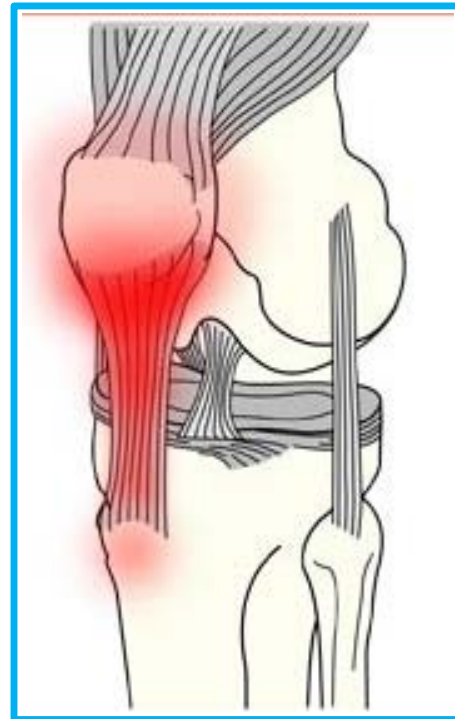




## What is Patellar Tendinopathy (Tendonitis)?

The thigh muscles (quadriceps) attach to the top of the kneecap while the patellar tendon runs from the bottom of your kneecap to the top of your shinbone. When the quadriceps muscle contract they pull on your kneecap which in turn pulls on your shinbone to straighten your leg.

Patellar tendinopathy comes from repetitive overuse activities (i.e. running, jumping, and squatting). A common cause of this problem is repetitive jumping (hence, a common name for patellar tendonitis is “Jumper’s Knee”). Tiny microscopic (not visible to the normal eye) tears within the tendon can become irritated which leads to inflammation and weakness. This is known as patellar tendonitis. Other causes can include weak or tight leg muscles leading to imbalance of the muscles around the knee. Some chronic illnesses such as obesity, kidney failure, autoimmune diseases, and diabetes can lead to disruption or loss of the blood supply to the patellar tendon leading to tendinopathy. Shoes with poor cushioning and working long hours on hard surfaces (concrete or pavement) can contribute to patellar tendonitis in the normal or replaced knee.



## Signs and Symptoms

Patellar tendinopathy is more common in athletes under the age of 30 but can also occur in adults over the age of 60. This can occur in the normal knee or one that has been replaced. The first symptom of patellar tendonitis is usually pain at the bottom of your kneecap which may be associated with swelling or a burning sensation in the same area. This can often cause anterior knee pain because the pain is located in the front (anterior) part of your knee. The pain is usually worse with movement because when the muscles contract, they pull on the inflamed tendon. Certain activities where the leg muscles must work very hard to keep balance such as descending stairs, standing from a low chair, or getting out of a car can be difficult with patellar tendinopathy. When such symptoms occur on an everyday basis for an extended period of time, it important to avoid activities that make the pain worse and consider seeking treatment to avoid more damage to the tendon.

## Treatment

The overwhelming majority of patients with patellar tendinopathy usually respond to conservative treatment. Tendon inflammation is often the reason for the pain therefore rest, ice, anti-inflammatory medications usually help. By strengthening the muscles around the knee the tendon will become stronger and the symptoms will improve.

- ❑ **REST** – Avoid repetitive aggravating activities such as squatting, running or jumping
- ❑ **ICE** – Apply ice for 15-20 minutes to the affected area every 6-8 hours.
- ❑ **ANTI-INFLAMMATORY MEDICATIONS** – Nonsteroidal anti-inflammatory drugs (NSAIDs) (Ibuprofen, Naproxen, Meloxicam) or acetaminophen will help decrease the pain and swelling. Applying topical creams/gels, such as diclofenac or capsaicin, can help with tendinopathy pain. 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.
- ❑ **EXERCISES** – Stretching and strengthening exercise are key to building the necessary strength to overcome tendinopathy.
- ❑ **BRACING** – A patellar tendon strap or knee brace can help to unload the tendon while you recover

The American Association of Hip and Knee Surgeons (**AAHKS**) has prepared a set of stretching and strengthening exercises to help with your patellar tendinopathy. Remember it may take 4-6 weeks to see improvement in the pain and discomfort. If the pain does not subside after this time period, we encourage you to contact your physician. Remember surgery is rarely needed for patellar tendinopathy because it is usually a soft tissue problem. Steroid injections are usually not indicated for this issue because they can weaken the tendon.

