

Innovation in knee arthroplasty

# MYKNEE

Your 3D Printed  
Patient-Specific Solution!



## MyKnee, a solution designed for you

MyKnee is a precision instrument tailored for each individual patient based on a radiological image of their knee.

The MyKnee technology was designed to achieve a **MORE ACCURATE, FASTER AND LESS TRAUMATIC**, total knee replacement.



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This brochure has been prepared to help you feel safe and confident about your operation. It addresses any questions you may have regarding the surgery and post-operative recovery.

 **MyKnee®**  
PATIENT MATCHED TECHNOLOGY  
IN KNEE REPLACEMENT



## Introduction

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**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 to developing degenerative joint diseases, such as gonarthrosis (arthrosis of the knee). One of the consequences of any joint disease is **pain**.

Statistics show that roughly one third of Americans 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!**

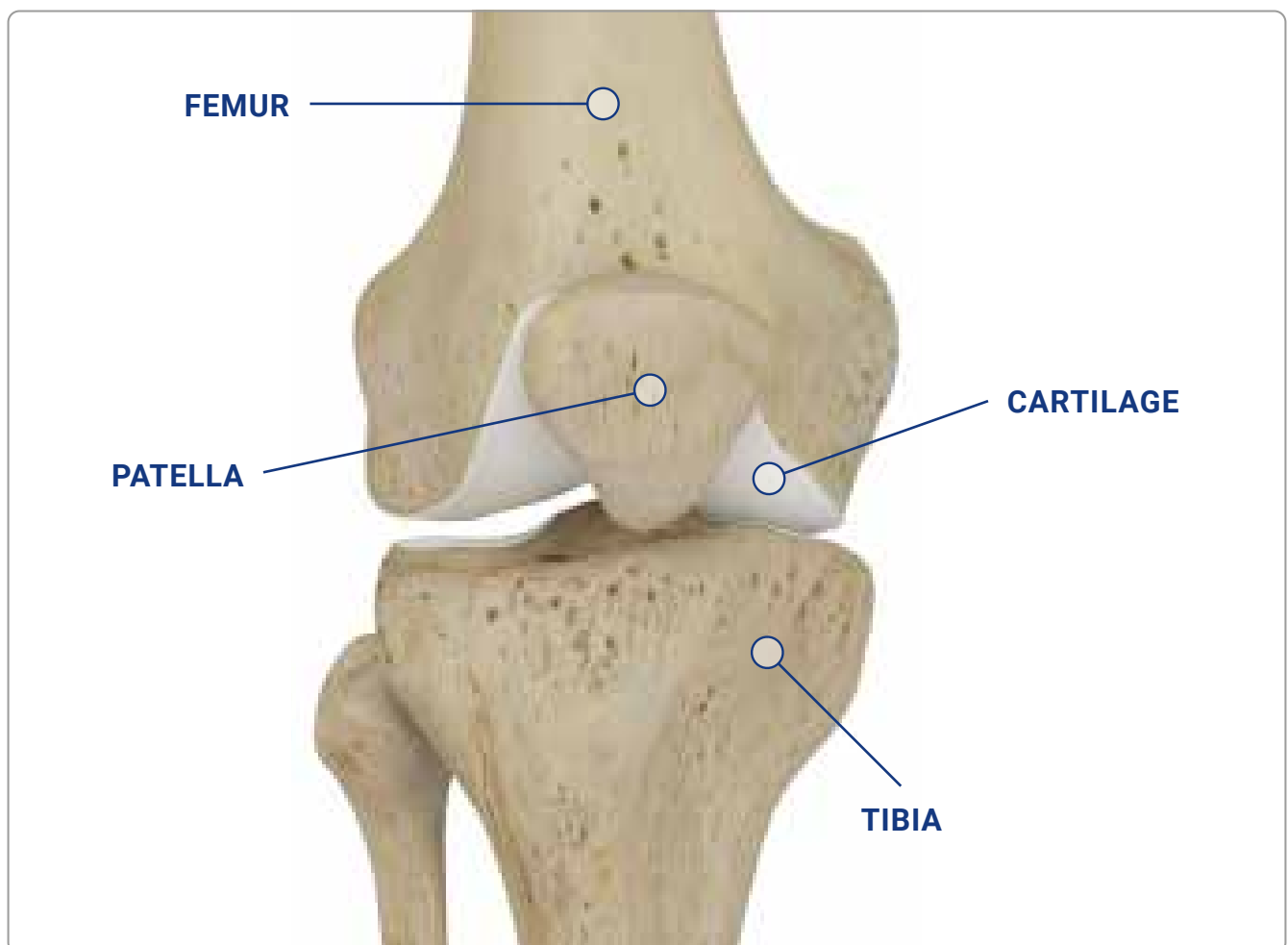
## **YOU WANT TO GET RID OF THE PAIN AND YOU CAN!**

