

# Home Therapy Exercises Before Your Knee Replacement



## Exercising before Surgery

Low-impact exercises help to relieve stiffness and pain associated with an arthritic joint. Exercising before surgery will help strengthen your muscles in addition to getting you mentally ready for the recovery process by familiarizing you with some common exercises after surgery.

The American Association of Hip and Knee Surgeons (AAHKS) have outlined a home exercise program for you before your knee replacement. This handout accompanies our patient exercise videos that you can find at (<https://hipknee.aahks.org>). Exercises will focus on Stretching, Strengthening, and Endurance.

This program starts with a warm-up period of stretching followed by strengthening and endurance exercises.

Taking over-the-counter anti-inflammatory medications (ibuprofen, naproxen, meloxicam) or Panadol before or after exercising can help with swelling and discomfort. Please check with your primary care doctor before starting any anti-inflammatory medications especially if you have had heart, stomach, kidney issues in the past. We recommend brief warm-up and cool-down periods before and after exercising.

Exercising should not cause excessive pain or discomfort. If you feel discomfort, stop the exercise or alter the motion so that you are more comfortable. Sometimes your arthritic hip or knee limits your ability to perform certain exercises. Listen to your body and try to perform these exercises to the best of your ability. **Remember putting the work in before surgery will make your recovery easier.**



We recommend attempting these exercises at least **3-4 days a week for 30-60 minutes** each day. You can break up your exercise routine and do some exercises in the morning and others in the afternoon or perform different groups of exercises on different days.

### DISCLAIMER

**PLEASE USE THESE EXERCISES AS A GUIDE AS IT IS ULTIMATELY BETWEEN YOUR AND YOUR SURGEON TO DECIDE WHICH THERAPY SETTING IS RIGHT FOR YOU BEFORE YOUR SURGERY. YOUR SURGEON MAY RECOMMEND ALTERATIONS TO THIS ROUTINE. IF YOU EXPERIENCE ANY ABNORMAL DISCOMFORT, DIZZINESS, OR FEELINGS OF PASSING OUT, PLEASE STOP EXERCISING AND CONTACT YOUR PHYSICIAN AS SOON AS POSSIBLE.**



# STRETCHING EXERCISES

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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. A heating pad or warm towel can be used to help relax the muscles in preparation for stretching. The following stretches can also be performed in-between exercises to keep the muscles from getting tight. It is recommended that your exercise program **begin and end** with stretches. Ice can be applied to the hip or knee joint after exercising. **Muscle memory** (or training your muscles to move in a certain way so that it becomes second nature) **is an important process to get your muscles ready to work after surgery, so why not start preparing before surgery!!!**

## 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, 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 10-30 seconds (as indicated for each exercise)
- ☐ Slowly return back 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 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 back of your thigh. It is important to stretch these muscles because they can become tight especially with arthritis. This stretch is also used during warm-ups to get your muscles ready for other exercises. There are a few ways to perform a hamstring stretch. It is important to try to relax during stretching exercises. Do not hold your breath. Instead, focus on taking slow deep breaths while trying to stretch a little bit further. **Remember to keep your toes pointed toward the ceiling at all times.**



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 Seconds

# CALF STRETCH

## HEEL CORD



This exercise stretches the calf muscles. 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. There are a few ways to perform the calf stretch. It is important to try to relax during stretching exercises. Do not hold your breath. Instead focus on taking slow deep breaths while trying to stretch a little bit further. 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 at all times.



1. 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 at all times
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 Seconds

# 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. 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. It is important to try to relax during stretching exercises. Do not hold your breath. Instead focus on taking slow deep breaths while trying to stretch a little bit further.

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 at all times
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 Seconds



It is normal for your leg muscles to atrophy (shrink) before joint replacement surgery. Exercises can help muscles regain strength as well as improve the nerve signals to improve strength and function. It is important to exercise the leg muscles in different ways to improve overall function. Exercise bands or ankle weights can be added to most of these exercises to increase the degree of difficulty. **Muscle memory** (or training your muscles to move in a certain way so that it becomes second nature) **is an important process to get your muscles ready to work after surgery, so why not start preparing before surgery!!!**

