- Bring knee towards opposite shoulder



Start Position



Keep good posture



Bring knee towards opposite shoulder

6. Hip Adductor Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Begin in the side lunge position as shown
- Your leg should be out to the side and slightly behind you, both feet flat on the floor

Execution:

- Keeping your back straight, lunge deeper to the side until you feel a stretch along the inside of your leg.



Lunge to side - You should feel a stretch on the inside of your leg

7. Partial Wall Squat | Isometric

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Stand with back against wall

Execution:

- Perform a squatting motion, sliding down the wall
- Stop at desired depth and hold



Back against wall , feet one stride length from wall



Partial squat, hold

8. Hip Extension (Countertop, Band)

Preparation:

- Stand with hands on countertop, holding a band
- Loop the band around your foot

Execution:

- Press your leg down and back against the resistance of the band



Band looped around foot, hands holding countertop



Press band down and back



Leg finishes straight and slightly behind you body



9. Clamshell

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Lie on your side with your hips at 45 degrees and your knees bent to 90 degrees.
- Your heels are in line with your buttocks.
- Tilt your hips forward towards the ground slightly.

Execution:

- Lift your knees apart (like a clam opening)



Start position



Lift knees apart

10. Knee Flexion (Band)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Attach band to ankle
- Sit on a chair with good posture

Execution:

- Curl knee against resistance



Start position



Curl knee against resistance

11. Knee Extension (Band)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Attach band to ankle
- Sit in a chair with good posture

Execution:

- Straighten knee against resistance



Sit in a chair with good posture



Straighten knee against resistance

12. Calf Raise | Hand Support (Countertop)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Standing in front of a countertop
- Place your hands on the countertop

Execution:

- Stand on your tip toes, lifting your heels as high as you can



Holding countertop for support



Lift heels



Standing on tip toes, Lower back down with control

13. Bridge

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Lie on your back with arms resting at your sides, palms up
- Bend hips and knees, placing feet on flat surface
- Pull belly button in

Execution:

- Lift your hips off the surface to make a bridge
- Do not arch your back
- Keep belly button pulled and squeeze glutes during movement
- Lower slowly



Lie on back, arms resting at your side, palms up; Bend hips and knees, place feet on flat surface



Keep belly button pulled and squeeze glutes during movement



Lower slowly back to start position

Level 2 Function

Requirements for progression




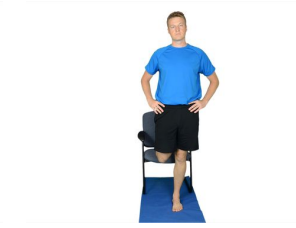
- Able to walk 15-30 min
- Able to sit to stand from chair without use of hands 10-15 times in 1 minute
- Medium gait speed with low to no use of gait aids
- Irritability – medium

Potential inclusion criteria:

- Able to walk 15-30 min
- Able to sit to stand from chair without use of hands 10-15 times in 1 minute
- Medium gait speed with low to no use of gait aids
- Irritability – medium

Goals

- Low impact aerobic exercise 150 min/week
- Daily stretching 2 x 30 sec/stretch
- Strength 3-4 x/week, 3 sets of 8-12 reps

<div>1. Heel Slides</div>		<div>Sets: 2 Hold: 20 seconds Frequency: daily</div>
<div>Preparation:</div> <ul style="list-style-type: none"> • Lie on back with knee straight <div>Execution:</div> <ul style="list-style-type: none"> • Keeping the heel in contact with the floor, slowly slide heel up toward buttocks • Relax back to the start position. 		<div>  <div>Start Position</div> </div> <div>  <div>Slide heel up</div> </div>
<div>2. Quadriceps Stretch (Chair)</div>		<div>Sets: 2 Hold: 20 seconds Frequency: daily</div>
<div>Preparation:</div> <ul style="list-style-type: none"> • Stand tall with foot on the seat of a chair <div>Execution:</div> <ul style="list-style-type: none"> • Push your hip forwards and feel a a stretch in the front of your thigh 		<div>  <div>Push your hip forward and avoid arching through lower back</div> </div> <div>  <div>Maintain straight alignment, thighs are parallel</div> </div>

3. Gastrocs Stretch (Wall)

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Stand in front of a wall with one leg forward and one leg back

Execution:

- Keeping your back leg straight and heel on ground, lean forward bending your front knee



Eyes and head forward, hands relaxed on wall, belly button pulled in



Bend elbows to move closer to the wall to stretch the back leg, keep front knee behind toes

4. Hamstring Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Sit on the edge of a chair

Execution:

- Put one leg out front
- Keep your knee locked
- Lean forward from the hips
- You should feel a stretch in the back of your leg



Eyes and head forward, hands resting on thigh, toes toward the ceiling



Hinge at hips to feel stretch in the back of the thigh

5. Piriformis Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Sit with good posture
- Have one knee crossed over the other as shown

Execution:

- Bring knee towards opposite shoulder



Start Position



Keep good posture



Bring knee towards opposite shoulder

6. Hip Adductor Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Begin in the side lunge position as shown
- Your leg should be out to the side and slightly behind you, both feet flat on the floor

Execution:

- Keeping your back straight, lunge deeper to the side until you feel a stretch along the inside of your leg.



