

Advice & exercises after total knee replacement (TKR)

Summary

We are delighted to present to you a protocol for your recovery after your total knee replacement.

In our experience, 8 to 9 out of 10 patients experience a significant improvement in their symptoms after total knee replacement, so much so that most feel that they should have undergone this earlier.

The key to a successful recovery is, good planning, a positive attitude and performing the right rehabilitation exercises at the right time. There is a balance to be struck between rest and exercise. Unlike a hip replacement, a knee replacement operation takes a longer time to get over.

In the first six weeks, the knee can be sore in a different way to the arthritic pain and it's important to take the right painkillers.

Warmth, swelling and discomfort will persist for up to three months and sometimes longer. By six months most patients feel much better and understand how much the knee replacement has improved their symptoms.

It can take 9 to 12 months for the knee to feel like it's "fully bedded in".

The following rehabilitation protocol is a generic protocol, and we may modify this according to your own needs.

Mr Gupte will discuss any modifications with you in clinic.

Introduction

Total knee replacement

A total knee replacement is usually done for severe arthritis and primarily used to eradicate the pain. In most cases you will regain the range of movement you had pre-operatively and sometimes a little more, but it will not allow you to fully squat or sit back on your heels and knee replacements are not made for high impact activities

such as running and jumping. You are likely to be aware to some degree that you have had a knee replacement. It is common for pain to persist along the joint line for up to two years after the surgery.

During the surgery the end of the thigh bone (femur) is replaced by a metal component, the upper end of the shin bone (tibia) is also replaced with a metal component and a plastic spacer inserted between the two.

For a total knee replacement, a skin incision is made down the front of the knee and the underlying tissues moved to one side of the kneecap (patella). The patella is then deflected to one side. This stretches the muscles around the knee resulting in bruising, swelling and weakness. It is therefore very important to start your exercises early to overcome these problems.

After your operation

Pain

- Having a joint replacement will relieve the arthritic pain from the joint itself, but because of the trauma to the soft tissues surrounding the joint during surgery you may experience some pain. Taking your medications regularly and following the guidelines in this booklet should help minimise this.
 - If the pain relief provided is not sufficient please inform the nursing staff or your doctor and further pain control will be provided.
 - On discharge some pain may persist for a further few weeks/ months and you should use this as a guide when increasing your daily activities. A moderate ache which settles quickly is acceptable, severe pain which takes hours to settle is not.
- If you experience sharp pain, stop the activity immediately and if symptoms persist contact your GP for advice.

Swelling

- Your knee may swell for up to three months or more after your operation.
- If this occurs, sitting with your leg up and an ice pack will help ease the swelling. You may use crushed ice, a gel pack or a pack of frozen peas which must be wrapped in a damp towel or tea towel before being placed on the knee.
- Do not keep the ice pack on any longer than 10 minutes. Any longer than this and the body will increase the blood flow to the area in an attempt to warm the tissues up again. This will make the swelling worse. Allow 20 minutes between applications.

Infection

- The knee is likely to remain slightly warm for up to 3-6 months after your knee replacement.

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- Should your wound leak and your dressing need changing before your appointment to have your clips/sutures removed please contact your GP surgery to arrange this.
- If during the first four weeks after your surgery the knee becomes red, increasingly more painful and/or discharging pus, particularly if you feel unwell with a high temperature please call 0207 4835160.
- This will arrange an appointment for the wound to be checked by one of our knee surgeons although be aware that it may not be with the surgeon who did the operation.
- If infection is suspected/confirmed, you must also contact your surgeon to organise an early review but it is likely that this will be arranged for you when you attend your follow-up.

Standing and walking

- You will be able to get out of bed the same day as or the day after your surgery; however, if you do not have adequate knee control you will not be able to go further than transferring to the chair /commode only.
- When you first get up your physiotherapist will give you a walking aid to help. This is usually a frame and you will then progress to crutches or sticks as able.
- When walking you should move the walking aid/s forward first, followed by the operated leg then the un-operated leg last.
- You should retain 2 crutches or walking sticks until you can walk without a limp, this may be as much as 6-8 weeks.
- You may progress to 1 crutch or stick around the house when confident and to one stick/crutch or none when you no longer have a limp and are confident to do so both indoors and outside.

