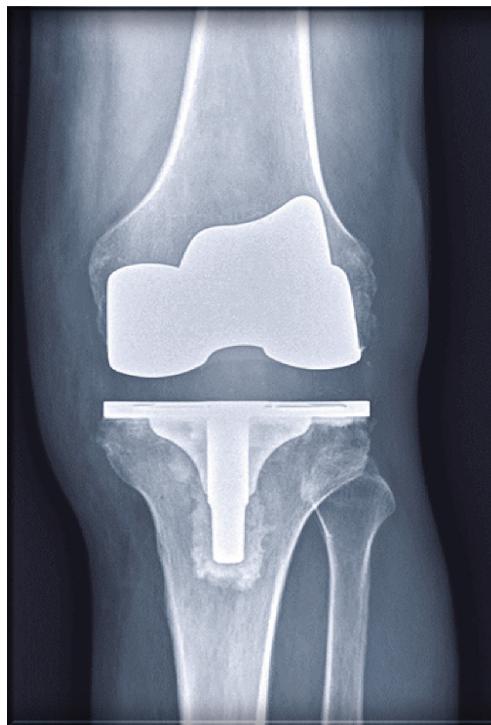


Home Therapy Exercises After Total Knee Replacement



Recovery after Surgery

To see the full benefit of knee replacement, therapy will be a necessary part of the rehabilitation process. Therapy can reduce swelling, decrease pain, improve range-of-motion, build strength, and improve balance and endurance. Most patients can return to sedentary jobs and activities such as driving within 4-6 weeks, while more demanding occupations like working as a laborer may take longer.

**It is recommended you
dedicate 30-60 minutes
each day for exercises.**

The knee rehabilitation program has three phases based on how long ago your surgery was: Weeks 1-3, Weeks 4-6, and Weeks 7 and beyond.

This program starts with a warm-up period of stretching followed by more specific exercises for the knee muscles. We recommend using over-the-counter anti-inflammatory medications such as ibuprofen, naproxen, or meloxicam along with a pain reliever such as acetaminophen before or after exercising to help with swelling and discomfort. Please follow your physician's guidance and the dosing directions on the package. We recommend a brief cool-down period after exercising.

These exercises are a general guide to rehabilitation after total joint replacement. After completing the 12-week program, you should continue a "maintenance exercise program" two to three days a week to keep your muscles strong and healthy.

Summary of Knee Exercises

	WEEKS 1-3	WEEK 4-6	WEEK 7+
Stretches:	Hamstring Stretch	Hamstring Stretch	Hamstring Stretch
	Calf Stretch Heel Cord	Calf Stretch Heel Cord	Calf Stretch Heel Cord
	Secondary Calf Stretch	Secondary Calf Stretch	Secondary Calf Stretch
	Seated Quad Stretch	Seated Quad Stretch	Seated Quad Stretch
Strengthening:	Glute Sets	Quad Arcs	Hip Abduction/Adduction
	Ankle Pumps	Prone Knee Bends	Mini-Squats
	Thigh Squeezes	Straight Leg Raise	Step-ups
	Quad Sets	Hip Abduction/Adduction	Bridges
	Quad Arcs	Heel Slides	
	Prone Knee Bends	Mini-Squats	
	Calf Raises		
Endurance:	Walking	Stationary Bicycle	Stationary Bicycle
Balance:	Eyes Open	Eyes Open / Eyes Closed	Eyes Open / Eyes Closed

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Stretching Exercises

Stretching helps to prevent injury by getting the muscles ready for a workout. Typically, patients are advised to spend **5-10 minutes** stretching before exercising. It is recommended that your exercise program begin and finish with stretches. Ice can be applied to the hip or sore muscles after exercising.

General Tips for Stretching Exercises

- Warm-up by walking 5-10 minutes to get your muscles ready for the exercise program.
- Remember to stretch in a slow and controlled manner and avoid rapid motions.
- Perform each stretch until you experience a “tolerable discomfort” in the muscle; adjust the stretch to your comfort.
- Try to hold the position for 30 seconds.
- Slowly return to the original starting position.
- Take a deep breath and relax for 5 seconds between repetitions.
- Cool-down – 5-10 minutes of icing or slow walking to finish the workout.

