

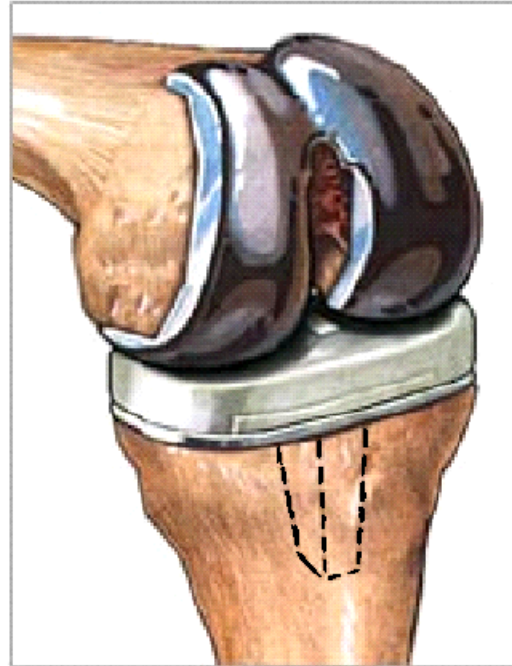
Knee Replacement Exercise Booklet

Weight Bearing As Tolerated

BEFORE



AFTER



Patient Name: _____

Surgeon: _____

Date of Surgery: _____

Physiotherapist: _____

416-967-8633 (3rd floor)

416-967-____ (____ floor)

Outpatient physiotherapy, basement level:

416-967-8626



Sunnybrook

HOLLAND BONE AND JOINT PROGRAM

Reduce Pain and Swelling

Ice and Heat:

- Ice can be applied to your operated leg for **10 –15 minutes**. You may find this most helpful after exercise. Ice on the knee while elevating your leg above your heart helps decrease **swelling**
- Beginning **one week** after surgery, you may apply heat behind your knee or to the thigh muscle well above the incision for **10-15 minutes** before you exercise. **Do not** apply heat directly over the incision. Do not use heat if you have been prescribed antibiotics for your knee

Pain Medication:

- Pain medication should be taken as prescribed
- It is important that your pain is controlled so that you can complete 2-3 exercise sessions each day and gradually progress your walking
- If you have pain when doing your exercises, take your pain medication before starting your exercises. The goal is to be 4/10 or lower (low to moderate pain) on the 0-10 pain scale
- For more information about pain management visit www.sunnybrook.ca/hipkneepain

Walking

- ◆ This is an excellent activity but walking is not a substitute for your exercises. **Gradually** increase your walking distance after you leave the hospital. A sudden increase in your standing or walking may cause **more swelling, more stiffness and more pain.**

My Knee is Getting More Stiff. What do I do?

Please assess your knee movement using the diagrams on the following two pages and track your progress. On the last page of this booklet a tracking chart is provided for you and your physiotherapist to track your progress. If your knee is feeling more stiff, **are you:**

- ◆ **Doing enough exercise?** If your knee is becoming more stiff you should increase to 10 repetitions of range of motion exercises every two hours. It is normal to have pain while doing these exercises.
- ◆ **Taking the prescribed pain medication as suggested in hospital?**
- ◆ **Icing your knee frequently?** You should ice your knee for 10-15 minutes, especially after the exercises. Allow at least one hour between icing sessions. A bag of frozen peas wrapped in a kitchen towel or pillowcase makes an ideal ice pack.
- ◆ **Applying heat to the thigh muscle** well above the incision or behind the knee for 10-15 minutes before exercises. You should feel a pleasant warmth, not a burning sensation.
- ◆ **Elevating your leg above the heart level?** You may need to do this for 20 minutes, 2-3 times a day to help decrease the swelling (See page 6 for details).
- ◆ **Doing too much other activity?** Often a sudden increase in activity level is the reason for an increase in knee swelling and stiffness. Decreasing your other activities for a 24-hour period may help. Take more rest breaks.
- ◆ **Staying in one position?** For example, if you sit for a prolonged period of time, it can also cause stiffness. Be sure to change position frequently.

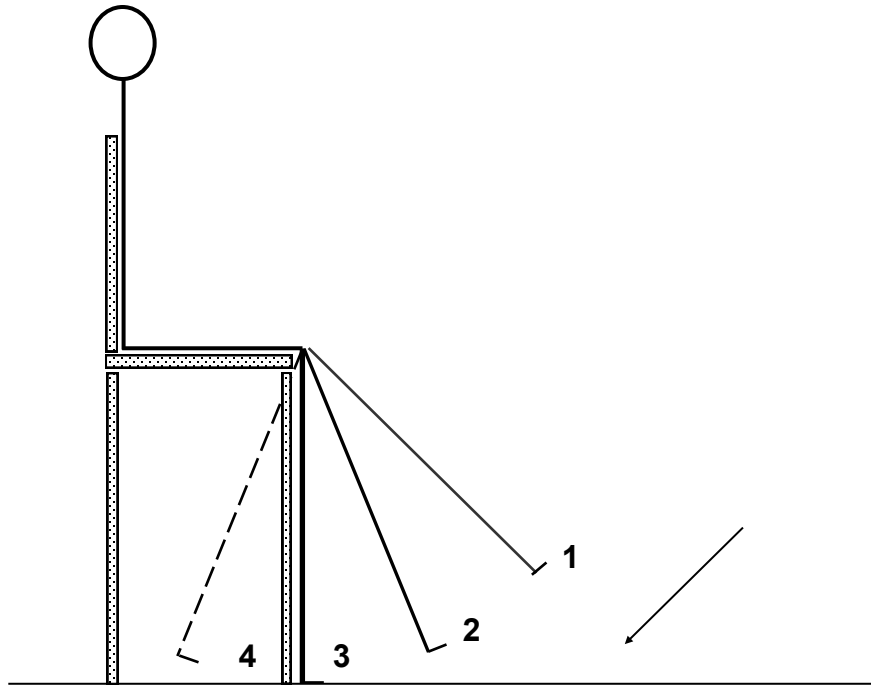
If you have tried the above strategies for 3 days with no improvement please call and leave a message at the patient support line: 416-967-8526