There are a variety of surgical and non surgical solutions to treat your disease. Your physician will advise you about 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 that you undergo a total knee replacement.

## 1 - The knee and gonarthrosis

### KNEE ANATOMY

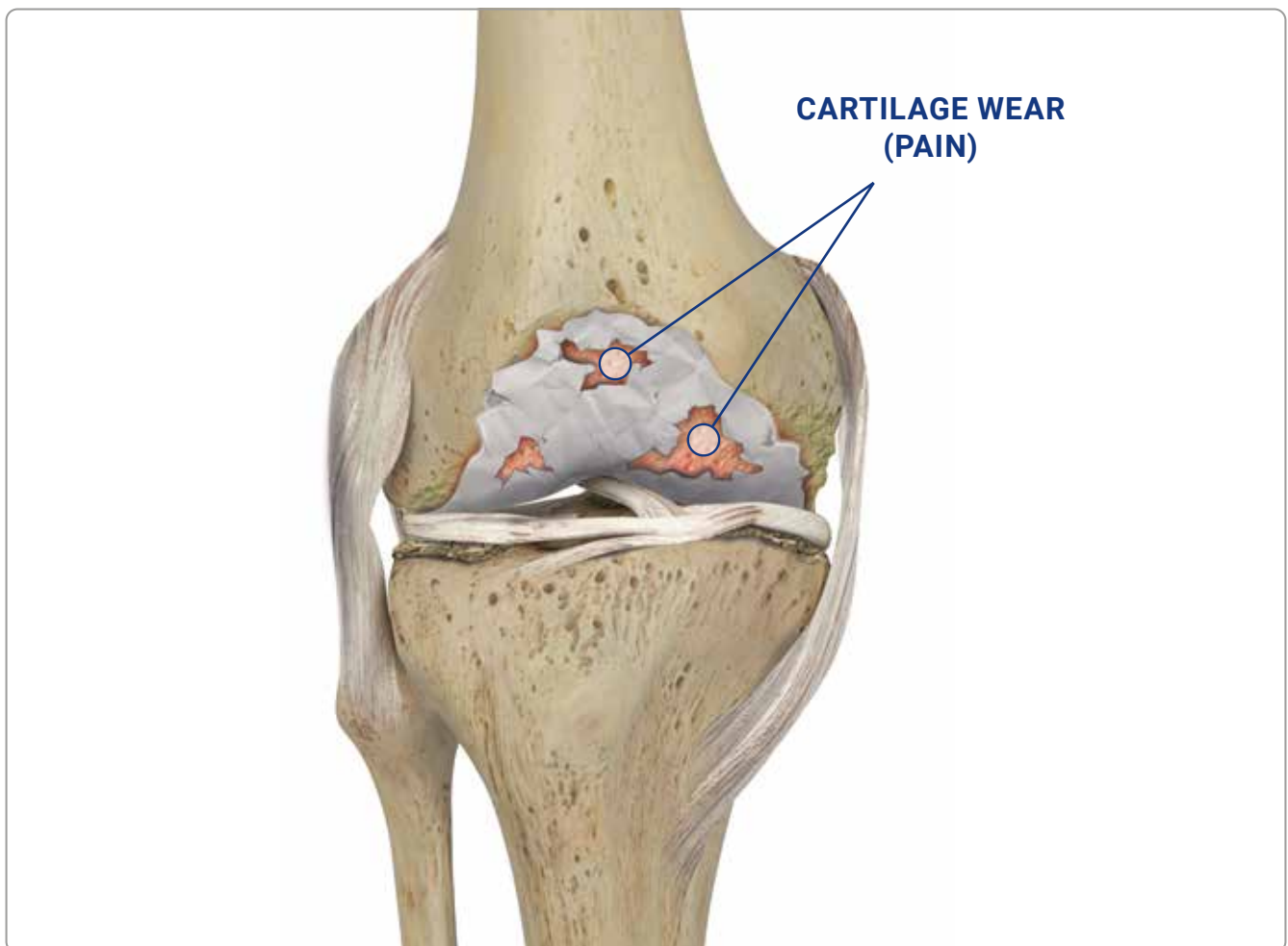
The knee joint is comprised of three bones: the **femur**, the **tibia** and the **patella**. The leg movement is driven by the thigh **muscles**, the biggest of which is the quadriceps, located in the front of the thigh. The thigh and shin bones are connected by **ligaments**, which give stability to the knee joint. The surface of the femur, tibia and patella, 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.



