



醫院管理局
HOSPITAL
AUTHORITY

Total Knee Replacement

Pre and Post-operative Care

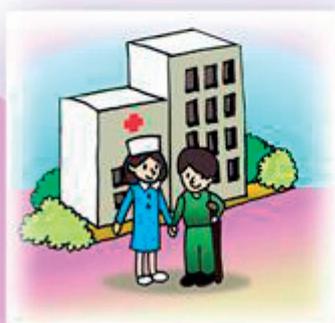


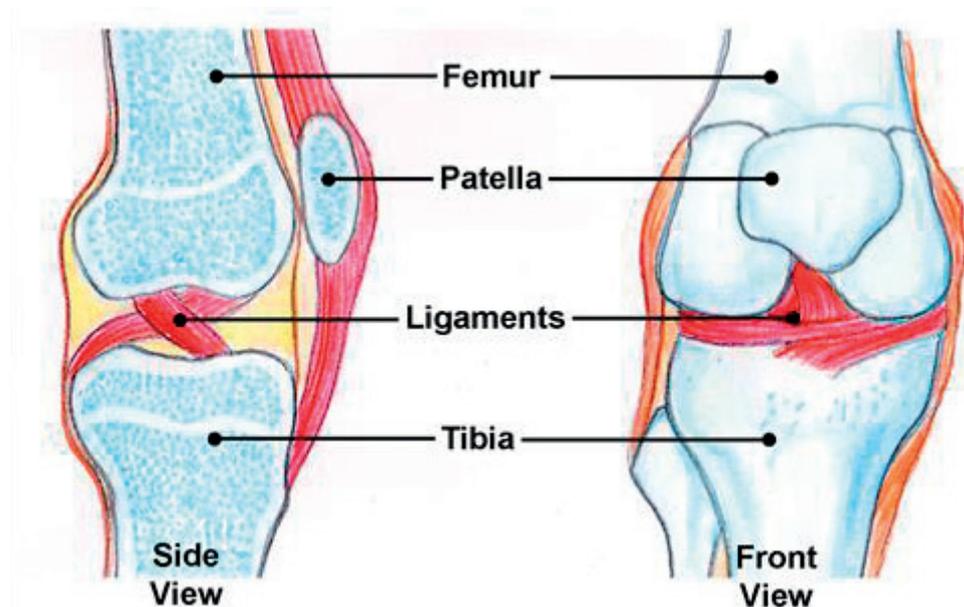
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Introduction

Total Knee Replacement is a surgical procedure involving replacing of an artificial knee joint. In order to facilitate your rehabilitation process, this booklet helps you to understand the operation, the pre-operative and post-operative care and the related risks.