Note: You can expect some muscle soreness when you first start a stretching program.

Hamstring Stretch Seated

The hamstrings are a group of muscles on the backs of your thighs. It is important to stretch these muscles because they can become tight after knee replacement. **Remember to always keep your toes pointed toward the ceiling.**

1. Begin by sitting in a hardback chair, prop your leg on a stool or chair directly in front of you.

2. While keeping your back straight, slowly reach for your toes while at the same time keeping your knee straight. You will feel a stretch along the muscles in the back of your thigh.



3. Try to hold the stretch for **30 seconds**.

4. Slowly return to the starting position.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	1	30 sec

Calf Stretch Heel Cord

This exercise stretches the calf muscles. These muscles can become tight after knee replacement. This stretch is also used during warm-ups to get your muscles ready for other exercises. You will need to **lean next to a wall or door** to complete this stretch. Start by placing your toes on the bottom of the wall/door with your heel on the ground. Be sure to keep your toes pointed forward the entire time.

1. Start by placing your toes on the bottom of the wall/door with your heel on the ground. Be sure to always keep your toes pointed forward.
2. Remember to keep your knee straight and then lean forward until you feel stretch in the back of your calf.
3. Try to hold the stretch for **30 seconds**.
4. Slowly return to the starting position.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	1	30 sec

Secondary Calf Stretch

The second part of the calf stretch is shown below. This exercise stretches the calf muscles differently compared to the first stretch. You will need to **lean next to a wall or door** to complete this stretch.

1. Stagger your stance with one foot in front of the other.
2. Keep the toes of both feet pointed forward while your hands are on the wall/door. Be sure to keep your **back knee** straight with the heel on the ground the entire time.
3. Now slowly lean forward until you feel a stretch in the back of your calf.
4. Try to hold the stretch for **30 seconds**.
5. Slowly return to the starting position.



This exercise should be performed on both legs.

SETS	REPETITIONS	HOLD
3	1	30 sec

Quadriceps Stretch

The Quadriceps are a group of muscles on the front of your thigh. This stretch should be performed several times a day to help keep the muscles flexible. This stretch is also used during warm-ups to get your muscles ready for other exercises. For this exercise you will need to sit toward the front of a hardback chair.

1. Begin by bending your knee back as far as it will go until you experience a tolerable stretch. You will feel a stretch along the muscles on the front of your thigh and knee.
2. Try to hold the stretch for **30 seconds**.
3. Next take your opposite leg and use it to help further bend your knee to experience more of a stretch.
4. Slowly return to the starting position.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	3	30 sec

Strengthening Exercises

It is normal for your leg muscles to atrophy (shrink) before and after joint replacement surgery. Exercises can help muscles regain strength and improve the nerve signals to improve strength and function. As your swelling decreases, muscle strength improves.

General Tips for Strengthening Exercises

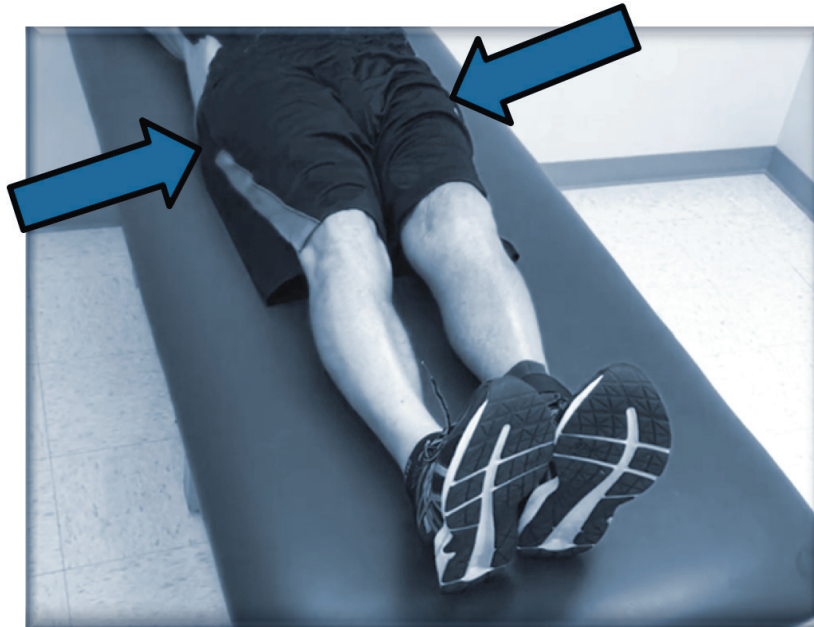
- Strengthening exercises are usually performed **after warm-up and stretching**.
- Please use the **“sets, repetitions, hold”** as a guide during exercising.
- Remember to control the muscles to slowly return to the original starting position.
- Take a deep breath and **relax for 5 seconds** between repetitions.
- It is important to take 5-10 minutes to cool-down after exercising. This should include stretches and applying ice to sore muscles.

