

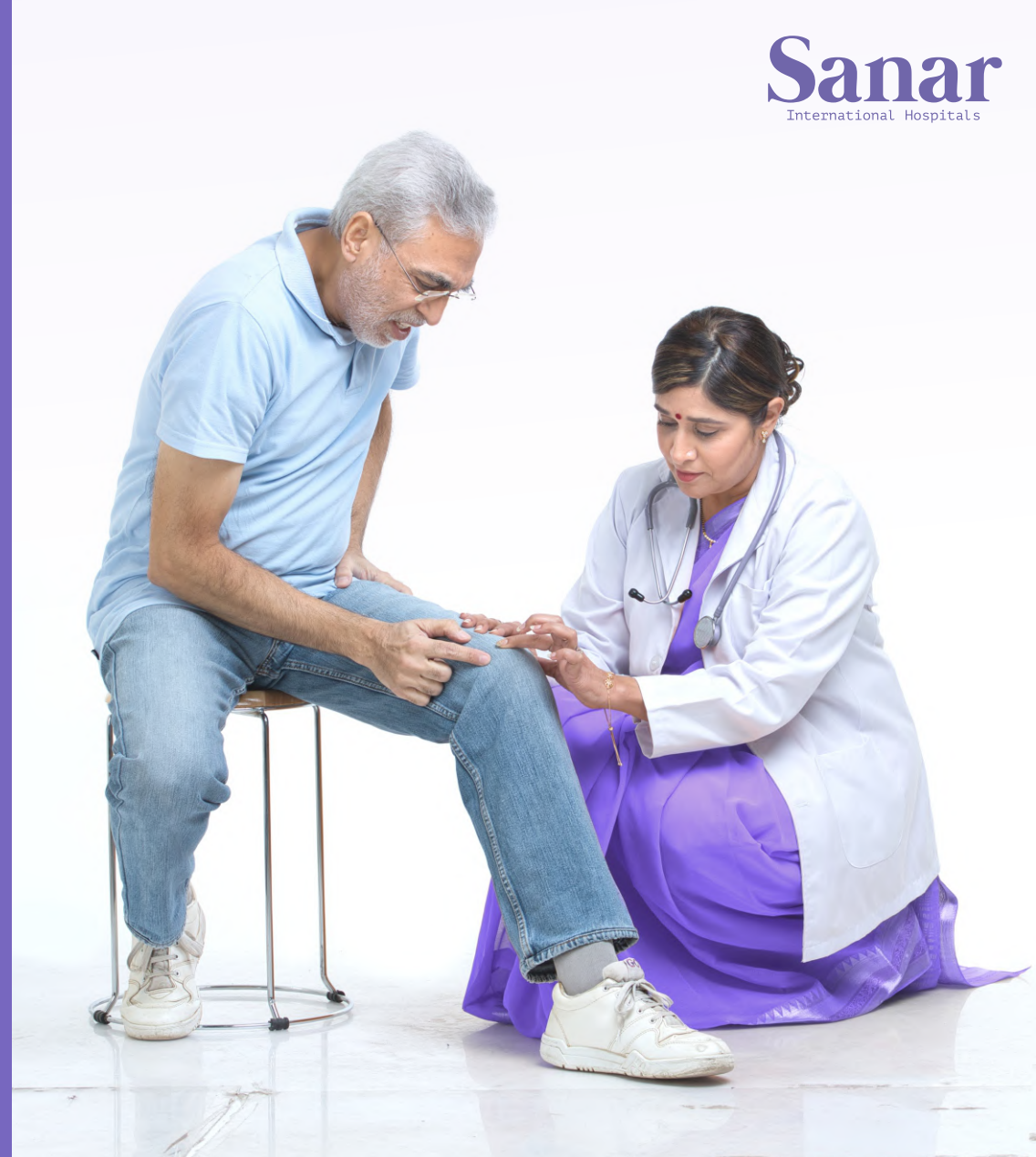
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**Total
Knee Replacement**

The Knee Joint

The knee is the largest joint in the body. It is commonly referred to as a 'hinge' joint because it allows the knee to flex and extend (bend and straighten like a door hinge).