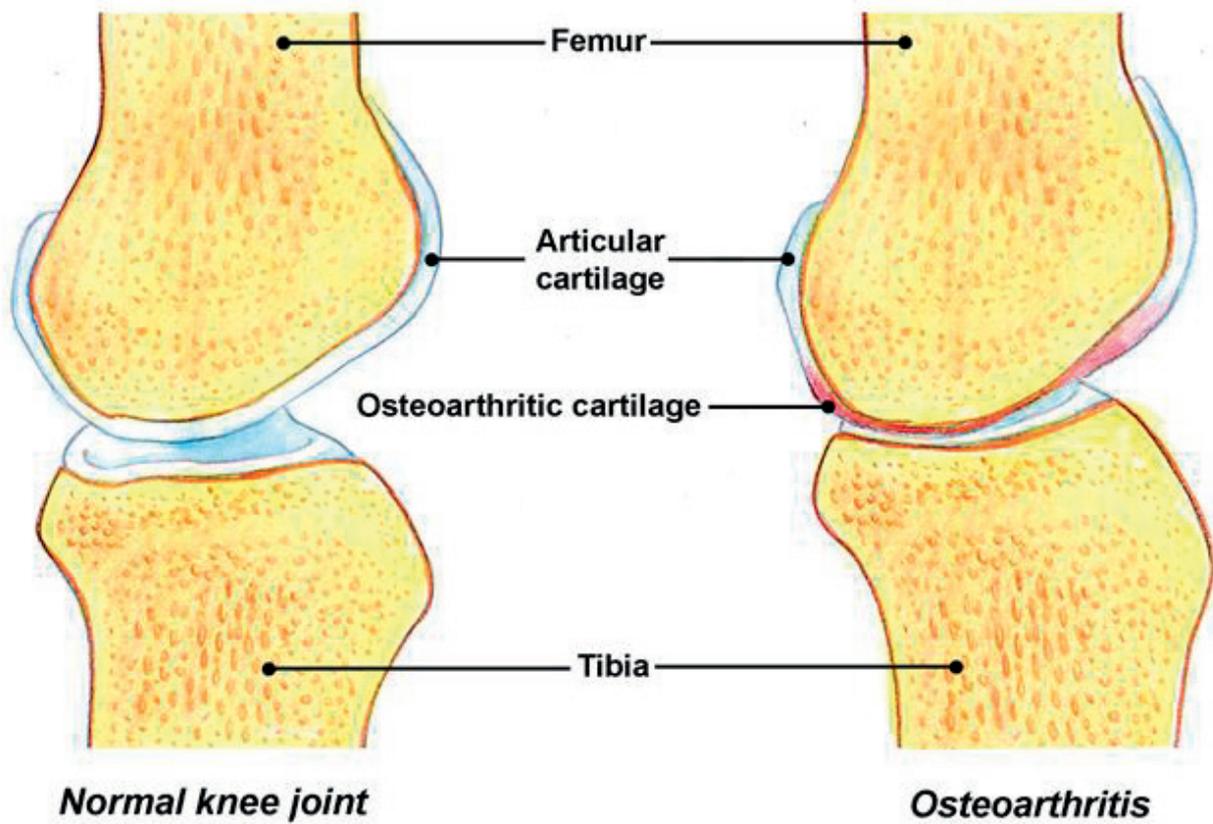
Anatomy and Function of Knee Joint

The knee joint is composed of femur, tibia and patella. The ligaments, tendons and muscles are attached to the bones to maintain the stability of joint during mobilization. The thigh muscles give strength to the knee joint.



In a normal knee joint, distal femur and tibia are covered by cartilage. However, cartilage damage is commonly occurred in the patients with osteoarthritis and rheumatoid arthritis.

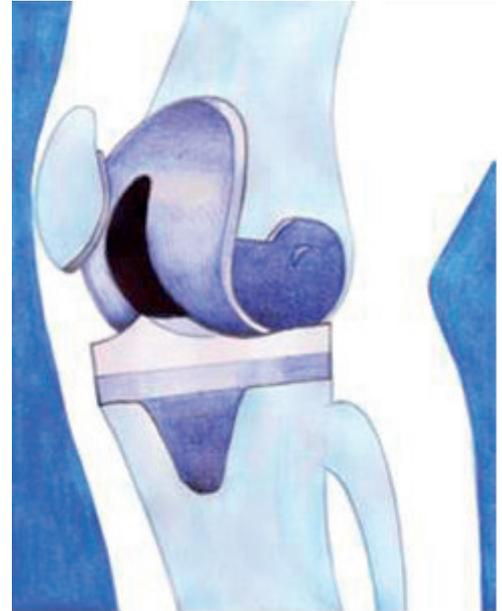
Spur formation is common in patients with osteoarthritis. They always presented with joint pain, swelling, local increase in temperature, joint stiffness, deformity and decrease in function.



For the management, patients can try oral analgesic and lifestyles modification. If these non-operative treatments were failed, they could consider having total knee replacement.

Indications for Total Knee Replacement

- Osteoarthritis
- Rheumatoid arthritis
- Benign or malignant tumor over the knee joint



Aims of the Operation

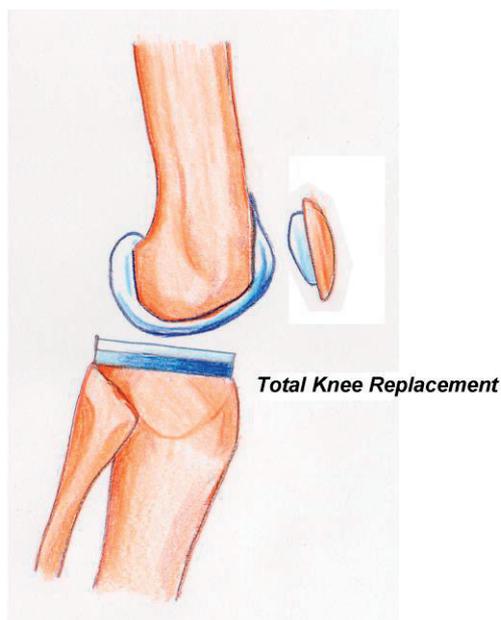
- Reduce pain
- Maintain the stability in motion

How does the Total Knee Replacement can help the Patients?

