

# Knee Replacement Patient Guide



# Welcome

Thank you for choosing Penn Medicine for your knee replacement surgery. We encourage you to carefully read through this guidebook and the accompanying insert and reference them throughout your knee replacement journey. If you have any questions, please contact your surgeon's office directly.

## Contents

<b>General Information</b>	
• Understanding Knee Replacement Surgery .....	2
• Risks of Knee Replacement Surgery .....	2
<b>Preparing for Knee Replacement Surgery</b>	
• Identifying a Knee Replacement Coach .....	4
• Pre-Operative Education Class .....	4
• Obtaining Medical Clearance .....	4
• Medication Management .....	5
• Alcohol, Smoking, & Narcotic Use .....	5
• Pre-Operative Rehabilitation .....	5
• Preventing Surgical Site Infections .....	6
• Preparing Your Home .....	6
• Scheduling Transportation .....	7
• Arrival Time Confirmation .....	7
<b>Your Knee Replacement Surgery</b>	
• Day Before & Morning of Surgery Preparations .....	8
• At Your Surgical Location .....	9
• Discharge .....	11
<b>Life After Knee Replacement Surgery</b>	
• Transitioning Home .....	12
• Post-Operative Care .....	14
• Knee Precautions .....	15
• Activities of Daily Living .....	15
• Post-Operative Rehabilitation .....	23
<b>Exercises</b>	
• Exercises .....	24

## General Information

### Understanding Knee Replacement Surgery

Your knee is made up of three basic parts that work together to ensure smooth motion and function. When arthritis affects the joint and the cartilage that cushions the knee wears away or is destroyed, the joint requires replacement.

Your orthopaedic surgeon will consider many factors, such as age, bone density, and the shape of your joints to determine the exact type of knee replacement you'll receive and how it will be inserted.

#### Total Knee Replacement Surgery

If the cartilage damage in your knee has occurred on both sides of the knee or in all three joint components, a total knee replacement may be performed. This involves resurfacing the knee joint and using artificial components to replace damaged tissue.

#### Partial Knee Replacement Surgery

Sometimes, the cartilage damage in your knee is limited to just one side or the other. When this happens, a partial knee replacement procedure may be appropriate. Partial knee replacement is similar to total knee replacement except only one side of the knee joint is resurfaced. This involves a quicker recovery and a smaller scar.

#### Outcomes

After knee replacement surgery, patients generally experience less pain, more mobility, and can resume most of the activities they enjoyed before the onset of arthritis. Long-term studies show that 85%-90% of artificial joints are intact and functional for 20-25 years. Your artificial joint will last longer if you maintain your ideal weight and if you avoid high-impact activities.

### Risks of Knee Replacement Surgery

Knee replacement surgery is a major surgery, and although advances in technology and medical care have made the procedure very safe and effective, risks can occur. We encourage you to discuss the potential risks with your orthopaedic surgeon, primary care provider, and your family. Every measure will be taken by our team of experts to minimize any risk and avoid complications.

#### Blood Clots

Blood clots can form in a leg vein and in your lungs after knee replacement surgery and can be dangerous. Factors that increase your risk of blood clots include advanced age, obesity, history of blood clots, smoking, and cancer. Medications and activities to prevent blood clots after surgery are required to reduce this risk.

#### Infection

Infection is very rare in healthy patients having knee replacement surgery. Patients with chronic health conditions like diabetes or a compromised immune system are at higher risk of infection after any surgery. If an infection develops, it's usually treated with antibiotics. Deeper infections inside the joint are rare, but they may require additional surgery if they occur.

#### Nerve, Blood Vessel, & Ligament Injuries

Damage to the surrounding structures in the knee, including nerves, blood vessels, and ligaments, is possible but extremely rare. Some patients experience numbness in the area of the incision, which usually resolves over time.

#### Delayed Wound Healing

Sometimes the surgical incision heals slowly, particularly if you take corticosteroids, have a disease that affects the immune system (such as rheumatoid arthritis or diabetes), or if you are a smoker.

#### Limited Range of Motion

The day of surgery, you will begin exercises to help improve your range of motion. Even after your rehabilitation, you may continue to feel some stiffness after physical activity, particularly with excessive bending. Most patients find this stiffness minor compared to the limited function they experienced prior to surgery.

#### Hematoma

Bleeding into the knee can occur either immediately after surgery or at a later time. Symptoms include acute pain and swelling. Your surgeon will evaluate and determine a course of action/treatment if this occurs.

#### Loosening of the Joint

Over time, loosening of the artificial knee components is possible due to erosion of the bone surrounding the prosthesis.

### To reduce the risk of many complications:

- Reduce or eliminate the use of tobacco and alcohol.
- Manage your diabetes, if applicable.
- Maintain a healthy diet.
- Use good hand-washing techniques.
- Perform exercises as directed by your care team.
- Limit high impact activities as directed by your surgeon.

# Preparing for Knee Replacement Surgery

## Identifying a Knee Replacement Coach

Your “coach” is a person that you designate to support you as you prepare for and recover from your knee replacement surgery. Please identify a family member or close friend who will be there to encourage and assist you throughout your experience. Your coach may attend doctors’ appointments, assist you after surgery, and provide any additional support needed to help you reach your goals. They should be prepared to assist with discharge and provide transportation home after surgery, and depending on your progress, you may need their assistance at home following surgery.

If you do not have a coach, we encourage you to talk to your care team before having your surgery to discuss discharge plans.

## Pre-Operative Education Class

We understand that surgery may feel overwhelming for you and your loved ones. To ease your concerns and help you feel confident, we’ve designed a special pre-operative education class to prepare you for your joint replacement surgery. The class will help you better understand your diagnosis, the knee replacement process, and what to expect throughout your journey. See your guidebook insert for more information about your class.

## Obtaining Medical Clearance

Managing your physical and mental health before and after surgery is extremely important and helps reduce the risk of complications. Your surgeon will want to be sure chronic conditions such as diabetes, high blood pressure, heart failure, depression, anxiety, kidney failure, and anemia are well managed prior to surgery.

## Pre-Admission Testing

Pre-admission testing is required prior to your scheduled surgery in order to ensure you have medical clearance for the procedure. Your surgeon will confirm which tests are required for you depending on your health, when your testing needs to be completed, how your pre-operative appointment can be scheduled, and where it may be completed.

During the visit, you will meet with a healthcare provider to review your medical and surgical history, complete a physical, have blood drawn, and complete any other tests ordered by your surgeon, such as an x-ray, electrocardiogram (ECG), and/or a stress test.

We suggest you wear comfortable, easy-to-remove clothing. You may eat breakfast and take all your normal medications on the day of your pre-admission testing. Please be prepared to provide the following information during your appointment:

- Insurance cards and any necessary referrals
- Name and contact information for your primary care doctor and any specialists you see
- Dietary restrictions or allergies
- Allergies to medications
- Prior surgeries
- Any medical conditions
- Current medications, including dosages and frequencies
- Daily vitamins, herbal supplements, and patches
- Advance Directives (living wills or healthcare proxy)

If you are unable to make your appointment, please contact your surgeon’s office immediately to reschedule. Failure to complete pre-admission testing could result in cancellation of your surgery.

## Addressing Healthcare Needs

Your surgeon may recommend you meet with additional healthcare providers before, during, or after your pre-admission testing session. This may include an in-person visit or pre-operative phone call with an anesthesia physician for surgical planning and/or someone from your transition planning team so you can start to discuss your plan for returning home after surgery.