## ARTHROSIS OF THE KNEE

In cases of arthrosis, or gonarthrosis, 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. In the case of advanced osteoarthritis, your doctor may suggest that you undergo a total knee replacement.

**SUCCESSFUL KNEE REPLACEMENT CAN RESULT IN DRAMATIC PAIN RELIEF AND IMPROVEMENT IN THE KNEE JOINT FUNCTION.**



## 2 - Total knee replacement

### WHAT IS A TOTAL KNEE REPLACEMENT?

A 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**.

A **plastic insert** is implanted between the femoral component and the tibial baseplate. 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.



**FEMORAL COMPONENT**  
Metal



**PLASTIC TIBIAL INSERT**  
Polyethylene



**TIBIAL BASEPLATE**  
Metal



## **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:

### **Reduction of knee pain**

Pain may be rapidly and dramatically reduced, potentially eliminated!

### **Recovery of mobility**

You may radically improve the mobility of your knee.

### **Improvement in quality of life**

Your everyday activities may no longer be limited by pain and reduced mobility!



## 3 - Conventional procedures and Myknee

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The positioning of a knee prosthesis is achieved using surgical instruments to 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 achieve satisfactory positioning for 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 analyzing 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 innovative **3D Printing technology**. This solution offers a very accurate manufacturing process and the highest design flexibility to match your knee anatomy. This allows for the creation of instruments that are specifically tailored for your knee, always respecting high quality standards.

The MyKnee technology allows for preparation of the bones for implanting the prosthesis, **respecting the characteristics of your anatomy.**

## 4 - Why choose a Myknee operation?

The MyKnee technology enhances the benefits of a standard knee replacement by offering a **more accurate, faster and less traumatic procedure through the use of surgical instruments tailored to each patient.**



**Your 3D Printed  
Patient-Specific Solution**

**DESIGNED FOR YOU,  
BY YOU!**



### **More accurate positioning of the prosthesis<sup>[1-10]</sup>**

MyKnee fits the shape of the knee accurately, allowing for precise preparation of the bone for implanting the prosthesis. Each phase of the operation is planned in advance by the surgeon based on the analysis of a 3D model of the knee and taking into account the patient's condition. It has been proven that an accurate positioning results in increased survival of the prosthesis.



### **Less traumatic procedure<sup>[14-16]</sup>**

Conventional procedures require damaging the anatomic structures (e.g., the medullary canal) in order to position the surgical instruments used to implant the prosthesis. MyKnee preserves these structures, allowing for a significant decrease of blood loss and risk of embolism.

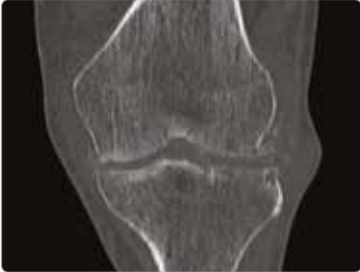


### **Faster surgery<sup>[1-13,17]</sup>**

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.

