Rotating Platform Knees
Function with Wear Resistance
Today's diverse patient population demands a knee system that can react to the needs of the individual patient. The Sigma Knee System brings together function with wear resistance to match patient needs.

Regardless of the size, shape or activity level of patients, surgeons can feel confident that with the Sigma Knee system, they can choose the procedure and implant to meet their patients' demands.
The Sigma Knee System offers one of today’s most comprehensive, integrated knee systems. It embraces a wide variety of philosophies and surgical techniques and continues to develop with the addition of further implant options and instrumentation.

The Sigma Rotating Platform Knee Portfolio

Femoral Component
- CR
- CR150
- CR Porocoat®
- PS
- PS with lugs
- RP-F
- Open Box PS

Patella
- 1-Post (Round & Oval)
- 3-Post (Round and Oval)
- Inset

Polyethylene Insert
- Curved (CVD)
- Stabilized (STB)
- RPF

Tibial Tray
- MBT Cementless Cone
- MBT Cemented Cone
- MBT Cementless Keel
- MBT Cemented Keel
Sigma Rotating Platform Knees
Function with Wear Resistance

Femoral Components
Rounded coronal geometry maximizes contact area while minimizing contact stresses
Accommodates high flexion with Sigma CR150 and RP-F

Highly Polished Cobalt Chrome Tibial Tray
Minimizes abrasion and is designed to reduce backside wear
Based on the clinical heritage of the LCS

Unidirectional Motion
Conforming design promotes insert rotation relative to tibial tray
Self aligning bearing is designed to decouple flexion extension and rotation into two unidirectional motions
Diminishes incidence of tray loosening by reducing torque stress at the proximal tibia
Optimal Function

The Sigma femoral components are designed to provide optimal function for high demand patients. The main benefits of the femoral components are:

Rounded Coronal Geometry

By utilizing a round-on-round geometry, the system allows a larger contact area and lower contact stresses, both in neutral alignment and varus or valgus lift-off compared to flat-on-flat designs. This optimizes the trade-off between maximal contact area and constraint of the implant.¹

In contrast, lift-off of the femoral component in a flatter condylar design can lead to edge loading on the opposite side. This may cause high concentrations of contact stresses on the polyethylene.

High Flexion

Today’s patients want a knee that provides both function and stability during high flexion. Only Sigma Knees offer high flex designs to accomodate the different philosophies of PCL management and the wear reducing benefit of rotating platform.

The Sigma Knee’s clinically proven J-curve gives uncompromised implant-to-bone contact through 150 degrees of flexion, reducing the risk of point contact stress.
Wear Resistance
Highly Polished Cobalt Chrome Tray

DePuy Orthopaedics established leadership in implant design with the introduction of rotating platform knees in the United States. This unique mobile bearing design now has over 30 years clinical success.

Proven Design

The MBT Tray builds upon clinical experience gained with the DePuy Orthopaedics rotating platform design. Its long term success, 97.7% at 20 years, demonstrates that bearing rotation can effectively reduce wear and loosening forces.  

Highly Polished Surface

The polyethylene friendly, highly polished CoCr tray creates a smooth surface, minimizing abrasion.

The highly polished top surface of the MBT tray allows the insert to articulate smoothly and provides excellent low wear performance.

Unidirectional Motion

The design of the rotating platform MBT tray plays pivotal role in separating complex, multidirectional motions inherent in fixed bearing designs. The motion can be separated into two categories:

- Topside motion flexion / extension
- Backside motion internal / external rotation

Topside motion: The congruent, articulating surface of the rotating platform design maximizes contact area while diffusing shear and torsional forces which may lead to implant loosening.

Backside motion: The decoupling of stresses minimizes constraint forces placed on the bone implant interface to improve implant fixation that may assist in the long term survivorship of the implant as evidenced by 97.7% survivorship at 20 years.
Technical Details

Sagittal Shape
*10 mm for size 6

Coronal Shape
**Not Available for TC3 Femoral Components

Box height of Sigma PS Femoral Components

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M.B.T. Info

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Curved Insert
10, 12.5, 15, 17.5 (mm)

Posterior Stabilized (PS) Insert
10, 12.5, 15, 17.5, 20, 22.5, 25 (mm)

RP-F Insert
10, 12.5, 15, 17.5 (mm)

M.B.T. Tray Sizing

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Anterior View of M.B.T. Tray with Keel

Keel Length is 13mm for Sizes 1 – 3, and 19mm for Sizes 4 – 7

Lateral View of M.B.T. Tray with Keel

Tray Thickness is 4.8mm for all M.B.T. Trays

Anti-rotation Keel swept back 25 degrees

M.B.T. Tray with Central Stem

Porocoat M.B.T Tray
Composite Thickness = 4.8mm

Same Porocoat Thickness is on Entire Bottom Surface of M.B.T. Trays

Porocoat Thickness = 0.8mm

Anti rotation tabs are 1.5mm proud of central stem
Sigma High Performance Instruments

Function

HP Instruments deliver Function with Wear Resistance through ease of use and improved alignment. Ease of use, or function, impacts all healthcare providers throughout the surgical pathway including surgeons, scrub techs and surgeon assistants by creating a straightforward and efficient procedure.

Distal Femoral Resection

Efficient - Engineered for fast pinning and easy removal. Adjustments designed to be easy to access and use.

User-Friendly - Designed for comfortable fingertip control.


Fixed Reference

Options - Anterior or Posterior referencing in one system, available in 0, 3, 5, or 7 degrees of rotation. Rotation Guides provide reference points to Whiteside's line and epicondylar axis.

Optimized profile - Cutting blocks minimize soft tissue impingement, enable complete cuts, and are the same M/L width as the implant.

Flexibility - Allows for easy downsizing or upsizing changes, as well as last minute +2 or -2mm adjustments.
Wear Resistance

Wear resistance is a key factor in an implant’s long-term success. It is influenced by implant alignment, which is a combination of surgical skill and precise instrumentation.

Tibial Resection

**Stability** - Blocks are designed to maximize stability against the bone, to promote a more accurate cut.

**Precision** - Instruments provide 1 mm resection adjustment – which allows for optimum gap balancing. Precise calculation sets the exact degree of slope that the surgeon desires based on leg length.

**Versatility** - Multiple alignment checks/tools are available to aid in correct placement and resection.

Tibial Preparation

**Precision** - 1 mm cement mantle produced by instruments provides consistent implant fit.

**Accuracy** - Tray tower is designed for drill and punch to occur at the same spot on the tibia.

**Rotation** - Rotating Platform instruments allow surgeons to locate optimal implant positioning for rotation.
TruMatch™ Personalized Solutions

TruMatch Solutions bring a new level of personalized total knee replacement surgery to the operating room, allowing the surgeon to work with cutting guides individually prepared to match the alignment criteria and actual bone surfaces of each patient. This personalized technology is designed to improve implant positioning, functionality, and procedure efficiency through:

- Customized femoral and tibial cutting guides based on mechanical alignment and a CT scan of each patient
- Software that delivers a patient proposal based on each surgeon’s surgical preferences
- Reduction in surgical steps, standard instrumentation, sterilization time, and operating room turnover time
References