Note: Slight muscle discomfort can be expected - these exercises should not cause pain. If you experience pain, back off and modify your technique. If pain is still present, we recommend avoiding the specific painful exercise.

Glute Sets

This exercise works the buttock muscles and helps with your circulation after surgery. To perform this exercise, we recommend lying on your back on a soft surface or mat.

1. Your legs should be straight out in front of you.
2. Next, slowly squeeze your buttocks together without raising off the surface.
3. Hold the muscle contraction for **5 seconds**.
4. Slowly relax your muscles – your legs should not move during this exercise.



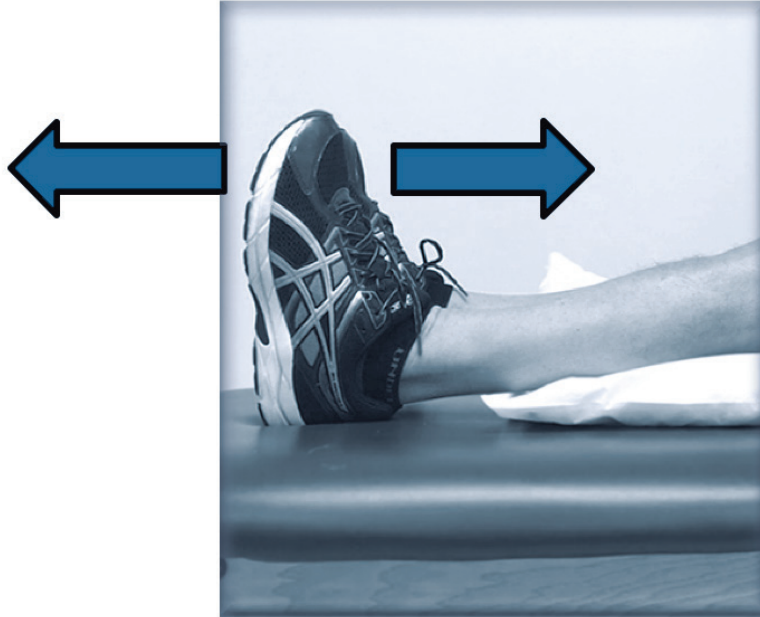
SETS	REPETITIONS	HOLD
3	10	5 sec

Ankle Pumps

This exercise works the calf muscles and helps with your circulation after surgery. To perform this exercise, we recommend lying on your back on a soft surface or mat. Place a small towel or pillow behind your knee. Remember to keep your knee straight and your toes pointed toward the ceiling.

1. Begin by pulling your toes back toward you (like taking your foot off a gas pedal).
2. Next point your toes away from you (like pushing on a gas pedal). You will feel your calf muscles tighten.
3. Hold each position for **3 seconds** before slowly relaxing and returning to the starting position.

This exercise should be performed on both legs.