At Home Keep Checking That Your Knee Movement is Improving

Estimate your Knee Bend (flexion):

Sitting in a chair with your body weight evenly distributed on both buttocks and your back against the chair, bend your operated knee by sliding your heel under the seat.

If you are unable to bend past position 2 by two weeks (after surgery) call us and leave a message at 416-967-8526.



****If foot cannot move under the chair begin to do one of exercises #22, #23, #24, #30, #31, #32 more often in the day, suggested 10 repetitions every 2 hours.**



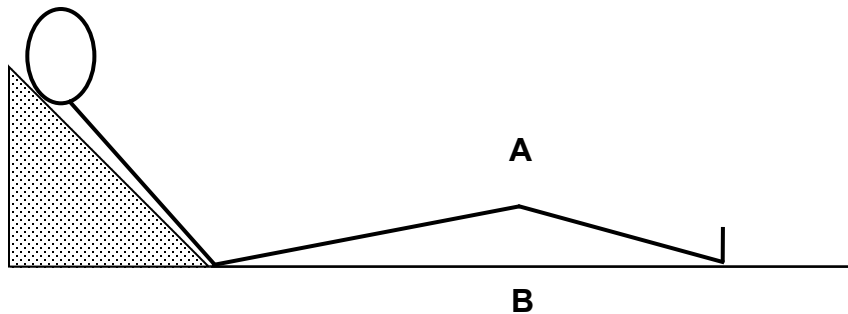
Your Goal: Foot under the chair



At Home Keep Checking That Your Knee Movement is Improving

Estimate your Knee Straightening (extension):

Push down on your thigh to straighten your knee towards the bed, making sure that your toes are pointing up to the ceiling. Straighten your knee as much as possible towards position B. If you are unable to straighten the knee beyond position A by two weeks after surgery call us and leave a message at: 416-967-8526.



****If you are unable to straighten your knee flat on the bed, even with hands pushing, begin to do one of exercises #27, #28 or #29 more often in the day, suggested 10 repetitions every 2 hours.**

If you were provided a knee splint in hospital, please wear while sleeping at night until your knee is straight



Elevation



Elevate your leg regularly to help manage swelling. To elevate properly, lie down fully with your leg higher than your heart. Place pillows under your leg so that your ankle and knee are higher than your hip. Make sure to keep your knee straight. Stay in this position for 20-30 minutes, and repeat several times during the day. **Ankle pumping** while in this position can also help reduce swelling.

Positioning at rest: When resting or lying in bed always keep your knee straight. Do not place pillows directly underneath your knee. If you were provided a knee splint in hospital, please wear while sleeping at night until your knee is straight.

Tools and Resources

To prepare for outpatient physiotherapy, please obtain the following equipment:

Elastic Resistance Bands: a light resistance band, a medium resistance band, a heavy resistance band.

Long strap or belt for specific exercises.

You may purchase these items at our gift shop located on the 1st floor lobby area at the Holland Centre or at a medical supply/sporting goods store of your choice.

myHip&Knee App: This free app can help keep you on track during your recovery. For more information and download/access instructions, go to www.sunnybrook.ca/myHip&Knee

Post-operative Exercises

Repeat Each Exercise 3 Times Per Day

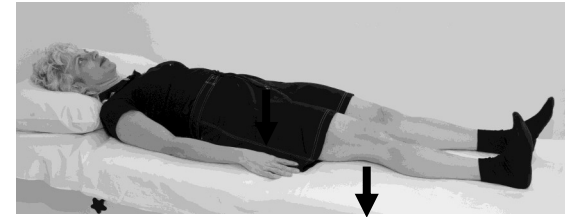
It is recommended that these exercises be taught to you by a physiotherapist.
Not every exercise is needed, your physiotherapist will determine which are important for you.

1. Static Quadriceps Strengthening

- Tighten the muscle on the front of your **operated** thigh to press your knee into the bed and bring toes towards you

Hold 5 seconds
Repeat 10 times

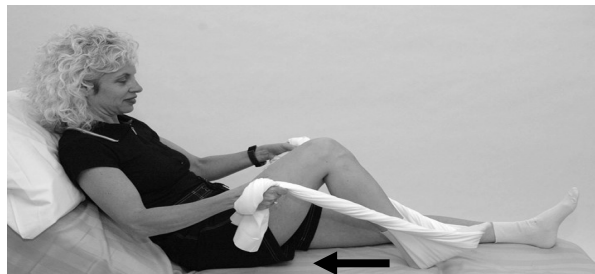
This exercise may also be done while sitting up.



