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 is designed to bring 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 with the addition of further implant options and instrumentation.
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 150 and RP-F Knees.

**Highly Polished Cobalt Chrome Tibial Tray**
Minimizes abrasion and is designed to reduce backside wear.
Based on the clinical heritage of the LCS™ Total Knee System

**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.
The SIGMA Femoral Components are designed to provide enhanced 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. SIGMA Knees offer high flex designs to accommodate the different philosophies of PCL management and the wear reducing benefit of rotating platform.

The SIGMA Knee’s specific J-curve gives enhanced implant-to-bone contact through 150 degrees of flexion, potentially reducing the risk of point contact stress.
DePuy Synthes established leadership in implant design with the introduction of rotating platform knees in the United States. This mobile bearing design now has over 30 years clinical success.

**Wear Resistance**

**Highly Polished Cobalt Chrome Tray**

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

**Proven Design**

The MBT Tray builds upon clinical experience gained with the DePuy Synthes rotating platform design. Its long term success, 97.7% survivorship at 20 years for mechanical reasons or poor clinical knee score, 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 improved 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

<table>
<thead>
<tr>
<th>Size</th>
<th>Height</th>
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<tbody>
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<td>Size 1.5</td>
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<tr>
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<td>14.8 mm</td>
</tr>
<tr>
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<tr>
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<td>Size 5</td>
<td>18.6 mm</td>
</tr>
<tr>
<td>Size 6</td>
<td>19.5 mm</td>
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M.B.T. Info

Size  | Keel Height  | M/L Keel
---    |------------|------
1.5    | 38 mm      | 37 mm
2      | 38 mm      | 37 mm
2.5    | 38 mm      | 37 mm
3      | 38 mm      | 37 mm
4      | 43 mm      | 43 mm
5      | 43 mm      | 43 mm
6      | 48 mm      | 49 mm

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

<table>
<thead>
<tr>
<th>Size</th>
<th>M/L (mm)</th>
<th>A/P (mm)</th>
<th>Stem Length (mm)</th>
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</table>

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 Porous Coating Thickness = 0.8mm

Anti rotation tabs are 1.5mm proud of central stem

Same POROCOAT Porous Coating Thickness is on Entire Bottom Surface of M.B.T. Trays
Function

HP Instruments are designed to 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.

**Visual Cues:** Line-of-site engraved marking for quick, eye-friendly visual clarity. Secure color-coded locking after adjustment.

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 are designed to minimize soft tissue impingement, enable complete cuts, and are the same M/L width as the implant.

**Flexibility:** Allows for 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 bring a high 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