### GENERAL TIPS FOR EXERCISING

- ❑ Talk to your healthcare provider first
- ❑ Stretch **SLOWLY** and in a controlled manner, avoid sudden or rapid motions
- ❑ Hold the stretch to the point you feel mild discomfort and relax as tolerated
- ❑ **MODIFY STRETCHES TO ACCOMMODATE FOR A PRIOR HIP OR KNEE REPLACEMENT**

You can expect some soreness when you first start a stretching program

### 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. YOUR SURGEON MAY RECOMMEND ALTERATIONS TO THIS ROUTINE. IF YOU EXPERIENCE ANY ABNORMAL DISCOMFORT, DIZZINESS, OR FEELINGS OF PASSING OUT, STOP EXERCISING AND CONTACT YOUR PHYSICIAN AS SOON AS POSSIBLE.**



Stretching and strengthening exercises are key to managing symptoms of patellar tendinopathy. A good stretching routine should be performed **2-3 times a day** to keep the muscles around the knee joint from getting stiff. In the beginning, we recommend stretching morning and evening. As your muscles become more flexible, you can then stretch once a day to keep the muscles limber.

## GENERAL TIPS FOR STRETCHING EXERCISES:

- ❑ Warm-up: Complete the stretching exercises before strengthening exercises
- ❑ Perform slow steady motions until you feel a TOLERABLE DISCOMFORT; adjust tension to your comfort
- ❑ Hold for the position up to 30 seconds as tolerated, and at least for a minimum of 5 seconds
- ❑ Slowly return to the original starting position
- ❑ Take a deep breath and relax for 5 seconds between repetitions
- ❑ Cool-down: Apply ice to the front of the knee for 5-10 minutes after your exercise routine

# HAMSTRING STRETCH (SEATED)



Tight hamstring muscles can also contribute to patellar tendinopathy. We present three different ways to perform a hamstring stretch. Please select an option that both you and your surgeon are comfortable with. Remember that the hamstring muscles can be stretched differently depending on which position you choose. Therefore we recommend alternating the hamstring stretch from time to time. **This exercise should be performed on both legs.**



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. **Remember to keep your toes pointed towards the ceiling at all times.** (You will feel a stretch along the back of your thigh)

3. Try to hold for **30 seconds**
4. Slowly return to the starting position



### EXERCISE MODIFICATION

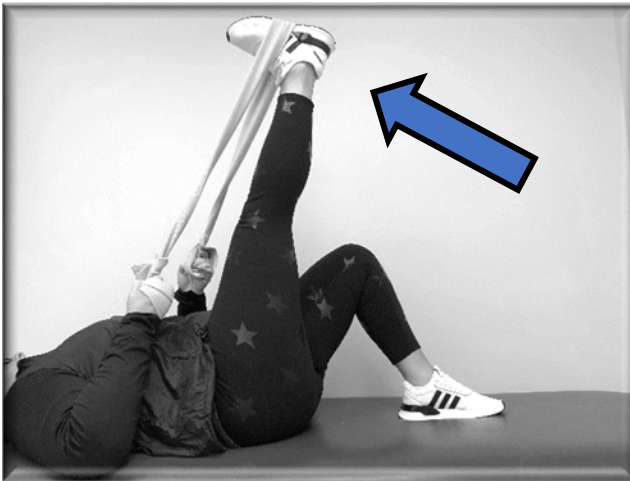
**HIP REPLACEMENT:** Please check with your surgeon before performing this particular exercise – You may need to limit your motion based on your surgeon's guidelines

REPS PER SET	HOLD STRETCH	# OF SETS
5-10	5-30 SECONDS	3

# HAMSTRING STRETCH (ADDITIONAL OPTIONS)



Here are two other methods of stretching the hamstring muscles while lying on your back or standing. You can use any position that is most comfortable for you. **This exercise should be performed on both legs.**



1. While lying on your back, place a towel or cord around the bottom of your foot
2. While keeping your knee straight, slowly pull your leg in an upward direction using the towel to pull higher (You will feel a stretch along the muscles in the back of your thigh)
3. Try to hold for **30 seconds**
4. Slowly return to the starting position

**OR**



1. While standing, place your foot on a stool or chair.
2. While keeping your knee straight, slowly bend forward to touch your toe (You will feel a stretch along the muscles in the back of your thigh)
3. Try to hold for **30 seconds**
4. Slowly return to the starting position

REPS PER SET	HOLD STRETCH	# OF SETS
5-10	5-30 SECONDS	3

### EXERCISE MODIFICATIONS

**HIP REPLACEMENT:** Please check with your surgeon before performing this particular exercise – You may need to limit your motion based on your surgeon's guidelines

