Knee Replacement
The Journey

Dr Keith Holt

Knee replacement is a procedure that leads to experiences which are different for each individual concerned. It is not possible to determine exactly how well one person might or might not fare with this, or how long it might take to achieve function that is better than it was pre-operatively, but the aim is to try and optimise each individual’s pathway through the journey. Perhaps the most important determinants are for you to be aware of the process that leads up to your hospital stay, and to be informed about what might happen during your stay. Such information will hopefully remove a lot of the unknowns that give concern, and therefore lead to a smoother recovery.

Pre-operative time-line for Knee Replacement

Date for surgery agreed and surgery booked

Decide upon a support person to help you before and after surgery
Make sure they are available for the date you have booked

Once booked, you will receive a phone call from Hollywood to arrange:
1) a date to attend the pre-admission clinic
2) a date for the group education session which you may like to attend

Prepare your home & organise meals
Hire equipment for your post surgery needs

1 week before surgery - attend pre-admission clinic

The day before admission, Hollywood will ring to confirm or change your admission time for the following day

Admission to day surgery unit (DSU)
Length of stay 3 - 4 days (3 - 5 days for bilateral replacement)
**Overall time-line for Knee Replacement**

**2 days before surgery**
Start to apply nasal cream twice a day

**The day before surgery**
Admission time confirmed by hospital
Have first Chlorhexidine wash

**Day of surgery**
Fast from midnight for morning surgery, from 7.00am for afternoon surgery
Take usual medications with a small amount of water
(note exceptions: - blood thinners, diabetic medications etc.)
Last nasal treatment and Chlorhexidine wash
Admission to hospital – as confirmed by hospital
Usually 6.30am for morning surgery
11.00am for afternoon surgery
Surgery carried out
Hospital stay of 3 - 4 nights, 3 - 5 nights for bilateral replacement

**Day 1**
Urinary catheter removed
Stand out of bed
Commence physio and work on achieving knee flexion

**Day 2 or 3**
Shower
Walk short distances with a frame
Progress to crutches
Aim for knee flexion of 90º or more (more is better)
Walk around the ward with crutches

**Day 3 or 4**
Adductor canal block catheter removed
Block may be topped up prior to removal if necessary
Discharge with home therapy program if flexion is greater than 90º
Discharge to have out-patient physiotherapy if flexion is less than 90º
Discharge medications provided
Further prescriptions to be supplied via the office
(phone in working hours, try not to run out on a weekend)

**At Home**
Do not walk around more than necessary as it increases swelling
Get plenty of rest with the leg(s) up at waist height
Make sure that you can still achieve more than 90º flexion
Organise to see a physiotherapist if flexion range is less than 95º

**Weeks 3 - 6**
Come off crutches, use a stick if necessary

**Week 6**
Review in the office
Gentle pool therapy
Exercise bike for range of motion, but no long walks
Return to driving
Aim to be off all narcotics by 6 - 8 weeks (sooner is better)

**Week 12 / 13**
Review in the office with an x-ray to be done on arrival
Starting to walk 1 - 2 kilometres, usually better than pre-op
Consider golf (usually 9 holes) or similar
The turning point for most, sleeping becomes normal again
Further review to be organised, but only if necessary
**DAILY EVENTS OF YOUR HOSPITAL STAY**

**DAY OF SURGERY**

You will:
- Shower with chlorhexidine wash, and use nasal cream at home before surgery
- Enter the hospital using entrance number 2
- Be admitted to the Day of Surgery Unit (DSU) and prepared for theatre
- Be in surgery for just over 1 hour, 2 hours for a bilateral replacement
- Be in the Recovery room / Post Anaesthetic Care Unit after surgery (1-2 hours)
- Then be transferred to one of the Orthopaedic Wards when ready

Throughout:
- You will be monitored closely by nursing staff
- You will be offered regular pain relief so that you remain comfortable. Don’t try and get by without it.
- You will be able to eat and drink as tolerated

You will:
- Have an IV drip in your arm to provide fluids, antibiotics and, if necessary, pain relief
- Have a small catheter in the upper thigh through which local anaesthetic will be infused by a pump
- Have had an indwelling catheter inserted so that you do not have to get up to empty your bladder
- Expect that you may have a poor nights sleep on this the first night following surgery

**POST OP DAY 1**

You will:
- Have blood taken to check on your haemoglobin, and to ensure that your kidneys are working normally
- Have your urinary catheter removed and commence walking to the toilet
- Have an x-ray taken of your knee - either this day or the next
- Stand out of bed
- Be helped by the physiotherapist to begin the all important task of bending the knee
- Commence muscle exercises which you may practice on your own
- Learn how to use your local anaesthetic pump, begin to understand your pain medication
- Become aware that you will need to get adequate rest periods between therapy sessions

You may:
- Need to alter your pain drugs if there is nausea or sickness - to optimise a regime may take several days
- Need your local anaesthetic (adductor canal) block topping up if it is not working adequately
- Sit out of bed for meals

**POST OP DAY 2**

You will:
- Begin walking short distances around the ward, starting with a frame but advancing to crutches
- Sit out of bed for all meals
- Shower with some assistance
- Learn more about your medication and how to self medicate
- Learn to ask for extra analgesia before therapy sessions and work out how much you need
- Need to ensure that you are taking adequate rests between activities

You may:
- Need your local anaesthetic (adductor canal) block topping up if it is not working adequately
- Dress in comfortable day clothes
POST OP DAY 3 & 4

You will:
- Sit out for all meals and shower independently
- Dress in comfortable day clothes and appropriate footwear
- Progress walking on the ward and go to the physiotherapy gym
- Get instruction on muscle exercises with the physiotherapist
- Ensure you understand, and have a regimen for, your medication
- Have your adductor canal catheter removed - usually day 3 for single knees and day 4 for bilaterals
- Have adductor canal block topped up before removal if needs be
- Complete discharge planning with the team
- Go home with discharge medications if goals are reached

GOALS FOR DISCHARGE

To be checked by ward staff and physiotherapist
- You are comfortable enough to be self catering (within the house, not shopping)
- You can walk with walking aids (usually but not always crutches)
- You can manage stairs if that is needed
- Your wound is dry and clean (minor leakage is usually okay but may need a new clean dressing daily)
- You have reasonably normal bowel function
- You (and ideally your support person) have an understanding of your discharge medications
- You feel you can manage at home

So if you had surgery on Tuesday, you would be looking to go home on Friday / Saturday

For Bilateral Knee replacements:
- If you have reached the above goals you may be able to get home
- Usually this is on day 4 or 5, but can be earlier if you are doing well

So if you had surgery on Tuesday, you would be looking to go home on Saturday / Sunday

Discharge time is before 10.00am - except under exceptional circumstances

REHABILITATION

For the majority:
- Formal rehabilitation in a specialised unit will not be required (and places are hard to get)
- If you are getting over 90° (and preferably 100°) of flexion at home, you may do your own physio
- If you are slipping behind however, or cannot reach the 90° plus mark, then you will need some help

Options are:
- Star Physio, either in the Perth Orthopaedic building or in Mosman Park <www.starphysiowa.com.au>
- Ian Lowther in West Perth or Cottesloe <www.lowtherphysiopod.com.au>
- The Hollywood Functional Rehabilitation unit in Nedlands <www.hfrc.com.au>
- MTM Physio Duncraig <www.mtmphysio.com.au>
- Your local Physiotherapist, or another that Dr Holt may recommend for you.

Transfer to a Rehabilitation Unit:
- This cannot be arranged ahead of time, the beds being under the care of a Physician not Dr Holt
- To qualify, you have to have a medical problem keeping you in hospital past the expected discharge day
- It is not possible to use these facilities just to get extra time in hospital
- A Rehabilitation Physician needs to assess you to make sure that you qualify under Medicare rules
**PRE-SURGERY HYGEINE INSTRUCTIONS**

**Pre-operative Anti-Microbial Treatment**

It is known that the majority of infections that arise in the first few days and weeks after joint replacement are caused by organisms from a patients own skin. One way of decreasing the infection risk therefore, and one that is proven, is to decrease the bacterial load on the skin before surgery. This can be done by using anti-bacterial preparations that treat both the skin and the nose, the latter particularly, often being a source of potentially harmful bacteria.

Having a pre-operative body wash with antiseptic soap, and applying antibiotic nasal ointment or cream, although simple to do, are therefore thought to be important pre-operative measures.

*It is recommended that you have a shower, using a chlorhexidine body wash, on the night before, and on the morning of, the surgery.*

*It is also recommended that you use nasal ointment (or cream) twice a day, beginning at least 2 - 3 days before your operation, and including on the day of surgery.*

---

**Pe-Op Body Wash**

**Chlorhexidine Pre-op Wash 4% - you will need 2 tubes of this**

*This comes as a 50mL tube and you will need 2 tubes.* Although it is obtained from a pharmacy, it does not require a doctor’s prescription. Make sure that you read the information leaflet enclosed, and do not use this product if you have a known reaction to Chlorhexidine. Also, make sure that you do not mix Chlorhexidine with any other chemicals or detergents. If for some reason you cannot use this product, please contact Dr Holt’s office for advice.

Wash with the ‘Pre-op Wash’ the night before, and on the morning of, the day of your surgery (i.e. twice). One tube is to be used for each body wash: Just follow the application instructions below. Importantly, you must ensure that you do not rinse the solution off for a minimum of 1 Minute after it has been applied to an area.

**Instructions for use**

Steps 1 - 8 can be done using the entire contents of 1 tube. For steps 2 - 6, you should aim to use the first half of the tube only. For step 8, you will use the other half.

**Ensure that you do not rinse off the solution from your skin for a minimum of 1 minute after it has been applied.**

Step 1:  Wet your whole face, body and hair in the shower or bath.

Step 2:  Use a small amount of the Pre-Op Wash and wash your hair. Lather well and rinse.

Step 3:  Apply a small amount of undiluted Pre-Op Wash to your face. Avoid your eyes, shutting them tight. Pay particular attention to the nose area, then rinse off.

Step 4:  Work down the neck and arms paying particular attention to the underarm and navel areas. Using a sponge for this may make it easier.

Step 5:  Now cleanse the genital and buttock area, again using the Pre-Op Wash and sponge.

Step 6:  Next, work down the thighs and legs, including your feet.

Step 7:  Rinse your entire body.

Step 8:  Now repeat all of the above using the remaining half of the tube. Focus mainly on the armpits, navel, genital areas, buttocks and anal region.

Step 9:  Thoroughly rinse your entire body.

Step 10:  Dry your self with a freshly laundered (clean) towel, then dress in freshly laundered (clean) clothes.

*Derived from Perrigo Australia - Information for Use - www.perrigo.com.au*
PRE-SURGICAL HYGEINE INSTRUCTIONS

Pre-Op Nasal Ointments
2% Mupirocin (Bactroban) Nasal Ointment OR Nasalate Cream

There are two product options for treatment. Both can be purchased from a pharmacy but you may need to check with your local pharmacy to confirm that they have one or other product in stock.

These options are:

1) 2% Mupirocin (Bactroban) Nasal Ointment: which requires a doctor’s prescription. This can be provided by Dr Holt either at the time of booking your surgery, or later, by phoning his office.

2) Nasalate™: purchased over-the-counter and does not require a doctor’s prescription.

2% Mupirocin (Bactroban) Nasal Ointment

Mupirocin nasal ointment is an antibiotic which can be used to remove bacteria from inside your nose prior to surgery.