2. Knee Bend With Leg Press

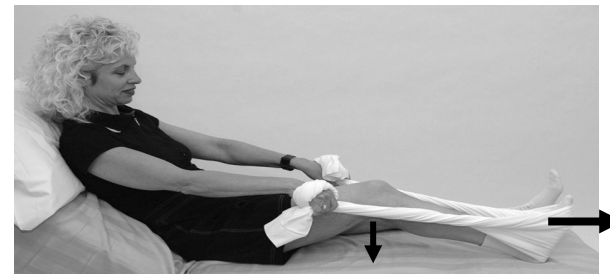
- Place a sheet around the foot of your **operated** leg
- Use it to help bend the **operated** knee
- Keep your heel on the bed

Hold 5 seconds



- Tighten the muscles in the front of your leg and push your foot against the resistance of the sheet until your knee is straight
- Keep your heel on the bed

Repeat 10 times



Post-operative Exercises

3a. Roll Stretch

- Place the heel of your **operated** leg on a roll with the toes pointed to the ceiling
- Tighten your front thigh muscles to press your **operated** knee down toward the bed
- Place your hands above the knee (as shown) and press down to help maximize the stretch behind your knee
- Do not bounce with your hand, hold the stretch instead

Hold 10-20 seconds

Repeat 5-10 times



3b. Knee Extension in Sitting

- Sit on the edge of a chair with your operated knee straight and non-operated knee bent
- Point your toes towards the ceiling and push downwards on your leg, above the knee, to straighten it (as shown)
- Make sure that you are sitting up straight with your back arched
- To increase the stretch, slowly lean forward while maintaining an arched back and keeping your chest up and forward

Hold: 10-20 seconds

Repeat: 5-10 times

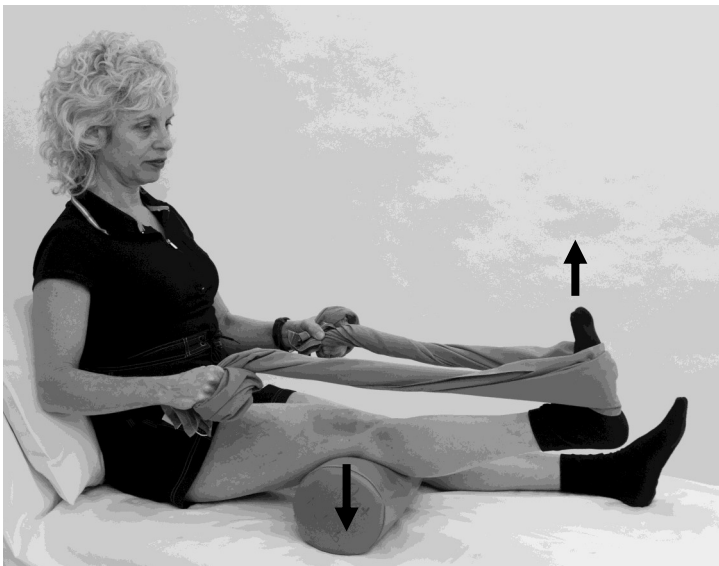


Post-operative Exercises

4. Active-Assisted Quads Over Roll

- Place a roll under your **operated** knee and a sheet around your foot
- Push your knee down into the roll, contract the muscles in the front of your leg and lift your foot as high as you can, using the sheet to assist
- Once your knee is straight gradually release the sheet and hold that position using the muscle (keep pressing the back of your knee down on the roll)

Hold 5-10 seconds
Repeat 10 times



5. Sitting Knee Extension

- Sit on a firm surface, chest up with low back arched
- Tighten the muscles on the front of your thigh (quadriceps) to straighten your **operated** knee
- Keep your thigh pressing down on the chair as you raise your foot
- Feel the stretch behind your thigh and knee
- Lower your leg slowly

Hold 5-10 seconds
Repeat 10 times



Post-operative Exercises

6. Knee Bend Progression

a) Sitting on the bed or chair, bend your **operated** knee by sliding your heel under the seat. You may use a plastic bag to assist with sliding the heel back.

Hold 10-20 seconds
Repeat 10 times



b) Cross your **non-operated** ankle over your **operated** ankle, and use it to help bend your **operated** knee. Ensure you do not lift your buttock off the bed.

Hold 10-20 seconds
Repeat 10 times



c) Loop a belt around the ankle of your **operated** leg. Bring it up and over your shoulder. Bend your **operated** knee using your leg muscles and then assist your bend by using your hands to pull on the belt (as shown).

Hold 10-20 seconds
Repeat 10 times



These are 3 different exercises that you can use to improve your knee bend

How To Manage Stairs One At A Time



To go up the stairs:

1. Put your **non-operated** leg on the step.
2. Use the cane and handrail to help step up.
3. Bring your **operated** leg up to the same step.

