Innovation in knee arthroplasty

MYKNEE

Your 3D Printed Patient Specific Solution!
**MyKnee** is a precision instrument which is tailored for each individual patient from a radiological image of their knee.

The MyKnee technology potentially enables the intervention of knee arthroplasty to be more accurate, faster and less traumatic.

- **More accurate positioning of the prosthesis** \(^{[1-10]}\)
- **Less traumatic procedure** \(^{[14-16]}\)
- **Faster surgery** \(^{[11-13, 17]}\)

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**IMPROVE YOUR QUALITY**

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Clinical studies of reference:

8. Goldberg T et al, CB-based Patient Specific Instrumentation is Effective in Patients With Pre-Existing Hardware about the Knee. Bone Joint Journal vol. 95-B no. SUPP 34 326, 2013
18. Data on file: Medacta
## Introduction

1. **The knee and the gonarthrosis (arthrosis of the knee)**  
   Discover how your knee works and what is gonarthrosis

2. **Total knee replacement**  
   Learn about the artificial knee and its benefits

3. **Conventional procedures and MyKnee**  
   Discover why MyKnee is different to conventional procedures

4. **Why choose a MyKnee operation?**  
   The benefits of a total knee arthroplasty by the MyKnee System

5. **The MyKnee adventure**  
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6. **Getting ready for your operation**  
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8. **Taking care of your new knee**  
   …enjoy your new knee!

This brochure has been produced to help you feel safe and confident about your operation. Questions you may have regarding the surgery and post-operative recovery, are addressed.
IMPROVE YOUR QUALITY
INTRODUCTION

The knee is the largest and most complex joint of our body. It has a very difficult function: carrying our body weight. Therefore, it is not surprising that the knees are the joints which are most vulnerable to injuries or developing degenerative joint diseases, such as gonarthrosis (arthritis of the knee).

One of the consequences of any joint disease is pain.

Statistics show that roughly one third of the American population over the age of 45 suffer knee pain. Knee pain limits your daily activities, affects your mood, your health, and overall, your general well-being!

You want to get rid of the pain and you can!

There are a variety of surgical and non surgical solutions to treat your disease. Your physician will advise the most suitable treatment, according to your age, activity level and expectations.

Knee pain and stiffness caused by advanced arthrosis is severely limiting and your physician may suggest you undergo a total knee replacement.
1 - THE KNEE AND THE
GONARTHROSIS

KNEE ANATOMY

The knee joint is comprised of three bones: the thigh bone (femur), the shin bone (tibia) and the kneecap (patella). When you flex or straighten your leg, the thigh bone turns on the shin bone, while the kneecap runs along the end of the thigh bone. 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 surface of the kneecap, thigh bone and shin bone, where the bones come into contact, is coated with a smooth tissue called articular cartilage. The cartilage, together with a substance called synovial fluid, prevents the bones from rubbing against each other and causing damage.

ARTHROSION OF THE KNEE (GONARTHROSIS)

In cases of arthrosis, the cartilage deteriorates and the bones start rubbing directly against each other. The result is joint pain, which worsens day by day, and limits motion.

Knee replacement is a common treatment for severe arthrosis. Successful knee replacement can result in dramatic pain relief and improvement in the knee joint function.
WHAT IS A TOTAL KNEE REPLACEMENT?

Total knee replacement surgery aims at substituting the bone and cartilage of the joint that has been damaged by arthrosis with plastic and metallic components.

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 insert** is implanted. It replaces the cartilage function allowing the thigh and shin bones 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. The main benefits of a successful total knee replacement are:

1. **Reduction of knee pain**
   Pain may be rapidly and dramatically reduced, 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!
3 - CONVENTIONAL PROCEDURES AND
The positioning of a knee prosthesis is achieved using surgical instruments which prepare the bone for implanting the prosthesis.

**CONVENTIONAL PROCEDURES**

In conventional procedures, the surgical instruments are the same for all patients. Conventional instrumentation must be adjusted by the surgeon during the procedure in order to get satisfactory positioning on each individual.

**MYKNEE: THE INNOVATION**

MyKnee is a 3D Printed surgical instrument which fits your knee accurately, because it is tailored for you.

Medacta, after analysing a diagnostic image of your leg, provides your surgeon with an instrument that is designed and manufactured specifically for your knee, and approved by your surgeon on the basis of computer-aided planning.

MyKnee instruments are manufactured with the innovative 3D Printing technology. This solution offers a very accurate manufacturing process and the highest design flexibility to match your knee anatomy. This allows to realize instruments specifically tailored for your knee, still respecting high quality standards.

MyKnee technology allows preparation of the bones for implanting the prosthesis, respecting the characteristics of your anatomy.
4 - WHY CHOOSE A MYKNEE OPERATION?
Starting with an image of the knee, MyKnee is an instrument that is tailor-made for every patient.