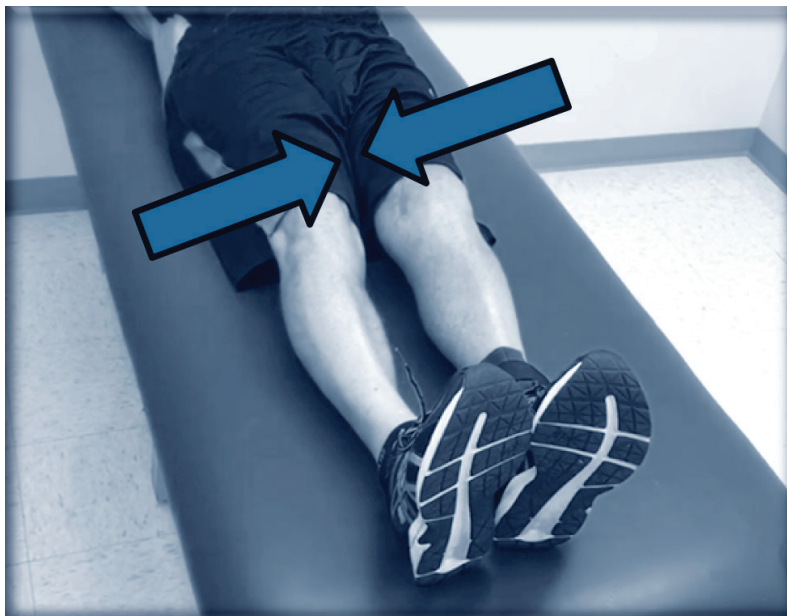


SETS	REPETITIONS	HOLD
3	10	3 sec

Thigh Squeezes

This exercise works the inner thigh muscles (adductors) and helps with your circulation after surgery. To perform this exercise, we recommend lying on your back on a soft surface or mat.

1. Begin with your legs together and straight out in front of you.
2. Next, slowly squeeze your thigh muscles together. You will feel the muscles on the inside of your thigh tighten.
3. Hold the muscle contraction for **5 seconds**.
4. Slowly relax the inner thigh muscles. Your legs should not move during this exercise.



SETS	REPETITIONS	HOLD
3	10	5 sec

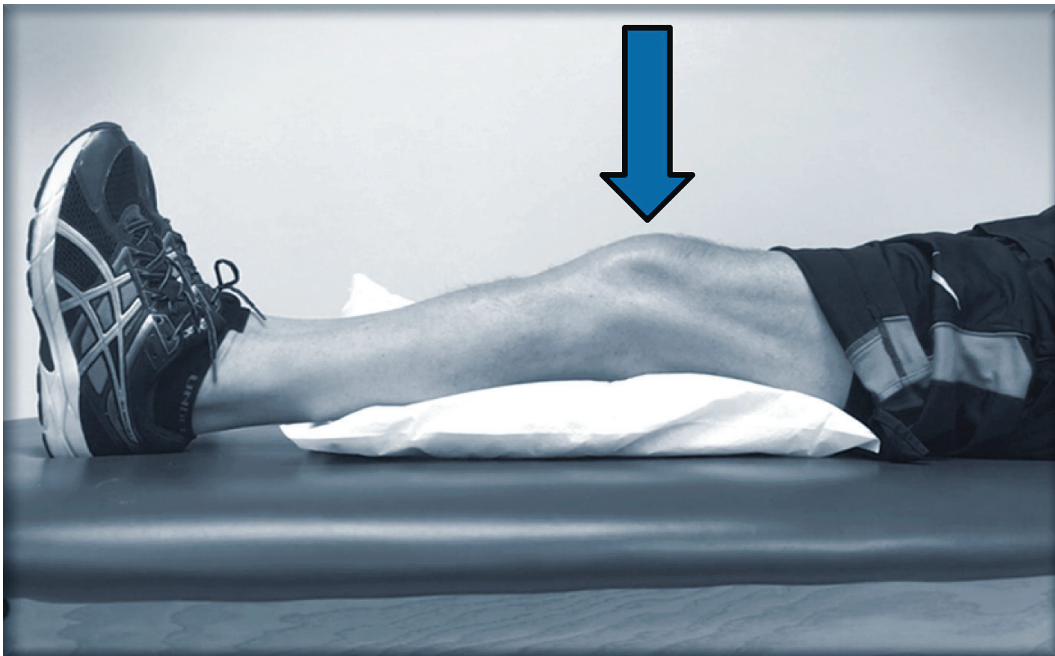
Quad Sets

The quadriceps are a group of muscles on the front of your thigh. This exercise helps to wake up the muscles for the first few weeks after surgery. To perform this exercise, we recommend lying on your back on a soft surface or mat.

Place a small towel or pillow behind your knee.