To go down the stairs:

1. Lead with the cane and the **operated** leg first.
2. Bring **non-operated** leg down to the same step.

As your knee range of motion and strength improves, you will eventually be able to resume "normal" stair pattern (i.e. up and down with either leg)

Exercise Instructions

Strengthening exercises:

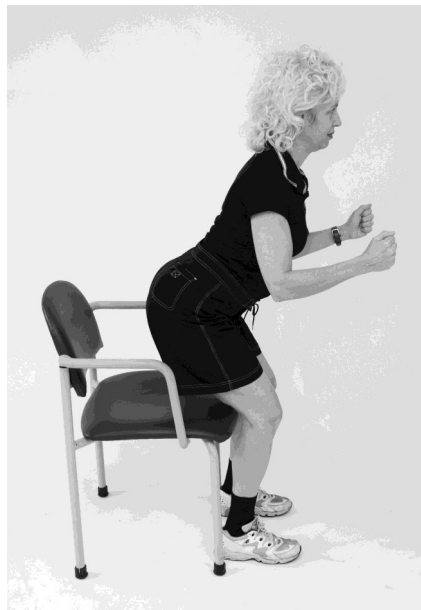
- Start by doing your strengthening exercises daily
- Start with 1 set of 8-15 repetitions
- Progress gradually to 3 sets of 8-15 repetitions, take a 1-2 minute break between sets
- Once you are able to do 3 sets of 8-15 repetitions, you can begin doing them every other day (3-4 times a week)
- You do not need to hold the exercise position, instead move slowly and smoothly with control
- Move on to an exercise labeled “**progression**” when you can easily complete 3 sets of 8-15 repetitions. It is OK to start with 1 set of 8-15 repetitions of the **progression** exercise and then gradually build up to a second and third set as able
- Not every exercise is needed and not every exercise will be right for you. Your physiotherapist will determine which are important for you

Remember: Knee joint pain is normal and expected with exercise after having knee replacement surgery. Doing your exercises regularly is very important in order to restore range of motion and function. Be sure to take your pain medications 45 minutes before you exercise to best control your pain.

Strengthening Exercises

7. Chair Rise

- Stand in front of a chair with your feet and knees hip-width apart
- With your weight distributed evenly between your feet, stick your buttocks back and slowly sit down
- If needed, you may use your hands to assist you in raising and lowering from the chair. Progress by not using your hands
- Pause briefly and then stand up fully, again without using your hands



Progression A:

- Tie a resistance band around your thighs (above your knees)
- Start with your knees and feet hip-width apart
- Lower and raise off of the chair while maintaining outward pressure on the band (hip-width apart)
- Knees remain in line with feet and not ahead of toes.

Progression B:

- Sit down and stand up with the operated leg closer to the chair and the other leg forward



A: With band around thighs



B: With one leg back

Strengthening Exercises

8. Quarter Squat



- Stand in front of a chair/sink, holding on for safety
- Keep equal weight through both feet with toes pointing forwards
- Bend your knees and stick your buttocks out
- Lower your buttocks down slowly and with control, using hand support as needed
- Ensure a slow controlled movement and return to standing position

Progression: Hold on to a support surface. Perform a quarter squat with your operated leg as you slide the other leg backwards.

You may need to use a "slider" under the non-operated leg (foot). A plastic bag on a carpet or a washcloth on a hard floor are options.



Do not allow your knees to go ahead of your toes

9. Standing Hip Abduction

- Hold onto a counter for balance
- Stand tall and move your **operated** leg out to the side and slightly backwards
- Repeat with the other leg (alternate legs)
- Make sure to keep your hips level and upper body straight. Do not hike your hip or lean sideways
- You should not feel any low back pain

Keep your toes pointing forward

Progression: tie a theraband around both legs, above your knees.

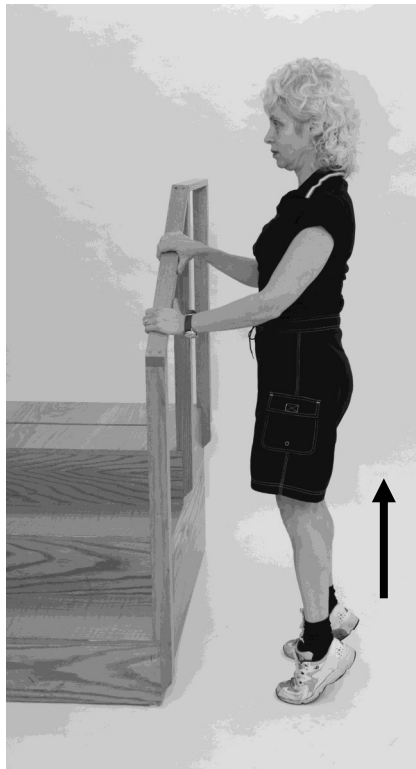


Strengthening Exercises

10. Heel Raises

- Holding on to support if needed, raise your heels off the floor
- Do not let your knees bend as you lift

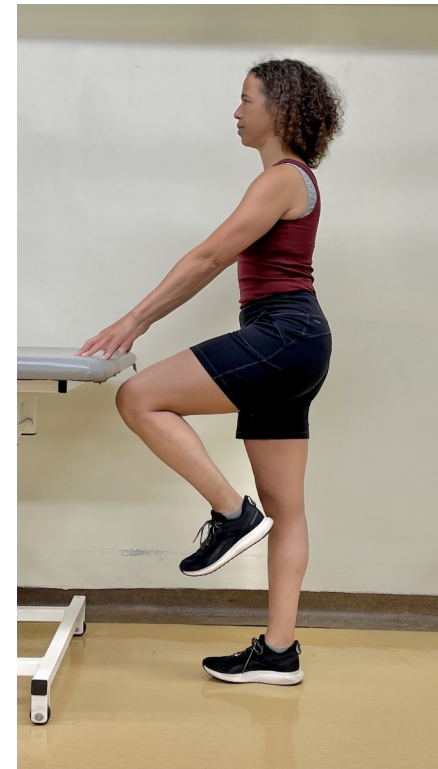
Progression: Stand only on your operated leg and complete the same heel raise.