## 5 - The MyKnee adventure

MyKnee is a surgical instrument which **fits your knee accurately**. How does it work?



### 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.



### REPLICATION OF YOUR KNEE AND CREATION OF MYKNEE

Using the 3D scans, Medacta will create a 3D model of your knee and your personalized surgical instruments.



### SURGEON'S 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.



### 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.



**...ENJOY YOUR NEW KNEE!!!**

## 6 - Getting ready for your operation

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### TEST & CHECKS

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

### 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 these from specialised shops.



## 7 - What to do in the hospital

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### 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 the 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

Specialized personnel will, from day one after the surgery, take care of your recovery by defining the most suitable rehabilitation program for you and accompanying you through the gradual recovery process. Rehabilitation can be started on 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.



## 8 - Taking care of your new knee

### LONG TERM CARE OF YOUR NEW KNEE

Follow your orthopaedic surgeon's instructions carefully to minimize 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.

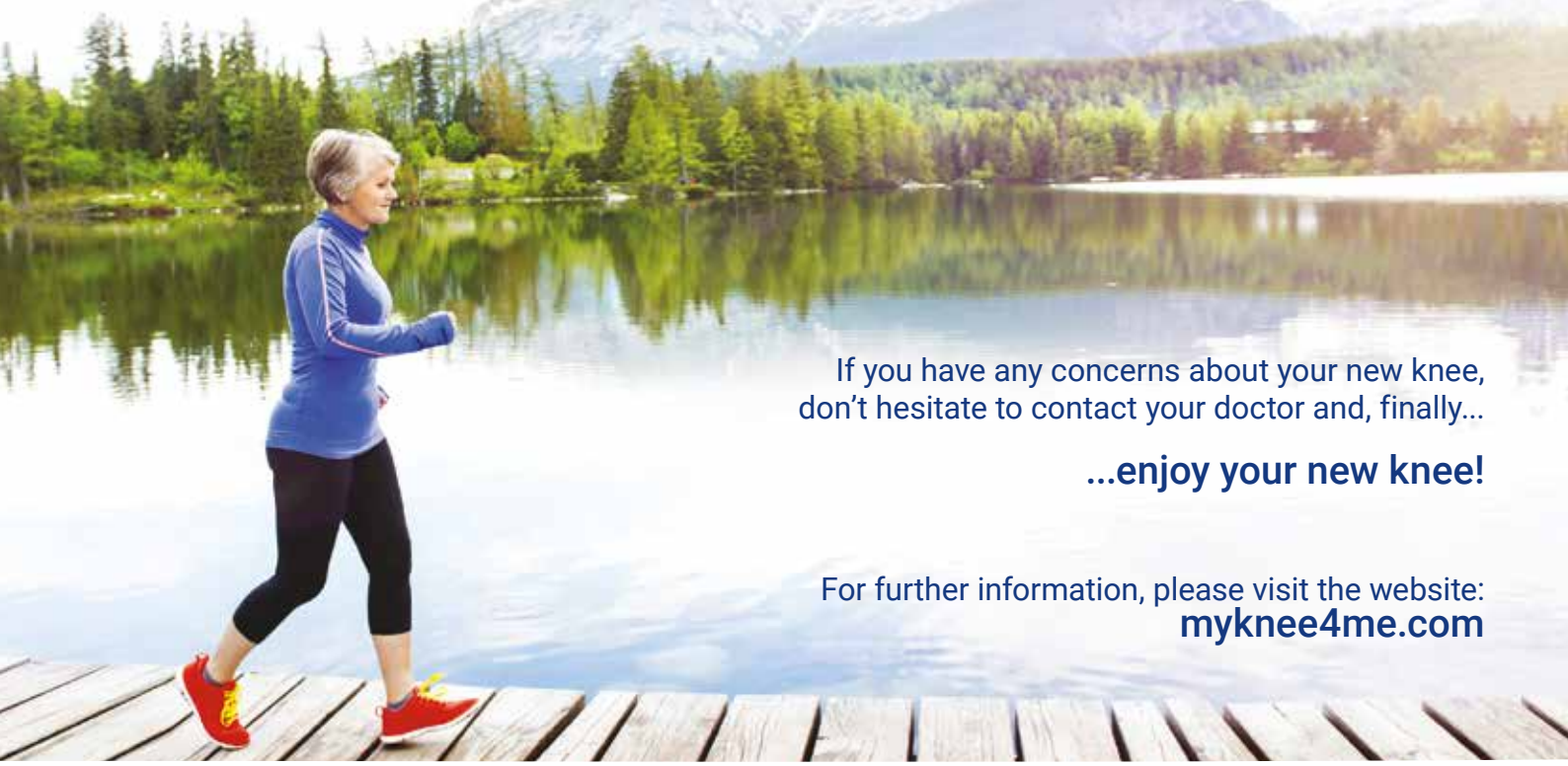
### Don't Forget

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



#### Clinical studies of reference:

<sup>[1]</sup> 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 <sup>[2]</sup> 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. <sup>[3]</sup> Nabavi et al, Assessment of the Accuracy of TKR's Performed Using Patient Matched Technology by Computed Tomography, Podium Presentation at the 27<sup>th</sup> ISTA congress Kyoto, Sept 24-27, 2014 <sup>[4]</sup> Leon V, Patient matched technology vs conventional instrumentation and CAS, Poster at the 13<sup>th</sup> EFORT Congress, Berlin, May 23-25 2012. <sup>[5]</sup> Dussault M, Goldberg T, Greenhow R, Hampton D, Parry S, Slimmack M - Preoperative planning accuracy of MyKnee system. M.O.R.E. Journal. 