The results from your pre-admission testing visit will be sent to your primary care physician to review. At your healthcare team’s discretion, you may need to schedule an appointment with your primary care physician and any specialists as needed, such as your dentist and/or cardiologist (if you have one).

## Medication Management

Your care team will advise you about which medications to take or stop prior to surgery.

## Alcohol, Smoking, & Narcotic Use

Alcohol can affect blood clotting and cause dehydration, which may lead to problems during and after your procedure. If you drink alcohol, it is important to tell your care team so they understand your risk for complications, including alcohol withdrawal, pneumonia, infections, blood clots, and gastrointestinal bleeding. Your surgeon will advise you when to stop drinking before surgery to minimize these risks.

Smoking, vaping, and chewing tobacco increase the chance of complications during and after surgery as well. These include infections, slow wound healing, blood clots, and breathing problems. If you use tobacco, we strongly encourage you to quit as soon as possible. Your care team can connect you with a Penn Medicine program that offers support for quitting.

If you take narcotic medications for pain, tell your care team how much and how often you use them. This helps us plan the safest and most effective pain control for you after surgery.

## Pre-Operative Rehabilitation

Prehabilitation or “pre-hab” is an exercise program performed before surgery. Your motivation and commitment to performing pre-operative exercises regularly and properly is perhaps the most important factor in ensuring a speedy recovery and determining the long-term success of your new knee. Please visit page 24 of this guidebook for exercises that should be performed before surgery.

## Preventing Surgical Site Infections

At the time of surgery, it's important that you are free from infections. There are several steps that you can take to help prevent surgical site infections.

### Dental Care

You may continue routine cleanings as scheduled, but all other dental work must be completed at least six weeks prior to your surgery. Please call your surgeon's office if any dental problems arise prior to your scheduled surgery date.

### Shaving

It is very important that you do not shave your legs or use hair removal products anywhere near the surgical area for 48 hours prior to surgery. Studies show an increased risk of surgical site infection associated with shaving due to the microscopic cuts in the skin that allow bacteria to enter.

### Yard Work

Avoid yard work for 10 days prior to surgery. Also plan to have someone else help with outdoor work such as gardening or cutting the grass for at least two weeks after surgery.

### Illness

If you become ill with a fever, cold, sore throat, flu, or any other illness, please contact your surgeon's office.

### Skin Rash

Please report any broken skin, rashes, or sunburn to your surgeon.

### Pre-Surgery Skin Preparation

Before surgery, your skin needs to be thoroughly cleansed with a special product. During your pre-admission testing visit, you may be given the product and detailed instructions regarding how to cleanse your skin prior to surgery.

## Preparing Your Home

We recommend that your coach, spouse, family member, or friend stay with you for at least 72 hours after your surgery until you are able to perform activities of daily living independently and safely.

You and your caregivers may want to consider these tips to help make your home safe and comfortable when you return from your surgery:

- Purchase a non-slip bathmat for inside your tub/shower.
- Check every room for tripping hazards. Remove throw rugs and secure electrical cords out of your way.
- Determine what items from dressers, cabinets, and shelves you'll need immediately after returning home. Any items you use often should be moved to counter height to avoid excessive bending or reaching.
- Make sure stairs have handrails that are securely fastened to the wall. If you must use stairs to enter or once within your home, please discuss this with the physical therapist during your visit.
- If you have pets, you may want to consider boarding them for a few days after your return home or gate off an area of your home to avoid tripping over them or other accidents.
- We recommend that you use a chair that has a firm back and armrests during your recovery. A chair with a higher seat will help you stand more easily. Chairs with wheels should not be used under any circumstances. Ensure that the chair where you will be spending most of your time during recovery allows you to keep your legs elevated.
- To increase nighttime visibility, install night lights in bathrooms, bedrooms, and hallways.

## Equipment

You may need some assistive medical equipment to aid in your recovery. A member of your care team may discuss your home setup with you prior to surgery, either in person or over the phone, in order to confirm what equipment you need based on the setup of your bathroom, bedroom, stairs, etc.

Your care team will provide recommendations for any speciality equipment you may need to purchase, as well as order any items that may be billed to your insurance and provided to you before discharge or delivered to your home. Some of the equipment you may need during your recovery is as follows:

### Assistive Devices and Personal Aids

- Walker, crutches, and/or cane
- Reacher/grabber/dressing stick
- Long-handled sponge
- Leg-lifter/raiser
- Sock aid
- Elastic laces for shoes
- Long-handled shoehorn

### Bathroom Equipment

- Portable commode
- Toilet seat riser
- Shower bench and/or bathtub chair
- Transfer bench
- Grab bar for shower or tub

## Scheduling Transportation

Arrange transportation to and from your surgery in advance. You are not allowed to drive yourself home. If using a bus, train, cab, para-transit, or car service (e.g., Uber or Lyft), a responsible adult must accompany you. This person should also be present to hear the discharge instructions to ensure a safe and smooth transition home.

## Arrival Time Confirmation

Depending on your surgical location, you will either receive a call from your care team or be asked to call them directly prior to the day of your surgery to confirm your expected arrival time. Please see your guidebook insert for more detailed instructions. The arrival time that you receive will be 1.5 to 2 hours before your scheduled surgery.

# Your Knee Replacement Surgery

## Day Before & Morning of Surgery Preparations

### Eating

Eat light meals the day before surgery. The anesthesia and other medications at the time of surgery may slow down your bowel function causing constipation.

Do not eat anything after midnight the night before your surgery. Do not chew gum or eat hard candy, mints, cough drops, etc.

Patients who are taking GLP-1 antagonist medications should speak to their surgeon regarding eating and drinking prior to surgery.

### Drinking

You may drink clear liquids up to two hours before your scheduled arrival. To decrease nausea and vomiting after surgery, we encourage you to drink up to 8oz (1 cup) of clear liquid per hour from the time you wake up until 2 hours prior to your scheduled arrival time. Approved clear liquids you may drink, unless otherwise instructed by your surgeon (speak to them about this if you are diabetic), include:

- Plain tap or bottled water (no sparkling water)
- Electrolyte/sports drinks such as Gatorade® or Powerade® (no red flavors)
- Clear fruit juice such as 100% apple juice or white grape juice (no juices with pulp)
- Plain tea or black coffee (no dairy or creamer)

*Do not drink any other liquids, such as drinks with protein or other additives, or your surgery may be cancelled.*

You may brush your teeth and spit out any rinse water the morning of your surgery.

### Medications

Stop all medications as your care team has instructed. If you are currently on any medication that has been allowed to be continued, please take it with a sip of water.

### Smoking

Do not smoke the day of surgery.

### Hygiene

To reduce the risk of potential complications and infections, please follow your surgeon's instructions on how to clean your skin the night before surgery. You may be given Chlorhexidine Gluconate (CHG) wipes or cloths, which are antiseptic to help reduce the risk of getting a staphylococcus aureus surgical site infection. If you receive this product from your care team, it's very important that you use it as instructed. If you were not given any special bathing instructions, or you are allergic to Chlorhexidine, be sure to bathe or shower with Dial® antibacterial soap the night before your surgery.

Please sleep on clean bed linens the night before your surgery. Wear clean, comfortable clothes the morning of your surgery.