1. Keep your toes pointed toward the ceiling and slowly push the back of your knee down into the towel/pillow. You will feel your thigh muscles tighten.
2. Hold the muscle contraction for **5 seconds** before slowly relaxing and returning to the starting position.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	10	5 sec

Quad Arcs

This exercise helps to wake up the muscles for the first few weeks after surgery. To perform this exercise, we recommend lying on your back on a soft surface or mat. For this exercise, place a rolled-up towel or pillow behind your knee that allows your knee to rest in a comfortable bent position.

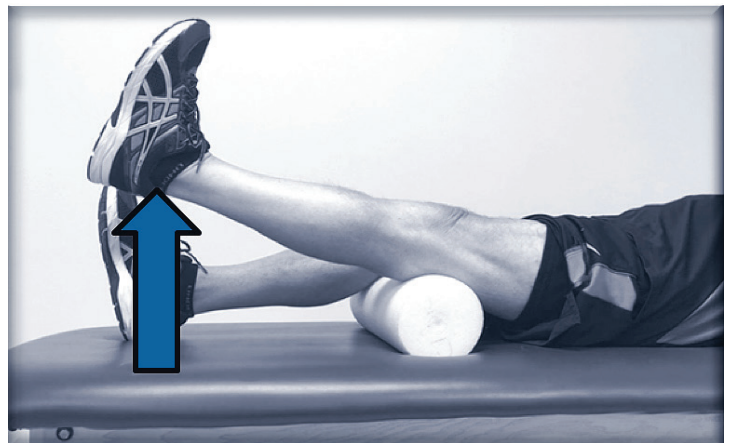
1. With your toes pointed toward the ceiling, slowly straighten your knee while keeping the back of your knee on the towel/pillow. You will feel your thigh muscles tighten.



2. Try to hold the muscle contraction for **5 seconds** with the knee straight.

3. Next slowly relax the thigh muscles and allow the leg to return to the starting position.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	10	5 sec

Prone Knee Bends

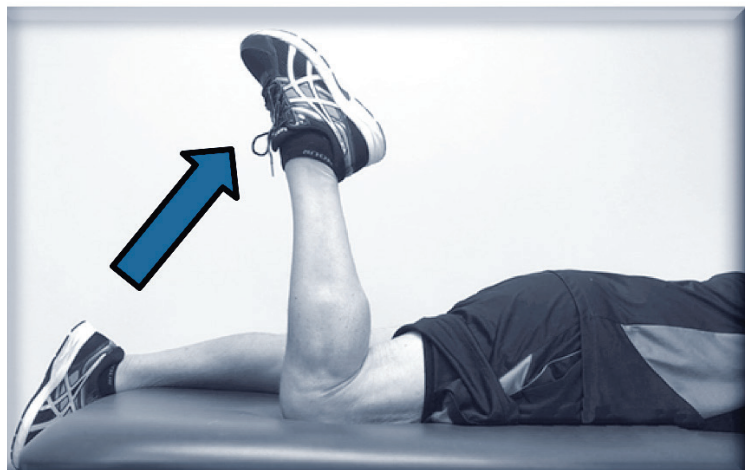
This exercise works the hamstring muscles on the back of your thigh. To perform this exercise, we recommend lying on your stomach on a comfortable surface. Keep the front part of your thigh in contact with the surface at all times.

1. Point your toes away as if you were pushing on a gas pedal.



2. Slowly bend your knee up until your lower leg points towards the ceiling.
3. Hold the bend for **5 seconds** before slowly returning your leg to the starting position.

This exercise should be performed on both legs.