Lunge to side - You should feel a stretch on the inside of your leg

7. Wall Squat (Band)

Sets: 2 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Stand with back against wall, band or belt around knees
- Feet away from the wall

Execution:

- Perform a squatting motion, sliding down the wall
- Rise up, straightening at the hip



Back against wall, feet one stride length forward



Squat - Squeeze knees gently against band/belt

8. Hip Extension Eccentric (Band)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Stand with good posture, feet shoulder width apart
- Hold onto a counter or object for support

Execution:

- Lift one straight leg behind you as if stepping back
- SLOWLY return to the starting position



Lift leg back



Using buttocks, slowly relax against resistance

9. Clamshell

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Lie on your side with your hips at 45 degrees and your knees bent to 90 degrees.
- Your heels are in line with your buttocks.
- Tilt your hips forward towards the ground slightly.

Execution:

- Lift your knees apart (like a clam opening)



Start position



Lift knees apart

10. Knee Flexion Concentric (Band)

Sets: 2 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Attach an ankle weight or tubing to your foot as shown.
- Stand with good posture. Use a table or countertop for support.

Execution:

- Lift your heel up towards your buttocks as far as you can, bending your knee.
- Relax your leg, returning to the start position.



Start position



Bend knee

11. Knee Extension (Band)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Attach band to ankle
- Sit in a chair with good posture

Execution:

- Straighten knee against resistance



Sit in a chair with good posture



Straighten knee against resistance

12. Calf Raise Eccentric | Bilateral (Chair)

Sets: 2 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Stand holding a chair as shown

Execution:

- Stand on your tip toes, lifting your heels as high as you can
- SLOWLY lower heels to floor
- Return to start position



Start Position



SLOWLY lower to start position





Level 3 Function

Potential inclusion criteria:

- Able to walk 30+ min
- Able to sit to stand from chair without use of hands 15+ times in 1 minute
- High gait speed with no use of gait aids
- Irritability – low

Goals

- Low impact aerobic exercise 150 min/week
- Daily stretching 2 x 30 sec/stretch
- Strength 4-5 x/week, 3 sets of 8-12 reps

1. Heel Slides	Sets: 2	Hold: 20 seconds	Frequency: daily
<div>Preparation:</div> <ul style="list-style-type: none"> • Lie on back with knee straight <div>Execution:</div> <ul style="list-style-type: none"> • Keeping the heel in contact with the floor, slowly slide heel up toward buttocks • Relax back to the start position. 			<div>Start Position</div> <div>Slide heel up</div>
2. Quadriceps Stretch (Chair)	Sets: 2	Hold: 20 seconds	Frequency: daily
<div>Preparation:</div> <ul style="list-style-type: none"> • Stand tall with foot on the seat of a chair <div>Execution:</div> <ul style="list-style-type: none"> • Push your hip forwards and feel a a stretch in the front of your thigh 			<div>Push your hip forward and avoid arching through lower back</div> <div>Maintain straight alignment, thighs are parallel</div>

3. Gastrocs Stretch (Wall)

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Stand in front of a wall with one leg forward and one leg back

Execution:

- Keeping your back leg straight and heel on ground, lean forward bending your front knee



Eyes and head forward, hands relaxed on wall, belly button pulled in



Bend elbows to move closer to the wall to stretch the back leg, keep front knee behind toes

4. Hamstring Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Sit on the edge of a chair

Execution:

- Put one leg out front
- Keep your knee locked
- Lean forward from the hips
- You should feel a stretch in the back of your leg



Eyes and head forward, hands resting on thigh, toes toward the ceiling



Hinge at hips to feel stretch in the back of the thigh

5. Piriformis Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Sit with good posture
- Have one knee crossed over the other as shown

Execution:

- Bring knee towards opposite shoulder



Start Position



Keep good posture



Bring knee towards opposite shoulder

6. Hip Adductor Stretch

Sets: 2 | Hold: 20 seconds | Frequency: daily

Preparation:

- Begin in the side lunge position as shown
- Your leg should be out to the side and slightly behind you, both feet flat on the floor

Execution:

- Keeping your back straight, lunge deeper to the side until you feel a stretch along the inside of your leg.



Lunge to side - You should feel a stretch on the inside of your leg

7. Wall Squat on Ball | 2 Down, 1 Up (Band at Knees)

Preparation:

- Stand with back on ball as shown
- Have band around knees

Execution:

- Perform a squatting motion using both legs
- At the bottom, shift weight onto one leg
- Return to the start position using one leg



Stand with back on ball



Perform a squatting motion using both legs



At the bottom, shift weight onto one leg



Return to the start position using one leg

8. Hip Extension Eccentric (Band)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Stand with good posture, feet shoulder width apart
- Hold onto a counter or object for support

Execution:

- Lift one straight leg behind you as if stepping back
- SLOWLY return to the starting position



Lift leg back



Using buttocks, slowly relax against resistance

9. Clamshell Side Plank (Band)

Sets: 2 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Band around knees
- Go into a side plank

Execution:

- Perform a clamshell with the top leg
- Do not twist through your trunk



Go into a side plank



Perform a clamshell with the top leg

10. Knee Flexion Concentric (Band)

Sets: 2 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Attach an ankle weight or tubing to your foot as shown.
- Stand with good posture. Use a table or countertop for support.

Execution:

- Lift your heel up towards your buttocks as far as you can, bending your knee.
- Relax your leg, returning to the start position.



Start position

Bend knee

11. Knee Extension (Band)

Sets: 2-3 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Attach band to ankle
- Sit in a chair with good posture

Execution:

- Straighten knee against resistance



Sit in a chair with good posture

Straighten knee against resistance

12. Bent Knee Calf Raise | Single Leg

Sets: 2 | Reps: 8-12 | Frequency: 2-3x per week

Preparation:

- Stand on one foot at the edge of a step, knees bent as shown

Execution:

- Raise up onto toes
- Return to start position



Start Position

Raise up onto toes