Please avoid:

- Showering or bathing the morning of surgery
- Using lotion, deodorant, powders, aftershave, or perfume
- Shaving or clipping the surgical area prior to surgery
- Wearing makeup
- Wearing jewelry

### Packing

Please bring the following items with you to surgery:

- Photo ID
- Insurance card
- Current list of medications
- Comfortable sneakers/tennis shoes or shoes with flat, non-skid, rubber bottoms that can easily be put on. Do not bring tight-fitting or backless footwear.
- Clean, comfortable, and loose-fitting casual clothing like elastic-waist pants/shorts or jogging outfits, t-shirts, undergarments, and socks
- Pajamas, a gown, and/or a knee-length robe that opens all the way down the front
- Personal toiletries
- A copy of your advance directive, a living will, or durable power of attorney for healthcare. If you don't already have a copy of an advance directive, forms will be available at the hospital.
- A credit card if you need to purchase medications and/or equipment at a hospital pharmacy prior to discharge, as payment will be required at the time of purchase.
- If your care team requires you to use a walker upon discharge and it has been properly sized for you, be sure to bring it and leave it in the car. If you are not sure if your walker is at the proper height for you or if you need your walker sized for your height, bring it into the hospital with your name on it for your therapist to size.

If you use any of the following at home, please bring them as well:

- Custom-fitted prosthesis or braces
- Eyeglasses and/or contact lens and cases with solution
- Dentures and denture storage
- Hearing aids with batteries
- Inhalers
- Respiratory machine, mask, and hose

Please leave the following items at home:

- Valuables of any kind, including jewelry
- Medications

### Transportation

Please have your coach drive you to your surgical location. See your guidebook insert for any driving/parking instructions and surgical site maps.

## At Your Surgical Location

### Arrival

Please arrive at your surgical location at the time you were given. Refer to your guidebook insert for specific instructions on where to check in upon arrival.

### Preparation

Our highly skilled nursing staff will take you to a pre-operative area where you can change and safely store your belongings.

A nurse will complete several safety checks, including verifying your name and date of birth, reviewing your medical history, allergies, and medications, and taking your vital signs. They will perform other preparations as needed and ask you to sign a surgical consent form.

An anesthesiologist will meet with you before surgery. At that time, they will examine you, discuss your medical history, and determine the best plan for your anesthesia care. It's important that you tell your anesthesiologist about any prior problems or difficulties you have had with anesthesia.

Your surgeon will greet you and make any final preparations as needed. You will then be taken to the operating room once it's time for your surgery.

### Surgery Operating Room

Inside the operating room (OR), you will be greeted by your surgical care team. You will again be asked you to identify yourself and your birth date, which is required to ensure your safety. The operating room is kept cold, but your care team will ensure that you are kept warm. Your vital signs will be monitored.

You will then be given any anesthesia, nerve blocks, pain medication, and/or fluids as needed. During your surgery, you will be given medications to help decrease post-operative pain and decrease bleeding.

The total time required for surgery differs from patient to patient, depending on the type of replacement and complexity of the procedure. Some procedures can last less than 1 hour, while others may be more than 3 hours. Start to finish (getting you ready for surgery, surgery time, and recovery) is usually about 3 to 4.5 hours.

### Family Waiting

When you are taken to the operating room, your coach and any other visitors will be asked to go to a waiting area and provide a cell phone number so that they can be contacted with updates on your progress after surgery. Each waiting area is equipped with comfortable seating and WiFi.

Once your knee replacement is complete, a member of the surgical team will contact your coach so they can discuss your procedure with the surgeon.

### Recovery

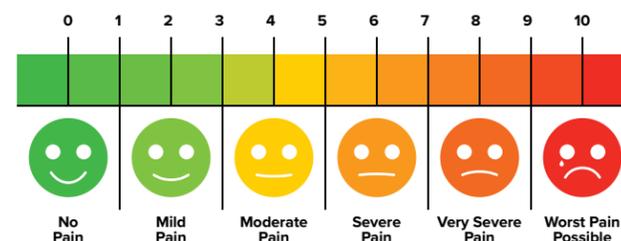
After surgery, you will be taken to the Post Anesthesia Care Unit (PACU), or recovery room, where your vital signs and pain level will be closely monitored. An x-ray of the new joint may be obtained.

Everyone responds differently to surgery and anesthesia. You may spend approximately 1 to 3 hours in the PACU while you recover from the effects of anesthesia. Depending on your status, bed availability, and your discharge plan, you may work with a therapist or nurse to get up and walk in the recovery room and/or you may be moved to a hospital room or discharged.

If you are moved to a hospital room, your care team will assess you and continue to monitor you frequently. Your surgeon will check in and be able to answer any questions you have. The goal during your hospital stay is to maximize your comfort and expedite your ability to move and regain your independence.

### Pain Management

We encourage you to tell us about any pain you experience, specifying where it is, how often you feel it, and what it feels like (sharp, dull, aching, or spreading out). Your care team will often ask you to rate your pain on a scale from 0-10, with 0 meaning no pain and 10 meaning the worst possible pain:



It is normal to feel a certain amount of pain after surgery. Pain can be caused by multiple factors and varies from person to person. Your care team will continue your advanced pain protocol to get your pain level low enough that you are able to rest comfortably and actively participate in your therapy sessions. There are a number of ways we can help control your pain, including:

- **Positioning:** This may involve elevating the leg that was operated on.
- **Cold Therapy:** Ice and other forms of cold therapy may be used to help control pain.
- **Movement:** It is particularly important to start your post-operative exercises (ankle pumps, quad sets, and gluteal sets) as soon as possible.
- **Medication:** Medication and liquids will be given intravenously or by mouth after surgery.
- **Nerve Block:** This method of controlling pain uses an anti-inflammatory injection to “turn off” a pain signal coming from a specific area of the body.
- **Deep Breathing:** You may be given an incentive spirometer device to help keep your lungs clear and prevent pneumonia. You should slowly inhale through your nose and slowly exhale through your mouth, ideally 10 times each hour (at least 3 to 4 times per day).

This enhanced recovery after surgery program helps ensure you recover safely and lowers your risk of complications after surgery. Our goal is to reduce pain and nausea, keep you hydrated, improve movement, and ultimately make your discharge and recovery faster and easier while minimizing any risk of opioid dependence.

### Food & Drink

Following surgery, you may resume a normal diet as tolerated. You may be asked to chew gum to help improve recovery of bowel function, if needed.

### Movement

It is our goal to get you moving with your new joint as soon as possible, many times within hours of your surgery. Once your vital signs are stable and you have regained movement and sensation in your lower extremities, your care team will work with you to get you moving.

A physical therapist may perform an evaluation and build a therapy plan with exercises designed to help increase strength and flexibility in your knee. An occupational therapist may also work with you on activities of daily living and teach you how to use assistive devices, as needed, to help with daily tasks when you go home.

### Discharge

Some patients stay overnight and are discharged one or two days after surgery. If your pain is well controlled, you're doing very well medically and with rehabilitation, and you have strong support at home, you may be eligible to go home the same day as your knee replacement surgery.

Our goal is for you to regain independence and get home. You and your coach will receive specific discharge instructions and should have a firm understanding of them.

# Life After Knee Replacement Surgery

## Transitioning Home

Your recovery will progress significantly in the first few months and then may progress more gradually over time. If you have specific concerns or fail to progress, you should talk to your surgeon.

## Pain

It is normal to experience some pain after knee replacement surgery. Following your care team's regimen of rest, cold therapy, elevation, and taking your pain medications as prescribed should gradually decrease your pain, but if it does not relieve your pain to a satisfactory level, please contact your surgeon's office.