**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on your knee replacement(s)

# QUADRICEPS STRETCH



This stretch is to stretch the thigh muscles and patellar tendon. You will need a chair or countertop for balance during this exercise. Remember that you can control how much stretch is on the muscle by adjusting how far you bend your knee. You should feel a stretch in your groin during this exercise. **This stretch should be performed on both legs.**

1. Begin by grabbing our knee with your hand as you balance on the opposite foot
2. Slowly pull your foot toward your buttocks until you experience a tolerable stretch along the front of your thigh. (For a more **ADVANCED** stretch, you can try to move your thigh backwards as you pull up on your foot)
3. Try to hold for **30 seconds**
4. Slowly return to the starting position



REPS PER SET	HOLD STRETCH	# OF SETS
5-10	5-30 SECONDS	3

## EXERCISE MODIFICATIONS

**HIP REPLACEMENT:** Please check with your surgeon before performing this particular exercise – You may need to limit your motion based on your surgeon’s guidelines

**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on your knee replacement(s)

# CALF STRETCH

## HEEL CORD

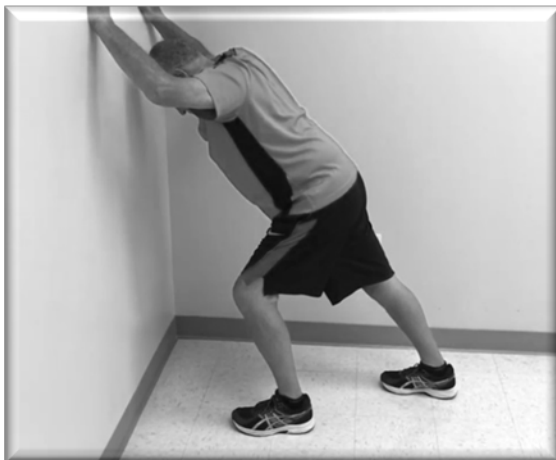


It is important to stretch the muscles on the front and back of your leg when managing patellar tendinopathy. You will need to **lean next to a wall or door** to complete this stretch. There are a few ways to perform the calf stretch. This stretch can be performed in two different ways.



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 for **30 seconds**.
4. Slowly return to the starting position

**OR**



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 for **30 seconds**
5. Slowly return to the starting position

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

REPS  
PER SET  
**5-10**

HOLD  
STRETCH  
**5-30**  
SECONDS

# OF  
SETS  
**3**

### EXERCISE MODIFICATIONS

**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on you knee replacement(s)



Remember that patellar tendinopathy is often the result of weak or overworked muscles, therefore strengthening exercises are also important to help address the pain. It is important to exercise the leg muscles in different ways to improve overall strength and function. **The key will be to SLOWLY control each exercise repetition muscle contraction in order to build strength to overcome tendonitis.** Exercise bands or ankle weights can be added to most of these exercises to increase the degree of difficulty. We begin by presenting simple exercises and then progress to more **ADVANCED EXERCISES**.

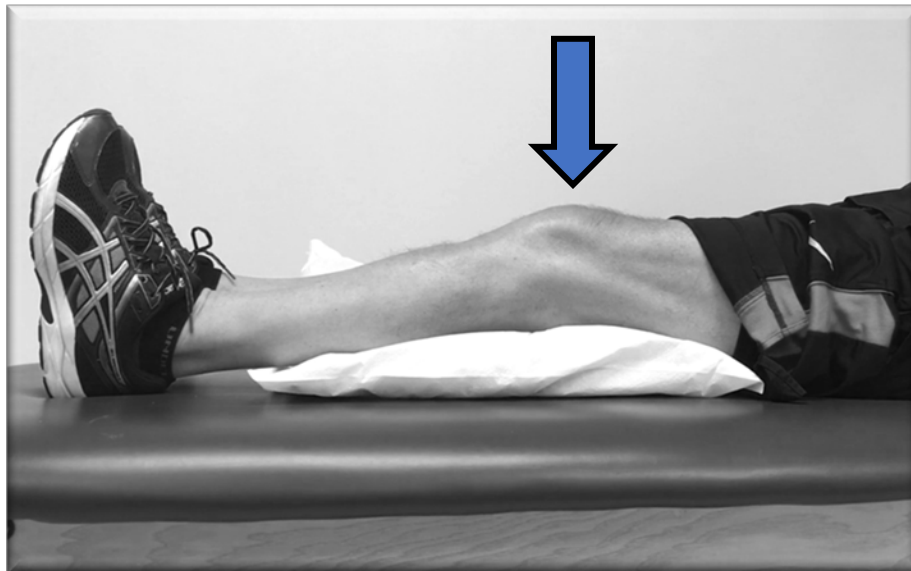
## GENERAL TIPS FOR STRENGTHENING EXERCISES