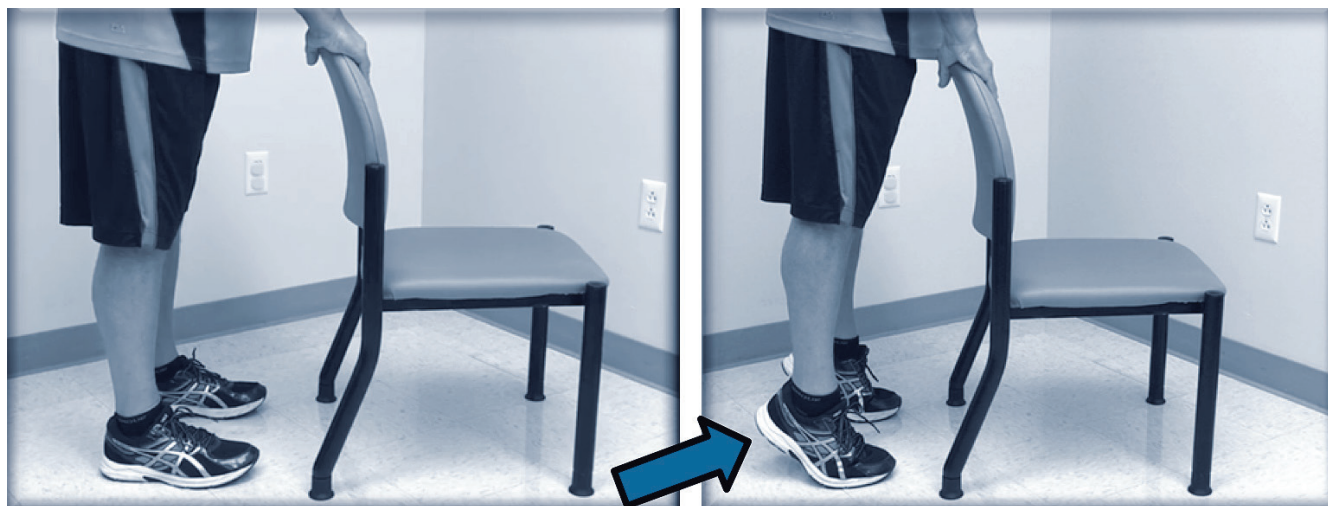
SETS	REPETITIONS	HOLD
3	10	5 sec

Calf Raises

This exercise works the calf muscles. To perform this exercise, we recommend using a chair, counter or railing for balance. Begin by spacing your feet shoulder-width apart.

1. Push up onto your toes to raise both heels off the ground.
2. Hold for **5 seconds** before slowly lowering your heels back to the ground.

As you get stronger, you can do these standing on one leg at a time.



SETS	REPETITIONS	HOLD
3	10	5 sec

Straight Leg Raises

This exercise works the quadriceps (thigh) muscles. To perform this exercise, we recommend lying on your back on a soft surface or mat. To take pressure off your back, your opposite leg should be comfortably resting in a bent position with your foot on the ground.

1. Begin by tightening your thigh muscles with your toes pointed toward the ceiling.
2. Slowly lift your entire leg off the ground while keeping your knee straight.
3. Try to bring your leg up until your thighs are at the same level.
4. Try to hold your leg up for **5 seconds** and then slowly return your leg to the starting position.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	10	5 sec

Hip Abduction/Adduction Supine

This exercise works the muscles on the inside (adductors) and outside (abductors) of your hip. The exercise can be performed in three different positions. We recommend starting with the exercises lying on your back. When that becomes easy then progress to the exercises in standing, and finally for a more challenging exercise you can perform the exercises while lying on your side. Removing your shoes before attempting this exercise can allow your leg to slide easier.

1. Remember to keep your toes pointed toward the ceiling and your knee straight.
2. Slowly move your leg out to the side until a comfortable stretch is felt in your groin.
3. Next slowly move your leg back to the starting position.

This exercise should be performed on both legs.

Lying on
Your Back
(supine)



SETS	REPETITIONS	HOLD
3	10	none

Hip Abduction/Adduction Standing

When performing this exercise, we recommend using a chair, counter or railing for balance. Remember to keep your back straight for this exercise.

1. Begin by slightly rotating your toes toward the side.
2. While keeping your knee straight, slowly move your leg out toward the side. You will feel the muscles on the side of your hip tighten.
3. Try to hold the end position for **5 seconds** before slowly returning your leg to the starting position.

This exercise should be performed on both legs.

Standing



SETS	REPETITIONS	HOLD
3	10	5 sec

Hip Abduction/Adduction Sidelying

You should only progress to this exercise after the supine and standing exercises become too easy. To perform this exercise, we recommend lying on your side on a comfortable surface. Begin by lying on your side with your lower leg resting on the ground with the knee slightly bent.