Instructions for use

Please read the information leaflet enclosed with the 2% Mupirocin (Bactroban) Nasal Ointment. Note that 2% Mupirocin (Bactroban) Nasal Ointment is for use in your nose only.

Step 1: Wash your hands before and after applying the nasal ointment.
Step 2: Apply a ‘double match head’ amount into each nostril using your little finger.
Step 3: Massage the sides of your nostrils together so that the ointment is spread within your nose.
Step 4: Perform this twice a day (morning and night) starting 3 – 5 days prior to your operation. Include an application of the ointment in the morning on the day of the operation.

Discontinue using if burning, irritation or soreness is experienced.

Nasalate™ Cream

Nasalate™ is a cream containing chlorhexidine and phenylephrine hydrochloride used for care of nasal mucosa. It is an anti-bacterial cream, but not an antibiotic. For most people this is adequate, though bactroban is preferred.

Instructions for use

Please read the information leaflet enclosed with the Nasalate™ Nasal Ointment. Note that Nasalate™ Ointment is for use in your nose only.

Step 1: Wash your hands before and after applying the nasal ointment.
Step 2: Apply a ‘double match head’ amount into each nostril using your little finger.
Step 3: Massage the sides of your nostrils together so that the ointment is spread within your nose.
Step 4: Perform this twice a day (morning and night) starting 3 – 5 days prior to your operation. Include an application of the ointment in the morning on the day of the operation.

Discontinue using if burning, irritation or soreness is experienced.

All queries regarding this instruction sheet or to the obtaining any of the pre-surgery antimicrobial treatments should be directed to Dr Holt’s office.
HOME PREPARATION DETAILS

Contact
Once a date for your knee surgery has been agreed on, the hospital will be made aware. Following this, the pre-admission nurse will ring you for a telephone assessment. She will be able set a date both for your pre-operative clinic appointment, and for your attendance at one of the group education sessions.

Booking into the Hospital
In order to facilitate your admission, the hospital needs to make up your file ahead of time. To do this, your information should (if possible) be provided to them at least 1 - 2 days before your admission, but earlier is better. For knee replacement, we suggest doing this as early as possible so that clinics can be organised. That is, by preference, a couple of weeks ahead at least.

Everything that you need to do this can be found on the hospital website under 'patient information' (click on the link listed below). Before accessing this site, please make sure that you have the following information to hand:

- health fund membership details
- medicare card
- DVA card (if applicable)
- pension card (if applicable)
- pharmaceutical card (if applicable)
- a list of all medications that you take

For info, go to: www.hollywood.ramsayhealth.com.au/For-Patients/patient-information.aspx, or

To book in: www.hollywoodprivatehospital.com.au and click on Book your admission (on the lower left of the page)

If you are unable to use the internet, you may book in by calling the bookings staff at the hospital between 8.00am and 4.30pm on business days, on the following number:

(+61) (08) 93466456 - Please allow 30 minutes for this

If you book in on-line, you will be given a booking reference and a booking password which you may save for future use. This will then facilitate any further admissions to the hospital that you may have. Be aware that the passwords are case sensitive.

Your Support Person
Where possible, it is important to organise a support person. This could be a partner, a family member, or a close friend, who can help you through your journey. A support person can help you organise your home, be with you after surgery, and help you collecting and administering your medication. It is important to make sure that their availability coincides with your surgery date. If it does not, then consider ringing Dr Holt's office to change your surgery date to a more appropriate time.

A support person does not necessarily have to live with you, but it is helpful if they can telephone you daily to check on how you are managing, help you with shopping, and drive you to your follow up appointments. Remember that a support person is there to be a guide and a help. They are not meant to take over your life for you.

Home set-up
When possible, it is important to set up your home before your surgery. This will allow you to easily, and safely, move around your home with a walking aid after surgery, thus reducing the risk of falls or injury. You may like to ask your support person to assist you in making the following preparations before you come into hospital:

Heavy cleaning tasks will be difficult for the first few weeks. If you do not have a support person who can assist, consider organising a cleaning service

Removing mats from the floor to ensure that halls are unobstructed. Likewise, check that pathways are not obstructed or broken. If you are unable to address these issues in time, try to avoid these areas completely

Rearrange furniture to give yourself enough room to manoeuvre with walking aids. Move your bed downstairs etc.

Stock up on pre-cooked meals, or freeze individual meals, to cover the first 1-2 weeks after discharge. Consider organising a delivery of groceries with your local supermarket, or use an on-line service such as: https://shop.coles.com.au

If you normally drive, you will need to make arrangements to cater for your transport needs as you will be unable to drive for the first 6 weeks.

Arrange for any other assistance you feel you may need from family or friends for the first 1-2 weeks after discharge. If you live alone, we recommend receiving at least a once daily telephone call to ensure that you are okay. You may also need some help with vacuuming, laundry, etc. In addition, if there is a potential for a fall, and particularly if you live alone, then you may wish to look into arranging a pendant alarm.

If you have any concerns regarding whether your home or furniture will need adjustment, please speak with the occupational therapist at the education class. It is important to start looking at your home environment early on, and to consider things like:

Bed location and floor level are important. If your bed is upstairs, you may like to consider moving it downstairs for a few weeks. If your bed is very low or very high, you may wish to adjust it and test it before surgery. Make sure that you able to get out of bed on the same side that you are having the surgery on as this makes this task much easier. It is also how you will be taught.

Chair: Get a good chair - one that is firm, has armrests, and a seat high enough to allow you to stand up with ease. You may need to purchase or hire one. (Please refer to the purchase/hiring information below)

Access to Shower/Bath: Do you have a high step into the shower or a shower over the bath? If so, you may want to consider fitting some rails in the shower and/or hiring an adjustable shower chair (please see equipment hire list).
**Access Outside Home:** Do you have steps anywhere around your home that you cannot avoid? Consider things such as uneven paths, inconsistent surfaces and slopes. Think about how you are going to get into your home safely after discharge.

Whilst in hospital, the Physiotherapists can teach you how to manage stairs safely so, if you need to learn this, make sure you let them know.

**If you have any concerns** regarding whether or not your home furniture is suitable, or if you think it needs adjustment, please speak to the Occupational Therapist at the education class.

**Purchasing and/or Hiring Necessary Equipment**
During the first few weeks after your knee surgery, you will experience limitations with some of your daily activities. The pictures on the following pages demonstrate examples of equipment that you may need to assist you once you are back in your home. The Occupational Therapist at Hollywood Private Hospital will discuss your individual equipment needs at the education class.

If you have private health insurance, please arrange for hire/purchase of your equipment prior to your admission. If you are a DVA funded patient, please do not hire or purchase any equipment until you have spoken to the Occupational Therapist.

**Getting to Hollywood**
You will need to be driven to hospital, you cannot drive yourself. Public transport may be possible. Taxi or ride sharing is fine. Please make sure however, that whichever way you choose to get there, that you arrive on time. If you are late your surgery may be cancelled.

If you are running late due to unforeseen circumstances such as bad traffic flow, accidents on the road etc., please ring the hospital directly (93466000) and speak to the area manager or to the admissions ward. If we are notified early enough, we may be able to change the order of the list. As such changes cause delays however, late notification may lead to inadequate time being available at the end of the adjusted list to do your surgery. In this case, it will have to be re-booked. This can be done via Dr Holt’s secretaries at his office.

**Parking at Hollywood**
Entrance 2 - Monash Avenue
*This provides access to Hollywood Private Hospital’s main reception. It is also the entrance for all admissions.*

**Please Note:** Drop off and short term parking is only available for 2 hours. If you intend to park for longer than 2 hours, please use the Multi Storey Car Park via Entrance 5.

**Visitor parking** is also available at the following campus locations:
Entrance 5: Surrounding the Hollywood Medical Centre building (off Monash Avenue)
Entrance 5: Adjacent to The Hollywood Clinic
Entrance 6: Outside what used to be the Hollywood Functional Rehabilitation Unit (off Verdun Street)
Entrance 7: Near the Lawrence McCarthy ward (off Verdun Street).

Note that all on-campus visitor parking is pay parking.
ESSENTIAL EQUIPMENT

Forearm Crutches

You will use forearm crutches in hospital so please bring them in with you. Generally it is cheaper to buy these (and then perhaps sell them afterwards if needs be) than to hire them. Most chemists can supply them but the hospital does not.

Ideally, it is a good idea to get these early on and practise with them before coming in for your surgery. If you don’t feel confident with practising on your own, then it may be worth getting help from a physiotherapist.

Appropriate Seating

It is necessary to have a chair with a firm seat, armrests, and reasonable height, to enable you to stand up with ease. If the legs are too short, you will not be able to stand up easily. If the legs are too long, you will not be able to reach the floor, and hence, you will have trouble achieving good flexion. Similarly, you will have trouble using a skate board (or similar) properly.

An Over the Toilet Frame

This will enable you to stand up off the toilet easily. It will also help you turn to sit and so on. Some are height adjustable. If your toilet is the correct height then you may only need the rails and not the seat.

Shower Stool / Chair

If you experience difficulty standing to shower and/or dress after your operation then you may need to hire or purchase a chair similar to one of those shown. Alternatively, if you have someone to help you move it, you can use the toilet chair.

Note that a stool is not really good enough because it does not have arms that you can use to get on and off it.
### OPTIONAL EQUIPMENT

#### A Long Handled Washer
You may need some other long handled aids to help you shower and dress. For example, a back scrubber to sponge and to wash.

#### A Pick Up Reacher
This will help you pick up items off the floor

#### A Soap Bag
Retrieving dropped soap can be difficult, so a soap bag may prove useful. One way of making one is to use a stocking. Tie the soap in at one end, then tie off the other end to the tap or shower head. The soap can then be lathered through the stocking.

#### A Long Handled Shoe Horn
This is to assist with putting your shoes on.

#### A Sock Aid and Dressing Stick
The former to enable you too put your stockings or socks on, the latter to help get them off, and to help you dress.

#### A Skate Board or Similar
One of the best, and cheapest, devices comes from Bunnings (and perhaps other similar outlets), where it is sold as a ‘Round Dolly’ for moving plants. It has the advantage of being big enough for both feet to be placed onto it, allowing one leg to drive the other.
**Pre-Operative Tests**

In order to proceed with your surgery various tests need to be performed. We need blood tests to make sure that your haemoglobin level is adequate (full blood count), and to make sure that your kidney function is good (urea and electrolytes). The full blood count will tell us about your haemoglobin, but it will also give us information about your red blood cells. Hence, if you are a little bit anaemic, we can see if this might be due to iron deficiency or other factors. These can then be investigated ahead of time, and hence treated. In particular, if you are iron deficient, your chance of being significantly anaemic post surgery is increased: but treatment by iron infusion (or injection) will significantly improve that situation.

Knowing your kidney function will help us determine how easily you will excrete the drugs that you will be given for your anaesthetic. This in turn will dictate not only the dose of those drugs, but the frequency that they can given. In some instances, the liver is responsible for metabolising those drugs. Whilst liver function test are not a part of a standard work up, they can be included if there is any suggestion that there may be an abnormality.

We also need an ECG which will act as a baseline against which any changes can be compared. It is sometimes the case that the heart changes into an unusual rhythm post surgery, often relating to a lowered haemoglobin. This is rarely of any concern from a function point of view, but some of these rhythms do need treatment. To that end, it is helpful to know what your pre-surgery rhythm was.