You should resume the medications you were taking prior to surgery as prescribed. You should also continue taking any additional medications as instructed, which may include:

- Acetaminophen (such as Tylenol)
- Anti-inflammatory medicine (such as Celecoxib, Meloxicam, or Ibuprofen)
- Blood thinner (such as Aspirin, Eliquis, Xarelto, Coumadin, Lovenox, or Arixta)
- Short-acting narcotic (such as Oxycodone or Tramadol)

If pain is limiting your exercise tolerance, then we recommend taking pain medication 30 to 45 minutes before a physical therapy session in order to prevent severe pain. Pain medication should only be taken as needed to lessen pain, and you should gradually lessen your dependence on it. Most patients are able to wean themselves off of narcotic pain medication within a week or two and only take Acetaminophen and anti-inflammatories if indicated.

Pain medication may cause nausea, constipation, or light-headedness. Remember to take it with food and plenty of water.

Avoid drinking alcohol or driving while taking prescribed pain medication. You should continue to take a stool softener until you are no longer taking pain medication.

## Constipation

Some people experience constipation because of anesthesia, decreased mobility, and/or taking pain medication. You should not let more than 3 days pass without a bowel movement. Consider drinking more water, drinking warm prune juice or warm ginger ale with a teabag daily, adding dietary fiber to your diet (such as bran cereal with chopped prunes and apple juice, and other fruits, vegetables, beans, and nuts), or taking an over-the-counter stool softener or a laxative to prevent constipation. If you have not had a bowel movement 24 hours after taking a laxative, please call your surgeon's office. Exercise and walking also help prevent constipation.

## Swelling

Swelling, bruising, and redness around your incision are normal parts of the body's healing process. Swelling can occur in your entire leg (including your foot) and bruising can travel from your groin to your toes. Swelling varies by person but usually peaks around 7-14 days after surgery and may last from a few weeks to a year. Swelling and bruising can be decreased with:

- **Rest:** Continue to perform ankle pumps at least 10 times an hour, but balance your exercise regimen with rest periods throughout the day, elevating your legs when at rest.
- **Cold Therapy:** Continue to use cold therapy as instructed by your care team to help reduce pain and swelling for the first few weeks following surgery. Never place the cold packs directly on your skin.

- **Compression:** If your care team recommends using compression devices at home, continue to wear them as directed to reduce swelling and improve circulation. They may be removed while you sleep at night.
- **Elevation:** Continue to elevate (prop up) your leg for 45 minutes to 1 hour, 2 to 3 times a day to alleviate swelling.

## Infection

Your body temperature may be higher than normal for several days after surgery. Because you are at risk of developing an infection, it's important to monitor for the following signs and symptoms:

- Increased drainage from the incision (covering half or more of the dressing)
- Swelling, redness, or warmth around the incision
- Fever above 101°F, chills, or sweating
- Pain that doesn't improve with rest or pain medications
- Wound edges that begin to separate

If you notice any of these symptoms, call your surgeon's office immediately.

Tips to Prevent Infection:

- If you are prescribed antibiotics, continue to take as prescribed to reduce the risk of infection in your new joint.
- Wash your hands thoroughly with soap and water for at least 20 seconds before touching your incision or dressing.
- Keep the incision covered with the surgical dressing, and do not remove it unless instructed by your surgeon.

- Reinforce the edges of your dressing with surgical tape if they become loose.
- Avoid touching, picking at, or applying any lotions, creams, or ointments to your incision.
- Ensure your bed linens and clothes are clean.
- Keep pets off your bed and away from your incision.
- Most patients can shower after discharge, but check with your surgeon before doing so.
- Keep your incision dry and do not soak it in water (e.g., bathtubs, swimming pools, or hot tubs) until cleared by your surgeon (typically until 6 weeks after surgery). If your dressing becomes heavily soaked (covering half or more of the dressing), contact your surgeon's office immediately.

## Blood Clots

After knee surgery, you are at risk of developing a blood clot, also known as a deep vein thrombosis (DVT). Blood clots can form in either the arms or legs, but most commonly occur in the lower leg. It's important to monitor for the following signs and symptoms of blood clots and contact your surgeon's office immediately if you notice any of them:

- Pain in your thigh, calf, or ankle
- Tenderness, redness, and warmth in the arm or leg
- Increased swelling

When you have a blood clot, it blocks the flow of blood and there is a risk that when the clot breaks off it travels through the bloodstream to your lungs causing a pulmonary embolism (PE).

If you experience a sudden onset of **shortness of breath, chest pain, and/or lightheadedness,**

**CALL 911 IMMEDIATELY.**

### Tips to Prevent Blood Clots:

- Follow your surgeon's recommendations for anti-coagulation (AC) medication, also known as blood thinners. These medications are typically prescribed for about 1 month, but the exact duration may vary based on your medical history and your surgeon's preferences. Blood-thinning medications can come in the form of a pill or injection.
- Avoid sitting for more than 45 to 60 minutes at a time. Take frequent, short walks and increase the distance each day as you feel comfortable.
- Stick to your exercise program, completing it at least twice daily.
- Perform ankle pump exercises every 1-2 hours while awake to promote blood flow.
- Elevate your leg to reduce swelling and pain.

## Post-Operative Care

### When to Call Your Surgeon

A moderate amount of bruising, swelling, and redness can be expected after knee replacement surgery. If you experience any of the following, you should contact your surgeon:

- A fall
- Inability to walk
- Pain, tenderness, or swelling isolated to your calf and/or ankle on either side
- Increased redness around your incision
- Bruising that gets bigger
- Thick yellow drainage from the incision site or any other wound and/or a bad odor
- Your knee dressing is 50% soaked with drainage
- A persistent temperature over 101° F (38.3° C)
- Persistent nausea and/or vomiting
- Bleeding from the surgical site
- Bleeding from your mouth or coughing up blood
- Blood in your urine or bowel movements
- You have a nosebleed or cut that won't stop after applying pressure
- Inability to do your exercises for any reason
- Toes that are very cold and do not get warm when you cover them

- Any unexpected problems, concerns, or questions

If the following symptoms are not relieved or worsen after cold therapy, rest, and elevation, please call your surgeon's office:

- Swelling
- Numbness, tingling, or burning
- Pain not controlled by medication or pain that is getting worse

Notify your surgeon's office if you have any other questions after your surgery.

### Follow-up Appointments

After surgery, you will need to periodically be evaluated to make sure that your new joint is functioning correctly, your wound is healing properly, and your surgical staples or sutures are removed if needed. Post-operative appointments and wound care are based on your care team's protocol, but may include a surgical follow-up appointment a few weeks after surgery, along with physical and/or occupational therapy and a primary care visit as needed. You will likely visit your surgeon's office several times during the first year, and then have your knee replacement monitored annually for life.

### Future Medical & Dental Care

Follow up with your surgeon regarding post-operative dental care.

Before any future medical or dental procedures, it is important to inform your provider that you have a knee implant. Antibiotics may be required before the procedure as it is possible that an infection elsewhere could spread to your knee.

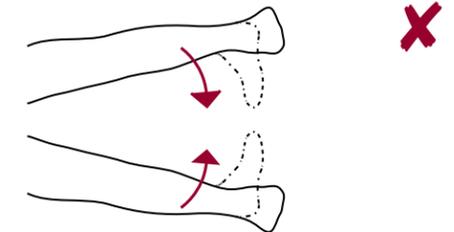
If you need an MRI in the future, make sure it is known that you have an artificial knee. The metals used in current knee implants are usually compatible with MRI machines as they are non-ferrous (non-iron based materials).

## Knee Precautions

After knee replacement surgery, there are certain rules or "precautions" you must follow for as long as your care team has instructed to protect your new knee, prevent potential complications, and allow for proper healing. Ask your care team if you have any questions, as not all people have the same precautions.