- Warm-up: Complete the prior stretching exercises first
- Perform slow steady motions until you feel a TOLERABLE STRETCH and adjust tension to your comfort
- Hold the position for up to 5 seconds before slowly returning to the starting position
- Take a deep breath and relax for 1-2 seconds
- Repeat for 3 sets of 5-10 repetitions as tolerated
- Cool-Down: Apply ice to the FRONT PART OF THE KNEE FOR 5-10 MINUTES after your exercise routine





The quadriceps are a group of muscles on the front of your thigh. This exercise helps to wake up the muscles before 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.

REPS PER SET	HOLD STRETCH	# OF SETS
10	3-5 SECONDS	3

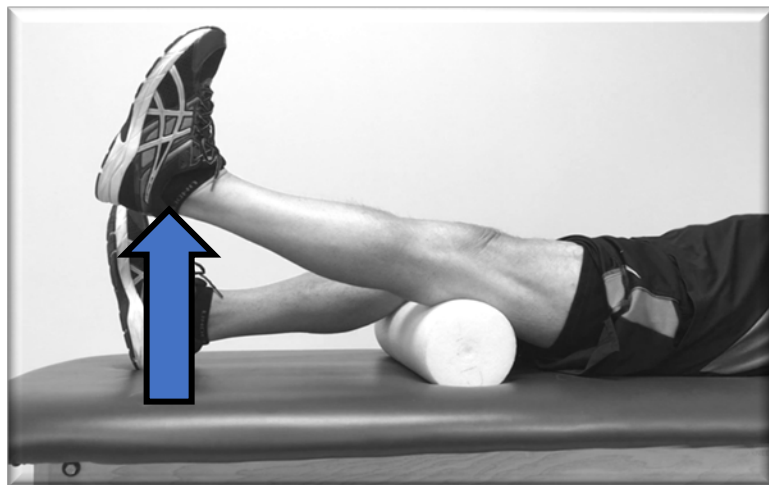
**This exercise should be performed on both legs**



Quad arcs are one of the key exercises that really focus on strengthening the quadriceps 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. As this exercise gets easier, ankle weights can be added to increase the difficulty. It is normal to develop some soreness along the patellar tendon after this exercise.



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



REPS PER SET	HOLD STRETCH	# OF SETS
10	3-5 SECONDS	3

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

# STRAIGHT LEG RAISE



This exercise works the entire quadriceps muscle from hip to knee. 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. Remember to slowly control the leg against gravity and do not let the leg drop back to the ground. **This exercise should be performed on both legs.**



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

## EXERCISE MODIFICATIONS

**HIP REPLACEMENT:** Please check with your surgeon before performing this particular exercise – You may need to limit your motion based on your surgeon's guidelines

**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on your knee replacement(s)

REPS  
PER SET  
**10**

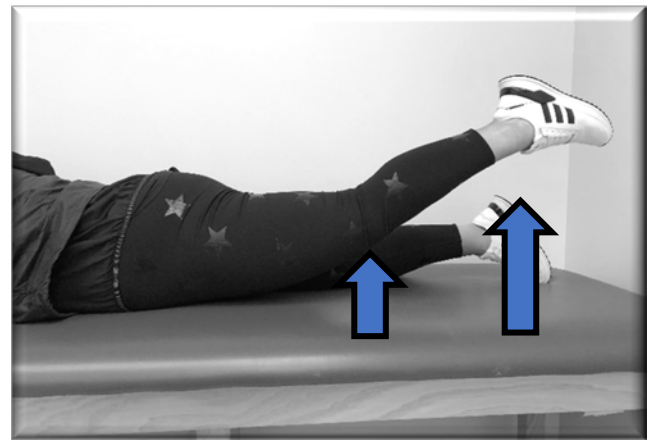
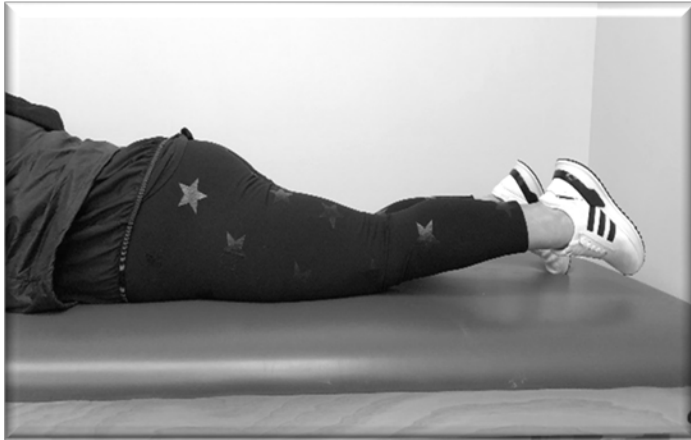
HOLD  
STRETCH  
**3-5**  
SECONDS

