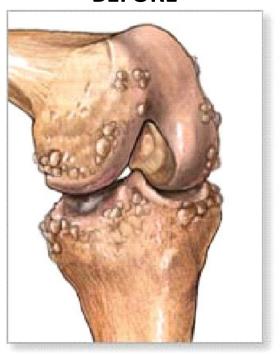
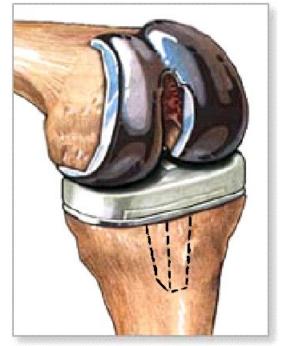
Knee Replacement Exercise Booklet Weight Bearing As Tolerated

BEFORE

AFTER





Patient Name:	
Surgeon:	
D 00	

Date of Surgery:____

Physiotherapist:_

- □ (416) 967-8633 (3rd floor)
- □ (416) 967-8637 (6th floor)
- □ (416) 967-8520 (7th floor)



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 thigh while elevating your leg above your heart helps decrease to **swelling**.
- Beginning one week after surgery, you may apply heat behind your knee or on the front of your hip, for 1015 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

♦ Walking is not a substitute for your exercises. Start with short walks throughout the day and slowly increase them as you improve. A sudden increase in your activity levels 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.

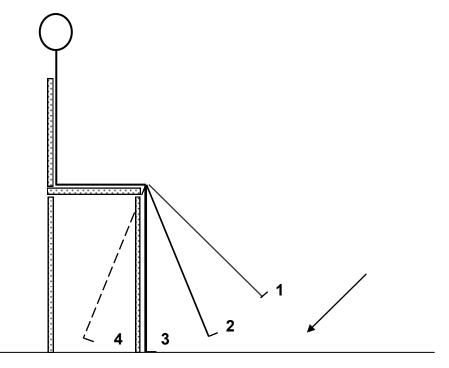
If you have tried the above strategies for 3 days with no improvement please call and leave a message at : 416.967-8526

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.

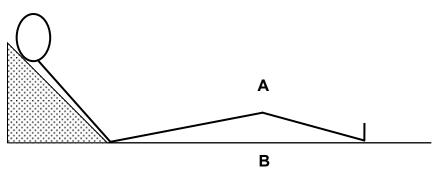




At Home Keep Checking That Your Knee Movement is Improving

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

in the day, suggested 10 repetitions every 2

hours.

flat on the bed, even with hands pushing, begin to do one of exercises #27, #28 or #29 more often



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.

Post-operative Exercises

- 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.
- In the first few weeks at home it is important that you continue to improve your knee bending and straightening.

Repeat Each Exercise 3 Times Per Day

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 <u>5</u> seconds. Repeat <u>10</u> 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 <u>10</u> times.



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 <u>above the knee</u> (as shown) and press down to help maximize the stretch behind your knee. Do not bounce with your hand, hold the stretch instead.

Hold <u>10-20</u> seconds. Repeat <u>5-10</u> times.



3b. Knee Extension in Sitting

- Sit on the edge of a chair with your operated knee straight and unoperated 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: <u>10-20</u> seconds. Repeat: <u>5-10</u> times.



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 try to let go of the sheet and hold that position using the muscle (keep pressing the back of your knee down).

(*note: the sheet *only* assists to raise/lower the foot)

Hold <u>5-10</u> seconds. Repeat <u>10</u> 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 your raise your foot. Feel the stretch behind your thigh and knee.
- Lower your leg slowly.

Hold <u>5-15</u> seconds. Repeat 5 times.



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 <u>10-20</u> seconds. Repeat <u>10</u> 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 <u>10-20</u> seconds. Repeat <u>10</u> times.



c) Bend your *operated* knee with assistance of a belt (as shown). Loop the belt around the ankle of your *operated* leg. Bring it up and over your shoulder and pull.

Hold <u>10-20</u> seconds. Repeat <u>10</u> times.



Keep your buttocks on the chair

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, reciprocal)

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.
- 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.

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 without using your hands.
- Pause breifly and then stand up fully, again without using your hands.
- If needed, you may use your hands to assist you in raising and lowering from the chair. Progress to not using your hands.





Progression:

- Tie a Theraband around your thighs (above your knees) and hold a theraband as pictured, with your thumbs up.
- Start with your knees, feet and hands hip-width apart.
- Lower and raise off of the chair while maintaining outward pressure on each band (hip -width apart).
- Knees remain in line with feet and <u>not</u> ahead of toes.