Standing from a chair

- Place operated leg out in front of you.
- Push up with both hands on the chair arms; once balanced place hands on the frame.
- Do not use the frame to pull yourself up.
- OR push up with one hand on the chair arm, holding your crutches or sticks in the other hand.
- Once balanced, place crutches or sticks in both hands
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Sitting down

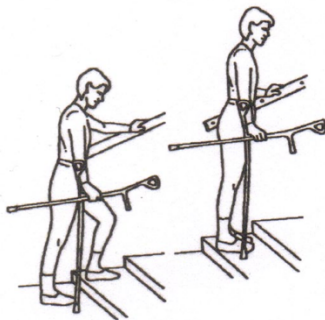
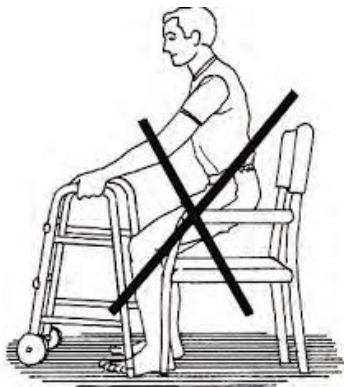
- Stand close enough to feel the chair against the back of your legs.
- Place operated leg out in front of you.
- EITHER let go of the walking frame and reach back to the arms of the chair with both hands OR place both crutches/sticks in one hand and place the other hand on the arm of the chair.

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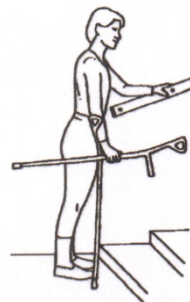
- Gently lower yourself into the chair.

Stairs

- To begin with it is better to go up or down the stairs one step at a time.
- Place the crutches/sticks in one hand and hold onto the rail with the other.
- Going up, you should place the un-operated leg on the step above first, followed by your operated leg and crutch/stick.
- Coming downstairs you should place your operated leg together with your crutch/stick onto the step below first, followed by your un-operated leg last.



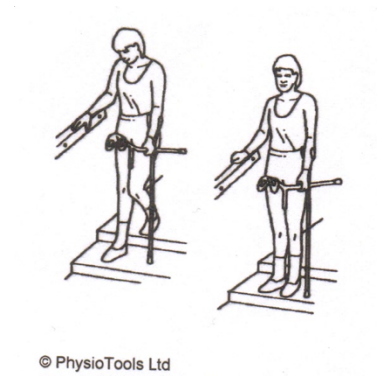
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Kneeling

This can take between 6 and 12 months before it becomes fully comfortable.

- You will not do any harm to the knee replacement by kneeling on it.
- Some people can kneel on the knee within a few weeks of their surgery and some people never find it comfortable to kneel.
- Once the scar is comfortable start by kneeling on a soft surface, i.e. the bed.
- Once you can comfortably kneel try a firmer surface, you may find it beneficial to use a cushion or kneeling pad.

Functional activities

- Avoid jarring and twisting activities, such as pushing a shopping trolley or vacuuming for 6-8 weeks.
- You should avoid having a bath until the wound is fully healed and you can get out of the bath again, this is unlikely to be before 6 weeks.
- If you have a walk in shower you can use immediately as the dressing is shower proof, always take your time and try and hold onto something solid when stepping in and out, or have someone with you. It is advisable to have an anti-slip mat for safety. If a separate shower is unavailable we recommend a strip wash.
- You may find that standing up to strip wash is uncomfortable. It is therefore advisable to sit on a chair or stool at the sink.
- Dressing – you may have problems putting clothes over your operated foot and leg, try dressing your operated leg first and undressing it last. If this is still difficult ask your occupational therapist to demonstrate some dressing aids that may be useful.
- Preparing food and drink – you may find that standing up to prepare food and drinks is uncomfortable. It is advisable to sit on a chair or stool in the kitchen.
- You will return home with walking sticks or crutches and so will find it difficult to carry food and drink from the kitchen therefore it is advisable to organise an area in the kitchen to eat meals.

Before you go home:

Also consider how you are going to manage domestic activities such as shopping, cleaning, putting out the dustbin and feeding pets.

Driving

- Do not drive until you can do an emergency stop. If the left knee is replaced and you have an automatic car you may be able to drive it six weeks. However with the right knee, as this is the leg that uses the brake, this can take two to three months.
- In order to drive you should be relatively pain-free, not be heavily dependent on walking aids, have a good range of movement and your reflexes should be good enough to do an emergency stop.
- Even then you should take it easy to begin with and have a 'test drive' with an experienced driver before you go out on your own.
- You need to contact the DVLA and your insurance company if you are not driving after 3 months of the surgery.