### No Rotating or Twisting Your Operative Leg (Turning In or Out)

Your toes should always be pointing forward. Do not allow your toes to point inward ("pigeon-toe") or outward when in bed, sitting, standing, or walking. Your toes, knees, and shoulders should always face the same direction.



### No Kneeling or Squatting

Do not kneel or squat until cleared by your care team. Generally, you can begin kneeling six to twelve weeks after surgery, based on comfort level. Some patients may not be comfortable kneeling for several months.

### Elevate Properly

Do not place a pillow under just the operative knee, but rather, place pillows or a wedge under the entire leg when elevating so your toes are higher than your nose.



## Activities of Daily Living

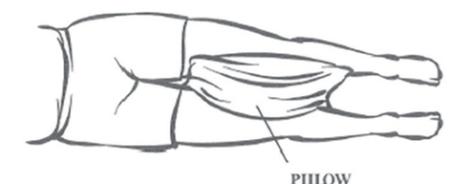
Activities of daily living are tasks that you perform throughout the day. Your therapist may teach you additional ways to get these tasks done safely that may involve assistive equipment.

We recommend you form a daily self-care routine and try to do as much yourself as possible, asking your coach to help you with tasks that you feel you can't do safely by yourself.

### Rest

It's common to have difficulty sleeping after surgery and for your energy levels to decrease. Be sure to take rest breaks as needed during the day to support the healing process. Your energy levels will gradually improve.

Sleeping on your back is preferred; however, you may sleep on your non-operated side with a pillow between your legs to keep your legs from crossing. If you use a machine for sleep apnea, it's especially important that you use it at home following surgery, both overnight and during naps.



## Transfers

A transfer is any time you change positions from one seated surface to another or from a seated surface to standing. Here are some tips for successful transfers:

- Always choose a sturdy chair with a firm seat and armrests. Avoid seats that are too low and do not sit in chairs with wheels. Be sure to sit in seats that are at least as high as the back of your knees, adding a firm cushion if it is not high enough. For periods of rest, use a seat that allows for elevation of the legs, such as a recliner or ottoman.
- You may want to keep your operative leg slightly out in front of the other leg so it does not bend too much when you are sitting or standing.
- If you have trouble getting up and down, lean forward slightly to shift your weight onto your feet.
- When you stand, use both hands to push up from a firm surface. Do not reach for your walker or crutches until you have your balance. Never pull up on your walker for help to stand because it can cause the walker to tip and result in you losing your balance and falling.
- Always wait a few seconds after standing before starting to walk to be sure you are not feeling dizzy so that you are steady on your feet.

## Getting In and Out of Bed

To get in bed, sit down on the edge of the bed (closer to the head of the bed than the foot of the bed). Extend your arms behind you for support and scoot back so that your knees are touching the side of the bed and your operative leg is extended out further in front of you. Start turning your body toward the middle of the bed, lifting one leg up onto the bed and then the other without crossing them. Use a leg lifter to lift your operative leg onto the bed. Then gently lower your trunk and shoulders down on the pillows.

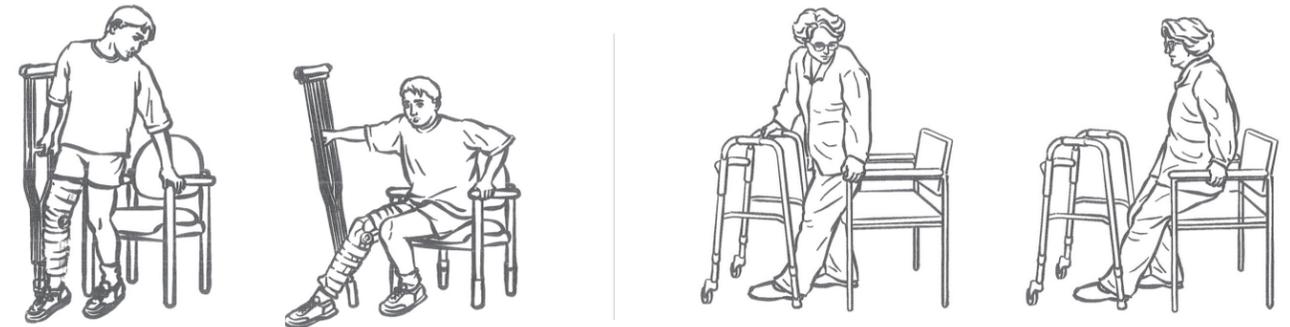


You will want to get out of bed on your operated side. Sit up onto your elbows and then up onto your hands with your legs straight out in front of you. Using your arms, scoot to the edge of your bed. Move around, keeping your body and legs straight. Do not roll. Sit on the edge of the bed using your arms for support. Using a leg lifter, lower your legs to the floor one at a time and slide your operated leg out in front of you. Use both hands to push off the bed, balancing yourself before reaching for your walker.

Do not cross your non-operated leg under your operated leg when getting in or out of bed as this breaks a knee precaution.

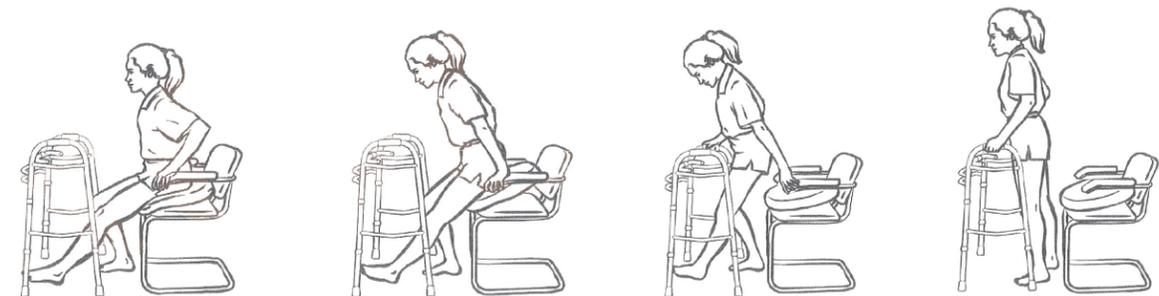
## Sitting Down

- Back up, leading with the unaffected leg, until you feel the seat on both legs.
- Scoot the affected leg out in front of you.
- Reach back for armrests or grab bar near the seat or surface you'll be sitting on, one hand at a time. Do not start to sit with your hands on your assistive device.
- Slowly lower yourself down to the edge of the seat, keeping your affected leg in front of you in order to take pressure off and not increase pain.
- Scoot back into the seat.



## Standing Up

- Scoot to the edge of the seat.
- Keep your affected leg out in front and your unaffected leg underneath you.
- Use both hands to push up from the armrests of the chair or surface on which you are sitting.
- Stand.
- Reach for your assistive device.



## Using the Toilet

To use the toilet, back up with your non-operative leg until you feel the back of your legs against the toilet, keeping your operative leg out in front. If using an elevated commode or raised toilet seat with arms, use the armrests to lower yourself onto toilet seat and scoot back while bending your knee and hip on the non-operated side. When you are ready to stand up, scoot forward and use the armrests to help you stand. Do not reach for your assistive device until you have your balance.

## Bathing

Do not take a shower, bath, or swim until cleared by your care team. Once given permission, do not soak your incision in water. If your surgeon used a waterproof bandage, you can shower with it in place. If you do not have a waterproof bandage, you should place a waterproof plastic wrap over the bandage.

When washing your back, do not twist your upper body around. Instead, use a long-handled sponge to assist you with washing your back, legs, and feet. If possible, have someone available to help you the first few times you bathe after surgery.

