"I use the DePuy Revision Knee System because of its versatility. With this system I can solve nearly any situation I encounter in the OR."

Dr. Thomas Fehring, OrthoCarolina Hip and Knee Center, North Carolina

The DePuy Knee Revision Portfolio offers surgeons a comprehensive array of implant options for cases that require varying levels of constraint. From moderate soft tissue laxity and minor bone defects through end-stage revision, and all systems can be combined with the M.B.T. Revision tray.

System Options:

P.F.C. SIGMA® TC3 RP  
LCS® COMPLETE™ Revision  
S-ROM® NOILES™ Hinge  
Limb Preservation System (LPS)™

M.B.T. Revision with sleeve and stem
ADDRESSING TWO OF THE MAJOR REASONS FOR KNEE FAILURE:

Addressing Loosening with Rotating Platform

Addressing Instability with Metaphyseal Sleeves

Addressing Efficiency with High Performance Revision Instruments
REDUCE LOOSENING FORCES WITH ROTATING PLATFORM\textsuperscript{2,3}

The only revision knee portfolio with a mobile bearing option for every constraint level.

\begin{align*}
\text{Fixed bearing tray stress} & \quad \text{Rotating platform rotational freedom}
\end{align*}

Mobile-bearing knee prostheses have been shown to reduce stresses transmitted to the fixation interface, which could improve implant stability and decrease the incidence of implant loosening.\textsuperscript{2,3} Russo et al. reported improved fixation at the bone-implant interface with mobile-bearing knees, which was attributed to stress reduction provided by constraint reduction with a mobile tibial insert.\textsuperscript{2} Bottlang et al. showed that under 10 degree tibial external rotation, the mobile-bearing knee induced 33\% less compressive strain than the fixed-bearing knee.\textsuperscript{3}

SIGMA\textsuperscript{®} TC3 RP has been shown to reduce torque stresses by up to 87\% versus a constrained fixed bearing device.\textsuperscript{4}

Goldstein et al. presented simulator data which are very encouraging with respect to the damage and wear that occurs to MB constrained polyethylene liners as compared with FB controls. To put this into the clinical perspective, less surface and post wear can translate into lower rates of osteolysis and wear, as well as less stress on fixation interfaces. These facts become more important in a more constrained knee as a TC3 if the increased frequency of knee revision surgery is realized, particularly in a more active population. The simulator data help us conclude that there is an advantage of MB as compared with FB knee revision surgery.\textsuperscript{5}
ADDRESS INSTABILITY FROM BONE LOSS WITH METAPHYSSEAL SLEEVES

The stepped metaphyseal sleeves compensate for substantial cavitary defects, compressively load the bone and provide a solid foundation for implant stability.6,7

Case History

With the central and peripheral tibial defects filled, the surgeon is able to restore the patient’s natural joint line.

The metaphyseal sleeves can fill type 2 and 3 defects, while bringing the implant into contact with strong, supportive bone. The sleeve is stepped to compressively load the bone and form a strong foundation for reliable implant stability, avoiding excessive bone resection and preserving true joint line restoration. The sleeves provide a variety of sizes and options (both fully porous and distally porous).6,7
COMPENSATE FOR SEVERE BONE LOSS

A comprehensive range of defect-fill options

The DePuy Revision System provides a platform for progressive compensation of bone loss.

Regain Joint Stability

The DePuy Revision System forms the platform for progressive compensation of moderate to severe bone loss. A combination of trays, augments and stem options allow the surgeon to gain implant stability.
PROVIDE SEAMLESS SURGICAL INTEGRATION

Provides simplified surgical approaches to handle a multitude of situations encountered in the OR.

Same canal preparation throughout the system. The Universal stems on both the tibia and femur are slotted and have flutes to enhance diaphyseal fit and rotational stability and match bone stiffness more closely.8

Same broaching technique throughout the various levels of constraint. A simplified surgical flow allows the surgeon to cut directly off the tibial broach and reference femoral cuts.

Same tibial preparation regardless of the level of constraint needed. This eliminates the need for additional instrumentation and OR time. As the tray is universal, the surgeon can seamlessly transition to the next level of constraint.
When performing a complete knee revision, DePuy Orthopaedics’ High Performance Revision Instrument System is designed to minimize the number of instrument cases required for a surgery. In addition with enhanced visual cues and easy adjustments on the cutting blocks and a simplified trialing system, the High Performance Revision Instruments allow surgeons to work efficiently throughout the procedure.

The purpose of the High Performance Revision Instrument System is to deliver simplicity and efficiency to revision challenges encountered in the OR.
BONE DEFECTS IN REVISION TOTAL KNEE ARTHROPLASTY

The DePuy Orthopaedics Revision Knee System allows the surgeon to address Engh Classification T1/F1, T2/F2 and T3/F3 bony defects, taking full account of the soft tissue envelope status from a fully functional joint through the absence of any viable ligaments.