Work

- If you plan to go back to work after your operation, you should check with the surgeon when this would be appropriate.
- If you need a medical certificate for your employer, please ask the nurses before you leave hospital. Further certificates can be obtained from your GP.
- This is usually around 4-8 weeks following your operation if you have a sedentary job. A job that includes more physical activities such as prolonged walking or standing or heavy lifting may require up to 3 months.

Sports/hobbies

- If you wish to return to sport consult your surgeon before doing so.
- Walking and swimming are encouraged but sports which call for jogging or jumping, or contact sports are not.
- Golf –can start playing at 8-12 weeks but start with chipping and putting before playing 9 or 18 holes. Avoid the driving range for up to 3 months as the repetitive twisting can aggravate the knee.
- Gardening is fine but take care with heavier work such as digging. Start very gradually and do not increase the amount of activity until you feel confident and have suffered no adverse symptoms. Invest in a kneeling stool for weeding etc. If you cannot kneel long handled tools will be of benefit.

Travelling

It is not advisable to fly within 6 weeks of having a joint replacement due to the increased risk of developing venous thromboembolism (VTE) – blood clot. Long haul flights should be avoided for 3 months.

Follow-up on discharge

Mr Gupte will review you at 2 weeks and two to three months after discharge, with a final check at 6 months.

Physiotherapy follow-up will be arranged after your 2 week clinic appointment, dependent on circumstances and where you live. As discussed prior to your discharge to maximise the benefit gained from your joint replacement it is advisable to be reviewed by physiotherapy before your 6-week clinic appointment.

Day 0/1

The following exercises need to be done regularly throughout the day to prevent blood clots in the calves or chest infections.

Deep breathing

- Breathe in through the nose.
- Hold for 2-3 seconds.
- Breathe out through the mouth.
- Do 3-4 deep breaths each set with a short rest in between.
- Do 10 -12 deep breaths in total.

Circulatory exercises

- Point and bend your ankles.
- Circle your ankles in both directions.
- Do a minimum of 20 of each exercise.

You should try to do the following exercises ten times each, 3 or 4 times a day.

Static quads

- Sit or lie with your leg straight out in front of you.
- Tense your thigh muscles (quads) by pushing the knee down into the bed, pulling your toes towards you.
- Hold for a slow count of ten.
- Repeat 10 times.

Straight leg raise

- Sit or lie with your leg straight out in front of you.

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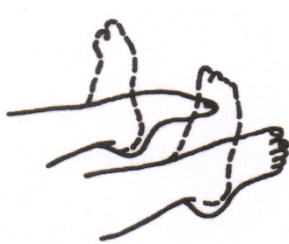
- Tense your thigh muscles (quads) as for exercise 3, then lift your leg approximately 2 inches off the bed.
- Hold for a slow count of 10.
- Repeat 10 times.
- It is essential that you at least attempt this exercise. Even if you are unable to achieve this straight leg raise you will still be working the muscles in your leg.

Static hamstrings

- Sit or lie with your leg straight in front of you.
- Pull your heel into the bed by tightening the muscle at the back of your thigh.
- Hold for a slow count of 10.
- Repeat 10 times.

Static gluts

- Tense your bottom muscles.
- Hold for a count of 10.
- Relax.
- Repeat 10 times.



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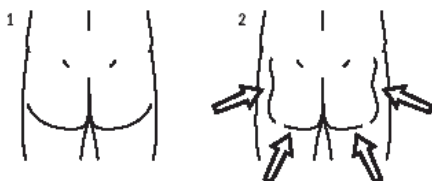
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Knee flexion on the bed

- Sit with your back supported or lie flat.
- Bend your knee up towards you and then slowly lower it back down.
- Repeat 10 times.

Please note. A sliding board can be useful for this exercise.

Ask your physiotherapist if you are finding this exercise difficult. Once at home a tray and talcum powder or a plastic bag will work equally effectively.

Mobilising

- You will also get up today.
- If you do not have adequate knee control you will be able to transfer into the chair only.
- You can begin to mobilise with a frame once you have adequate knee control.

The following exercises can be started as soon as you are able to sit in the chair.