Imaging studies are very important and, of course, everyone who has been booked for this procedure will have had some done. Of most use from a surgical standpoint are the plain x-rays, and mostly these will have been done. Occasionally the procedure will be done based solely on an MRI or a CT, but this is unusual. Either way, these studies need to be available. If you have a hard copy of the pictures then these should be brought in. If not, then try and remember which radiology group did the pictures just in case this hasn’t been noted in your file. Unfortunately, we are unable to access the pictures from all radiology providers, and we cannot search through all of the different ones looking for studies that may have been done. If the studies have been done through one of the two big providers (SKG or PRC) we will search for them, but we will not search through all of the smaller ones.

As a routine we will not test for coagulation problems. If there is any suggestion that you have a problem with clotting that has not been investigated, then we need to know this so that the relevant blood tests can be done. Many disorders of clotting can now be treated, so it is important to identify these ahead of time so that the relevant treatment can be instigated.

The opposite to a bleeding problem is a risk of developing a DVT (deep vein thrombosis) or a PE (pulmonary embolus). If you are at risk for this, noted by prior history or family history, then this needs to be mentioned. If the risk is not delineated, then tests can be done to try and identify any relevant factors. These in turn will then dictate the extra level (over and above normal) of prophylaxis to be provided.

**Consultation with the Anaesthetist**

Every Anaesthetist is different in terms of whether he wants to see you in his office prior to surgery or not. Either way, if there is any doubt about your fitness for anaesthesia, a consultation with the anaesthetist will be made for you. For those who are deemed fit however, the Anaesthetist will often just see you in hospital on the morning of surgery.

**The Pre-Operative Clinic**

Hollywood hospital provides a pre-operative clinic service where all of the above tests can be performed. Where practicable therefore, it is helpful to get to that clinic.

In addition to the tests, they will also run through the admission process, and they will discuss what is going to happen, pre-, during, and post- surgery. This will include such things as instructions on bowel and skin preparation.

If you are a country patient, then it may not be possible to get to this clinic, but for all others, it is preferable to attend. To that end, Hollywood hospital will ring you prior to the surgery to make an appointment for this. In general, this is held about a week before surgery.

When you go to the pre-admission clinic, it is important to bring in all your medications: prescription, non-prescription, and over the counter ones, preferably in their original labeled boxes, so that these can be checked and recorded. You should also consider bringing your support person, someone who can help you following your surgery. This will serve to help you remember things afterwards, and will provide some general support for you.

**The Group Education Session**

At the same time as the above is organised, Hollywood will also arrange an appointment to come to the Group Education Session. In the time period before your surgery you are encouraged to attend this session which will help educate you in regards to the process of admission, the surgery, and the recovery. For many, this is an opportunity to ask any, thus far unanswered, questions. It is also a time when you might get answers to questions that you haven’t yet thought about. Most find this to be a very worthwhile session, and Dr Holt recommends attendance.

Among the things that this session will discuss, are the things you can do to prepare for your time at home post surgery. This will include organising meals and hiring equipment for the home.

**Admission Time**

The day prior to surgery, the hospital will ring you to advise a time to come in for your surgery. Usually this will be at 06.30 on the day of surgery and, if you have not heard differently, you should come in then. The Anaesthetist will then see you at about 07.00 for a (final) review before the surgery.

Admission will be to the Day Surgery Unit, and it is from there that you will be taken to the theatre. After your surgery, you will be taken to the recovery room, and then to one of the Orthopaedic Wards. Length of stay is usually 4 - 5 days (6 - 7 for bilateral knee replacement).
A pre-operative exercise program has some merits, but it is limited. It is certainly not essential to a good recovery and there is no point in doing this if it is just going to make the knee sore. On the other hand, it does help to be a little bit fitter and stronger before your surgery so, if you can manage this without stirring the knee up too much, it may be worthwhile.

If you are wanting to have a program made up, and to have it supervised, then this can be organised for you. There are many therapists who can help with this, and Dr Holt may be able to help you choose one of these. A short list of providers used by Dr Holt is at the end of this chapter.

Other non-aggravational activities you may like to entertain are: walking in water, swimming with a kick-board and flippers, exercise bike riding, and cross training.

Crutches are needed post surgery, even if it is only for 2 or 3 weeks. Often one of the limiting factors to leaving the hospital is the inability to transition from a walking frame to crutches. Crutches will need to be hired or purchased prior to surgery. If picked up prior to surgery, you will have an opportunity to practice on them pre-operatively; with help from a physio if needs be. Such practice will go a long way towards making the transition to crutches easier post surgery.

Medications that may need to be stopped include all those that make you bleed more. These include aspirin, plavix, iscover, warfaren, rivaroxaban, apixaban, dabigatran etc. and a full account of those is detailed elsewhere. Importantly however, anyone taking regular fish or kail oils, also needs to stop them. These oils seem to act a bit like warfaren and can make people significantly anti-coagulated. It is therefore important that the body has at least a week to recover after cessation of these. In that time, normal clotting ability should be restored.

Where there is a need to remain anti-coagulated, these medications will be adjusted by Dr Holt, if necessary in conjunction with your cardiologist or your Haematologist. For instance, if you have a stent in your heart, you will need to stay on aspirin, but plavix, iscover, or similar must be stopped. Similarly, if you have had a TIA or a stroke, you will need to be on a physio if needs be and perhaps low dose cloxane.

A prior DVT will usually be well covered by the standard anti-coagulation that is prescribed. A prior PE on the other hand, can only be prevented by full anti-coagulation, and because of the risks associated with this, individual programs will be made on an ‘as needs’ basis. Similarly, this applies for those with artificial heart valves etc.

Diabetic medication usually needs adjustment. If you are on tablets only, then they are normally missed out on the morning of the procedure - given that you will be fasting. For insulin dependent diabetics, the usual rule is to use half of the normal morning dose of insulin on the day of surgery. To check this, it is better to find out who your anaesthetist will be, and to contact him for advice. He will then adjust the dose as required.

If you have an insulin pump, then you will need to contact the anaesthetist prior to surgery to discuss this, he will give you instructions on how to adjust this as needs be.

Medications that may need to be continued include all of your every day drugs for blood pressure and so forth. These can be taken on the day of surgery if taken early with a small glass of water. Do not take them with food or milk as this may lead to your surgery being delayed or canceled.

If you have sleep apnoea and have a CPAP machine, please bring it in so that it can be used after your surgery. This is particularly helpful in the recovery room whilst you are waking up.

If you have a lap band make sure that it does not need deflating before the surgery. Your general surgeon who looks after this can advise you on this and either he, or the anaesthetist, can deflate this if needs be. It can then be re-inflated at some stage after surgery.

If you have a pacemaker we need to know what type (defibrillating or not), and who your cardiologist is, just in case we need to adjust it or temporarily turn it off.

Other Important things you can do

- Consult your G.P. if you have any health issues that may need to be managed prior to your surgery.
- Ensure that your teeth and gums are free from infection prior to surgery.
- Ensure that any dental work is completed well before your surgery.
- Plan a nutritious diet and try to keep your weight down. See a nutritionist if needs be.
- Make sure that your bowel movements are soft and regular, as constipation is a major post operative complaint due to all the pain killing medication that you may need to take.
- You will be started on a bowel regime at your pre-admission appointment but if needs be you can get your pharmacist to help with this beforehand.
- Avoid any damage or abrasion to your skin from gardening. This can easily get infected and, if this happens, your surgery will be cancelled until the infection is clear.
- Beware of tinea in the groin, under breasts, or between the toes. Whilst this is fungal, the damaged skin can be secondarily colonised by bacteria. Over the counter medication can cure the tinea, just ask your pharmacist or G.P. for advice. It may take a while to fully settle, so get onto this early.
- Ensure that any podiatry work is completed well before your surgery.
- Notify the surgeon if you develop a cold or flu in the week before your scheduled surgery. Although this is viral, a type of infection that won’t spread to your knee, it can affect your breathing and your larynx, hence making your anaesthetic unsafe. If necessary, Dr Holt can arrange for you to discuss this with your anaesthetist.
COMING INTO HOSPITAL

Hospital Admission Time & Length of Stay

Dr Holt's office will give you instructions on the admission time that is expected. Sometimes however, the hospital will ring you to update that time, usually to make it slightly later, but occasionally to make it earlier. One way or the other, you will be informed of any updates to your admission time.

In general, your admission will be the same day as your procedure. The way hospitals are funded nowadays, is such that they cannot afford to have admissions the night before the procedure. Essentially, hospitals are given a lump sum to manage your surgery. This means a fixed number of days of funding, plus theatre fees, prosthetic fees, and so on. This means 3 - 4 nights for a single knee replacement and 4 - 5 nights for a bilateral replacement. Hence, if you come into hospital a day early, then you have to leave a day early to be within your funding limit. After that, the hospital has to pick up the tab for any extra time spent as an in-patient. The health funds will not continue to fund admissions that exceed their particular time frames.

It is important to note that, if you ring your fund and they say that you can stay in hospital longer, then this is not at their expense. Hence, such approval does not mean that there will be any more funding available from the fund, or that the hospital will be paid extra. After their lump sum has been exhausted, their obligation to you is gone: such is the nature of this system (Otherwise known as DRG’s - Diagnostic Related Groups)

The exception to the above is for country patients who have nowhere to stay in Perth. In this situation, the hospital will sometimes agree to allow earlier admission, but they do this at their own cost, not that of the fund. Hence, this facility is only used when absolutely necessary, and it is at the hospitals discretion - they have to agree to it.

The other exception is when there have been supervening post-operative medical issues that need on-going medical treatment as an inpatient. In this situation, you can be transferred from Dr Holt’s care to that of a Physician which, in some cases, may be in the rehabilitation ward. It is to be noted however, that the rehabilitation ward is primarily for on-going medical care and not on-going Orthopaedic care. It cannot be booked ahead of time, and each patient must be seen by a physician, and be approved for further care, before being accepted. If you are relatively fit, and do not have a persisting medical problem that requires in-patient management, then you will probably not qualify for this limited resource. Such decisions are made on the ward by a rehabilitation physician during the recovery phase. They cannot be made before then, and certainly not prior to admission.

What to bring into hospital

1. All medications, both prescription and non prescription, preferably in their original boxes, with labels showing dose regimes. If you have all your tablets in unlabeled dose packs, you will need to bring in an itemised list showing dose and frequency of each tablet. Include Bactroban nasal cream if supplied.

2. All X-rays. For the major providers these can be obtained on line at the time of surgery. They can only be found however, if we know which radiology group did them (SKG, PRC, Insight, Envision, Global, Great Southern, etc.). Where possible we try to note down all provider ID information when you are seen in the office, however, this information may be incomplete, especially if new films have been ordered in preparation for surgery.

It is not practicable for us to go through and search every Radiology Group’s server, and for those groups who are not on the PACS system, we may not be able to get the films on-line at all. It is important therefore, that if you have films or a CD from one of those latter groups, that you bring those in. If you have had imaging done by one of the big groups, it is helpful if you can remember which ones, just in case we have trouble getting them on line.

Note that if you are bringing films or CDs in, and you have both plain X-rays and an MRI or CT, the plain X-ray is the most important for this procedure; so make sure that this comes in with you. Do not leave a plain X-ray at home thinking that an MRI or CT is better.