- Reduce pain
- Improve the range of motion of the knee
- Correct the deformed knee joint
- Restore walking function and ability

Design of Total Knee Replacement

Total knee replacement is a surgery that removes the diseased or damaged bone and cartilage, and then the affected joint is replaced by an artificial one, which made of metal and plastic. In general, the artificial joint includes three parts: femoral, tibial and patella component.



For the artificial joint, the femoral implant is made of alloy metal, e.g. cobalt-chromium alloy and titanium alloy. The tibial implant is made of polyethylene, which commonly known as plastic, with an alloy base on it. The patella part is usually made of polyethylene. With this combination, the wear rate is relatively low and hence the artificial joint becomes more durable. Besides, cement is also commonly used for stabilizing the artificial joint.

The operation generally takes about 1 - 2 hours, longer time may be needed for complicated cases. If the client is suffered from both knee diseases, doctors will usually perform the operations separately.

Artificial Joint Fixation

Methods of fixation include cemented fixation, cementless fixation and hybrid method.

Cemented fixation

Special bone cement is used to affix the implant. It does not bond the bone and the implant together; it primarily fills the spaces between them to facilitate their adhesion. Solidification of bone cement only takes several minutes. Cemented fixation allows patients to walk and resume activities in the early post-operative period.

Cementless fixation

Porous metal prosthesis allows bone tissue growing into the prosthesis within several weeks. This method strengthens the integration between the bone and the implant without the use of cement.

Your Orthopaedic surgeon will advise you on the suitable type of knee implant and the method of fixation. If you have any enquiry, please consult your doctor.

Surgical Procedure

1. A vertical incision 15 to 20 cm over the front of knee joint.
2. Excessive synovium or bony spur is removed.
3. The distal end of femur is cut to fit the femoral implant.
4. The proximal end of tibia is cut to fit the tibial implant.
5. The back of the patella is shaved.
6. Implants are positioned and fixed. The alignment, stability and mobility of the knee joint are examined.
7. A drainage tube may be placed near the wound.
8. The operative site is dressed with bandage.



Expected Outcome

After surgery, knee pain is much reduced. Deformity and stiffness are improved as well. In general, 90% of the artificial knee joint is expected to be used more than 10 years. For the young and active patient, the artificial joint may have mechanical wear and loosen. Revision surgery may be required.

Risks and Complications

Total Knee Replacement is a safe and worldwide surgical procedure. However, there are still encounter undesirable effects and complications.

General complications

Same as other surgical procedures, there may have a general complications: wound infection, pneumonia, myocardial infraction and stroke, etc.

Specific Complications

1. Bleeding

The amount of blood loss is variable and blood transfusion depends on the patient's condition.

2. Nerve injury

Nerve may be injured during operation and skin numbness around wound area.

3. Thromboembolic disease

Deep vein thrombosis after total knee replacement may be occurred while the incidence of pulmonary embolism is rare.

4. Infection

The infection rate is relative low when preventive measures are well taken.

5. Stiffness

Stiffness occasionally occurs after surgery which may require further training.

6. Dislocation

Dislocation of artificial knee joint is rare.

Patient should understand the risks and complications of the operation.

For further information please consult your doctor.

Preparation before Surgery

1. Pre-operative Education

Specialty nurse will explain about the peri-operative care, pain control, rehabilitation and discharge plan with you. Please raise your questions if you have any enquires.

2. Consent for Operation

Your surgeon will explain the aims of operation, procedure, treatment and potential complications before you sign the consent form.

3. Anaesthetic Assessment

Anaesthetist will discuss about the anaesthetic procedure and potential complications (general or epidural anaesthesia) with you. You may be referred to other specialties for further assessment and management to optimize your health status.

4. Pre-operative body check including

- Body height and body weight
- Electrocardiography (ECG)
- Blood and urine tests
- X-ray Chest and Knees
- If you have dental caries, periodontitis disease or loose tooth, please seek for dentist advice before surgery to minimize the risks of anaesthesia and post-operative implant infection

5. Health tips before Surgery

- If you have any discomfort, e.g. flu, diarrhea, urinary infection or lower extremities skin infection, please seek for medical advice.
- Do not apply any analgesic patch on your knee to avoid skin irritation.
- Quit smoking and alcoholic drinking.
- Follow the medical advice to withhold the medication such as anticoagulants e.g. warfarin/ plavix, Chinese medicine or Non-steroidal Anti-inflammatory Drugs (NSAIDs).