The Healthy Knee

Each bone end is covered with a layer of smooth shiny cartilage that cushions and protects while allowing near frictionless movement. In addition, there is a special washer like cartilage between the joint surface of the thigh and leg bones called Meniscus. Cartilage, which contains no nerve endings or blood supply, receives nutrients from the fluid contained within the joint. Surrounding the knee structure is the synovial lining, which produces this moisturising lubricant. If damaged, the cartilage is not capable of repairing itself.

Strong fibres, called ligaments, link the bones of the knee joint and hold them in place, adding stability and elasticity for movement. Muscles and tendons also play an important role in keeping the knee joint stable and mobile.

Arthritis

Arthritis is a non-specific term often used to describe symptoms like aches, pains and stiffness in joints. Rheumatism is another term used for aches and pains in muscles, joints or other parts of the body. In Arthritis, the cartilage gets worn away, gradually.

Types of Arthritis

Osteoarthritis: This is perhaps the most common type of Arthritis where cartilage simply wears out due to overuse or old age, much like a car tyre.

Rheumatoid Arthritis: This is an autoimmune disease where body's immune system which is designed to fight infections and help in healing wounds, goes haywire and attacks its own tissues, especially joints. Usually, young adults develop this type of joint issue and the patient feels unwell. The joints, usually fingers, swell and become painful.

Infective Arthritis: A common occurrence in India following either usual bacterial infection or Tuberculosis leading to damaged joints with severe signs of infection.

Traumatic Arthritis: Injuries to the joints damage the lining of cartilage. The cartilage develops cracks, which do not heal with original quality tissue. This becomes a weak spot, which gradually wears and follows a course akin to osteoarthritis, though at much



younger age. This can often be seen in people playing regular sports like football and rugby.

Treatment

Depending on the severity of patient's condition and doctor's recommendation, various surgical interventions are available. These include:

- **Arthroscopic Debridement:** A telescope is inserted into the knee and parts of wear and tear are removed
- **High Tibial Osteotomy:** The shin bone (tibia) is cut at the upper end and re-aligned to distribute the load in the knee. This is possible only in arthritic knees
- **Total Knee Replacement:** Surgical procedure in which the entire damaged knee area is resurfaced with artificial components
- **Unicondylar Knee Replacement:** Unlike total knee replacement only the damaged portion of the knee is replaced and re-aligned

Total Knee Replacement

Total Knee Replacement or 'Arthroplasty' is re-aligning of the joint (bone end surfaces) with artificial parts called Prosthesis. There are three components used in

the artificial knee. The femoral (thigh) component is made of metal and covers the end of the thigh bone. The tibial (shin bone) component is made up of metal and UHMWPE (medical-grade plastic), which covers the top end of the Tibia.

Usually titanium metal is used to fix bearing knees and cobalt chrome in mobile bearing knees. Two varieties of knee design form the base of this component. The polyethylene is attached to the top of the metal to serve as a cushion and form a smooth gliding surface between the metal of the femoral and tibial components.

These components are usually cemented to their respective bones, though some uncemented models are also available.

The third component, the patella or knee cap, is made up of polyethylene. The surgeon decides at the time of operation if it should be replaced in a particular situation or not.

Patients with severe arthritis of both knees are recommended replacements of both knees together after a thorough medical evaluation. Joint replacement is also being done using computer assistance which improves implant alignment and surgical precision.

Hi-Flex Knees: A new design called high flexion knees are now being commonly used. These allow patients, near complete range of movement of the knee. The patients can comfortably sit cross-legged on the bed. It is suitable for patients with slim legs.