Inner range quads

- Sit supported or lie on the bed.
- Place a rolled up towel wrapped around something solid like a tin under your knee.
- Straighten your knee, lifting your heel off the bed.
- Hold for a slow count of 10.
- Relax and repeat 10 times.

Full range quads

- Sitting on the edge of the bed or in a chair.
- Pull up the toes of the operated leg, tense the muscles at the front of the thigh and straighten the knee.
- Hold for a slow count of 10 then relax.
- Repeat 10 times.

Knee flexion in sitting

- Sitting on the edge of the bed or in a chair.
- With your foot on the floor bend the knee as far as possible.
- Hold for 2-3 seconds then relax.
- Repeat 10 times.

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You can begin to mobilise with a frame once you have adequate knee control. If you don't have adequate knee control by day 3 you will be given a splint which will keep the knee straight and allow you to mobilise.

Once you can mobilise round the ward independently with a frame you will be progressed to crutches or sticks.

Once safe on crutches/sticks and on the stairs you may go home. This can be as early as day 2 or 3 post-op, but everybody is different and some people will take longer to recover.

Once home

The following information and exercises are guidelines only. Everybody is an individual, some of you will find that you meet the targets documented easily and some of you will never achieve them. The same applies to the exercises; some of you will find them easy and others will not be able to manage them particularly the advanced ones. Only do those that you feel comfortable with.

Discharge – 2 weeks

Once home you must continue with the exercises you have been shown in hospital.

Be aware now that you are home you may feel more tired, this is normal and may take a few weeks to go away. You may still need to rest for part of the day.

If you wish you can also try the following exercises:

Assisted knee bend in sitting

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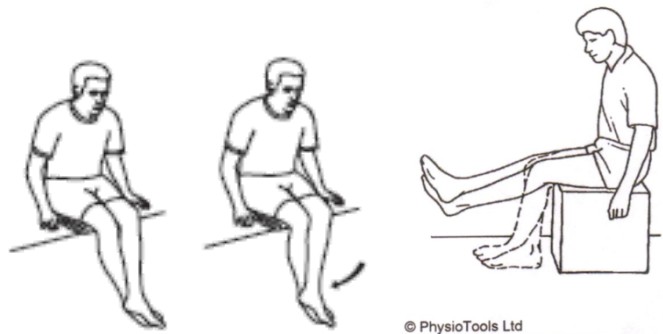
- Sit in a chair, bend the operated leg as far as you can.
- Cross the good leg over the front of the operated leg.
- Give a gentle push with the good leg to increase the bend.
- Hold for 2-3 seconds.
- Relax, repeat 10 times.

Resisted exercises in sitting

- In sitting, cross your legs at the ankle with the operated leg underneath.
- Use the top leg to resist as you straighten your knee.
- Once the knee is straight, swap legs so that your operated leg is

now on top.

- Bend your knee providing resistance with the underneath leg.
- Repeat 10 times.



Using block in front of foot

- Sit in a chair, bend your knee as far as possible.
- Have someone block your foot with theirs or use something solid i.e. bottom stair or wall.
- Gently slide forward in the chair to increase the bend in the knee.
- Hold for 2-3 seconds. Repeat 10 times.

Passive hyperextension

This exercise is very good if your knee does not straighten fully because the muscles behind the knee are too tight.

- Sit in a chair, place the heel of your operated leg on a stool or chair with the knee unsupported.
- Push down gently with you hand on the knee.
- Hold for 10 minutes or as long as tolerated.

Heel raises in standing

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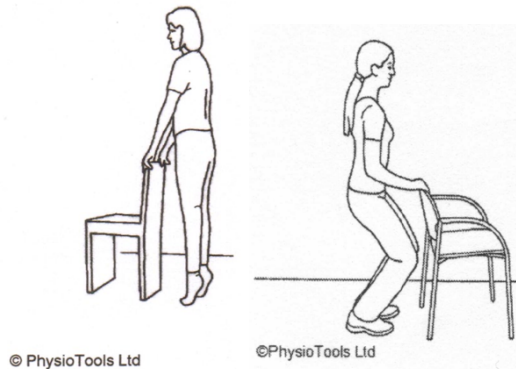
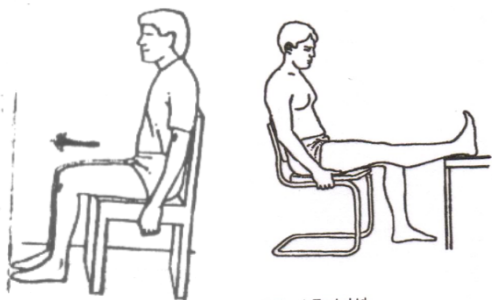
- Standing, holding onto something solid.
- Rise up on your toes, lifting your heels off the ground.
- Relax.
- Repeat 10 times.