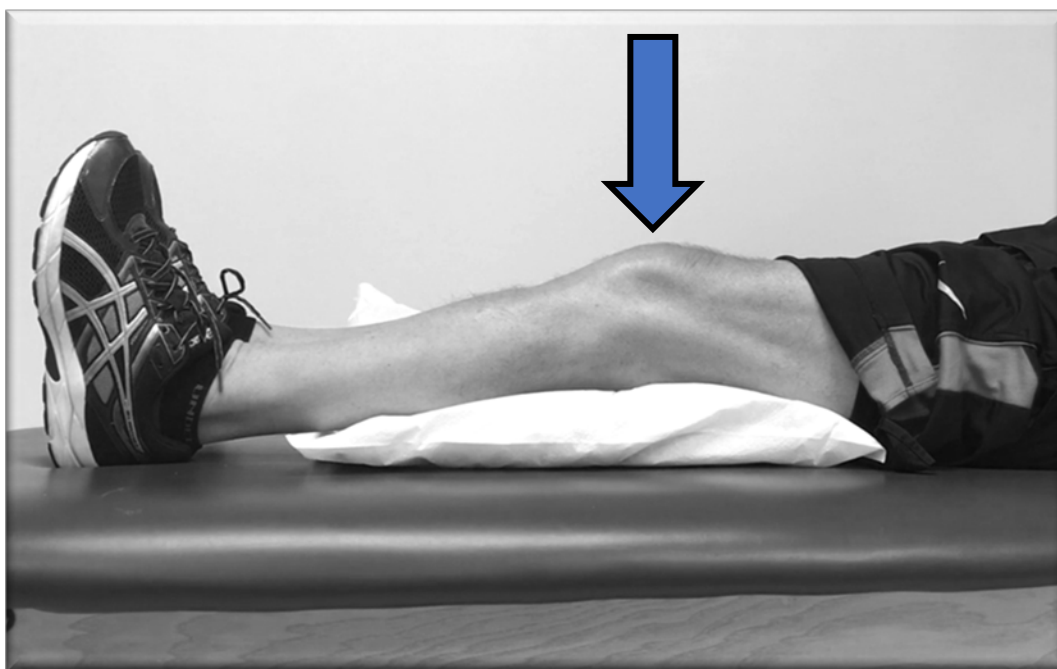
#### GENERAL TIPS FOR STRENGTHENING EXERCISES:

- ☐ 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 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 do experience pain, back off and modify your technique. If pain is still present, we recommend holding off with the particular painful exercise.



The Quadriceps are a group of muscles on the front of your thigh. This simple exercise helps to wake up the muscles in preparation for more difficult exercises. 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.

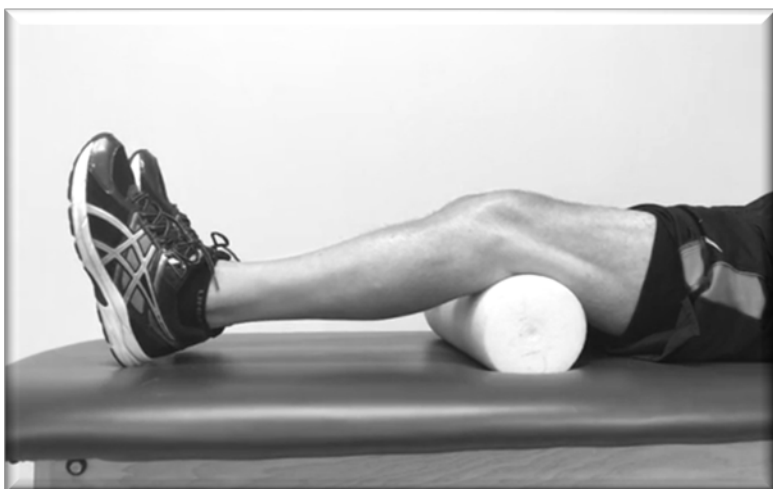
**This exercise should be performed on both legs**