# OF  
SETS  
**3**

# PRONE KNEE EXTENSION



This **ADVANCED EXERCISE** works the hip, buttock, and hamstring muscles. We usually recommend this exercise **after straight leg raises become easier**. To perform this exercise, we recommend lying on your stomach on a comfortable surface. Remember ankle weights can be added to increase the degree of difficulty of this exercise. **This exercise should be performed on both legs.**



1. Point your toes away as if you were pushing on a gas pedal
2. Slowly lift your **entire leg** off the table while trying to **keep your knee straight** (Try to keep you hip in contact with the ground)
3. Hold for **5 seconds** before slowly returning your leg to the starting position

REPS PER SET	HOLD STRETCH	# OF SETS
10	3-5 SECONDS	3

## EXERCISE MODIFICATIONS

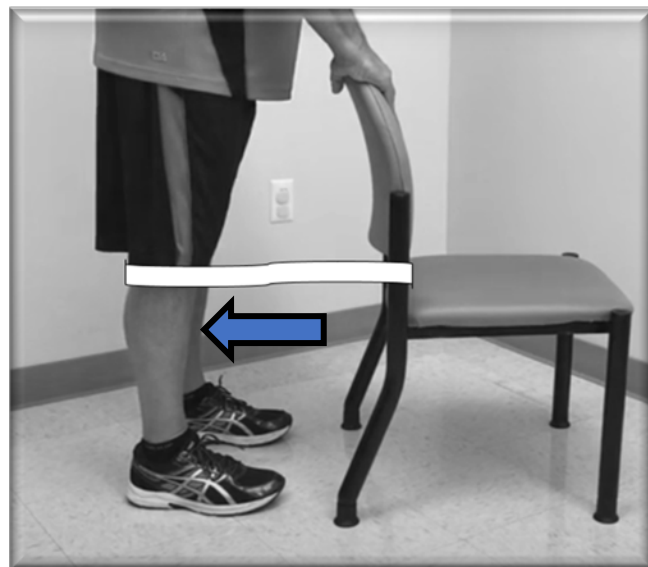
**HIP REPLACEMENT:** Please check with your surgeon before performing this particular exercise – You may need to limit your motion based on your surgeon’s guidelines

**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on your knee replacement(s)



This **ADVANCED EXERCISE** is usually performed after you become comfortable with the previous exercises. To begin, an exercise band is placed your affected knee and the other end is secured to a stabilized object such as a chair. The goal of this exercise is to slowly control you knee during the exercise without letting the band pull your knee forward too quickly. **This exercise should be performed on both legs.**

1. Start with your feet about shoulder-width apart and at a comfortable distance from the chair so that the **band is taught and your knee is slightly bent.**
2. Next slowly straighten your knee while keeping your foot fixed on the ground. The exercise band will tighten further. Be sure to not let the band pull your knee forward.
3. Try to hold your knee straight for **5 seconds** before **SLOWLY** returning to the starting position. Concentrate so as to NOT let the band pull your knee forward too quickly.



#### EXERCISE MODIFICATIONS

**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on you knee replacement(s)

REPS  
PER SET

10

HOLD  
STRETCH

3-5  
SECONDS

# OF  
SETS

3



Wall squats are a great **ADVANCED EXERCISE** to build strength and endurance in all the leg muscles. Keeping your low back and shoulders against the wall helps to maintain good alignment during this exercise. Be sure to have a chair, counter, or railing for balance when attempting this exercise. **It is important to keep your knees in line with your toes at all times during this exercise.**