1. Start by rotating your toes so they are pointing toward the ceiling.
2. While keeping your knee straight, slowly raise your leg toward the ceiling until a comfortable stretch is felt in your groin. You will feel your outer hip muscles tighten.
3. Try to hold the end position for **5 seconds** before slowly returning your leg to the starting position.

This exercise should be performed on both legs.

Sidelying



SETS	REPETITIONS	HOLD
3	10	5 sec

Heel Slides

This exercise works the quadriceps (thigh) and hamstring muscles. To perform this exercise, we recommend lying on your back on a soft surface or mat. We also recommend performing this exercise while **wearing socks** so your foot can slide easier. Remember to always keep your knee pointing toward the ceiling.

1. Slowly bend your knee and slide your heel back toward your buttock until a comfortable stretch is felt at the front of your knee.
2. Try to hold the position for **5 seconds** before slowly pushing your knee straight until the back of your knee rests against the surface.
3. A strap can also be used to help slide your heel further to increase the stretch on the knee.

This exercise should be performed on both legs.



SETS	REPETITIONS	HOLD
3	10	5 sec

Mini-Squats

This exercise works several muscle groups including the quadriceps (thigh muscles), hamstrings, and calf muscles. It is important to protect your back, so we recommend using a smooth surface such as a wall during this exercise. Be sure to have a chair, countertop or railing close by for balance if needed.

Begin with your feet about shoulder-width apart and about 18 inches from the wall.

1. Start by slowly bending your knees and sliding your back down the wall until your knees are at a **comfortable bend**.
2. Try to hold the position for **5 seconds** before slowly straightening your knees and sliding your back up the wall.
3. Be sure to concentrate and keep your knees directly over your toes at all times during the exercise.



SETS	REPETITIONS	HOLD
3	10	5 sec

Step-ups

This exercise works several muscle groups including the quadriceps (thigh muscles), hamstrings and calf muscles. Be sure to have a chair, countertop or railing close by for balance if needed. In the beginning, you can start with a 4-inch step and then progress to a 6-inch, then 8-inch, then 10-inch and finally a 12-inch step.



Start with the leg with the hip replacement on the step (the step leg).

1. Begin by shifting your weight to the step leg as if you were to climb the stairs. The goal is to bring your opposite leg up to match the step leg. **Do not place weight on the opposite leg.**



2. Hold for **5 seconds**.

3. Now slowly lower your opposite leg back to the floor by controlling the muscles of your step leg. You will feel the hip and thigh muscles contract during this exercise.

This exercise can be attempted in different directions. Try stepping in different directions such as forward, backward, and to the side to work different muscles.



SETS	REPETITIONS	HOLD
3	10	5 sec

Bridges

This exercise works the thigh and hip muscles in addition to the abdominals and low back muscles. To perform this exercise, we recommend lying on your back on a firm comfortable surface. Both knees should be comfortably bent with your feet flat on the floor and about **shoulder-width** apart at all times during this exercise.

1. While keeping your hands at your sides, begin by slowly lifting your bottom off the ground by tightening your leg and stomach muscles.
2. Keep lifting as high as you can until your stomach is in line with your knees.
3. Hold for **5 seconds**.
4. Next slowly return to the starting position.



SETS	REPETITIONS	HOLD
3	10	5 sec

Endurance Exercises

After a knee replacement, it is also important to work on endurance exercises. Endurance is the ability to work over a period of time. Think of it as another form of strengthening during your recovery process that will allow you to perform your day-to-day activities without getting too tired.

Endurance exercises can be anywhere between a few minutes to one hour or more. Walking, bicycling, and swimming build endurance by improving nerve impulses to your muscles and as well as improving your cardiovascular health.

These types of exercises usually start about four to six weeks after your knee replacement. Continuing these exercises two to three days a week will not only keep your knee replacement working well, but these exercises are a key for maintaining a healthy lifestyle. We currently do not recommend running or high impact exercises after your knee replacement.



Stationary Bicycle – The stationary bicycle (and for some a recumbent bicycle) are important to build strength and endurance. This machine is unique in that you can alter the resistance as well as adjust the seat position during a workout. For knee replacement patients, we suggest starting with the seat further away from the pedals. To help regain range-of-motion the seat can be moved closer to the pedals. Remember to spend part of your time pedaling forward as well as backward to work different muscle groups.