11. Marching in Standing

- Hold onto a counter for support
- Bend your knee and lift your bent knee upwards
- Bend your knee further back as you raise the leg up
- Keep your back straight and alternate legs

Progression: March on the spot without hand support.



Strengthening and Balance Exercises

12. Seated Hamstring Curls

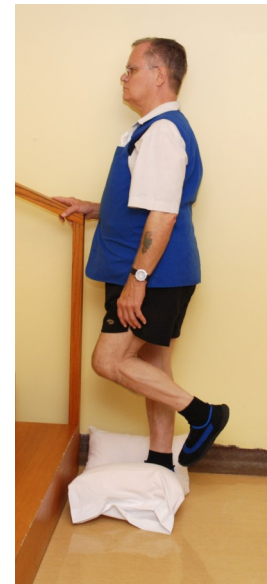
- Sitting in a chair, place a theraband around the ankle of your **operated** leg
- Bend your knee against the resistance of the band, keeping your foot off of the floor
- Keep equal weight through both buttocks
- Slowly allow your leg to return to the starting position



13. Single Leg Balance

- Balance on your **operated** leg, holding on to a counter for support if needed
- Squeeze your buttocks together and make sure to keep your hips level
- Try to practice in front of a mirror to avoid hiking your hips
 - **Try to hold for 30 seconds.**
 - **Repeat 3 times.**

Progression: once you can stand without holding on, progress to standing on an uneven surface such as a pillow.



Strengthening Exercises

14. Forward Step Up

- Stand facing forwards with your **operated** leg (foot) on the step
- Step up by straightening the **operated** knee, **but do not let your knee move ahead of your toes**
- Slowly lower your **non-operated** leg to the floor by bending your hips and knees and sticking your bottom back (**make sure you can see your toes**)



Starting Position



Both Feet On Step



Return to Starting Position

****Helpful Tip:** Increase the step height as able. Begin with a 2-4 inch step, progress to a 6 inch then 8 inch step height. (A book behind the step allows for step height progression if needed)

Strengthening Exercises

15. Clam Shell

- Lie on your **non-operated** side with your hips and knees slightly bent and your hips stacked on top of each other
- Squeeze your buttocks & abdominals
- Keep your feet together and open your knees as much as you can **without letting your top hip roll backwards**

Note: if possible, **push** your feet against a wall or headboard as you lift your top knee.

Progression: Tie a theraband around your lower thighs, just above your knees.

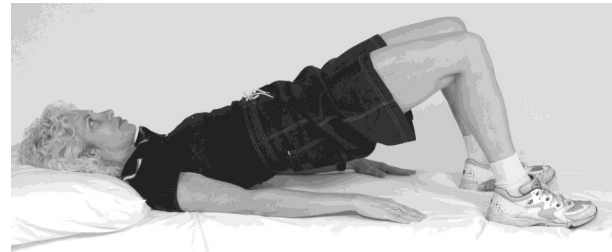


16. Bridge

- Start by lying on your back with your knees bent
- Squeeze your buttocks and lift your bottom off the bed, then slowly lower back down to the bed

Progression

- Lift buttocks off the bed with both feet on bed
- Once you are up, lift your **non-operated** leg up an inch
- Keep your non-operated leg up as you lower buttocks back to the bed



Strengthening Exercises

17. Crab Walk

- Bring your feet together and tie a band just above your knees
- Stand with your feet hip-width apart
- Stick your buttocks out as if you are about to sit in a chair
- **Do not allow your knees to go ahead of your toes**
- Press your thighs apart against the tension of the band
- Maintain this squat position and take a few steps in one direction, then side step back in the other direction
- When stepping feet back together, don't bring your feet closer than hip-width apart
- Repeat in opposite direction until you are back to your starting position



Strengthening Exercises

18. Standing Abduction Against Wall

- Stand on your **operated** leg, bend your **non-operated** knee against a wall
- Your hip should not be touching the wall
- Slowly push your knee & foot outwards against the wall
- Make sure to keep your hips level and thighs in line

Progression: try to take your hand off the wall so that your lower leg is the only part of your body touching the wall.



19. Hamstring Curl

- While supporting yourself with your hands, bring the heel of the **operated** leg towards your buttock
- Remain standing up tall
- Move your thigh backward to keep it beside the other leg

Progression: Use an ankle weight around your ankle to increase the difficulty.



