What is a total knee replacement?

Total knee replacement surgery aims to substitute the bone and cartilage of the joint damaged by arthritis with metallic and plastic implants.

The surfaces of the thigh and shin bones are replaced with high-resistant metallic components, called the femoral component and tibial baseplate.

Between the femoral component and the tibial baseplate, a plastic tibial insert is implanted. It replaces the cartilage function allowing the thigh and shin bone to slide on each other. All materials used in a total knee replacement are highly biocompatible.

Why total knee replacement?

With almost 50 years of history, total knee replacement surgery is a very common and safe procedure for the treatment of severe arthritis. Approximately 1,000,000 knee replacements are performed annually worldwide.

FEMORAL COMPONENT
METAL

TIBIAL INSERT
POLYETHYLENE

TIBIAL BASEPLATE
METAL

The main benefits of a successful total knee replacement are:

1. **Reduction of knee pain**
   Pain may be rapidly and dramatically reduced, or potentially eliminated!
2. **Recovery of mobility**
   You may dramatically improve the mobility of your knee.
3. **Improvement in quality of life**
   Your everyday activities may no longer be limited by pain and reduced mobility!

GMK® SPHERE
MEDIALLY STABILIZED KNEE

MyKA™
KINEMATIC ALIGNMENT PLATFORM

For further information visit the website:

medacta.com

Bibliographic references:
[1] Koch P, Müller D, Pisan M, Fucentese S, Radiographic accuracy in TKA with CT-based patient-specific cutting block technique, Knee Surg Sports Traumatol Arthrosc. 2013 Oct;21(10):2200-5. [2] Anderl W et al, CT-based patient-specific vs. conventional instrumentation: Early clinical outcome and radiological accuracy in primary TKA, Knee Surg Sports Traumatol Arthrosc. 2014 [3] Ritter MA. et al. Postoperative alignment of total knee replacement: its effect on survival. Clin Orthop. 1994; 299:153-156. [4] Kalairajah Y. et al. Blood loss after total knee replacement: effects of computer-assisted surgery. JBJS Br. 2005 - Nov;87(11):1480-2. [5] Kalairajah Y. et al. Are systemic emboli reduced in computer-assisted knee surgery?: A prospective, randomised, clinical trial. JBJS Br. 2006 Feb;88(2):198-202. [6] Peersman G. et al. Prolonged Operative Time Correlates with Increased Infection Rate after Total Knee Arthroplasty. Hospital for Special Surgery Journal 2006 -Feb;2(1):70-2. [7] C. Rivière et al. Alignment Options for Total Knee Arthroplasty: A Systematic Review. OTSR 2017-Nov 103(7): 1047–56. [8] Dossett, et al. A Randomised Controlled Trial of Kinematically and Mechanically Aligned Total Knee Replacements: Two-Year Clinical Results. BJJ 2014-Jul; 96-B(7): 907–13. [9] P.A. Vendittoli. et al. Kinematic Alignment in Total Knee Arthroplasty Better Reproduces Normal Gait than Mechanical Alignment. KSSTA 2019-May, 27(5): 1410–17. [10] P. Schütz et al. "Kinematic Evaluation of the GMK Sphere Implant During Gait Activities: A Dynamic Videofluoroscopy Study." JOR 2019- Nov; 37(11): 2337–47. [11] S. Banks et al. "Can a Total Knee Arthroplasty Be Both Rotationally Unconstrained and Anteroposteriorly Stabilised?: A Pulsed Fluoroscopic Investigation." Bone Joint Res 2016-Mar; 5 (3): 80–86. [12] Pritchett, James W. "Patients Prefer A Bicruciate-Retaining or the Medial Pivot Total Knee Prosthesis." JOA 2011-Feb; 26(2): 224–28.

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GMK® SPHERE
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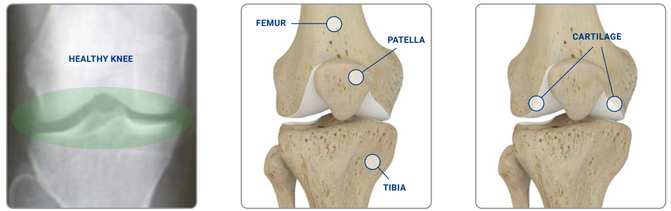
MyKA™
KINEMATIC ALIGNMENT PLATFORM

My total knee replacement procedure
The operation **tailored to you!**

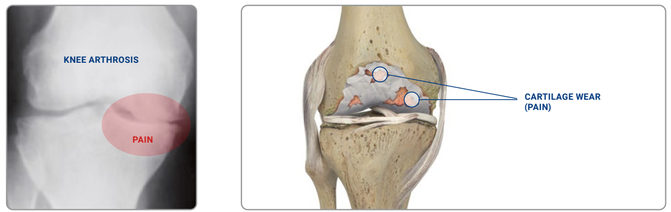
Anatomy of the knee

The knee joint is comprised of three bones: the thigh bone (femur), the shin bone (tibia) and the kneecap (patella). The leg movement is driven by the thigh muscles, the biggest one being the quadriceps, located in the front of the thigh. The thigh and shin bones are connected by ligaments, which give stability to the knee joint.
The surfaces of the kneecap, thigh bone and shin bone, where the bones come into contact, are coated with a smooth tissue called cartilage. The cartilage, together with a substance called synovial fluid, prevents the bones from rubbing against each other and causing damage.