2012 May; 2:22-25. <sup>[6]</sup> Müller D et al, CT based patient specific cutting blocks for total knee arthroplasty: technique and preliminary radiological results. Podium Presentation at the 71<sup>st</sup> Annual Congress of the SSOT, Lausanne, Switzerland, June 22-24, 2011. <sup>[7]</sup> Goldberg T et al, Ct-Based Patient-Specific Instrumentation Is Accurate for TKA: A Single-Surgeon Prospective Trial, Bone Joint Journal vol. 95-B no. SUPP 34 325, 2013 <sup>[8]</sup> Goldberg T et al, Ct-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 <sup>[9]</sup> Trong M, Helmy N et al, Improved positioning of the tibial component in unicompartmental knee arthroplasty with patient-specific cutting blocks, Knee Surg Sports Traumatol Arthrosc. 2014 Jan, Epub ahead of print. <sup>[10]</sup> Baldo F, Boniforti B, Patient-specific cutting blocks for total knee arthroplasty; preoperative planning reliability. J Orthopaed Traumatol 2011; 12 (Suppl 1): S23-S88 <sup>[11]</sup> Goldberg T, MyKnee economical and clinical results. Podium Presentation at the 6<sup>th</sup> M.O.R.E. International symposium, Stresa, Italy, May 13-14, 2011. <sup>[12]</sup> Koch P, MyKnee System: A new vision in total knee replacement. Leading Opinions - Orthopédie & Rheumatologie 2, 2011: 32-35. <sup>[13]</sup> Gagna G, Aspects économiques de la technologie sur mesure MyKnee en chirurgie prothétique du genou, Podium Presentation at the SOFCOT Annual Meeting, Paris, November 11-14, 2012. <sup>[14]</sup> Ritter MA. et al. Postoperative alignment of total knee replacement: its effect on survival. Clin Orthop. 1994; 299:153-156. <sup>[15]</sup> Kalairajah Y. et al. Blood loss after total knee replacement: effects of computer-assisted surgery. JBJS Br. 2005 - Nov;87(11):1480-2. <sup>[16]</sup> 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. <sup>[17]</sup> 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. <sup>[18]</sup> Data on file: Medacta



If you have any concerns about your new knee,  
don't hesitate to contact your doctor and, finally...

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

For further information, please visit the website:  
**[myknee4me.com](http://myknee4me.com)**

*"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