Strengthening Exercises

20. Terminal Knee Extension With A Soft Roll Behind The Knee While Standing At A Wall



Bent knee



Straight knee

- Stand with your back against the wall and your feet hip-width apart
- Place a roll behind your bent knee
- Straighten your knee by pressing the back of the knee into the roll

21. Isolated Terminal Knee Extension



Bent knee



Straight knee

- In standing with your feet hip-width apart, tie a band around your operated knee and around the leg of a heavy chair or table
- Bend your operated knee slightly, and then straighten it by pulling back against the band
- Make sure not to rotate your hips backwards

Exercise Instructions

Stretches:

- Warm up for 5-10 minutes prior to stretching (eg. walking, warm shower, stationary bike)
- Hold for 45 seconds (or 5 slow deep breaths) and repeat 3 times (unless stated otherwise)
- Stretch often every day, at least 2-3 times per day
- Not every exercise is needed and not every exercise will be right for you. Your physiotherapist will determine which are important for you

Stretches

22. Quadriceps Stretch Lying on Back

- Start by lying at the edge of the bed
- Two hands hug your ***non-operated*** leg up towards chest while you bend your ***operated*** knee
- You should feel a stretch in the front of your thigh

Note: to increase the stretch, let more of your thigh hang off the bed and bend your knee

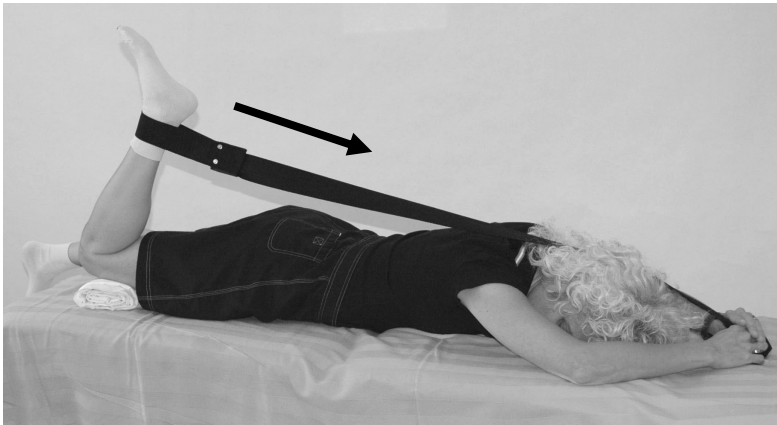
Operated
Knee



Stretches

23. Quadriceps Stretch Lying on Stomach

- Wrap a belt around the ankle of your operated leg and place a folded towel under your thigh
- Pull the belt to bring the heel of your **operated** leg toward your buttock
- Keep both hips flat on the bed
- Once you feel a strong stretch on the front of your thigh hold it for 45 seconds
- Slowly release

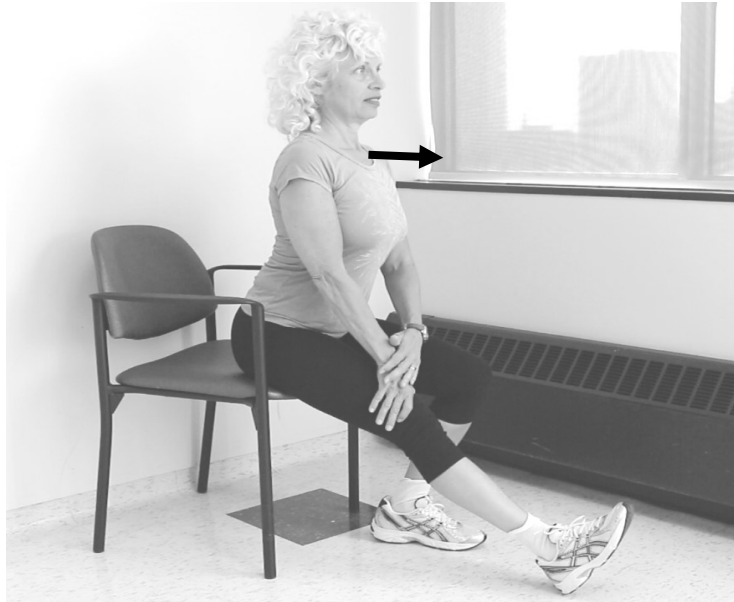


24. Quadriceps Stretch In Standing

- Hold the foot of your **operated** leg using a towel
- Pull on the towel upwards and bring your heel towards your buttock until a stretch is felt on the front of your thigh
- Keep your thighs parallel and keep **operated** knee pointed to the floor
- Do not bend at the hip



Stretches



25. Hamstring Stretch

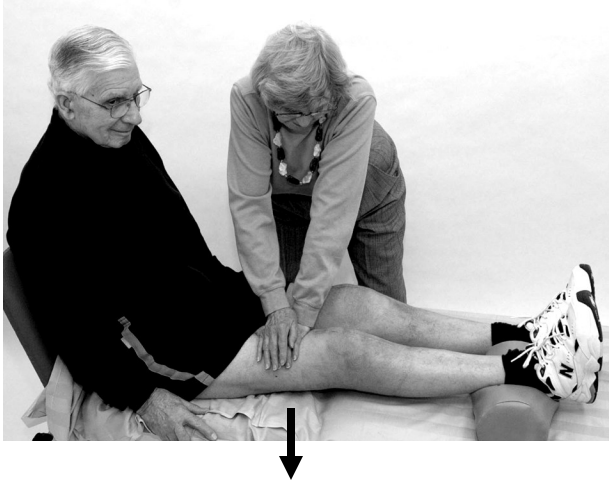
- Sit on the edge of a chair with your operated knee straight and non-operated knee bent
- Point your toes towards the ceiling and push downwards on your leg, above the knee, to straighten it (as shown)
- Make sure that you are sitting up straight with your back arched
- To increase the stretch, slowly lean forward while maintaining an arched back and keeping your chest up and forward