3. All your personal aids - marked with your name
   - crutches, frame, gofer, sticks etc.
   - long handled shoe horn, if you have one
   - dressing stick and pickup reacher if you have them

4. CPAP machine if you have one

5. Pyjamas, night gowns - Preferably short and loose fitting

6. Dressing gown. Note that a short sleeve one makes using elbow crutches easier.

7. Comfortable casual day clothes including underwear, and comfortable shoes or slippers (but not scuffs or tight footwear as your feet will swell a little post surgery). Although you will be dressing daily, try to bring only a minimal amount of clothes in a small bag or case.

8. All toiletries
   - soap, deodorant and sanitary items
   - toothbrush and toothpaste
   - shampoo and conditioner
   - comb or brush
   - razor, shaving cream etc.

9. Mobile phone, iPod, iPad etc., charger and headphones

10. Laptop computer and charger if you want to use this

11. Books or other reading matter

12. Information cards including:
   - health fund membership details
   - medicare card
   - DVA card (if applicable)
   - pension card (if applicable)
   - pharmaceutical card (if applicable)

13. This information brochure

14. DO NOT BRING JEWELLERY, LARGE SUMS OF MONEY, OR OTHER VALUABLES - all of which will be your responsibility, not the hospital’s, to look after.
Preparing For Theatre

The morning of surgery. You will need to shower, using the body wash that has been provided to you. In addition you should use the Bactroban or Nasalate nasal cream in your nose. This is important as it significantly reduces the numbers of bacteria on your skin and in the nasal region: the bacteria normally carried in these areas being the most common source of any infections that may occur post surgery.

Makeup or nail polish should be avoided, and any residual should be removed prior to admission. Consider taking nail polish off the night before.

Preparing for theatre. The nursing staff will dress you in an appropriate gown and hat. The latter is to hide the hair which can also be a site of infection. Usually the hat will be blue, but if you have an allergy, it will be red so as to alert the theatre staff and Anaesthetist.

You will also be asked to remove any jewellery, so the less you wear the better. This gives you the best chance that it will not be lost or misplaced. In general, you may still wear rings but they will be covered with tape to make sure that they do not come off, and are not taken off. Again, the less rings you wear the better.

You will be asked a number of times which knee you are having done and which knee it is.

Knee preparation. Prior to going to theatre, your knee will be inspected to make sure that there are no cuts or abrasions on it. If the knee needs to be shaved, then one of the orderlies will be around to do that for you. Usually this is done with clippers rather than with a razor.

In addition, you will be given a marking pen to put an arrow on the limb to be operated on. This should be placed in an area that will be visible after the sterile drapes have been placed on your leg, but should not be on the front of the knee area itself where the incision will be. The nurses will help you with the sighting of this.

Pre-medication is not generally given. While this was once always the case, we now know that this is sometimes the cause of nausea. Accordingly, it is now used sparingly: and mostly it just consists of a sedative which is given to calm any nerves.

When the time comes the theatre orderly will come and get you, usually transferring you to the theatre area on your bed. You will first go to the pre-operative area where everything will be checked. Again you will be asked your name, what you are having done and which knee it is.

The Theatre will be cold because the operating team will be in space suits which are quite hot to wear. They will give you a warm blanket but, if it is not enough, ask for another.

To help combat this during the procedure, the anaesthetists will cover you in a warming device known as a ‘Huggie’ (or similar). This is a special, hollow, paper sheet through which hot air is constantly circulated. It is usually applied after the anaesthetic has begun, so you may not be aware of this happening. It is however, very effective.

The theatre table is both hard and narrow. There are good reasons for this of course, but just remember to stay well centred.

Yet again, when you actually get into the theatre itself, you will be asked your name, which knee is being operated on, whether the knee have an identifying mark on it, and what procedure is being undertaken. This will be the final check.

Keeping everyone informed. It is best to have one support person contact the ward to see where you are, and to find out what is happening. The ward can usually give you a reasonable estimate of your expected time of return. They will usually know if there has been any delays in theatre or elsewhere. In general, you can expect to be out of the ward for approximately 4 hours.

From a logistics point of view, it is better that the chosen support person then be the contact for all other similar inquiries, thus not overburdening the ward staff who may be looking after 10 or more other patients having theatre that day. This plan means less waiting time on the phone for friends and relatives, and less time away from their patients for the ward staff.

The Anaesthetic

The most common anaesthetic is a general anaesthetic where the anaesthetist will put you to sleep for about an hour; two hours for a bilateral replacement. Sometimes a spinal or epidural anaesthetic is used, but much less so now than previously. Even so, these are more usually used for post operative pain management rather than as a solitary anaesthetic. This means that even if you have one of these, it is highly likely that you will get either significant sedation, or a general anaesthetic, as well. An exception to this would be where there is some conflicting medical problem (such as Alzheimer’s disease) which may be aggravated by a general anaesthetic, in which case just light adjunctive sedation may be used. Whatever the Anaesthetist chooses for you however, he will ensure that you are not aware of what is happening during the procedure.

The anaesthetic process. The first thing the Anaesthetist usually does is to insert a small cannula into a vein - usually in the hand or arm. Through this he will be able to give you the pre-operative antibiotics, some preparatory pain medication and some dexamethasone: the latter being a corticosteroid that is used to decrease pain, swelling and inflammation. These drugs are given first so that they circulate to the knee in time to saturate the local tissues ready for surgery.

Once the above has been done, the Anaesthetic Nurse will provide you with some oxygen to breathe. This is just oxygen and does not contain any anaesthetic agents. The aim of this is to bring the body reserve of oxygen up, ready for the anaesthetic.

The actual anaesthetic then begins. An induction agent (usually propofol) is injected into the drip that has been inserted into your hand or arm. This agent can cause some ache as it goes in, so it is generally administered with some
local anaesthetic to try and help that. It works quickly, and induces a pleasant feeling sleep (unlike some of the older drugs). However, the intravenous induction agent does not last very long so, as soon as it starts to work, a gaseous agent is added to the oxygen. This is then used for the majority of the procedure.

After induction an indwelling urinary catheter is inserted. This is done by Dr Holt, his regular assistant or the assisting nurse. This has a number of purposes. Importantly, it means that you will not have to get out of bed to go to the toilet for a day or two after surgery. In addition, it allows the nursing staff to monitor fluid input and output over the first day or so until things have stabilised. Finally, it prevents over-distension of the bladder which can be a problem when strong analgesics are used.

Once the urinary catheter has been inserted, the Anaesthetist will insert a small cannula into the upper thigh, to create a so called ‘adductor canal’ block. This is placed such that the end of the catheter is right next to the Saphenous Nerve in the adductor canal: a space in the thigh, between the muscles, through which the main artery and veins of the leg also pass. This is something that Dr Holt started to use some years ago to try and decrease post operative pain, and it has proven to be the most significant improvement in post-operative pain management since the inception of knee replacement. Not only can local anaesthetic be continuously infused by a pump, the block can be topped up with more concentrated local anaesthetic if needs be.

Generally this block is used for 3 - 4 days, significantly reducing the need for narcotic analgesics. In order to keep an eye on this, one (or more) of the specialist nurses from the ‘Acute Pain Service’ (APS) comes around every Orthopaedic Ward during the day. These nurses can top up the block. In addition, the Anaesthetist who is part of the APS will often come around with them to review the effectiveness of the block. If for some reason the block is not working as well as expected, or if the cannula has moved from where it was put, then he can re-site the cannula; something that is done in the ward under ultrasound control.

During the procedure the Anaesthetist will monitor your heart, blood pressure, ECG, brain activity, gas inflow concentration and gas outflow: anaesthetic machines now being able to discriminate between, and identify, each of the individual gases that may be used. Such monitoring is now very sophisticated, and provides immediate feedback of any discrepancies or problems. In the hands of a good anaesthetist therefore, anaesthesia can be regarded as extremely safe.

The Surgical Procedure

Preparation. A tourniquet, which allows blood to be squeezed out of the leg for the actual surgery, is usually applied to the upper thigh. Nowadays, this is usually inflated just for the first 5 minutes of the case, allowing the knee to be opened without too much bleeding. After that, it will be let down so that ‘tourniquet related’ thigh pain will not be induced. This does create slightly more blood loss but has been shown to lead to less post-operative pain and earlier discharge from hospital. If for some reason the blood supply is precarious (e.g., arterial disease in a diabetic or in a smoker), then it is not inflated at all.

Prior to the actual commencement of the procedure, the leg is washed twice with a chlorhexidine and alcohol solution. This is dyed a magenta colour so that the prepared area can be seen. This in turn leaves a pink leg which may take a few washes to remove. The double wash however, reduces the residual level of skin bacteria (mostly staph.) by over 99%: and this is important as the skin is the source of most subsequent infections.

Further measures taken during the procedure, including the use of space suits (to keep staff skin bacteria isolated from the wound) and special air conditioning (the so called ‘laminar flow’ system using highly filtered clean air), should then reduce the acute, deep, infection rate to around 0.1% (1 in 1000) or less. New UV light sterilisation of the theatres will also decrease the bacterial content of the operating room, and hence should also decrease risk.

The Surgery is carried out after the application of the sterile drapes. These are largely made of impervious paper. Some of them are stuck to the leg to prevent fluid tracking down past the prepared area, others have rubber dams to seal off the leg. These provide an isolated, water proof, sealed off, area in which to operate.

The procedure of knee replacement is well established and the instruments are reliable and accurate. The surgery is carried out using computer navigation (with or without robotic assistance) to optimize alignment correction, and any mal-alignment of the leg will be corrected to within two or three degrees of normal (or to where is thought to be optimal).
sets hard in 12 minutes. This means that the prosthesis is permanently attached to the bones even before the wound is closed. It cannot come loose and, for this reason, it can be stood on and used straight away. The limiting factor is not the prosthesis itself but rather the soft tissues which have to be sewn back together. This is done in 3 layers, with the deep sutures taking around 4 months to fully dissolve. This latter fact means that the sutures can pull against the soft tissues for that length of time: hence contributing to the length of recovery, and the feeling of tightness, that is usually seen.

The **dressing**s are applied at the end of the procedure after the now closed up knee has been injected with local anaesthetic and tranexamic acid. The latter is a drug that reduces bleeding by preventing clot removal and, as such, has been largely responsible for reducing blood loss: indeed, to the degree whereby post-operative transfusion is now very uncommon - even for bilateral knee replacement. It is also administered either by tablet prior to going to the operating room, or intravenously by the anaesthetist as part of the anaesthetic.

The outer dressing is an elastic type bandage (Coban) that is used to place some compression on the knee. It helps keep swelling down, which in turn helps decrease pain and increase the recovery of knee bend. It is generally removed at 48 hours, at which stage the wound will be covered with a new, but smaller, dressing.

By 4 - 5 days, be that whether you are still in hospital or not, all the dressings can come off. If there is still any remaining bleeding at that stage then that can be covered up with a smaller dressing until it stops. Usually this will require a dressing change (be that a band-aid or bigger) each day until the wound looks good.

The most troublesome wounds are usually the 2 small holes below the main wound on the tibia where the navigation pins were inserted. These have holes beneath them that go right through the tibia and, as such, sometimes continue to ooze for a bit longer than the wound. Again the treatment is usually to apply a new dressing every day until things have settled. If needs be however, and if the holes continue to leak, then they can be formally closed with a stitch.

**The Recovery Room** is where everyone wakes up. For many however, this part of the proceedings may not be remembered. It is here however, where the recovery room nurses look after you as you wake up, that things slowly return to normal. They will make sure that you wake up fairly smoothly, they will deal with any pain issues that may arise and, when they think you are ready, they will organise for you to be transferred back to the ward.