8. Quarter Squat



- Stand in front of a chair/sink and keep equal weight through both feet.
- Keep your toes pointing forwards.
- Bend your knees and stick your buttocks out.
- Lower your bum down slowly and with control, using hand support if needed.
- Ensure to complete as a slow controlled movement without holding the squat position.

Progression: Stand on operated leg only and perform quarter squat. Hold on to a support as needed.

Do not allow your knees to go ahead of your toes

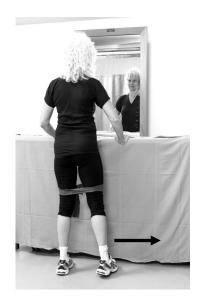


9. Standing Hip Abduction

- Hold onto a counter for balance.
- Stand tall and move your operated leg out to the side.
- Make sure to keep your hips level and upper body straight. Do not hike your hip.

Keep your toes pointing forward

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

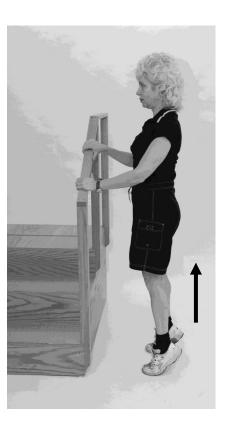




10. Heel Raises

- 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 if needed.
- Bend your knee and lift your bent knee towards your chest.
- Bend your knee further back as you raise the leg up.
- Keep your back straight and alternate sides.

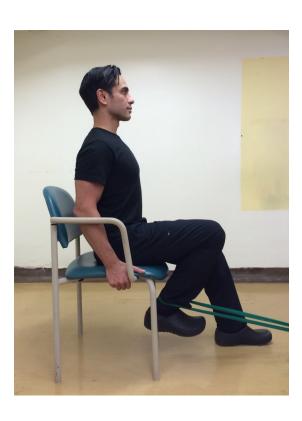
Progression: March on the spot without hand support.



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, a wobble board or a Bosu ball.





14. Lateral Step Up

- Stand facing sideways with your operated foot on the step.
- Step up by straightening the operated knee, but do not let you knee move over 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.



• If a full step is too challenging, start with your unoperated foot on a stool or book.

Picture B

- For a different challenge, loop a length of theraband around your operated knee and the rung of your stairwell (or another stable object).
- Keep the same starting position as before. As you step up, straighten your knee against the resistance of the band.
- When you begin to lower your non-operated leg to the floor, do so as slowly as possible. Do not let the knee bend quickly.









^{**} 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 beside the step allows for step height progression if needed)

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.
- 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. You may want to start off with a light resistance band.





16. Bridge

- Start by lying on your back with your knees bent to 90 degrees.
- Squeeze your buttocks and lift your bottom off 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 unoperated leg up as you lower buttocks back to the bed.





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.







18. Standing Abduction Against Wall

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

Progression: try to take your hand off the counter 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.



20. Terminal Knee Extension Squat

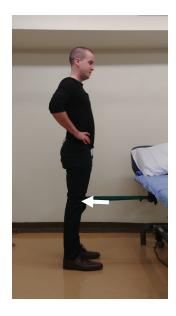




- Stand with your feet hip-width apart and loop a theraband around your operated knee and leg of heavy chair or table.
- Bend both knees and stick your buttocks back to perform a small squat.
- Straighten your knees and hips and return to the starting position
- As you straighten your knees, pull back on the band with your operated knee.

21. Isolated Terminal Knee Extension





- 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

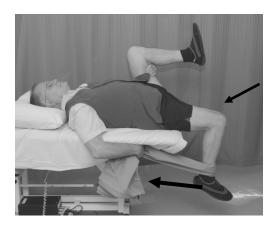
Stretches:

- 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.
- One hand hugs your non-operated leg up towards chest while you bend your operated knee with the help of a sheet or belt in the other hand.
- You should feel a stretch in the front of your thigh.

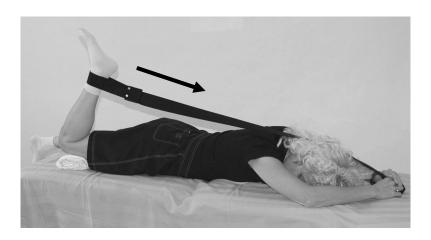


Operated Knee

Stretches

23. Quadriceps Stretch Lying on Stomach

- Wrap a belt around the ankle of your operated leg.
- Pull the belt to bring the heel of your operated leg toward your buttocks.
- Once you feel a strong stretch in the front of your thigh hold it for 45 seconds and then let go of the belt and try to hold it using your muscles.