## Getting Into a Shower or Bathtub

Your care team will determine what shower set up will work best in your home and show you how to enter your particular shower. A stall shower is preferred when available. Your therapist may recommend a shower seat for safety and/or to allow you to sit down periodically if you get tired standing. Follow these steps for a successful transfer:

- Stand next to the shower/tub facing the showerhead.
- Step sideways into the shower/tub using the leg closest to the tub first.
- Do not turn around while in the shower/tub.
- If needed, sit on a shower/tub seat until you feel steady enough to stand when showering.
- Reverse the steps when getting out of the shower/tub.



## Dressing

Your therapist may recommend a reacher, sock aid, and/or shoehorn to assist you with getting dressed and undressed safely. These items are all included in a “Deluxe Knee Kit” that’s available for purchase at a surgical supply store, local pharmacy, or online.

## Putting on Socks

- Sit on a chair or on your bedside.
- Pull the sock onto the sock aid as demonstrated by your therapist.
- Hold the sock in front of the foot on your affected side. Slip your foot into the sock. Pull the sock aid out of the sock.
- Put the other sock on with the sock aid or bring your foot toward your knee and slip it on with your hands.



## Putting on Pants

- Sit in a chair or your bedside.
- Using a reacher, catch the waistband of underwear or pants with the grabber.
- Slip the pants onto the affected leg first. Then slip your other leg into the leg hole.
- Use the reacher to pull pants over your feet and above your knee.
- Pull them to where you can reach with your hands.
- Hold the pants with one hand. Push up from the chair or bed and steady yourself with your walker.
- Then, once you are steady on your feet, pull the pants the rest of the way up.



## Putting on Shoes

- Wear slip-on shoes with a back or use elastic shoelaces.
- Sit in a chair. Put your foot into the shoe.
- Use a reacher or long-handled metal shoehorn to pull on the shoe.



## Physical Activity

Exercise is important for your recovery and overall health. Start by slowly increasing your walking and daily activity, putting as much weight on your leg as tolerated, unless told otherwise.

Low-impact activities like biking, gardening, and golfing are encouraged once cleared by your care team. Avoid sports or exercise equipment until your surgeon approves. High-impact activities such as running, jumping, heavy lifting, and contact sports are not recommended because they can damage your joint.

You may resume swimming when your incision is fully healed and your surgeon gives approval.

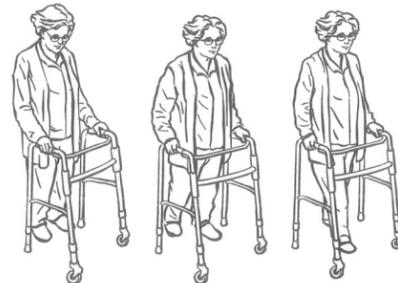
## Walking

Initially, you will be walking with the help of an assistive device. This will first be a walker or crutches, which will give you the most support. If you have a weight-bearing restriction, your assistive device will help you maintain it. A progression to a cane may be made with the assistance of your therapist.

### Using a Walker

Many knee replacement patients use a walker for 1 to 4 weeks. Please follow this sequence for stability when using a standing or rolling walker:

- Push the walker a few inches in front of you.
- Lean onto the assistive device so it supports your weight.
- Step forward with the operative leg so that the foot lands between your hands and in the middle of the walker frame.
- Step with the non-operative leg so that it lands even with or in front of the operative leg.
- Repeat, finishing each movement before you begin the next one.



Patients who are weight-bearing as tolerated and using a rolling walker may quickly progress to a normal gait pattern with one foot in front of the other while maintaining a smooth glide.

### Using Crutches

Some patients may be eligible to use crutches rather than a walker. Always remember:

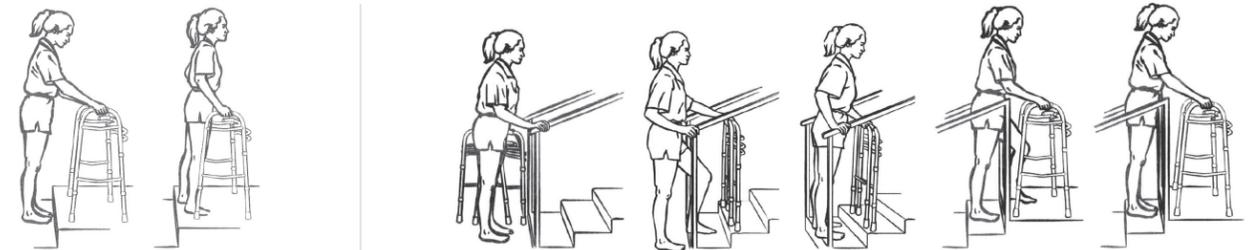
- Crutches should be placed 3 inches below your armpit when standing at full height.
- The bottom of the crutch should be 2 inches to the side and 6 inches in front of your foot.
- The handle should not allow your elbow to flex past 30°.
- The top of the crutch should not be used as the primary support. Body weight should be supported by the handle.

## Going Up and Down Stairs

Your therapist will recommend the safest way to approach your stairs after discussing your home setup. Be sure to maintain control during stair-climbing and go slow. Always wear proper footwear (rubber-soled shoes rather than socks or “slip on” shoes) and make sure your stairs are well lit and free of clutter.

### Going Up (“Up with the Good”)

- Walk to the edge of the step.
- Your next movement will depend on the set up of the stairs and the assistive device you’re using:
  - ▶ **Walker:** If you are using a walker and the steps are large enough to accommodate it, place it up on the next level, making sure all four legs are firmly on the surface. An alternative approach is to back up to the steps, putting weight on the assistive device and stepping up with the non-operative leg first, then the operative leg. Once balanced, lift all four legs of the walker up the steps. If the surface isn’t large enough to accommodate a walker but there is a railing available, fold your walker completely, holding the center of it in one hand and placing it up on the next level while grasping onto the railing with the other.



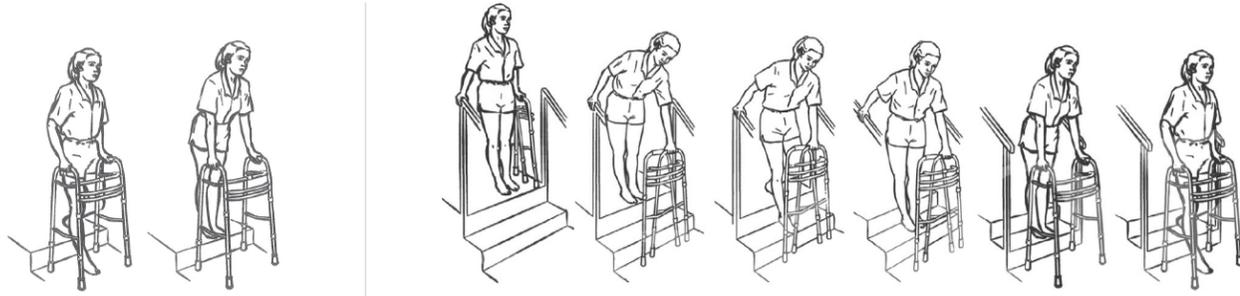
- ▶ **Cane or Crutch(es):** If you are using a cane or crutch and a railing is available, grasp the railing with the one hand and the assistive device with the other (if you have two crutches, put both under one arm or give one to your coach to hold). If you are using crutches and no railing is available, put one crutch under each arm.