When you wake up, you will have a mask over your nose which will supply oxygen. This will be left on until you get back to the ward. If you have a narcotic pump (PCA - Patient Controlled Analgesia), then the mask will remain until you no longer need it. If your pain is being covered well without that, then as soon as your measured oxygen level is satisfactory, the oxygen can be dispensed with. The nursing staff will monitor your oxygen levels regularly.

In addition to the mask, you will have an intravenous line in your arm so that you can have fluids, antibiotics, and other drugs, as necessary. You will also have an in-dwelling urinary catheter so that you do not have to get out of bed to pass urine, and an adductor canal block catheter which allows local anaesthetic to run into your thigh (to the saphenous nerve) to decrease pain.
The Orthopaedic Ward

For many, this is where real consciousness begins. There are currently 3 Orthopaedic wards all of which are generally staffed by experienced nurses. Of course there are new nurses from time to time, but Hollywood does a lot of joint replacement (sometimes close to 100 in week), so there is a lot of experience on each ward that can be accessed. Overall therefore, I think that the current nursing care is as good as, if not better, than most of the other hospitals in town. If there are problems however, then the senior nurse on each ward, or Dr Holt, may be able to help rectify things.

Pain management is usually the most significant early issue. Generally this is not in the first 12 hours or so because of the adductor canal block. If it wears off prematurely however, despite having a continuous infusion pump attached to the cannula, then something else will need to be done. Often this just means some pain killing drugs need to be asked for. Sometimes however, and particularly during the day time when the Pain Service is available, the block can be topped up with some stronger local anaesthetic. Either way your pain should be able to be brought under control. If not, then Dr Holt needs to know about it so that he can organise or prescribe something else.

For the first 24 hours, the Anaesthetist is generally responsible for your pain relief. He prescribes the drugs to be used, the amounts, frequency and so on. After that, Dr Holt is responsible, and he will usually come around to see you first thing on the morning after surgery to check that you have what is required, and to adjust this as necessary. Sometimes what is initially prescribed is either not enough, or is causing nausea. If this has not been corrected during the night, then you can have the ward ring Dr Holt for advice.

As stated previously, there is the APS (Acute Pain Service), who are available during the daytime (usually from 7am) to discuss things with. They can also contact Dr Holt if needed be, and drugs can be changed or altered to suit. As pain medication is a very individual thing, it sometimes takes a while to adjust this to a satisfactory regime but one of the aims of your time in hospital is to try and achieve this. The APS can often help with suggestions which they can then discuss with Dr Holt if necessary.

Your pain will be monitored by the nursing staff, but of course you will have to convey to them exactly how much you have. This is usually done on an analogue scale going from 1 (minimal pain) to 10 (worst pain you think you could ever experience - say having your leg cut off without anaesthetic). You will be asked this regularly, and you will get better at reporting this with practise. Importantly, there is no point in exaggerating your pain. 12 out of 10 does not exist despite how often people claim this. Usually that will be re-interpreted as a 6 or 7 out of 10, so be as accurate as you can.

Depending on how much pain you have, the nurses will provide medications based on what has been written up for you. Most people never use the maximum amount allowed, but you should not take that as a challenge. You will need good pain relief, not only to manage when you are quietly resting in bed, but also when you are having therapy. For the latter, it usually helps to have some extra medication before the physio comes to see you. This will not only help you get through this, it will also help you achieve more knee flexion.

Be aware, that whilst most of the pain is usually in the knee, there may also be some pain in the upper thigh from bruising around where the block was inserted (or from the tourniquet if used - uncommon). This area is less well covered by the adductor canal block, so it may need extra medication in its own right. If you need this, make sure you ask the nursing staff to provide it.

A typical peri-operative and pain protocol might look like this:

**At induction**
- I.V. Cortisone and anti-biotic
- Intra-operative narcotic - usually fentanyl or morphine
- Adductor canal block with catheter in-situ for 3 days
- Local anaesthetic into the joint at the end of the procedure
- Tranexamic acid I.V. at induction, and into the joint at the end of the procedure, to decrease bleeding (and thus pain)

**Post operatively**
- Rarely, a PCA (patient controlled analgesia) pump
- Cortisone tablets for one week to keep inflammation down
- Anti-biotic - 1 further dose
- Regular paracetamol as background pain relief
- Hydromorphone SR (slow release), Targin (SR) or Palexia SR, as background pain relief
- Regular celebrex (an anti-inflammatory) or similar twice a day
- Lyrica for the first 2 - 3 days (but not in the elderly)
- Quick acting Hydromorphone, Oxycodeone (like Targin), or Palexia (IR - immediate release) for top ups between SR (slow release) doses
- Ice packs as required for pain

Alternative narcotic drugs are discussed in the pain management information section but, currently, hydromorphone seems to be very effective with less nausea than the others: and is used for most people.

If you have excessive pain, be that at rest or when moving, it is important to tell your nurse. If you do not let her know, you will not get the analgesia you require.
DVT and PE

DVT prophylaxis is usually managed by thinning the blood with an anti-coagulant such as low dose (20mg) clexane injections, placed into fatty tissue (usually the abdomen). Given twice a day, it has been demonstrated to have good coverage over a full 24 hours, and with less bleeding than a double dose (40mg given just once a day, which is a common regime). After 5 days of this, the clexane will be ceased, to be followed by once daily low dose aspirin (100mg - e.g. Cartia which is enteric coated to protect your stomach) which will be continued for 6 weeks.

This regime has proved very satisfactory; giving rise to very few DVT’s, and minimal extra bleeding and bruising. As such, it avoids the need for foot pumps and DVT compression stockings. It also seems preferable to the newer oral anti-coagulants such as Rivaroxaban (Xarelto) and Apixaban (Elequis), which can sometimes cause excessive bleeding.

In addition to the above, activities such as moving the feet up and down, thereby using the calf as a pump, help to keep the blood circulating.

Note that none of the above seems to change the risk of having a pulmonary embolus, something that can only be prevented by full anti-coagulation. The degree of risk with full anti-coagulation however, is now thought to be unacceptable for most.

For those at higher risk of DVT and/or PE, the above regimes may be altered to suit the individual, balancing the risk benefit ratio. In some circumstances this will be done in association with your cardiologist or a haematologist.

Symptoms of a DVT

1. Pain in the calf, generally not behind the knee itself
2. A tightness or a cramp in the calf
3. Persistent swelling of the foot or lower leg

Symptoms of a PE

1. Pain in the chest, particularly on deep breathing
2. An associated shortness of breath
3. A persisting, abnormally low, oxygen saturation
4. A general feeling of unwellness exceeding what would be expected in the week or so after surgery

The diagnosis of a DVT is now made by ultrasound. This is usually referred to as a duplex scan and is easily carried out by all radiology practices. If it is needed while you are in hospital, it can almost always be done the same day so that, if treatment is required, it can be started immediately.

The diagnosis of a PE is slightly more difficult, requiring a CT Angiogram. Essentially, this is a CT scan of the chest with some intravenous contrast medium injected into a vein. This enables the blood vessels of the lungs to be seen, and hence, looked at directly. If any vessels are blocked, it means that there is a PE present. As such, this test can also tell how big or small this, and whether it is a single large clot or a shower of very small ones. Although requiring skilled reporting, it can be regarded as a very sensitive, highly accurate, test. If required, it will be dealt with as an urgent request.

Swelling

Swelling is normal for a procedure of this size, but is helped by the peri-operative cortisone regime that Dr Holt uses. The swelling occurs because of the amount of soft tissue work that has to be done, both to insert the new knee, and to repair the soft tissues at the end. It is variable as to how much swelling any one individual might get, but everybody gets some, and it lasts for months. Indeed, it is unusual for the operated knee to really look like a normal one before the 9 - 12 month mark.

Steps that can be taken to help the swelling are:

1. Early post surgery ice / cold therapy - helpful because it decreases initial bleeding and therefore bruising.
2. Elevation - very important, particularly getting it above waist height. This may help drain the swelling.
3. Not overdoing exercises - these cause swelling. It is important to work on flexion of the knee, but doing this just a limited number of times a day, and for short periods only.
4. Not walking too far in the first few weeks, and not starting to go on exercise walks for about 3 months.
5. Not continuing to exercise hard if, after some months, it is still sore. Once adequate motion has been achieved it is sometimes necessary to reduce activity until the soft tissues finally heal and settle down.
6. Judiciously using an anti-inflammatory agent. This is frequently prescribed in the post-operative period, but can be continued as necessary (though usually in a lower dose).
7. Seeking help if it becomes persistent and the range of motion is still inadequate.
8. Seeking help if the swelling comes on very suddenly, perhaps suggesting a bleed into the joint. This is particularly the case for those taking moderate or full anti-coagulation. In addition however, it also applies to aspirin given that some individuals are quite sensitive to it.

Bleeding into the joint

Bleeding into the joint is usually as a consequence of making the blood thinner to prevent DVTs and PE. It can also occur in those who have problems requiring higher doses of anti-coagulation, or who are on drugs such as plavix. It presents as an acute, rapid onset swelling in the knee, often in the first 2 weeks, and usually without significant fevers. It is much more common than infection and can be proven by joint aspiration. Drainage via needle or the arthroscope may be necessary if it is very sore. Rest, elevation and treatment for any bleeding problems will usually resolve the issue. This will usually involve cessation of any anti-coagulation if that is safe to do.

Wound Problems

Superficial infection. Your wound has been sewn up with a suture that is entirely under the skin. Like all sutures that are near the skin however, the ends, or occasionally bits in the middle, can work their way through the skin. Sometimes the stitch end can be felt or seen, but at other times the
area where this is happening just gets a bit red. Similarly, the suture in the next deepest layer can work its way out and, for this stitch, it is almost always at the ends where the knot is, being where it takes the longest time to dissolve. Any protruding stitches, infected or not, need to removed, or pulled on and cut short, so that the cut end completely disappears below the skin. If the area is red, it may also need antibiotics.

All of the stitches, in each of the three layers of the wound, are designed to hold some strength for at least 3 months. In general therefore, the wound problem relating to the sutures may not even present itself until some weeks post surgery. Similarly, the middle layer of stitch is a braided one and, as such, can drag in skin bugs as it is being put in. Some of these bugs can potentially hide in the braids where the peri-operative antibiotics cannot reach. This then means that an infection can break out and cause a localised superficial infection even weeks after surgery. This will either present as a small ulcer on the skin with some redness around it, or as an area of increasing redness related to the wound. Either way, it needs antibiotics, and any small area of wound breakdown needs to be cleaned up, removing any pieces of stitch that may be present and which can act as a focus for the infection.

**Cellulitis** is an infection in the skin which presents as a red area that is typically very tender. It gets bigger with time and often occurs further down the skin, seemingly unrelated to the wound itself. It is uncertain as to exactly how this occurs, but it may be via the blood stream into an area that intrinsically has bad blood supply, and where the body’s defences are therefore poor. Either way, it is a problem that needs urgent treatment, firstly to stop it spreading, and then to bring it under control. Usually this means a hospital admission for high dose intravenous antibiotics as it frequently fails to respond to oral medication: perhaps again, because the blood supply is poor, and hence, delivery of antibiotic to the site is poor.

Although the area of infection is warm you should not put ice or cold packs on it. The warmth and redness are just the body bringing in extra blood supply to the area to try and fix the problem. Such an increase in blood supply will actually help antibiotic delivery. Cold, on the other hand, reduces that blood supply, and hence will reduce any delivery of the antibiotic to the area; thus negating its effect.