Arthritis of the knee

With arthritis, the cartilage deteriorates and the bones start rubbing directly against each other. The result is joint pain, which can become worse over time and limit motion. Knee replacement is a common treatment for severe arthritis. **Successful knee replacement surgery can result in dramatic pain relief and improvement in knee joint function**.



The knee is the largest and most complex joint of our body. It has a very difficult job carrying the weight of our body with every step we take! Therefore, it is not surprising that knees are the joints in our body that are most vulnerable to injuries or developing degenerative joint diseases, such as arthritis.
One of the consequences of any joint disease is pain. Knee pain may limit your daily activities, affect your fitness level, emotional health, and your general well-being!

Can you get rid of the pain?

There are a variety of surgical and non surgical solutions to treat your disease. Your doctor will prescribe the most suitable treatment, according to your age, activity level and expectations. Knee pain and stiffness caused by advanced arthritis is severely limiting and your surgeon may suggest you undergo a total knee replacement.

Knee alignment and MYKA

NOT ALL KNEES ARE THE SAME…

We all recognise that people look different, their faces and their bodies. It turns out that **knees** are also different in shape and alignment, even when they are healthy. Although a lot of legs are almost **straight**, many are naturally **Varus** (bow-legs) or **Valgus** (knock-knees). Knees can become more Varus or Valgus as a result of disease (arthritis) but it may not be ideal to try to make **all** knees straight after surgery.

VARUS
The tibia is turned inward in relation to the femur, resulting in bow-legs.

VALGUS
The tibia is turned outward in relation to the femur, resulting in knock-knees.

BOW-LEGGED **KNOCK-KNEE**

INDIVIDUALISED KINEMATIC ALIGNMENT (MYKA)

Traditional surgery using **Mechanical Alignment** (or MA), aims to give **every patient a straight "knee alignment"** even if the patient's leg wasn't naturally straight when healthy.

With **Kinematic Alignment** (or KA), the surgeon aims to **restore the natural knee shape** and alignment that each patient had when their knee was still healthy - matching the knee replacement to each patient's **individual anatomy**.

Matching the patients individual leg shape means Kinematic Alignment can potentially make recovery easier and faster[7], compared to traditional surgery it may improve the patient's pain[8] and, possibly, improve the biomechanics of walking and daily activities.[9]

Stability of your knee

GMK SPHERE: THE MEDIALLY STABILISED KNEE

A normal knee is a complex structure - when it bends, the lateral (outer) side rolls back, while the medial (inner) side remains **stable**. The GMK Sphere knee implant is designed to provide a more natural motion that replicates this movement of the healthy knee. It allows stability in the inner side through a ball-in-socket mechanism. Stability is important for common activities such as going up and down stairs, sit to standing, getting into a car, and more demanding activities like shopping and gardening.

GMK SPHERE
MEDIALLY STABILIZED KNEE

STABILITY IS IMPORTANT FOR PATIENTS

The medial ball-in-socket mechanism of the GMK Sphere helps to replicate the function and the stability provided[10,11] by the natural ligaments and structures of the knee, most of which are removed during total knee replacement. Many patients prefer a **stable knee** design with a medial ball-in-socket compared to other conventional knee designs, as they feel more natural, more stable and stronger during common daily activities.[12]

Getting ready for your operation

PRE-ADMISSION CLINIC APPOINTMENT

Prior to surgery, you will attend a Pre-Admission Clinic appointment. This is normally organised 1-2 weeks before your scheduled surgery. At this appointment, you will have routine blood & urine samples taken and an ECG.

MEDICATION

Provide your surgeon with a complete list of any medications you are taking especially, any blood thinning medications. He will inform you if you need to stop or change any medication prior to surgery.

THE SURGICAL PROCEDURE

When the surgical team is ready, you will be taken to the operating room and prepare for surgery. During surgery, the damaged bone is removed from the articulating surfaces of both the femur (thigh bone) and tibia (shin bone) so that the new metal prosthesis can be fitted. After the new joint is in place, skin incisions are closed with stitches and you will then return to the recovery ward. The surgical procedure usually takes 1 to 2 hours.

AFTER THE OPERATION

Doctors, nurses and therapists will take care of your recovery by designing the most suitable rehabilitation programme for you and accompanying you through the gradual recovery process. Rehabilitation may begin the day of the operation, subject to your surgeon's recommendations. You will progress to weight bearing activities as tolerated and may discontinue assistive devices as your comfort level improves.

* Any equipment (crutches, stockings, etc.) will be ordered for you at the hospital.

POST OP CARE

Be sure to follow your surgeons' and the hospital teams' post-surgical instructions carefully to minimise any potential complications which may affect your recovery. These complications are quite infrequent and the simple steps to reduce their likelihood will be explained to you during your stay in hospital. If you have any concerns about your new knee, do not hesitate to contact your surgeon or your General Practitioner

**and finally,
enjoy your new knee!**