**SIMPLE**



**ADVANCED**

1. Start with your feet about shoulder-width apart and approximately **18 inches** from the wall.
2. Slowly bend your knees and slide your back down the wall until your knees are at a comfortable bend
3. Be sure to keep you back and shoulders against the wall
4. Try to hold the end position for **5 seconds** before slowly returning to the starting position (slide back up the wall) - **During the last repetition, you can time yourself to see how long you can hold the “seated” position before having to return to the starting position**

REPS  
PER SET  
**10**

HOLD  
STRETCH  
**3-5**  
SECONDS

# OF  
SETS  
**3**

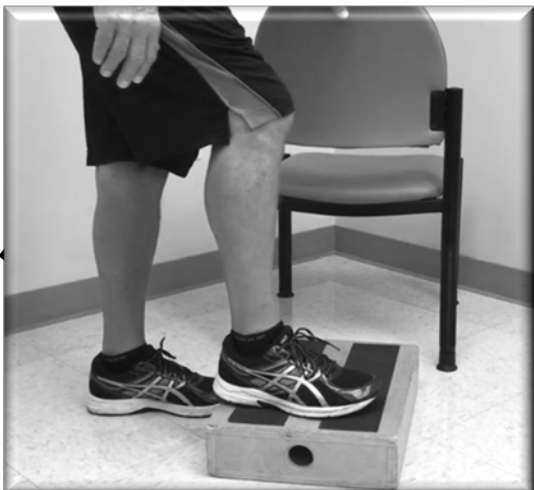
#### EXERCISE MODIFICATIONS

**HIP REPLACEMENT:** Please check with your surgeon before performing this particular exercise – You may need to limit your motion based on your surgeon’s guidelines

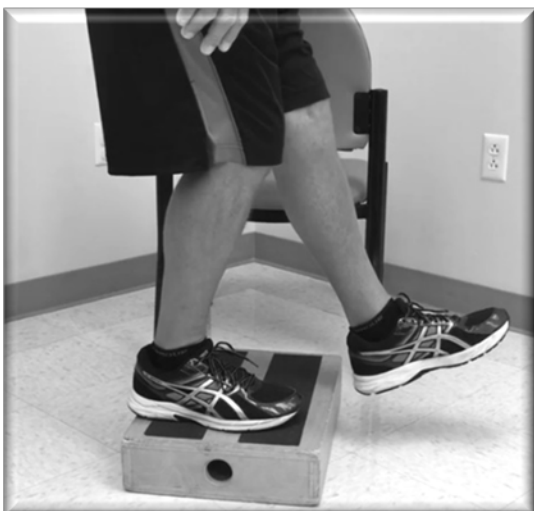
**KNEE REPLACEMENT:** You should bend the knee to a comfortable position that does not place additional stress on your knee replacement(s)



This **ADVANCED EXERCISE** requires you to be very comfortable with the previous exercises. Be sure to have a chair, countertop, or railing close by for balance if needed. It is important for you to focus on slowly stepping up and down to exercise your hip muscles properly for this exercise. 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.



1. Begin by shifting your weight to the leg on the step as if you were to climb the stairs. The goal is to bring your opposite leg up to match your other leg but **DO NOT** place weight on the opposite leg.
2. Try to 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)

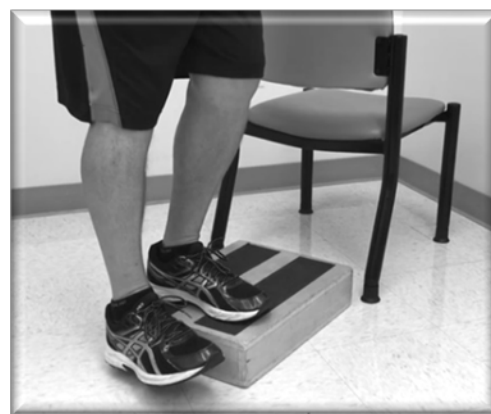


***\*This exercise can be attempted in different directions. Try stepping forward, backward, and to the side to work different muscles***

REPS  
PER SET  
**10**

HOLD  
STRETCH  
**3-5**  
SECONDS

# OF  
SETS  
**3**



**ADVANCED**

# Cool Down

Remember to take some time to cool down and drink plenty of water. Ice and elevation are good habits for any sore joints. This guide can be completed in its entirety or you can pick and choose exercises that are relative to you. Remember to modify the exercises to work around your respective joint replacement(s).

**This guide serves as a self-directed set of exercises. If there is ever any worsening pain, new onset numbness/tingling, or no improvements in your symptoms within 4-6 weeks, we encourage you to seek the guidance of your physician.**

**AAHKS**  
Patient  
Education  
Committee