Half squats

- Standing, holding onto something solid, bend both knees.
- Go as far as you can comfortably then stand upright again.
- Repeat 10 times.

Knee flexion in standing

- Hold onto a support.
- Bend the knee behind you, lifting the foot off the floor as far as you can.
- Hold for 2-3 seconds then relax.
- Repeat 10 times.



3 weeks post operation

Once the clips have been removed or the wound has healed if glued or sutured you may start to massage the scar if you wish, this will help loosen and soften the scar. Massage the scar with your thumb, making small circular movements along the

incision. Change direction of the circles frequently. Do 10-15 circles in each area, then move about one inch along the scar and repeat.

Use of creams such as body lotion, vitamin E cream, cocoa butter or Bio-oil is purely one of personal choice. They will not harm the scar and will probably make the massage more comfortable.

By the end of week 2 you should be comfortable and confident walking around the house and will probably be using only 1 crutch/stick indoors.

If you haven't mobilised outside the house you should be able to do so now. Start by walking a few minutes in one direction and then back. Keep to sticks or crutches outdoors until you can walk without a limp. Gradually increase the distance you walk each day. When negotiating a kerb place both crutches down first, then the operated leg followed by the non-operated leg. Going up the kerb, put the non-operated leg first followed by the operated leg and then the crutches (the same as you would do for stairs/steps).

The following exercises are designed to help you manage stairs normally. Only do them if you feel confident enough to do so.

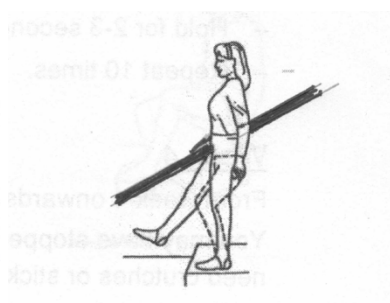
Step ups

- Stand facing the stairs.
- Place your operated leg on the bottom step.
- Hold onto the banister, and try and lift your weight up on the operated leg and place your other foot on the bottom step.
- Lower the good foot back down to the floor.
- Repeat 10 times.

Step downs

- Stand on the bottom step facing down the stairs.
- Hold onto the rail.
- Try and lower your good leg to the floor.
- Straighten up and return foot to the bottom step.
- Repeat 10 times.

You can also try the following exercises:



Foot on step to increase bend

- Use a single step or the bottom stair.
- Place the foot of the operated leg on the stair.
- Hold onto the rail or something solid.
- Keep your other leg straight and lean forward so that your knee bends more.
- Lean forward till you feel a good stretch, hold for 2-3 seconds. Relax.
- Repeat 10 times.

Heel digs

- Lie or sit supported.
- Bend the operated leg up towards you.
- Dig the heel into the bed.
- Hold for 2-3 seconds, relax.
- Repeat 10 times.

Single leg balance

- Hold onto something solid if you need to.
- Put full weight onto the new knee and try and lift your good leg off the floor.
- Hold for 20-30 seconds.
- Repeat 10 times.

Single leg heel raise

- Hold onto something solid if you need to.
- Put all your weight onto the new knee.
- Raise yourself onto your toes, lifting your heel off the ground.
- Hold for 2-3 seconds, relax.
- Repeat 10 times.

Week 4

From week 4 onwards the knee moves more freely and feels less stiff and more normal though pain is likely to persist along the joint line. You may have stopped using crutches or sticks around the house, but will probably still need crutches or sticks outside.

You can now use a static bicycle if you have one. Make sure that the seat is low enough that you can mount comfortably and high enough that you stand the best chance of managing to pedal. First move the pedal forwards or back until the knee cannot bend any further, reverse direction, do this for a few minutes as a warm up.



If after the warm up you still cannot pedal correctly continue with the rocking motion pushing to end of range and holding for a few seconds.
Rock or pedal for 5-10 minutes three times a day.