**Cellulitis** can take quite a long time to settle down, meaning that it often requires 5 days in hospital to get it under control, followed by a longer period of intravenous therapy, given at home. In order to do this a **PICC line**, being a long intravenous cannula that goes into a vein in the arm to deliver the antibiotic into a bigger vein nearer the heart, will be inserted. By doing this, the antibiotic is delivered into a region of high blood flow, thus diluting it to the extent that it will not cause any damage to the vein. Such a cannula can be left in for some weeks if needs be, albeit requiring a little bit of care and looking after; something that is usually done by the visiting infectious disease nurse, who will also deliver and administer the antibiotics.

Once under control, the intravenous medication will be changed to tablets. These are then taken until the infection seems cured. Often this is based on blood tests and loss of tenderness, rather than appearance, and this is because, even after the infection has gone, the area may still be red for some weeks.

**Deep infection** is a serious problem, though fortunately very uncommon in the acute setting (within 3 months of surgery), being seen in less than 1/1000 in Dr Holt’s series. Most infections in the actual joint come on years after the surgery, mostly being spread from other sites via the blood stream. In each instance however, they present as rapidly rising pain coming on over a day or two, ultimately becoming unbearable, with a loss of all movement. Indeed, any attempt at moving the joint is usually exquisitely sore.

As there is a gathering volume of pus within the joint, there is associated fever and a feeling of unwellness. This needs urgent treatment by joint washout. In addition, if caught early the polyethylene component of the knee is changed, this being a place where the bugs can shield themselves off from treatment, and thus hide from antibiotics. Following washout, prolonged antibiotics will be required but, if caught early, there is a fair chance that the joint can be saved. On the other hand, if it is caught late, or if the above treatment does not work, then the joint may have to be entirely removed. The knee is then replaced with spacers full of antibiotics that leach out into the joint. High dose intravenous antibiotics are also given.

After 2 - 3 months of intravenous therapy, if the joint looks settled, the antibiotics are ceased. If the joint stays settled after withdrawal of the antibiotics, then a new knee can be inserted. This will generally fix most, but not all, of the cases.

The message is: that if there is any question of a deep infection, then no antibiotics should be given until the joint fluid has been taken for culture, and usually this should be at the time of washout, be that open with polyethylene exchange, or arthroscopic where there is uncertainty.

**Wound care**

Your wound should only need a dressing for 4 - 5 days. It can then be left open providing that it is not leaking. There are no stitches to be removed, all being below the skin, and all being of the dissolving type. The wounds that tend to give most problems are the 2 small holes below the main wound where the navigation rods were inserted. Sometimes these keep leaking and thus need to be dressed, usually once a day, until the leakage stops. If it does not stop, it needs to be sutured.

If the wounds are all dry, you may get the knee wet without covering it. If it has been dry for a couple of days, then you are probably safe to go into a pool. Don’t get the skin too soggy in the first couple of weeks however, as this increases the chance of wound breakdown and infection.

The skin around the wound often gets very dry and scaly. Usually some moisturiser, rubbed into it twice a day, will fix this; albeit that it should not be rubbed into the actual wound until it is very stable (2 or more weeks post surgery). If moisturiser is not enough, some cortisone cream may be helpful (e.g. diprosone cream used twice a day).

**Constipation**

**Constipation** is, unfortunately, a very common problem. All the narcotics (morphine related drugs) can cause this, essentially by stopping the gut from working. Indeed, the only pain killers that do not have this effect are Paracetamol, Tramadol and Palexia. Of these, the latter two are essentially narcotic related drugs in that they block the opioid receptors; but they block other receptors as well, and therefore do not seem to have quite the same side effects as the morphine related drugs. Although they are different in some of their actions, they are in fact quite strong: indeed, of similar
potency to oxycodone (Targin, Oxynorm, Endone) and hydromorphone (Jurnista, Dilaudid). For this reason, they are very useful both when constipation is a problem, and when trying to come off the more addictive drugs at a time when moderate pain relief is still required.

The other drug that has been somewhat helpful is Targin. The active ingredient is oxycodone but it also contains naloxone which is a narcotic blocker. As this latter drug is not absorbed, it only works in the gut, therefore not blocking any systemic effects of the oxycodone. To an extent therefore, it does reduce the problem of constipation, but the extent is limited because its effect does not last as long as that of the Oxycodone. Nevertheless, it is preferable to Oxycontin, the older slow release version of oxycodone.

**Signs of constipation**

1. A change in your normal bowel habit
2. Feeling bloated and uncomfortable
3. Having to strain excessively when on the toilet
4. Having painful or difficult bowel movements
5. Having dry or hard stools (type 1 or 2 on the Bristol chart - see below)
6. Having fewer than 3 bowel movements per week

**Treatment of constipation** is something that begins at home, before surgery. In the days leading up to this you should try to eat a nourishing diet containing fibre, fruit, and so on, but avoiding heavy, difficult to digest foods. You should also try and keep well hydrated by drinking 1 - 2 litres of fluid per day. As you go into surgery, it is preferable that your gut is relatively empty so that there is less content to block you up. This also means less need to go to the toilet in the first few days.

In hospital the same applies, but the change in your diet, the surgery, the drugs, and the lack of activity, will all contribute to your bowel malfunctioning. To counter this, you will be encouraged to drink regular fluids, and you will be given regular stool softening medication. You will also be asked about your bowel function so that, if it is not functioning

---

**Bristol Stool Chart**

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Separate hard lumps, like nuts (hard to pass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2</td>
<td>Sausage-shaped but lumpy</td>
</tr>
<tr>
<td>Type 3</td>
<td>Like a sausage but with cracks on the surface</td>
</tr>
<tr>
<td>Type 4</td>
<td>Like a sausage or snake, smooth and soft</td>
</tr>
<tr>
<td>Type 5</td>
<td>Soft blobs with clear-cut edges</td>
</tr>
<tr>
<td>Type 6</td>
<td>Fluffy pieces with ragged edges, a mushy stool</td>
</tr>
<tr>
<td>Type 7</td>
<td>Watery, no solid pieces. Entirely Liquid</td>
</tr>
</tbody>
</table>
adequately after 2 - 3 days, stronger medication can be used to help things along.

When you get home, you may have to continue these measures to keep the bowel functioning normally.

**Things that help are:**

1. A well balanced and nutritious diet
2. Plenty of fruit and vegetables
3. Fibre supplements like benefibre
4. 1 - 2 litres of fluid per day
5. Regular exercise albeit within the limits of what your knee can tolerate. This may mean pool therapy such as swimming with a ‘pull-buoy’, gentle kickboard and flippers, perhaps just using a flipper on the good leg for a while, gentle pool walking and so on.

If you are having problems with this and think that you need help to get your bowel moving, you can contact Hollywood Hospital (usually the ward where you were as an in-patient), your pharmacy, or your GP: and certainly your GP should be able to help you. If you think you need a change of analgesic medication to help with this problem, then it may be better to contact Dr Holt’s office. The only certainty with constipation is that it will finally resolve when you are able to get off all the narcotic related drugs.

When dealing with the hospital, the Bristol stool chart, as shown above, can be used to help with your description of the problem. This, in turn, can be used to prescribe appropriate treatment.

---

**The Blues & Depression**

Like post partum blues, this can happen. It is part of getting over what is a relatively big procedure, where there may be no clear end point in site. Usually this comes on just 2 or 3 days after the surgery, and perhaps it is the realisation of what lies ahead to get maximum function and benefit from the surgery, that appears daunting. Either way, it is fortunately not usually long lasting. Generally, reassurance that you are on track, coupled with support from the Nursing Staff, who of course will have seen this before, will help you get through.

It can be quite difficult for a few days, and often it is coupled with crying and despondency. Whatever happens however, do not be afraid to talk to the Nursing Staff or to Dr Holt. There are things that can be done to help, and support from the outside is beneficial.

Fortunately, post surgery blues are short lived, being just a few days long; and rarely are drugs needed to help. There are however, lots of services in the hospital that can be relied upon if needs be. The most important thing to remember is that you are not the first to experience this, and nor will you be the last; so do not to try and keep it to yourself and do not get embarrassed by it, it is more common than you think. Always remember that you are not alone. You just have to speak up.

---

*It is very important not to let constipation get out of control as it can be very hard to fix if it becomes chronic.

If you are having trouble, make sure that you contact someone for help.*
**Physiotherapy and exercise**

**Physiotherapy** is essential to early recovery, and a therapist will usually visit you twice a day to begin with, and then once a day as things improve. The main focus of therapy is to achieve a good range of knee flexion, usually meaning over 90°, before you leave hospital. Of course that is not always achievable, so sometimes it is necessary to get some further therapy after you leave hospital. On the other hand, if you can easily get past 90° by yourself, then you will not need extra therapy at home. Importantly though, if you start to lose knee bend, then you will need help to get it back.

The physiotherapists on the ward spend almost all of their time looking after patients with joint replacements and, as such, they are very good at it. They are there to try and achieve good function, and it is important to let them help you. This is not always easy, and you may need pain killers before each session, but the quicker that good flexion is achieved, and the quicker that normal walking is achieved, the quicker the pain settles down. This, unfortunately, means pushing through the pain at times in order to make it get better more quickly.

Counter intuitive to the above is the fact that the knee will still need lots of rest to get the swelling down. Something that also helps knee flexion. What this means therefore, is that once you have done a therapy session, you should not do too much extra exercise. More is not better. You just need to do what you have to, and then have a good rest. To that end, if you achieve good flexion with one or two knee bends then that may be all you need. Doing it more often probably makes no difference.

On the theme of not over doing things, remember that the aim is to get the knee past 90° just 3 or 4 times a day, and easier is better. Hence, sitting on a chair and letting the leg hang to achieve flexion may be all you that need to do. There are lots of ways of bending the knee, but this method uses gravity - so it is the easiest. If the knee gets past 90° once or twice, that may be enough. Doing this 10 times or more in any one session therefore, is probably unnecessary.

To achieve better range, the other leg can be used to push the ankle back. Similarly, a skate board or similar (e.g. a Dolly as illustrated), can be used to move the foot back and forth under the chair. This is especially helpful if the other foot can be placed on the skateboard as well such that it can be used to drive flexion.

During all of this, it is important to look at the knee to see how much flexion is achieved. How far the leg hangs down is only a reasonable guide if your backside is firmly resting on the chair. Lifting the bottom up so that the thigh is no longer parallel to the ground may allow the lower leg to hang down further, but this is not achieving better flexion. The thigh must be horizontal, which may mean that a lower chair is better.

Lifting the leg off the bed is something that may take a few days to achieve. Again, there is no rush for this and many take 4 - 5 days to reach that goal.

**Ice** is commonly used to help with pain. Contrary to belief, ice probably does not help swelling directly. In the first few days however, it does decrease bleeding in the superficial tissues thereby indirectly reducing swelling. It is therefore worthwhile for that reason. After that time, its use is mainly to help reduce pain. It is therefore worthwhile after exercises or activity, and may be used for up to 20 minutes at a time.

**Walking with crutches** is the other main goal to be achieved before discharge. Generally one can expect to stand on the first day (perhaps day 2 in the case of bilateral replacement), use a walking frame the following day, and then migrate to crutches over the next day or two. Unlike a walking frame, crutches allow good mobility, faster walking, and the ability to manage stairs. Indeed, if you have stairs at home, then the therapists will show you how to go up and down these before you leave hospital. Fortunately, this is not as hard as you might think.