Unicondylar Knee Replacement

In some patients only one half of the knee joint is worn out. In these situations only one side of the knee is replaced. This is termed as Unicondylar Knee Replacement. It can be done in specific conditions, which only the surgeon can evaluate and advise.

Unicondylar Knee Replacement is comparatively economical and since the operation is less extensive, the post-operative recovery is faster.

Preparation for Surgery

- Patients must give a detailed account of their medical history to the surgeon as it may have a bearing on their operation and its outcome
- A detailed medical check-up is done prior to surgery, to make the surgery safe
- Certain medicines that one may be taking, particularly blood thinners might have to be stopped or some medicines may be added
- The patient needs blood transfusion during surgery depending upon the pre-operative haemoglobin levels. Some patients prefer to donate their own blood a few days



before the operation, which is transfused back to them on the day of the operation.

- The patient is admitted to the hospital two days before the surgery and advised not to eat or drink anything after midnight on the day of surgery
- An injection of blood thinning agent (anticoagulant) is administered, evening after the operation, to minimise chances of blood clotting in the legs
- Usually antibiotics are started on the morning of the operation. For patients with greater risk of infection, antibiotics may be administered a night before
- In order to receive medications and blood transfusions during surgery, an intravenous (IV) line will be inserted. The Anaesthesiologist discusses the type of anaesthetic to be used before surgery
- Most patients are operated under epidural or spinal anaesthesia where their legs are numbed and a fine tube is put in the back through which anaesthetic agent keeps dripping in. This also controls pain in post-operative period

Recovery

After the surgery, the patient is shifted to the post-operative observation room (HDU). A bandage is tied over the knee with a drain tube coming out of the bandage. This removes any blood collected in the knee and minimises the chances of infection.

An intravenous line is used for transfusing blood or fluids into the patient's arm. This is later used to administer antibiotics over the next few days and transfuse blood. In some instances a urinary catheter may be used to help elderly patients or those who have difficulty in urination.

Some leads are attached to the body to continuously monitor the ECG, blood pressure, pulse rate, breathing rate, etc. The patient remains in the observation room for a night. Once the anaesthetists are satisfied, patient is shifted to respective room the next day.

Post-operative management and physiotherapy

- Patient is encouraged to start in bed exercises within 24 hours of the operation.
- After 24-48 hours, drain from the knee joint is removed and the dressing is reduced in size. Patient is made to sit on bedside with legs supported
- 2-3 days after the operation, patient is encouraged to stand and walk using a walker and a day or two later, they are able to visit the toilet, with assistance, using a high seat
- Stitches are removed 2 weeks after the operation
- 3 weeks after the operation, patient is encouraged to walk with a walking stick
- 4-6 weeks after the surgery, patient is trained to start climbing stairs
- The patient is discharged from the hospital 5 days after the surgery with instructions regarding medicines and physiotherapy
- 12 weeks post-operative, one can usually begin driving vehicles, with due precautions
- One is advised not to squat or sit cross-legged after the operation, particularly on the floor
- The post operation schedule gets slightly extended in case of surgery being performed on both the knees

Points to remember

Total Knee Replacement Surgery helps in diminishing pain and stiffness in joints and restores mobility

- Choose a Surgeon who is a specialist in Joint Replacement surgery and performs them regularly



- Choose a well-equipped hospital having an operation theatre and facilities appropriate for Joint Replacement surgery
- Discuss with the surgeon and ensure that good quality implants are used
- Follow the instructions given by your surgeon

Revision Joint Replacement

The usual life span of a successful Total Knee Replacement is about 15 years. It may, however, vary under individual circumstances, and one might require a Revision Joint Replacement.

Understanding the risk

Problems and aspirations of each individual patient differ and these must be discussed with the Surgeon at length before the patient accepts the Total Knee Replacement operation.

Patient must know all that can go wrong and what can be done to save the situation. One must realise that one cannot squat on the ground after knee joint replacement.