Admission Arrangement

1. Personal belongings

- Patient's identification document (original copy)
- Admission slip
- Your current medications (well- labelled)
- Personal necessities (towel, tooth brush, non-slippery slippers, toilet papers, loose trousers, etc.)

2. Removed items before admission

- No makeup, nail polish or crystal nail polish.
- Ear-rings, necklaces and rings should be removed.
- Do not bring large amount of money and valuable items on admission. Hospital will not be liable for any of the loss and damage of your property.

3. Medication and fasting arrangement

Arrangement is according to the admission categories

(Category I or Category II) as follows:-

Category I (Admit one day before the operation)

- Take your breakfast and prescribed medications as usual.
- Start fasting after mid-night.

Category II (Admit on the operation day)

- Fast after mid-night at home before admission.
- On the admission day, take medications according to doctor's

prescription.

Pre-operative Preparation

1. Evening before the day of operation

➤ Personal hygiene

Bathing and hair washing should be taken before operation.

➤ Fasting before surgery

Patient will be advised no eating or drinking after mid-night in order to minimize the risk of vomiting during operation.

2. The Operation day

➤ Medication

According to the patient's condition, certain medication will be taken as ordered by anaesthetist. Please consult your doctor if in any doubt.

➤ Preparation before go to the operation theatre

- Voiding

- Put on the operation cap, gown and stockings

- Remove dentures, contact lens, accessories and metal objects.

- Make sure operative site is marked for identification

➤ Property

All the property, such as money, accessories, watch and mobile

phone should be kept by relatives or locked in patient's locker.

Post-operative Care

1. Pain relief

Anaesthetist will prescribe Patient Controlled Analgesia (PCA) and oral analgesics to relieve pain. Pain is usually decreased within 2 to 3 days; the PCA machine will be removed for early exercise training. Physiotherapist will apply ice-therapy to the operative knee to relieve pain and control swelling.

Oral Analgesics



Patient Controlled Analgesia (PCA) Machine



2. Wound Care

The wound dressing will be changed if oozing or wound examined by the surgeon. Otherwise, the surgical wound dressing should be kept intact and dry to prevent wound infection.

3. Drainage tube

Wound drainage tube may be placed near surgical area to prevent hematoma formation. In post-operatively 1-2 days, wound drainage tube will be removed as doctor's prescription.

4. Prevention of pressure sore

Regular turning and repositioning in bed to prevent pressure sore formation.

5. Exercises and ambulation

You should start deep breathing and coughing exercise to prevent pneumonia. Physiotherapist starts standing and walking exercise training early which helps to maintain the range of motion and restore muscle strength of the operative knee.

6. Prevention of lower limb Deep Vein Thrombosis (DVT)

Deep Vein Thrombosis (DVT) is the formation of a blood clot (thrombus) in a deep vein. Signs of DVT may include pain, swelling, or warmth of the affected limb. The clot detaches and travels through the veins to the heart and the lung is known as pulmonary embolism (PE). It can lead to serious complications such as respiratory failure and could be fatal.

Preventive measures

- Perform ankle pump exercise 20 times per hour (full flexion and extension of ankle joint).
- Do not cross legs or sitting for a long time. When standing or walking more than 30 minutes, should do lower limb stretching exercises to promote circulation and reduce swelling.
- Maintain optimal body weight, drink adequate water and quit



smoking.

- According to patient's leg swelling and mobility, it should wear anti-embolism stockings about one to three months to prevent deep vein thrombosis.

- Care of the anti-embolism stockings:

The soiled stockings can be washed with soap.

Avoid use of bleach and laundry dryer which can shorten the wear life of stockings.



Under the following conditions, patient should seek for medical advice:

- Calf swelling, hot and tender
- Fever and shortness of breath

7. Nutrition

In order to promote wound healing, a balanced diet and vitamins is recommended.

8. Elimination

Difficulty in urination and constipation are common after general anesthesia and spinal anesthesia. According to patient's condition, either catheterization or intermittent catheterization will be performed to empty the urinary bladder.

In case of constipation, patient should report to health care professionals for appropriate treatment.

9. Removal of stitches / staples

Stitches or Staples will be removed on Day10 to 14.

10. Discharge

Patient can go home if walking with aids steadily.