Most will use crutches for 2 - 3 weeks, but some for longer, and others not at all. Everyone is different. These, like other aids, are initially to help take some weight off the leg, but mostly they are used to aid balance. It helps to have practised with your crutches before admission as this will make transfer to these after surgery much easier. Use of the crutches however, is not essential. The prosthesis is solidly attached at the time of surgery and will not come loose. Similarly, it can bear full weight right from the outset. The limiting factor here is not the prosthesis, rather, it is the soft tissues that have been repaired and which will remain sore until they have adequately healed. The repair is strong, so the knee can still be pushed to achieve good flexion, and it will tolerate being walked on almost immediately.

**Remember that** gaining motion is important whereas walking is not. Too much activity will cause swelling which, in turn, will decrease motion. This means that a balance has to be struck between doing too much and not doing enough. Most people will find that by about day 5 they will go backwards a bit because of their increased activity and exercises. This then means having a day or two off therapy until the knee settles down again. More is not better, and the concept of getting enough rest is important.

**If you are not getting past 90° of flexion by the time you leave hospital, then you will need on-going physiotherapy after discharge.**

A good suggestion is to pick up your crutches early and practice on them. If you are not confident on them, then think about getting a physio to help you before you have your surgery.
PROGRESSING TO CRUTCHES

Walking Step - 1
When you first get out of bed the knee will be sore to stand on and you will need to lean on something to help you walk. Hence, the use of a frame.

Walking Step - 4
Some people get to walk directly from 2 crutches, some via 1 crutch. Either way, be careful and stay near walls and rails to help balance if necessary.

Walking Step - 2
By 3 - 4 days, most can get off the frame and move on to crutches. These have the advantage of allowing quicker walking speeds.

Walking Step - 5
Walking around the house is the first goal after discharge. Do it just a couple of times a day and make sure that you rest between times.

Walking Step - 3
Sometime in the first few weeks, one crutch can be dropped. If this is done, the single crutch should go on the good side, not the operated side.

Walking Step - 6
Once you have some confidence, you can go on short walks outside the house. Walking for exercise however, should not be undertaken for nearly 3 months.
MASTERING CRUTCHES

Going Up - Step 1
Stand on the operated leg and put the good leg up on the stair above. Going up - use the good leg first, going down use the operated leg first.

Going Down - Step 1
When balanced, move the crutches ahead of you and place them on the step below. Now change the balance so that the good leg and the crutches share the weight.

Going Up - Step 2
Use the good leg to climb onto the step. Balance on the good leg and take all the weight on this. As you go up, the crutches can be pulled up behind you.

Going Down - Step 2
With the good leg, you can gradually lower the operated leg onto the next step to join the crutches. The weight should then be transferred to that leg.

Going Up - Step 3
Pull the crutches up and place them on the new step. Make sure that you are balanced, and then proceed up the next step, beginning at ‘Step 1’.

Going Down - Step 3
The balance is now between the crutches and the operated leg. You can now take the weight off the good leg and bring it down to complete the step.
Important Points

1. **Time of discharge** is usually before 10am. This, like in any hotel, is so that the room can be cleaned and made ready for new patients. On weekends, the urgency for early discharge may be less than it is during the week, but nevertheless, where possible, this time should be aimed for.

2. **Pain Medication** will be provided at the time of discharge. The stronger analgesics however do not come with repeats, so most people will require more scripts after discharge. These can be arranged through the office and we can both fax scripts off, and post the originals, to the chemist of your choice.

Most people will need some night time medication for nearly 3 months, even if it is just paracetamol. During this time, the aim is to reduce the demand for the narcotic drugs that are used initially, moving to less problematic medication with time. Ideally, we like to get everyone off narcotic type analgesia by 8 weeks, but sooner is better. Certainly, as the weeks go by, addiction can become a problem: and going ‘cold turkey’ as it were, can be very unpleasant. In this vein, it is to be noted that weaning off these medications does not prevent withdrawal symptoms, it merely delays them. Hence, when the time comes, they are better just to be stopped, and if necessary, replaced by something less addictive.

Getting adequate pain relief that does not cause nausea, and does not interfere with bowel function, can be quite a hard process: and in some people this may require considerable changes of, and adjustments to, their drugs. The aim is that this will be all sorted out by the time of discharge, thus allowing provision of acceptable analgesia at home. If this is not the case, or if you are having trouble with your medication, the best option is to ring Dr Holt’s office for advice.

3. **Learning about your pain medications** can be done from Dr Holt’s website where there is an information sheet on this. If there are queries on any matter in the handout, please contact Dr Holt’s office directly.


4. **Anti-coagulation** will be provided upon discharge. Usually this will be in the form of low dose aspirin (100mg per day - e.g. Cartia). This is to be taken once a day for 6 weeks. There is evidence that this should be the minimum time period for this prophylaxis, however the risk period where there is an increased possibility of developing a DVT or PE probably goes out to at least 3 months. Having gone through the 6 week course however, the risk for the second 6 weeks is low providing flying or long trips are not undertaken.

For those already on long term anti-coagulation, the aim will be to wean back onto this over a week or so following surgery. This will be individualised depending on circumstances.

For those who experience excessive bleeding post surgery, the anti-coagulation may be ceased. Again, this will be individualised depending on circumstances.

5. **Your dressing** will be removed on day 4 or 5 but, if you are going home sooner, then sometimes it can be removed earlier. It should not be left on longer than this though. So, if you went home with a dressing on, make sure that it is removed in a reasonable time frame. Exposing, not covering up, the wound is good for it.

All the stitches are under the skin and will ultimately dissolve. If there are minor bleeding spots or leakages, just cover these with a small dressing and change this everyday to keep it clean. If it gets wet, just let it dry and then re-dress it. If it does not stop in a few days, or if it gets worse, Dr Holt should review the wound to see if it needs any other treatment.

EARLY DISCHARGE PROGRAM
(THE SHORT STAY OPTION)

The process discussed above is the common one that most people here still use. However, hospitals in other countries are often more expensive or more restricted by their health systems, particularly so in the USA. The trend in these countries has been to decrease the length of hospital stay and hence permit early discharge. Many of the large joint replacement units in the USA now do hip and knee replacement as day surgery, and bilateral knee replacement with just a single overnight stay. The published evidence now suggests that the outcomes are similar to the more traditional longer hospital stay plans that we are used to.

In order to achieve Day Surgery Knee Replacement, other systems must be in place, such as: regular home visits by a nurse and a physiotherapist, blocks being topped up at home, and analgesic medication supplied as needed. The units that do this do not do anything different than what Dr Holt does from a pain perspective. They use the same adductor canal blocks, the same joint injections, the same pain killers etc. What they do suggest however, is that no harm will come from early discharge, and that any problems can be sorted out via the visiting nurse. That is, they educate their patients so that they are ready for this.

In the U.K. where average stays are between 2 and 3 nights, they have managed to achieve a happy balance between a shorter stay, and adequate post operative care. Other countries are similar and, world wide, the trend is for shorter stays in hospital and more treatment from home.

In keeping with this trend, Hollywood can also help you get home early. If it is within 1 - 2 nights of surgery, then it is possible to go home with your block still in, and with a local anaesthetic pump still attached. Pain killers and follow up will then all be organised, and your progress monitored daily, until things settle down. If you want to be part of this, just let Dr Holt or one of the ward staff know.
**Important Points**

1. **The main aim of the first 6 weeks is to achieve near full extension and as much knee flexion as possible.** Full extension (getting the knee straight) can be achieved by putting the heel up on a coffee table or bolster, and then letting the knee go down towards the floor. This is usually a passive exercise, but you can have someone gently help work the knee down if needs be. Achieving flexion (bending the knee) can be done in lots of different ways. It does not matter which way is used as long as the knee bends. In line with that thought, the easiest way of bending the knee is to sit on a firm chair and to let the leg hang down vertically. The opposite ankle can then be placed on the top of the operated ankle, and can be used to push it back. Usually this should be held for 10 - 15 seconds then released. Repeat this a few times, 3 or 4 times a day, to try and gradually improve the range. If you are easily getting past 90º by yourself, you probably don’t need extra physiotherapy. If you cannot easily get to 90º, then it is very important to get help from a physiotherapist. If you do not have a good local therapist, you may like to consider going to Star Physio, both at the Outram street office or in Mosman Park, Lowther Physio in West Perth or Cottesloe, the Hollywood Functional Rehabilitation Clinic on Stirling Hwy Nedlands, or MTM Physio in Duncraig.

2. **Do not overdo any exercise.** The aim of the first 6 weeks is to regain movement, not to improve strength. Too much exercise, including too much walking, will just make the knee swell: and this will reduce the range of motion. Rest is very important to allow the tissues to heal and to get the swelling down. This includes periods of elevation to the extent that the knee is at, or above, waist height. If you want to get into a swimming pool to help with knee motion, it is possible after the first week if the wounds are clean and dry. Remember, it is about knee flexion, not exercise. Do not aim to walk distances in the pool. Sit on the edge, swing the leg, and let the water cool the knee. You can also use the steps as an aid to help push the knee into flexion.

3. **Make sure that you are taking enough analgesics.** Obviously, if you do not need these, do not take them. On the other hand, do not cease them if pain is preventing you from bending the knee. Remember what the primary aim is. The sooner that flexion is achieved, the sooner that walking becomes more normal, and the sooner the pain starts to get better.

4. **If you need more analgesics, ring the office and they will be provided for you.** When you do this, the office staff will need a fax number for your chemist so that the script can be sent straight through. They will also need a name and address for your pharmacy so that the original script can be sent to them. This is a legal requirement. If you cannot get a script for some reason, look at the ‘Pain Management after TKR’ section. One of the options there may help you.

5. **If you are having trouble with flexion make sure that you see a therapist.** The usual cause of a stiff knee is not swelling, but rather, scar tissue at the top of the knee. The healing cut in the quads tendon (above the patella) can glue down to the underlying distal femur. Flexing the knee pulls these surfaces apart and, once that scar is broken down, the flexion that has been gained will usually remain (albeit with a little bit of effort). If this is not happening, it will be picked up and checked at the 6 week review - so do not miss this.

The scar that stops flexion is soft to begin with, hence the emphasis is on achieving flexion as soon as possible. By 3 months it is thick and strong, particularly in the younger patients. If the knee has to be manipulated under anaesthetic therefore, it is more likely to be successful between the 6 and 8 week mark rather than at a later date. Certainly, after 3 months, the knee is usually so stuck that it cannot be manipulated: hence, to manipulate this after that time frame increases the risk of complications such as a fracture of the femur or a patella tendon rupture.

If you are young, strong, fit or similar, the 6 week mark may be the best time to manipulate the knee. Ideally, it should not be done too early for fear of pulling the wound apart, hence the 6 week wait. In the older population the scar is less strong, and hence, if it is a bit behind schedule when seen at 6 weeks, 2 - 3 week grace may be given to see if it will free up. We do this because we know that some people really loosen up in the second 6 weeks, so this is a reasonable approach. However, if by 8 - 9 weeks progress past 90º is not being made, then manipulation can be a very worthwhile procedure.

6. **Wound care is important.** If the wound continues leaking despite regular dressing changes, gets red and inflamed, or gets progressively more swollen, Dr Holt should be contacted. Early diagnosis of a problem, with correct and prompt treatment, is the best chance for a quick resolution. Do not let a minor problem become major.