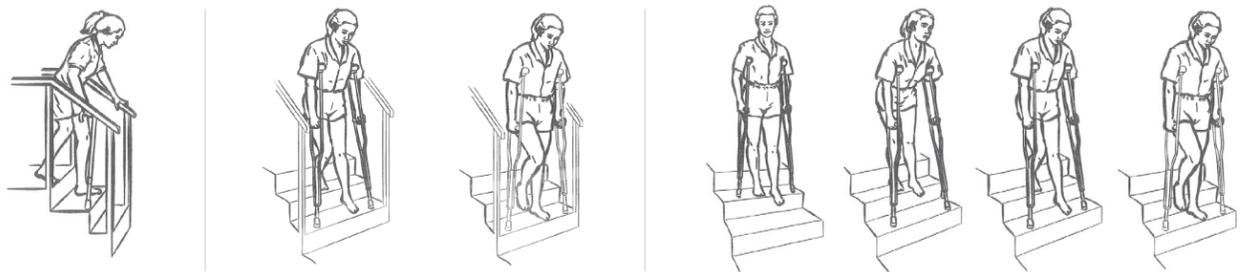
- ▶ **Alternative:** If there are consecutive steps with 2 railings available, you may move your assistive device out of the way (have someone carry it for you) and grasp firmly onto both rails.
- Raise your stronger (non-operative) leg up onto the step.
- Once you have your balance, press through your stronger (non-operative) leg to raise the weaker (operated) leg up onto the same step.
- If you are using a cane or crutch(es), have it follow.
- Repeat.

### Going Down (“Down with the Bad”)

- Walk to the edge of the step.
- Your next movement will depend on the set up of the stairs and the assistive device you’re using:
  - ▶ **Walker:** If you are using a walker and the steps are large enough to accommodate it, place it down on the level below, making sure all four legs are firmly on the surface. If the surface isn’t large enough to accommodate your walker but there is a railing available, fold your walker completely, holding the center of it in one hand and placing it down onto the lower step while grasping onto the railing with the other hand.



- ▶ **Cane or Crutch(es):** If you are using a cane or crutch and a railing is available, put it in one hand (if you have two crutches, put both under one arm or give one to your coach to hold) and place it down on the lower step while grasping onto the railing with the other hand. If you are using crutches and no railing is available, put one crutch under each arm and place both crutches down on the lower step.



- ▶ **Alternative:** If there are consecutive steps with 2 railings available, you may move your assistive device out of the way (have someone carry it for you) and grasp firmly onto both rails.
- Slowly lower the weaker (operated) leg down onto the step, making sure to keep it straight.
- Step down with the stronger (non-operated) leg onto the same step.
- Repeat.

### Driving

You should not drive a car or other motor vehicle until your surgeon says it is safe to do so. You will not be cleared to drive until you are finished your pain medications. In most cases, patients are able to resume driving about 2-6 weeks after surgery, depending on which knee you had replaced.

### Traveling

Because your new artificial joint contains metal components, you will likely set off the security systems at airports or shopping malls. This is normal and should not cause concern. When traveling long distances, you should attempt to change position or stand about every hour. Some exercises, like ankle pumps, can also be performed should you need to sit for long periods of time.

### Work

Ask your surgeon when it is appropriate for you to return to work. Your timeline depends on the nature of your job, work conditions, and overall recovery progression. If your job requires a work release form, ask your surgeon to sign one.

### Sex

Ask your surgeon when you can return to sexual activity. Typically, this is between 4 and 6 weeks after surgery. You should be mindful of knee precautions during sex. Your surgeon can tell you which positions are safe and how to protect your new knee until it is fully healed.

### Post-Operative Rehabilitation

After discharge, your surgeon will require continued rehabilitation to emphasize stretching and strengthening of the knee after replacement so that you can meet your recovery goals. Your care team will determine whether your rehabilitation can be completed by following a post-operative exercise program at home, or if you are required to complete outpatient physical therapy, home health physical therapy, or inpatient rehabilitation at a skilled nursing facility.

### Post-Operative Exercises

There are simple exercises that you will need to do to help strengthen your leg muscles and increase flexibility and function following surgery. To get the best results from your surgery, it is important that you do these exercises consistently and correctly. You may not be cleared to do all the exercises right away. Our goal is to assist you in achieving the safest level of functional mobility. Your therapist will instruct you in which exercises to do and how often. If you have any questions or concerns regarding your exercises, do not hesitate to contact your therapist. Please visit page 24 of this guidebook for exercises that should be performed after surgery.

# Exercises

Please perform these exercises before and after surgery.

## Ankle Pumps

This exercise will help tighten the calf muscles to promote blood circulation in the lower legs and prevent blood clots.

- Sit with your feet flat on the floor or lie on your back in bed.
- Bend your ankles up and down as if you are pumping a gas pedal.

Repeat 10-15 times on each leg, 2 times a day (increase to every hour while awake after surgery).

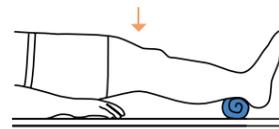


## Quad Sets

This exercise will tighten the quadricep muscles to strengthen the front of your thigh.

- Sit or lie on your back in bed with both legs straight (you can roll a towel under your ankle).
- Straighten your leg as if you are pushing the back of your knee into the bed.
- Hold for 5-10 seconds, then release.

Repeat 10-15 times on each leg, 2-3 times a day (increase to every hour while awake after surgery).

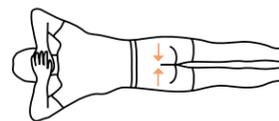


## Gluteal Sets

This exercise will tighten the gluteal muscles to strengthen your buttocks.

- Lie on your back with your legs straight.
- Squeeze your buttocks together as tightly as possible.
- Hold for 5–10 seconds, then release.

Repeat 10-15 times, 2-3 times a day (increase to every hour while awake after surgery).

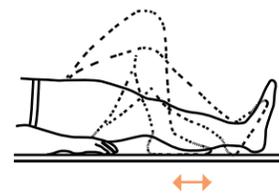


## Heel Slides

This exercise will tighten your hamstrings to improve knee strength and flexibility.

- Lie on your back with your legs straight and your toes pointed toward the ceiling.
- Slowly pull the heel of one leg toward your buttocks as far as you can (you can place a cookie sheet or plastic bag under your heel to slide it more easily if needed).

Repeat 10-15 times on each leg, 2-3 times a day.

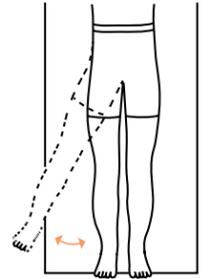


## Hip Abduction/Adduction

This exercise will strengthen the muscles that stabilize the thigh bone and hip.

- Lie on your back (you can place a pillow between your legs and a sliding board under your leg).
- Slide one leg out to the side while keeping your kneecap pointing toward the ceiling.
- Gently bring your leg back to the middle.
- Repeat with your other leg.

Repeat 10-15 times on each leg, 2-3 times a day.

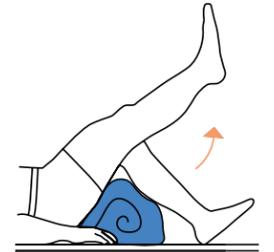


## Short Arc Quads

This exercise will strengthen the thigh muscles.

- Lie on your back in bed and bend one knee with your foot on the bed while putting a cushion (such as a rolled blanket or towel) under the other knee.
- Pull the foot and toes of your straight leg up by tightening your thigh muscles.
- Hold for 5 seconds, then relax.

Repeat 10-15 times on each leg, 2 times a day.

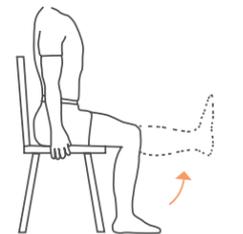


## Long Arc Quads (Seated Knee Extensions/Kicks)

This exercise will strengthen the muscles in the front of your thigh and shin.