Discharge Advice

1. Continue exercise to maintain muscle strength and the stability of knee joints
2. Keep the wound clean and dry. Allow shower after removal of stitches or staples.
3. Take medicine and follow up as advised.
4. Continue use of the walking aids until return to normal activities.
5. Avoid kneeling, squatting and excessive twisting of the knee at the early stage.
6. Avoid sitting more than 30 minutes. Should stand up and walk to promote circulation.
7. Do lower limbs exercises every 30 minutes during long distance travel to prevent swelling and deep vein thrombosis.
8. Ensure adequate rest between walking a long distance. Adjust the walking time and elevate the lower limbs if lower limbs develop swelling.
9. Follow physiotherapist's advice to apply ice therapy and mobilization exercise.
10. Avoid running and jumping because strenuous exercise may damage the

artificial joint.

11. Inform dentist or doctor the history of joint replacement operation to any procedure and surgery for the necessity of antibiotics.

12. Seek for medical advice of the following conditions:

- Signs of wound infection: fever, increase wound pain, redness, tenderness and exudates of wound
- Sudden onset of lower limb pain, knee joint deformity
- Fall or knee injury
- Calf and ankle swelling and tenderness

13. Consult health care professionals if any doubt.

Metal Detector in Airports

The sensitivity of the metal detector apparatus are varies in different airports. Inform the customs officers about your joint replacement if the alarm is activated.

Conclusion

The complication rate of Total Knee Replacement is very low when the patient follows the instructions of health care professional. Eventually, patient's quality of life is expected to be improved with pain free on activities of daily living. With the advance of technology, the prospective of knee replacement surgery is encouraging.

Suggestions of Prophylactic Antibiotic Regimens
for Patients with Joint Replacement

The use of prophylactic antibiotics in patients with joints replacement for events or procedures associated with anticipated bacteraemia is advisable. The following are recommended from the American Academy of Orthopaedic Surgeons.

Procedure	Antimicrobial Agent	Doses	Timing	Duration
Dental	Cephalexin, Cephradine, Amoxicillin	2 gm po	1 hour prior to procedure	Discontinued within 24 hours of the procedure. For most outpatient/ office-based procedures a single pre-procedure dose is sufficient.
Ophthalmic	Gentamicin, Tobramycin, Ciprofloxacin, Gatifloxacin, Levofloxacin, Moxifloxacin, Ofloxacin, or Meomycin- Gramicidin- Polymyxin B Cefazolin	Multiple drops topically over 2 to 24 hours or 100 mg subconjunct-ivally	Consult ophthalmologist or pharmacist for dosing regimen	
Orthopaedic	Cefazolin, Cefuroxime or Vancomycin	1-2 g iv 1.5 g iv 1 g iv	Begin dose 60 minutes prior to procedure	
Vascular	Cefazolin, or Vancomycin	1-2 g iv 1 g iv	Begin dose 60 minutes prior to procedure	

Procedure	Antimicrobial Agent	Doses	Timing	Duration
Gastro-intestinal				Discontinued within 24 hours of the procedure. For most outpatient/ office-based procedures a single pre-procedure dose is sufficient.
Esophageal, Gastro-duodenal	Cefazolin	1-2 g iv	Begin dose 60 minutes prior to procedure	
Biliary tract	Cefazolin	1-2 g iv		
Colorectal	Neomycin + Erythromycin base (oral) or Metronidazole (oral)	1 g po	Dependent on time of procedure, consult with GI physician and/or pharmacist	
Head and neck	Clindamycin + Gentamicin or Cefazolin	600-900 mg iv 1.5 mg/kg iv 1-2 g iv	Begin dose 60 minutes prior to procedure	
Obstetric and gynecological	Cefoxitin, Cefazolin, Ampicillin/ Sulbactam	1-2 g iv 1-2 g iv 3 g iv 3 g iv	Begin dose 60 minutes prior to procedure	
Genito-urinary	Ciprofloxacin	500 mg po or 400 mg iv	1 hour prior to procedure. Begin dose 60 minutes prior to procedure	

American Academy of Orthopaedic Surgeons (2010). Information Statement 1033: Antibiotic Prophylaxis for Bacteremia in Patients with Joint Replacements.

Retrieved from http://www.aaos.org/news/aaosnow/may09/cover2_t2.pdf

AAOS: Information Statement on Antibiotics after Arthroplasty, 2009, revised 2010.

The information is for general educational purpose and reference only.
Should you have any queries, please consult medical professionals.