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 buttocks until a stretch is felt in the front of your thigh.
- Keep your knees parallel and keep
 operated knee pointed to the floor. Do
 not bend at hip.



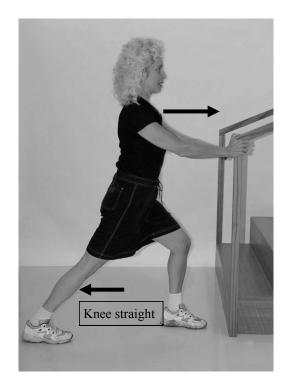
Stretches



25. Hamstring Stretch (Long Sitting)

- Sit on the edge of a chair with your knee straight and your toes pointed towards the ceiling
- Keep you chest up while you move your chest forward until a stretch is felt behind the thigh and knee (hands push on bed to help lift chest up).





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.

The coach **can assist** to regain straightening of the **operated** knee. The coach pushes 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

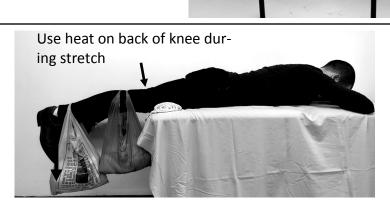
Sitting as shown, tie the handles of two bags together with equal weight in each bag and place it around your *operated* leg *above the kneecap* (one bag hangs on each side). Ensure the weight is NOT directly on your knee. Allow your knee to relax and "sink" towards the floor. You should feel a stretch behind your knee.

Hold <u>5-10</u> minutes. Repeat <u>2-3</u> times/day.

29. Gravity Assisted Knee Extension Stretch

Lie on your stomach with your operated knee, foot and ankle off the end of bed. Place a towel under your thigh just above the knee. To add stretch, place two bags around your leg as shown and place light weights in each bag.

Hold <u>5-10</u> minutes. Repeat <u>2-3</u> times/day.



Flexion Progression Stretches

30. Coach Assisted Knee Bend / Hamstring Strength

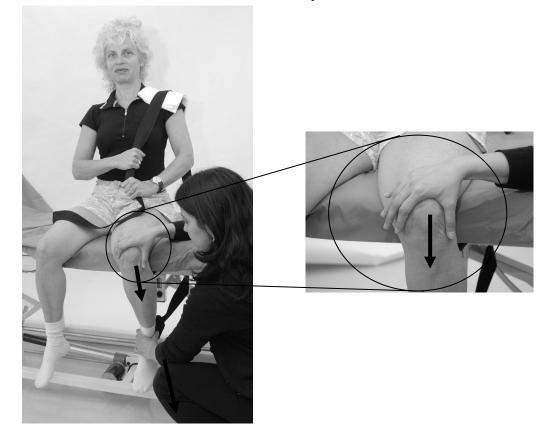
This is similar to **exercise #6**. In this exercise the coach is helping to increase knee bend.

**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.

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.

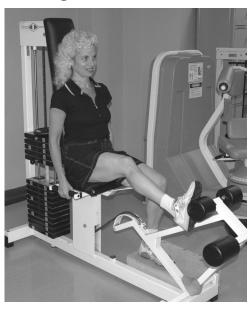
Gradually increase cycling to 15-20 minutes.

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 fitness instructor or a physiotherapist.

34. Leg Press



Begin the exercise with your knee bent at 90 degrees. Push against the weight to straighten the knee in a slow controlled movement and then release back slowly.

The leg press is not for everyone—consult your physiotherapist before attempting.

35. Hamstring Curls



Lie on your stomach with the leg straight and the bar on top of the ankle. Using a slow controlled movement, bend the knee to bring the foot towards the buttock and release back slowly.

For the above exercises, start with 1 set of 8-15 repetitions and progress 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 sporting activities as inexperienced people are at a higher risk for injuries and accidents**

<u>Walking:</u> 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.

Stationary Cycling: can be resumed 1-2 weeks following your surgery. Refer to page 27 for details.

<u>Swimming / Aqua-fit:</u> 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)

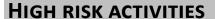
- ◆ **Driving** may be started sooner if you are not taking opiod pain medication and are able to climb stairs reciprocally (normal pattern), **only on the advice of your surgeon**
- ♦ **Golf** begin at the driving range
- **♦** Gardening

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.



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



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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Tracking you Knee Range of Motion

Knee Straightening	Knee Bending
	Knee Straightening