If a suture starts to protrude through the skin it can become infected. Early removal of this prevents that complication.

7. **If you are having problems phone Dr Holt or his office for advice.** This is particularly the case if there are signs suggestive of a DVT or PE. Most GPs are very good with systemic problems, constipation, urinary problems and so on. What they are less well acquainted with are procedures such as knee replacement where it is important to know what is normal and what to do about it if it isn’t. Rather than trouble your GP or go to your local Emergency Department, it is preferable to contact Dr Holt or his office directly.

8. **You will need to see Dr Holt for review at the 6 week mark** (about 5 weeks after leaving hospital). This can be arranged by phone (92124200), or by email (keith.holt@perthortho.com.au).
Ankle Flexion and Extension
Point your toes down, and then bring the foot right back using the ankle. This stretches the calf and is good for the circulation. Do a few of these every hour.

Knee Extension
Push the knee back into the bed by tightening the quads muscles first, and then the buttock muscles. This helps maintain good extension of the knee.

Assisted Knee Bending
Using a bandage or similar, the foot can be pulled up towards you, thus bending the knee. This is a good exercise in that can be done in bed.

Full Knee Extension
Using a rolled towel, the foot can be elevated off the bed. By then relaxing the leg, the knee will fall into extension. If needs be, it can be pushed back.

Heel Lifting
This is a quads exercise program which is the first step to straight leg raising. As the knee is supported, the lever arm is smaller, making this easier to do.

Straight Leg Raise
This is a harder exercise as it involves lifting the whole leg. It generally takes a few days to achieve but, being able to do this, will help you get in and out of bed.
CHAIR EXERCISES

**Passive Knee Flexion**
Sit on a firm chair where the height is such that the thigh is parallel to the ground. Without moving the thigh, try and let the lower leg hang vertically.

**Active Knee Extension**
As the quads get stronger, this form of straight leg raise will become possible. One of its advantages is that it can be done sitting down.

**Assisted Knee Bending**
Using the other foot, the ankle can be pushed backwards. Again, it is important that the thigh remain firmly on the chair, parallel to the ground.

**Active Knee Flexion**
Instead of using the other foot to push the ankle backwards, try doing it under its own power. This is harder and requires a better bend.

**Using the Dolly (or skateboard)**
By using one of these devices, the knee can be ranged by pushing the ankle back and forth. To get more control of this, place both feet on the platform.

**Using the Dolly (or skateboard)**
As this gets easier, the range can be slowly increased. Sometimes, using a slightly lower chair will also help this range increase.
STANDING EXERCISES

Active Knee Extension
Place the feet a few cm apart, but in line. Without moving the feet, push the knee backwards, aiming to get it back as far as the other knee.

Active Knee Flexion
Standing on the good leg, bring the knee up as far as you can (hip flexion), but try to let the shin hang down or behind the knee (knee flexion).

Gluteal Strengthening
Standing on the good leg, push the other one backwards and hold it for a few seconds, then rest. You can assist this by gently swinging the leg.

Hamstring Strengthening
Standing on the good leg, bring the heel up towards the buttock and hold this for a few seconds. Repeat this a few times.

Passive Knee Flexion
Using a step is a very good way of increasing the force that you can apply to the knee. It is a good exercise in that the step height can be varied.

Passive Knee Extension
The step can also be used to help extension. Be careful to lean forwards when doing this, both to increase the force you apply, and so that you do not lose balance.

Keith Holt - Perth Orthopaedic and Sports Medicine Centre © - 2018
Hydrotherapy and pool work is often the least painful way of exercising the knee. This can be done as soon as the wound is ready for this. In general, if fluid is not leaking out of the wound, it will not leak in. This usually means that you can get into a pool by about 10 days post surgery.

In the pool it is important to follow the mantra that you should not overdo it. Initially you are just trying to achieve flexion. Hence, just sitting on the edge of the pool with the leg hanging over into the water may be enough. Alternatively, you can just stand in the water and put a noodle under the knee to lift the thigh up - perhaps for just 20 seconds or so and for a few repetitions.

If you need to push harder than that, then you can stand with your foot on one of the pool steps and then lean forwards, thus pushing the knee into flexion. Again, just a few repetitions only.

Walking in the pool should be done with caution. The aim of the initial therapy is not to get the knee strong, or to get fit. If you do too much walking, then the knee will react by swelling. This in turn will then lead to a reduction in motion which is counter productive to that aim. Of course, as the knee settles down, walking in the pool can begin, but slowly, and not usually in the first 6 weeks.

The pool is a very useful adjunct to recovery, and it makes the knee feel good. Initially however, it is best to have some supervision with this to make sure that you are achieving enough flexion. This is because it makes you feel better than you are.

Using a Noodle

As you get better with knee flexion, you can use the noodle to move the foot backwards and forwards. The noodle maintains a constant lift on the leg and allows the knee to be flexed up. This also stretches the thigh.

Using the stairs

One of the best ways of pushing on the knee while in a pool, is to use the steps. Just put your foot firmly on the a step, and then move the body forwards over the foot. This will force the knee into flexion.

Walking in the pool

Initially this is best done by just walking on the spot, trying to get the thigh up and the knee bent. As the knee improves, walking forward can be commenced.
1. **Walking for exercise** should be limited until the swelling has started to settle, the wound has healed, and the knee has become more robust. For the first 6 weeks, excessive walking is not encouraged. It is better to get the swelling down first and get good motion in the knee. In this period, rest is still very important.

In the second 6 weeks, gentle walks along the block can be started, but don’t overdo it. If your knee becomes very sore or swollen an hour or two after such activity, then it is too early to do this. If your range of motion remains good, and the knee is not adversely reacting to such walks, then it may be possible to increase the distances that you are doing, albeit not to extremes.

For most people, it is about 3 months before they can walk 1 - 2 kilometres at a time, and do that on a daily basis. Averages are however, averages. There are always some who will be quicker, and some who will be a bit slower, to achieve this. Such differences do not mean that you will be quicker or slower to be able to walk as far as you like. That may be unrelated.

When you first start walking, keep on the flat, don’t walk on difficult areas such as soft sand, and go a sensible distance. Then increase the distance and difficulty slowly.

2. **Stairs and slopes** are hard. They stress the patello-femoral joint, which is often the most troublesome part of the knee. Of course everyone is different, but the average to go up stairs without holding on is 6 months, and the average to come down is 9 months. Down is almost always harder than up, and particularly on slopes.

There are newer designs of prosthesis that are a bit more patella friendly than the current models and, if this proves to be the case, and they become available in this country, then it is likely that a switch to one of these as the standard may occur.

3. **Crutches** are generally required for at least 2 - 3 weeks until confidence is regained. After that, a stick can be used until normal walking is achieved. Generally, by 3 months, most people can walk better than they did pre-operatively. For some, crutches will be needed for 6 weeks or so, for others, they will hardly be used. Everyone is different and lots of factors come into play with this. Certainly how fit and strong you are is important, but so to are the condition of your other joints, your age and so forth. There is no rush to get off crutches early, and this should not be done if it interferes with stability, and hence, increases the risk of you falling.

4. **Driving** is generally possible by 6 weeks if you can walk without crutches and feel safe. The main reason for the time delay, other than a police rule that may mean you are not covered by insurance, is that your reflexes will be very much slower than normal for at least 2 months post surgery. For the first 6 weeks therefore, it is important to have your support person, family, or friends help you get places, shop etc.

5. **Golf** is dear to the hearts of many. By 3 months most can walk a 1 kilometre or so, which is enough to contemplate picking up the sticks again. Perhaps start with a bucket of balls, then move to 9 holes with a buggy. If your club requires a letter to authorise the use of a buggy, contact Dr Holt’s office to get one made up.

As a rough guide, 50% of people can play 9 holes at 3 months and 10% can play all 18. The remainder take a bit longer, with the vast majority getting back by 6 months. Improvement then continues out to 12 months or so, with the swelling taking at least 9 - 12 months to fully settle.

6. **Tennis** is a less certain bet than golf, but it is possible to contemplate this as your knees improve. Mostly we are talking doubles, not singles, and initially it is best on grass or soft courts and not hard. The joint that has been put in has hard surfaces not soft, so there is less cushioning than a normal knee. Hence, there is more jarring passed onto the bones which can then cause aching to ensue.

7. **Bike riding** is perhaps the most common activity consequence following knee replacement. Indeed, 5 times as many people will ride a bike afterwards as did before. This is a good activity early on in that it helps with knee motion as well as strength. As there is no jarring involved however, it is possible to be much more active without the problems of ache and swelling. It does not matter whether this is on an exercise bike or a real bike, although it is generally better to start on an exercise bike where the conditions are well controlled.

If you use cleats, then initially you may need to replace these with cages or ordinary pedals. Cleats can be hard to get out of for a few months because of the twisting that is involved. Ultimately however, you should be able to use them; but it is important to practice this to make sure that you can achieve release before hitting the road.

8. **Time off work** is, on average, 2 months. This is an average time based on American figures, and it includes both active and sedentary workers. If you are active or work on hard concrete floors, then it may be 3 or more months until you can do full duties. If you are sedentary at work, you may be able to return earlier, but is best not to rush back. Once you return it is often hard to have more time off again.

In general, when organising time off, you should punt on being average. If you get back to work early, then everyone is happy. If you plan to get back early and find that you cannot, everyone is less happy.

If you can ease back into work part time, rather than going straight back to full time, then this is advantageous. Also, if possible, try going back to more sedentary duties for a while until you know how your knee is reacting.

If you have had 2 knees done rather than one, it may be 3 or 4 weeks longer until you can get back to work.
USEFUL NUMBERS AND URL's

Dr Holt's Office  
08 92124200  
https://www.keithholt@posmc.com.au

Delightful dinners  
08 9248 4899  
www.delightfuldinners.com.au

Hollywood Hospital  
And Dr Holt after hours  
08 93466000

Easy meals  
08 9379 3460  
easymealorders@tcsperth.com.au

Patient Information  

Home Chef  
08 9378 2544  
www.homechef.com.au

To book in  
www.hollywoodprivatehospital.com.au
and click on Book your admission
or
(08) 93466456
08.00 - 16.30 business days
Please allow 30 minutes for this

Orthopaedic Wards
(Leon) Goldsworthy - 2nd floor
(Thomas) Axford - 1st floor
(Charles) Pope - 1st floor

Star Physiotherapy
Above Dr Holt's Office
31 Outram street, West Perth - top floor
08 92124254
588 Stirling Highway, Mosman Park
08 63653264
713 Hay Street, Perth
08 92124254
www.starphysiowa.com.au

Home Chef  
08 9378 2544  
www.homechef.com.au

Kosher Food Services  
08 9375 4659  
www.mzh.org.au

Lowther Physiotherapy and Podiatry
1298 Hay street, West Perth
08 93222210
www.lowtherphysiopod.com.au

Hollywood Functional Rehabilitation
117 Stirling Highway Nedlands
08 93869961
www.hfrc.com.au

MTM Physiotherapy Duncraig
61 Arndale road, Duncraig
92464066
www.mtmphysio.com.au

Other Physiotherapists
Dr Holt, or the Ward Physio, may be able to help
recommend someone closer to your home

REFERENCE

‘The Hollywood Patient Information for TKR’ brochure

Keith Holt - Perth Orthopaedic and Sports Medicine Centre © - 2018