The following exercises are designed to help improve your balance:

Balancing with feet together

Stand where you can hold onto something solid if needed.

- Place both feet together.
- Slowly let go with one hand, and then as you feel balanced let go with the other.
- Hold for 10-15 seconds, repeat
- 10 times.
- Once you find this exercise easy, do it with your eyes shut.

Balancing one foot in front of the other

- Stand where you can hold onto something solid.
- Place the heel of your TKR leg just in front of the toes of your other leg.
- Slowly let go with one hand, and then the other.
- Hold for 10-15 seconds, repeat 10 times.
- Once you find this exercise easy, do it with your eyes shut. The next exercises will help to increase speed and strength:

Rolling a ball forward and back whilst seated

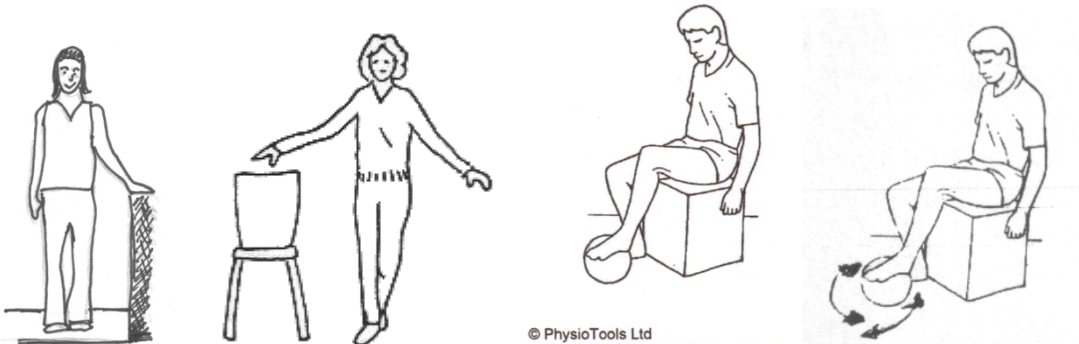
- Sitting in a chair, place a small football or similar sized ball under your TKR foot.
- Start by rolling the ball forward and back for a few minutes as a warm up.
- Next roll the ball back as far as possible, hold for a few seconds, then roll forwards.
- Repeat 10-15 times.

Rolling ball in small circles whilst seated

- Sitting in a chair, place the ball under your TKR foot.

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- Roll the ball clockwise in a small circle ten times, then 10 times in the opposite direction.
- As this exercise becomes easier, make bigger circles.



Squashing ball into the floor

- In sitting, place the ball under your TKR foot.
- Try and squash the ball into the floor.
- Hold for a slow count of 10.
- Repeat 10 times.

Inner thigh strengthening

- Sitting in the chair, place the ball between your knees.
- Squeeze your knees together, to squash the ball as hard as you can.
- Hold for 5-10 seconds, then relax.
- Repeat 10 times.

Rolling ball whilst standing

- Stand on your good leg holding onto something solid.
- With your TKR leg roll the ball sideways and back, and round in circles, both clockwise and anti-clockwise.
- Do 10 in each direction.

If the wound has completely healed, you may start swimming; if you cannot swim or do not feel confident enough to do so you may find the following exercises in water beneficial.

How long you exercise will depend on the temperature of the water and your exercise tolerance. The exercises should be done in water between waist and chest height; the deeper the water, the harder the exercise. You may wish to start in water waist height and then gradually increase the depth.