- Sit in a chair with both knees bent.
- Keeping your thigh on the chair, straighten out your knee as you slowly kick up.
- Hold for 5 seconds, then slowly lower your foot to the floor.

Repeat 10-15 on each leg, 2-3 times a day.

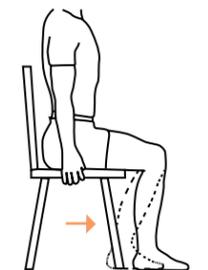


## Seated Knee Flexion (Bends)

This exercise will increase thigh muscle flexibility.

- Sit in a chair with both knees bent and both feet on the floor.
- Keeping your thigh on the chair, slide your foot as far under the chair as possible.
- Hold for 5 seconds, then slowly return to starting position.

Repeat 10-15 times on each leg, 2-3 times per day.

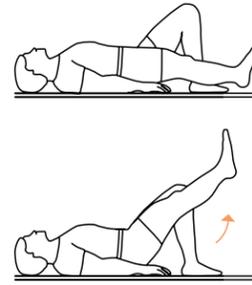


### Straight-Leg Raises

This exercise will strengthen and tighten the muscles on top of your thigh.

- Lie on your back and bend one knee while keeping the other leg straight.
- Exhale and tighten the thigh muscles of your straight leg to raise it about 6-8 inches. Do not lift your straight leg higher than the knee that is bent.
- Repeat with your other leg.

Repeat 10 times on each leg, 3 times a day.



### Terminal Knee Extension (Bolster Kicks)

This exercise will improve knee strength and flexibility.

- Lie on your back with a rolled towel (about 6" wide) under the knee of your operated leg.
- Slowly straighten your knee to a fully extended position.
- Hold for five counts, then relax.
- Repeat with your other knee.

Repeat 10-15 times on each leg, 2-3 times a day.



### Standing Hip Abduction (Side Kicks)

This exercise will strengthen your outer hip muscles. Make sure you are cleared to do this exercise.

- Stand tall on one leg (you can hold onto a stable support).
- Slowly raise your right leg out to the side, keeping your back straight, toes pointed, and kneecap pointed straight.
- Return to the starting position.

Repeat 10-20 times on each leg, 2 times a day. Complete one leg before switching to the other.

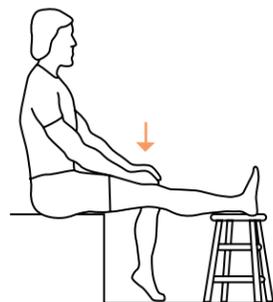


### Seated Knee Stretch

This exercise will ensure you have a straight knee following surgery.

- Sit on a firm, steady surface.
- Place the operated leg on another stool or chair of similar height.
- Lean forward and push down with both hands over the knee cap.
- Hold this position for 15 to 30 seconds.

Repeat 5 times.

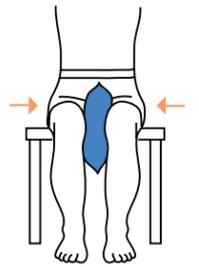


### Seated Hip Squeezes

This exercise will increase the strength of your inner hip/thigh muscles.

- Begin with both knees bent.
- Place a pillow or towel roll between your thighs.
- Gently squeeze the pillow or towel roll with both legs.
- Hold this position for 5 seconds.
- Relax and return to the starting position.

Repeat 10 times.



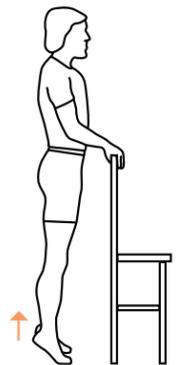
The following standing exercises are more challenging and should only be performed when instructed by your therapist. Be sure to hold onto a stable surface, such as a kitchen counter, when performing these exercises.

### Heel Raises

This exercise will improve the strength of your calf muscles and your standing balance.

- Make sure you are holding onto a table or counter.
- Keep your weight evenly distributed between both legs.
- Gently rise up onto your toes by lifting your heels off the ground.
- Keep your buttock muscles tight.
- Keep your knees straight throughout.
- Slowly lower your heels back down to the floor.

Repeat 10 times, 3 times per day.

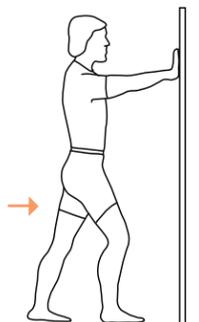


### Standing Calf Stretch

This exercise will improve the flexibility of your calf muscles.

- Stand facing a wall with your arms out in front of you.
- Step back with the leg you are stretching.
- Place your foot flat on the floor, keeping your toes facing forward.
- Gently lean forward, keeping your back knee straight and heel on the floor until you feel a stretch in your calf muscle.
- Hold for 15 seconds

Repeat 3 times on each leg.



### Standing March

This exercise will promote joint motion and strength.

- Hold onto a table or counter and lift your knee up to the level of your hip, keeping your body erect, and lower slowly.
- Alternate legs with each repetition.

Repeat 10 times, 3 times a day.



## Walk

Walking is an excellent way to keep your new knee flexible, strengthen your muscles, and improve your endurance. Remember these hints:

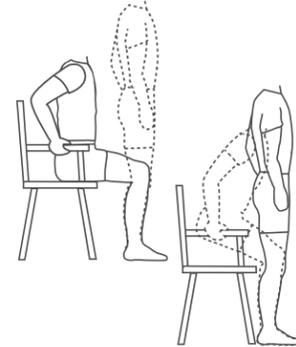
- Always use the assistive device recommended by your therapist.
- Stand and walk tall.
- Use a heel-toe pattern.



## Sit to Stands

This exercise will improve the strength of your hip and knee muscles.

- Sit in a firm chair with arm rests.
- Shift forward until your buttocks are near the front of the seat and place your feet firmly on the floor with your toes under your knees.
- Push down through your feet, stand up using your arms on the armrests if needed.
- To sit, stand with the back of your legs close to the edge of the chair. Bend your knees as you reach your buttocks toward the back of the chair.
- Lower yourself into the seat with control using your hands as little as possible.



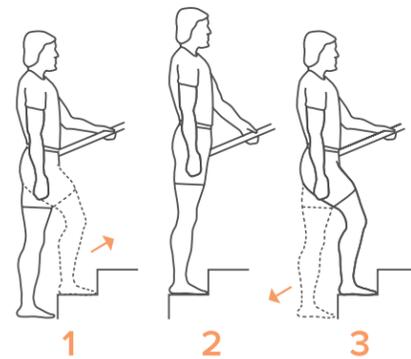
Repeat 10-20 times, 3 times a day.

## Step Ups

This exercise will improve the strength of your hip and knee muscles.

Make sure you are cleared by your therapist to do this exercise.

- Holding onto your railing, place your right foot on the first step.
- Slowly raise your left foot up to the level of the step, pressing through your right heel and tightening your buttocks.
- Keeping your right foot on the step, slowly lower your left foot back to the floor.



Repeat 10 times, then switch legs.

## Bridging

This exercise will strengthen your buttock and hip muscles.

Make sure you are cleared by your therapist to do this exercise.

- Begin with both knees bent to a comfortable position or using a towel roll under your knees to support your legs.
- Squeeze your buttock muscles and slowly lift your hips up 1-3 inches off of the bed.
- Slowly lower your hips to the starting position.

Repeat 10 times.

This exercise should be performed lying on your bed. Do not attempt to get onto the floor to perform this exercise, unless cleared by your doctor. It is very important to have correct form.