ENGH BONE DEFECT CLASSIFICATION SYSTEM

Type 1
T1 Tibia/F1 Femur

• Localised defect: cortical rim intact
• Near normal joint line
• Often requires small amounts of bone graft

Type 2
T2 Tibia/F2 Femur

• Cortical rim intact
• Central or peripheral metaphysis loss
• Requires cement fill, cancellous bone graft, augments or sleeves to restore joint line

Type 3
T3 Tibia/F3 Femur

• Loss of entire metaphysis and cortex
• Requires structural bone graft, hinged implant, sleeve or custom component
• Compromised ligaments
SOFT TISSUE LOSS IN REVISION TKA

Ligament Status
• Stable
• PCL Absent
• LCL Absent
• MCL Absent
• All Absent

Implant selection for revision TKA is based upon a combination of soft tissue/ligament stability and bone defects. The chart below shows DePuy Orthopaedics’ recommended implant systems using the Engh Bone Defect Classification System and ligament stability in the patient’s joint.²
P.F.C. SIGMA TC3

- Provides comprehensive revision portfolio from mild to severe bone loss and soft tissue laxity
- Compatible with both the rotating platform revision tray and the fixed bearing options
- Addresses the majority of commonly recognised defects

<table>
<thead>
<tr>
<th>T1/F1</th>
<th>Stable</th>
<th>PCL Absent</th>
<th>LCL Absent</th>
<th>MCL or All Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/RPS Augment or graft</td>
<td>P5 Augment or graft</td>
<td>PS/TC3 Stem always with TC3; Sleeve, augment and/or graft where required</td>
<td>S-ROM NOILES Hinge Sleeve always; Stem, augment and/or graft where required</td>
<td></td>
</tr>
</tbody>
</table>

| T2/F2 | PS or TC3 Stems always; Sleeve, augment and/or graft where required | PS or TC3 Stems always; Sleeve, augment and/or graft where required | TC3 or S-ROM NOILES Hinge Stems always; Sleeve, augment and/or graft where required | S-ROM NOILES Hinge Sleeve always; Stem, augment and/or graft where required |

| T3/F3 | S-ROM NOILES Hinge Stems and sleeves always; Augment and/or bone graft where required | S-ROM NOILES Hinge Stems and sleeves always; Augment and/or bone graft where required | S-ROM NOILES Hinge Stems and sleeves always; Augment and/or bone graft where required |

Soft tissue laxity

Trays: M.B.T. Revision Tray for mobile bearing revision (recommended), P.F.C. SIGMA Mod+ or P.F.C. SIGMA Offset Tray for fixed bearing.

Stems: Recommend stems for TC3 and S-ROM NOILES Hinge prostheses.

Sleeves: Recommend sleeves for all T3/F3 defects.
LCS COMPLETE Revision

• Provides comprehensive revision portfolio from mild to severe bone loss and soft tissue laxity

• Same articulation as clinically-proven LCS Knee System¹⁰

• Provides RP stabilised (RPS) and varus/valgus constraint (VVC) options

• The LCS COMPLETE portfolio is compatible with the M.B.T. Revision standard and build-up trays

<table>
<thead>
<tr>
<th>Bone defects</th>
<th>Stable</th>
<th>PCL Absent</th>
<th>LCL Absent</th>
<th>MCL or All Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1/F1</td>
<td>RP</td>
<td>RPS</td>
<td>RPS/VVC</td>
<td>S-ROM NOILES Hinge</td>
</tr>
<tr>
<td></td>
<td>Augment or graft</td>
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<td>Stem always with WC; Sleeve, augment and/or graft where required</td>
<td></td>
</tr>
<tr>
<td>T2/F2</td>
<td>PPS or WC</td>
<td>PPS or WC</td>
<td>WC or S-ROM NOILES Hinge</td>
<td>S-ROM NOILES Hinge</td>
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<td></td>
</tr>
<tr>
<td>T3/F3</td>
<td>S-ROM NOILES Hinge</td>
<td>S-ROM NOILES Hinge</td>
<td>S-ROM NOILES Hinge</td>
<td>S-ROM NOILES Hinge or LPS</td>
</tr>
<tr>
<td></td>
<td>Stems and sleeves always; Augment and/or bone graft where required</td>
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</tbody>
</table>

Trays: M.B.T. Revision Tray for VVC or RPS; M.B.T. Tray also for RPS.

Stems: Recommend stems for VVC and S-ROM Hinge prostheses

Sleeves: Recommend sleeves for all T3/F3 defects.
S-ROM NOILES Hinge

- Clinically proven hinge design for patients with severe soft tissue instability and/or bone deficiency.
- Offers a load-sharing polyethylene insert to reduce stress and wear.
- Metaphyseal sleeve options for tibial and femoral bone defects.
- Compatible with same M.B.T. Revision tray as with less constrained options; providing a seamless surgical flow.

<table>
<thead>
<tr>
<th>Bone defects</th>
<th>Soft tissue laxity</th>
<th>Stable</th>
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</tbody>
</table>
LPS (Limb Preservation System)

- One of the most comprehensive lower extremity systems
- Used for end-stage revision, severe trauma and oncology cases
- Compatible with M.B.T. Revision Trays
- Unique ability to resect bone in 5 mm increments
- Offers a variety of surgical solutions, including straight stems, bowed stems, and metaphyseal sleeves
HP Extraction Instruments

- Instruments designed to aid in the removal of any implant system
- Ergonomic handles and easy to use adjustments
HP Revision Instruments

- Streamlined technique
- Easy to use
- Designed to minimize the number of instrument cases required for a surgery
- Enhanced visual cues and easy adjustments on the cutting blocks
References


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