26. Calf Stretch

- Holding on to a support, place your **operated** leg behind you
- Keep your **operated** knee straight and the heel on the ground
- Bend your **non-operated** knee until you feel a stretch in the calf muscle of the **operated** leg
- Be sure to keep your chest up tall

Extension Progression Stretches



27. Coach Assisted Knee Extension On A Roll

- This is similar to **exercise #3**
 - Your coach **can assist** to regain straightening of the **operated** knee by pushing down with two hands above the **knee**
- **You should guide your coach to hold a stretch that is tolerable for you**

**Hold 10-20 seconds.
Repeat 5-10 times.**

28. Weighted Knee Extension In Sitting

- Sitting as shown, tie the handles of two bags together with equal weight in each bag and place on thigh of operated leg **above the knee cap**
- Allow your knee to relax and “sink” towards the floor
- You should feel a stretch behind your knee

**Hold 5-10 minutes.
Repeat 2-3 times/day.**



29. Gravity Assisted Knee Extension Stretch

- Lie on your stomach with your operated knee and foot off the bed
- Place a towel under your thigh just above the knee
- To add stretch, position two weighted bags as shown
- Keep both hips flat on the bed

**Hold 5-10 minutes.
Repeat 2-3 times/day.**



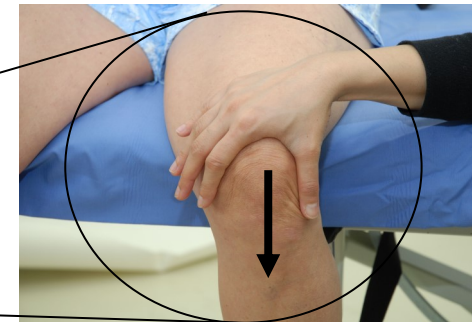
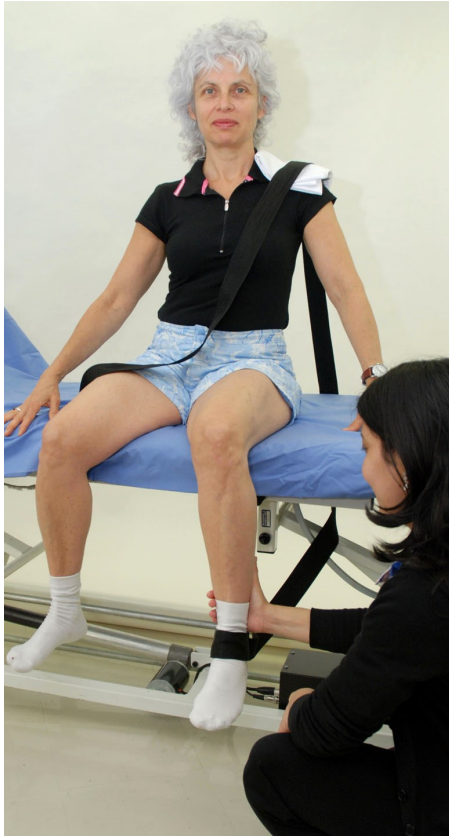
Flexion Progression Stretches

30. Coach Assisted Knee Bend / Hamstring Strength

This is similar to **exercise #6**. In this exercise the coach is helping to increase knee bend.

****You should guide your coach to hold a stretch that is tolerable for you.**

Keep your buttocks on the bed, do not lean away.



a) Push the **operated** leg back against the coach's hand and hold in position for **5 seconds**.

b) Relax the **operated** leg, allow the coach to press down on the top of the knee cap and pull the ankle down while you pull on the belt to bend your knee further. **Hold 10-15 seconds**.

Repeat above sequence of a) and b) **10 times**.

Flexion Progression Stretches

31. Prolonged Knee Flexion Against a Wall



- Start by sitting upright in a chair with your toes against wall.
- Shift your buttocks forward in the chair and try to bring your knee towards the wall.
- Keep shifting forward until you can touch the wall and feel a strong stretch in your knee.
- **Hold the position up to 20 minutes with heat on your thigh.**

To progress your knee bend further, place a book against the wall and position your toes behind the book. Repeat the exercise as written above.

32. Forward Knee Lunge Stretch

- Place the foot of your **operated** leg on a step.
- Lunge forward to bend your **operated** knee.
- Use support as needed and keep your body up tall.

**Hold 10-20 seconds.
Repeat 5-10 times.**



Cycling

33. Stationary Cycling

To gain range of motion:

Without any resistance on the stationary bicycle, start by rocking back and forth trying to bend the knee further each time. Once you can achieve a full revolution you can lower the seat to increase your range of motion further.

To improve strength:

Adjust the height of the seat so that your knee is slightly bent when the pedal is at its lowest point.