SETS	REPETITIONS	HOLD
<b>3</b>	<b>10</b>	<b>5 Seconds</b>

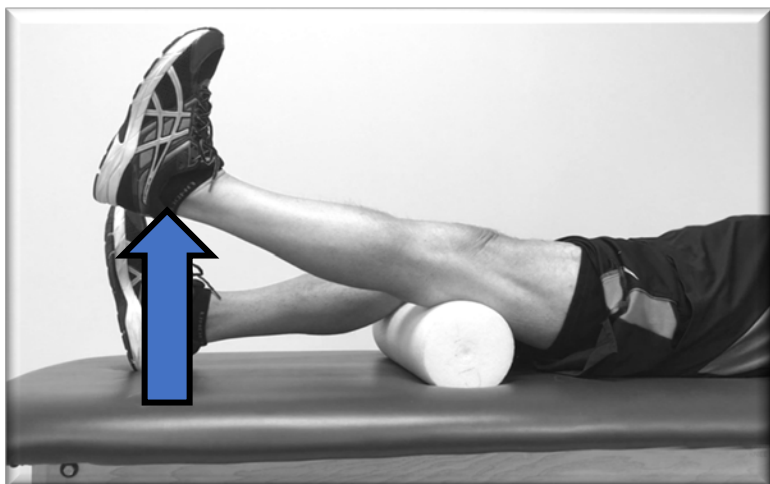




Quad arcs are a slightly more difficult exercises for your thigh muscles. To perform this exercise, we recommend lying on your back on a soft surface or mat. For this exercise, place a rolled up towel or pillow behind your knee that allows your knee to rest in a comfortable bent position.



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

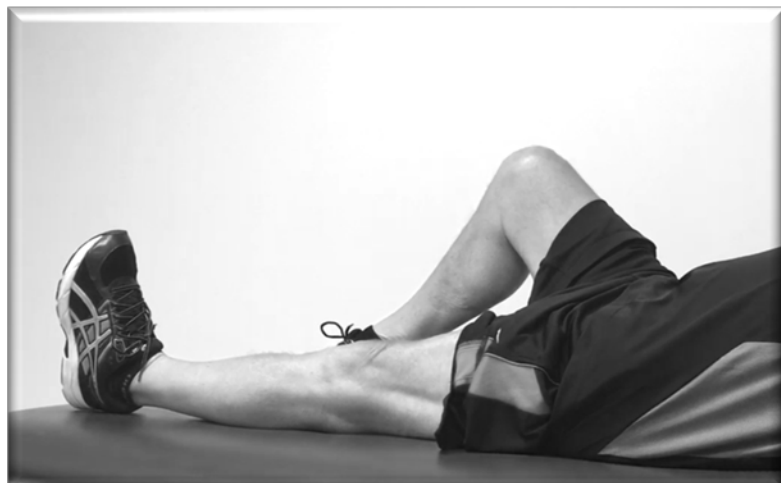
SETS	REPETITIONS	HOLD
3	10	5 Seconds



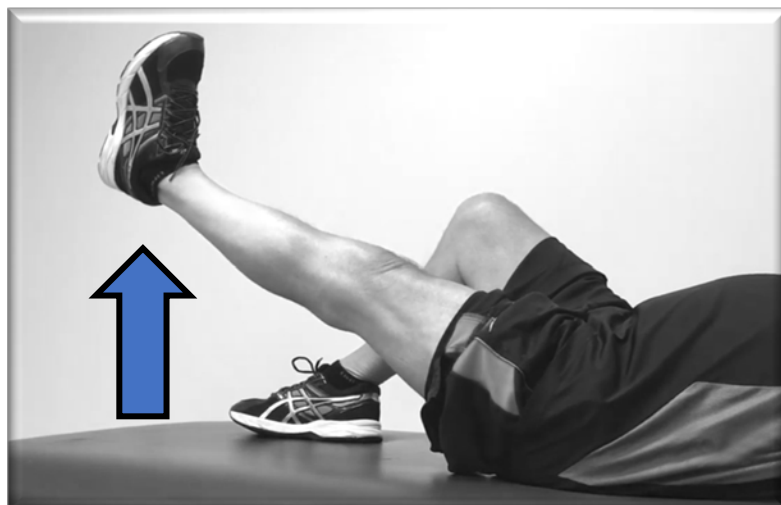
# STRAIGHT LEG RAISE



This exercise also works the quadriceps (thigh) muscles. This exercise is the hardest of all the quadriceps exercises. 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 the 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