MyKnee technology was developed to achieve the following results:

1. **More accurate positioning of the prosthesis**
   MyKnee fits the shape of the knee accurately, allowing precise preparation of the bone for implanting the prosthesis\(^1,2\). Each phase of the operation is previously planned by the surgeon by analysis of a tridimensional model of the knee and taking the patient’s condition into account. It has been proven that an accurate positioning results in increased survival of the prosthesis\(^14\).

2. **Less traumatic procedure**
   Conventional procedures require damaging anatomic structures (e.g. medullary canal) in order to position the surgical instruments used to implant the prosthesis. MyKnee preserves these structures, allowing a significant decrease of blood loss and risk of embolism\(^15,16\).

3. **Faster operation**
   The use of the MyKnee technology is very simple and straightforward. It potentially allows the surgeon to reduce the operating time, thus decreasing the time under anaesthetic and the risk of infection\(^17\).

Benefits of **MyKnee**

The MyKnee technology was designed to achieve a more accurate, faster and less traumatic total knee replacement, by the use of a surgical instrument tailored for the patient.
5 - THE MYKNEE ADVENTURE
MyKnee is a surgical instrument which fits your knee accurately.

1 **Obtain an image of your knee**
   The surgeon will organise for you to have a 3D scan (CT or MRI) of your Hip, Knee and Ankle.

2 **Replication of your knee and creation of MyKnee**
   Using the 3D scans, Medacta will create a 3D model of your knee and your personalised surgical instruments.

3 **Surgeon analysis of the planning**
   Your surgeon will adjust the settings of your MyKnee plan to match your anatomy, planning the position of your final knee implant.

4 **Preparation for surgery**
   Prior to surgery, your surgeon will receive the 3D printed MyKnee instruments and the 3D bone model which are specific for your knee. These instruments will be used to perform the surgery.

5 **...enjoy your new knee!!!**

Your 3D Printed Patient Specific Solution
Before undergoing your total knee replacement, your doctor will prescribe a complete physical examination to assess your condition and to ensure that there are no factors that could interfere with your surgery.
TESTS

Your doctor may ask you for blood and urine tests and possibly a cardiogram, prior to your surgery.

CHECK YOURSELF

1 Check your skin
   If your knee and leg have any skin infections or irritation, contact your orthopaedic surgeon prior to surgery: he or she will tell you how best to prepare your skin for surgery.

2 Check your teeth
   The incidence of infection after knee replacement is very low, however infection can occur if bacteria enter your bloodstream. Therefore, you should contact your dentist to have your teeth checked before your surgery.

MEDICATION

Prior to surgery, provide your surgeon with a complete list of any medication you are taking, including doses and times. He or she will inform you if you need to stop or change any medication.

SPECIAL EQUIPMENT

Special equipment, such as support stockings and crutches, may be needed: you can rent or buy it from specialised shops.
TAKE WITH YOU
THE DAY OF YOUR OPERATION

The surgical procedure will take approximately 1 to 2 hours.

It will be preceded by pre-surgical preparation and followed by monitoring in the recovery room.

The time away from your room will be longer than the operation due to time needed for your preparation for surgery, administration of anaesthesia and monitoring as you recover from the anaesthetic. Special care is taken to relieve pain after the surgery. Do not hesitate to call, even in the middle of the night, to obtain relief. Regular checks will be made by the nurses.

AFTER THE OPERATION

Specialised personnel will, from day one after the surgery, take care of your recovery by defining the most suitable rehabilitation programme for you and accompanying you through the gradual recovery process.

Rehabilitation can be started the day of the operation, subject to your doctor’s approval. You may progress to weight bearing activities as tolerated and may discontinue assistive devices as your comfort level improves.

1 A complete list of your routine medication including doses and times.

2 Your x-rays and all papers for hospital admission including a copy of insurance cards (if requested in your country).

3 Any equipment (crutches, stockings, etc.) ordered for you by your doctor.
LONG TERM CARE OF YOUR NEW KNEE

Follow your orthopaedic surgeon’s instructions carefully to minimise any potential complication that could affect your recovery and your implant lifetime. These complications, however, are quite infrequent and some simple rules can dramatically reduce their likelihood.

DON’T FORGET

1. Lead a healthy and active life
2. In case of fever, throat inflammation, pulmonary inflammation or similar, tell your physician that you have a knee implant
3. Undergo regular general check-ups
If you have any concerns about your new knee, do not hesitate to contact your physician and, finally, ...

...enjoy your new knee!
My experience:

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MY KNEE: THE OPERATION TAILORED FOR YOU!
“I could walk the next day. Sure, there is a basic pain, but it is nothing compared to my last surgery. Also the therapy three years ago has been more painful. As I can bend my knee much better and can also take the stairs, I have no problems”

E.O., Austria

“I’m looking forward to having my new knee and stop feeling pain”

M.B., USA

“Now I’m feeling very well and the quality of my life is improving, I’m happy again”

E.B., Austria

For further information visit the website:

myknee4me.com