Walking Outside – Begin with flat surfaces and then progress to uneven surfaces including hills. Walking on different surfaces is a great way to build endurance. Hiking is an excellent exercise because of the uneven nature of the ground and hills which can also improve your balance.

OVERALL INSTRUCTIONS FOR ENDURANCE EXERCISES

We recommend starting at a **low resistance** and a comfortable pace for **5 minutes**. Over the next few weeks as the exercise gets easier, you can add 5 minutes to the exercise to make it more challenging. We recommend being able to exercise at your current resistance level for 20 minutes before increasing the resistance.

GENERAL TIPS FOR ENDURANCE EXERCISES

- These exercises are usually started **four to six weeks** after your knee replacement.
- Endurance exercises are performed after a warm-up and stretching period.
- It is important to take 5-10 minutes to cool-down after exercising. This should include stretches and applying ice to sore muscles.

REMEMBER IF YOU EXPERIENCE ANY ABNORMAL DISCOMFORT, DIZZINESS, OR FEELINGS OF PASSING OUT, PLEASE STOP EXERCISING AND CONTACT YOUR PHYSICIAN AS SOON AS POSSIBLE.

Balance Exercises

It can take three months or more for your body to adjust to your new knee replacement. Initially your knee replacement leg will feel longer than the opposite side. This is because your muscles must learn how to “work” with your new knee joint. The feeling of a leg length difference will smooth out with time.

Balance and coordination exercises can help challenge your body during the recovery period. These types of exercises are necessary for a complete recovery. To perform these exercises, we recommend having a chair, counter-top or railing nearby.

Tandem Standing – During this exercise, place one foot in front of the other so that the heel of one foot is

touching the toes of the opposite foot. Be sure to stand straight with your head looking forward. Now try to maintain your balance for 30 seconds. Be sure to challenge your balance again by switching your feet to the opposite position.

Single-Leg Standing – Once you feel comfortable with tandem standing, you can try balancing on one leg while standing on a foam pad or pillow to further challenge your balance. Again, aim for standing on one leg for 30 seconds at a time. Be sure to practice on both feet.

When these exercises get easier, try to balance for 10 more seconds until you get up to 1-2 minutes of balancing at a time. To make it even more challenging, try the same exercise with your eyes open and then your eyes closed.

GENERAL TIPS FOR BALANCE EXERCISES

- These exercises are usually started **four to six weeks** after your knee replacement.
- Balance exercises are performed at the end of your work out session.
- We suggest being able to maintain your balance for at least **30 seconds** with your eyes open before attempting the same exercises with your eyes closed.
Eyes-closed exercises really challenge your balance – be sure to have a chair, railing or countertop close by if you lose your balance.
- It is important to take 5-10 minutes to cool-down after exercising. This should include stretches and applying ice to sore muscles.

REMEMBER IF YOU EXPERIENCE ANY ABNORMAL DISCOMFORT, DIZZINESS, OR FEELINGS OF PASSING OUT, PLEASE STOP EXERCISING AND CONTACT YOUR PHYSICIAN AS SOON AS POSSIBLE.



OPERATION WALK



AAHKS
AMERICAN ASSOCIATION OF
HIP AND KNEE SURGEONS

At-Home Exercises Following Hip or Knee Replacement Surgery

Members of the American Association of Hip and Knee Surgeons have put together this basic rehabilitation program for you to use after hip or knee replacement surgery.

These exercises can be performed in a graduated fashion in the weeks following your joint replacement as outlined in the plan. If you experience any abnormal discomfort, dizziness or feelings of passing out, please stop exercising and call your physician immediately.

Companion Videos

Demonstrations of these exercises along with a library of articles on hip and knee replacement can be found at

www.AAHKS.org/HipKnee.



This guide has been written and peer reviewed by the AAHKS Patient and Public Relations Committee and the AAHKS Evidence Based Medicine Committee. Links to this guide or content used from the exercises must be given proper citation to the American Association of Hip and Knee Surgeons. Images are copyrighted and may not be used outside of this guide without permission. Contact aahksstaff@aaahks.org.

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