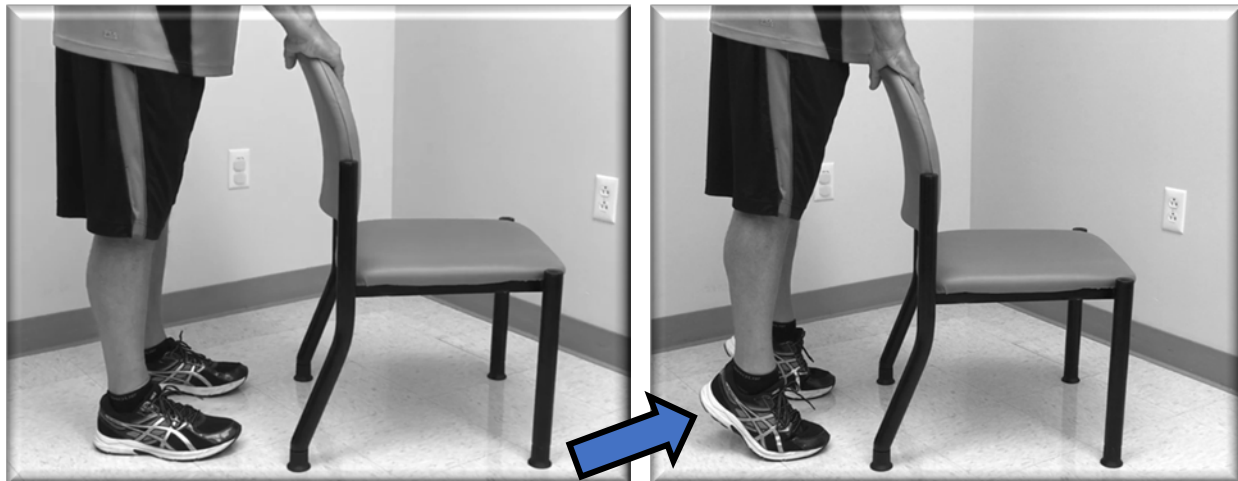
This exercise should be performed on both legs

SETS	REPETITIONS	HOLD
3	10	5 Seconds

# 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 PERFORM THIS EXERCISE STANDING ON ONE LEG AT A TIME\*\*\***

SETS	REPETITIONS	HOLD
<b>3</b>	<b>10</b>	<b>5 Seconds</b>



Before a hip or 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 before surgery. Endurance exercises can be anywhere between a few minutes to 1 hour or more. Walking, bicycling, and swimming build endurance by improving nerve impulses to your muscles and as well as improving your cardiovascular health. Sometimes your arthritic hip or knee limits your ability to perform these exercises. Listen to your body and try to perform these exercise to the best of your ability. Remember putting the work in before surgery will make your recovery easier. We recommend attempting these exercises 2-3 days a week.

**TREADMILL WALKING** – The treadmill is a good starting point before your hip or knee replacement. The idea is to walk at a comfortable pace while still keeping the “Heel-Toe” pattern. Sometimes walking in front of a mirror can help remind you to keep a smooth and even gait pattern. Patient’s usually start at a speed of 2-3 mph (it is okay to be slower as well). Once comfortable, you can increase the speed and incline in a safe responsible manner.

**ELLIPTICAL** – The elliptical machine is unique in that it simulates a normal walking pattern. You can adjust the resistance for a more difficult workout. Some machines also allow you to change the incline or decline resistance. It is important to gradually work up to a comfortable pace. Remember to complete exercises by going forward as well as going backwards on the elliptical to work different muscle groups.

**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 instance, moving the seat closer to the pedals will work more of the hip and thigh muscles. On the contrary, moving the sear further from the pedals will work more of the knee and lower leg muscles. Remember to spend part of your time pedaling **FORWARD** as well as **BACKWARD** to work different muscle groups.

**WALKING OUTSIDE**– Beginning with flat surfaces, walking can be progressed to uneven surfaces including hills and inclines/declines. Walking on different surfaces is a great way to build endurance before your joint replacement surgery.

#### GENERAL TIPS FOR ENDURANCE EXERCISES:

- ☐ Endurance exercises are performed after a warm-up and stretching period.
- ☐ It is better to exercise longer with lower resistance or incline to build your endurance before a hip or knee replacement
- ☐ It 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.**

## At-Home Exercises Before Knee Replacement Surgery

Members of the American Association of Hip and Knee Surgeons have put together this basic rehabilitation program for you to use before hip or knee replacement surgery. Please use these exercises only as a guide as it is ultimately between you and your surgeon to decide which therapy setting is right for you before your joint replacement.

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's office 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](http://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](mailto:aahksstaff@aaahks.org).*

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