Marching on the spot

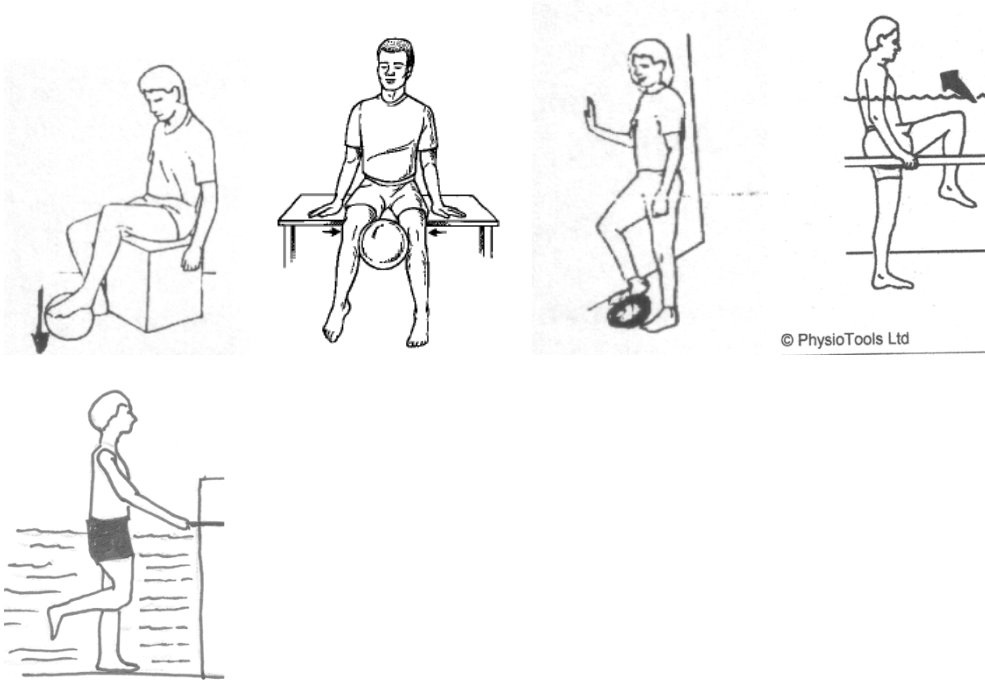
- Stand holding onto the edge if necessary.
- March on the spot, bringing the TKR knee as high as possible.

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- Do this for a few minutes.

Knee flexion in standing

- Stand holding onto the edge if necessary.
- Bend your knee backwards, lifting the foot off the floor.
- Allow the foot to rise as high as possible.
- Hold for a few seconds.
- Relax. Repeat 10 times.



Half squats

- Stand holding onto the edge if necessary.
- Bend both knees.
- Go as far as comfortable, before standing upright.
- Repeat 10 times.
- If you wish to make this exercise more difficult, do it as a single leg squat.

Water walking exercises

- Walking forwards: concentrate on spending equal time on each foot.
- Walking backwards: good for strengthening the muscles at the back of the thigh.
- Walking sideways: take one leg out to the side, then bring the other toward it. Practice leading with both the right and left leg.
- High knee walking: walk forward by lifting your knees as high as you can with each step.
- Lunge walking: walk forward by taking bigger and bigger steps.
- Toe walking: on your toes, walk forward, backwards and sideways.

As you become more confident increasing the speed at which you do the exercise will make it harder.

More advanced exercises include:

- Jumping up and down in the pool.
- Crunch jumps – jumping up and down, but bring your knees to your chest.
- Running on the spot.
- Hopping side to side on both legs.
- Hopping forwards and backwards on both legs.
- Star jumps.

1 month

Continue with the exercises you find most beneficial. It is important to continue some form of exercise to get the most out of your new knee. This can be swimming, walking, or cycling. You may also return to the gym, but it is important to get a personalised program developed by someone who understands the limitations of your new knee.

You should also feel confident and have enough stamina to go around the shops or supermarket, though standing still for any length of time the knee may still feel stiff and uncomfortable. Walking outdoors, we suggest you still

use 2 sticks but if you have no limp and good balance you may use one stick only.

You should be able to return to most daily activities such as cooking and cleaning and if you have a sedentary job you may be able to return to work



1 – 3 months

By now most of the pain is usually gone, though some stiffness and joint line pain may remain. It is important to continue with the exercises until the stiffness has gone and the knee moves freely.

If you wish to progress the exercises this can be done by increasing the number of times you do each exercise, or by placing a small weight, i.e. 1kg, around the ankle.

At your 6-week clinic appointment you should get the go ahead to drive again if you wish to, and may be able to walk without sticks.

3 – 6 months

If you have continued with the balance exercises you should now be able to do them without holding on.

You should be able to do all activities of daily living without restrictions, including climbing stairs normally.

You can continue with the exercises that you find most beneficial but with less intensity. Hopefully you are now able to return to sports such as golf, gentle tennis or badminton. Avoid high impact sports that include running and jumping and contact sports.

If you enjoy activities such as bowls, gardening and dancing you will hopefully find that you are now pain free and strong enough to start these again. Please note some people will still have some joint line pain.

6 months – 1 year

You should now be well enough to continue with your life normally. Please note that joint line pain can persist for up to two years after surgery.

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