As your knee gets stronger you may **gradually increase the resistance** up to a moderate level and increase the speed of cycling to make the exercise more challenging (i.e. pedal speed at 90 revolutions per minute (RPM)). Ensure that you are not working too hard by being able to carry on a conversation while cycling.

Increase resistance for up to one minute then decrease the resistance for 2 minutes (similar to going up and down hills), try to maintain your pedal speed at least at 60 RPM's even with additional resistance.



*Cycling can help you to improve range of motion, strength and overall fitness level. Gradually increase cycling to 15-20 minutes.

Exercises In The Gym

The following exercises can be done if you have access to gym equipment.
If you are not familiar with the equipment, consult a physiotherapist or a fitness instructor.

34. Leg Press (operated leg)



- Begin the exercise with your knee bent at 90 degrees
- Slowly push the weight, stopping just before the knee is fully straight

35. Hamstring Curl (operated leg)



- Lie on your stomach with the leg straight and the bar on top of the ankle.
- Slowly bend the knee bringing the foot towards the buttock and release slowly

These exercises are not for everyone – consult your physiotherapist before attempting

Start with 1 set of 8-15 repetitions and progress gradually to 3 sets.
Your muscles should feel tired after the exercise, if not increase the weight next time.

Resuming an Active Lifestyle

When you can return to your leisure activities after surgery depends on the physical demands of the activity and your stage of recovery.

**** Do not take up new high risk sporting activities as inexperienced people are at a higher risk for injuries and accidents****

Walking: This is an excellent activity, and you are strongly encouraged to gradually increase your walking distance after you leave the hospital. Walk outdoors as long as the sidewalks are dry or consider going to a nearby mall to walk indoors when the sidewalks are wet and slippery. It can be helpful to have a walking goal each day.

Stationary Cycling: can be resumed 1-2 weeks following your surgery. Refer to page 28 for details.

Swimming / Aqua-fit: can be resumed 6-12 weeks following surgery only if the incision is well healed and dry. No whip kick but gentle breast stroke and flutter kick is allowed. Avoid side-to-side leg exercise in Aqua-fit (i.e. jumping jacks).

ACTIVITIES THAT MAY BE RESUMED AFTER SURGEON/APP FOLLOW-UP (APPROX. 6-8 WEEKS)

- ◆ **Driving** may be started sooner if you are not taking opioid pain medication and are able to climb stairs reciprocally (normal pattern), **only on the advice of your surgeon**
- ◆ **Golf** - begin at the driving range
- ◆ **Gardening**

Kneeling: It is NOT harmful to kneel on your new knee, however kneeling may be painful. The use of a padded surface or pillow is recommended when kneeling. For example, a kneeling platform is recommended for gardening.



Kneeling Platform

ACTIVITIES THAT MAY BE RESUMED AT 12 WEEKS

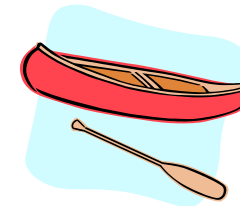
- ◆ Bowling (Lawn or Indoors)
- ◆ Golf - you may return to the course (may be started earlier than 12 weeks as long as able to walk without aids, and completed balance/core exercises)
- ◆ Outdoor cycling (**NOT** Mountain Biking)
- ◆ Low impact aerobic exercise
- ◆ Doubles tennis



HIGH RISK ACTIVITIES

All of the following activities are associated with slippery or unstable surfaces and increase your risk of falling. In addition, these activities can result in significantly higher forces on the replaced joint than are considered safe. It is not recommended to begin to learn one of these activities after your surgery. In the case of a highly experienced or expert athlete, the activity may be discussed further with the surgeon.

- ◆ Downhill skiing
- ◆ Cross-country skiing
- ◆ Ice skating
- ◆ Inline skating
- ◆ Mountain biking
- ◆ Canoeing
- ◆ Sailing
- ◆ Kayaking



HIGH RISK ACTIVITIES THAT ARE NEVER PERMITTED

- ◆ Singles tennis
- ◆ Jogging / Running
- ◆ Squash / Racquetball
- ◆ Basketball
- ◆ High impact aerobics
- ◆ **Weight Training: Heavy lifting is never recommended.**
Generally it is recommended to use lighter to moderate resistance and increase the challenge by increasing the number of repetitions performed.



General Aerobic Fitness Suggestions

Be active! You can return to activities you used to do before surgery using the following guidelines. However, **if you have not been active** before your surgery, please **consult your family physician** before starting to exercise.

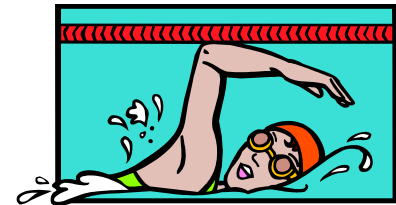
It is important to **start slowly** and gradually progress (i.e. increase the amount of time you exercise or the distance you are covering) to being more active.

Canadian Physical Activity Guidelines recommend:

- 150 minutes of moderate to intense aerobic physical activity (sweating a little bit and breathing harder) per week, in sessions of 10 minutes or more.
- Muscle and bone strengthening at least 2 times per week.
- More physical activity provides greater health benefits.

For more information about exercising after your knee replacement, please visit our website:

www.sunnybrook.ca/hollandboneandjoint/education



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