“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, each system promotes successful patient outcomes through the following areas:

- Reduce loosening forces with rotating platform
- Address instability from bone loss with metaphyseal sleeves.
- Provide seamless surgical integration
- Increase OR efficiency

System Options:

- P.F.C.® SIGMA® TC3 RP
- S-ROM® Nailes Hinge
- Limb Preservation System (LPS)™

- M.B.T. Revision with sleeve and stem
ADDRESSING THE TOP 2 REASONS FOR KNEE FAILURE:

Addressing Loosening
with Rotating Platform

Addressing Instability
with Metaphyseal Sleeves

Addressing Efficiency
with High Performance Revision Instruments
Inevitably, as constraint increases, rotation (induced by normal knee function) passes through the joint and loosening forces become stronger at the fixation interface. Optimized, curve-on-curve bearings are designed to accept rotation and for many patients this will be sufficient. However, only the SIGMA® Knee systems provide the rotational freedom to actively diffuse loosening forces, making it suitable for increased mechanical constraint within the implant. Freedom to rotate also allows the implant to find its natural alignment postoperatively, bringing the bearing surfaces into congruent, low-wear contact.
ADDRESS INSTABILITY FROM BONE LOSS WITH METAPHYSEAL SLEEVES

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

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

Same canal preparation throughout the systems. Universal Stems on both the tibia and femur allow rotational stability and reduce end-stem pain.

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.
High Performance Revision Instrumentation designed to make complex revisions easier.

When performing a complete knee revision, DePuy Orthopaedics’ High Performance Revision Instrument System reduces the amount of instrument cases needed by 40% versus leading competitors.* In addition with enhanced visual cues and easy adjustments on the cutting blocks and a new simplified trialing system, the High Performance Revision Instruments allow surgeons to increase efficiency throughout the procedure.

The end result is an instrument system that delivers simplicity and reproducibility to revision challenges encountered in the OR.

*Comparison between DePuy Orthopaedics SIGMA TC3 RP and S-ROM Hinge surgical techniques versus Zimmer LCCK and RHK surgical techniques and Stryker TS and MRH surgical techniques.
BONE DEFECTS IN REVISION TOTAL KNEE ARTHROPLASTY

The DePuy Orthopaedics Revision Knee System allows the surgeon to address 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.²

**Type 1**  
T1 Tibia/F1 Femur

- Localized 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 Orthopaedic's recommended implant systems using the Engh Bone Defect Classification System and ligament stability in the patient's joint.

<table>
<thead>
<tr>
<th>Bone defects</th>
<th>Soft tissue laxity</th>
<th>Stable</th>
<th>PCL Absent</th>
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<tbody>
<tr>
<td>T1/F1</td>
<td></td>
<td>Non-stabilized or stabilized</td>
<td>Stabilized</td>
<td>Stabilized or VVC (Varus/Valgus Constraint)</td>
<td>Hinge</td>
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<tr>
<td>T2/F2</td>
<td></td>
<td>Stabilized or VVC</td>
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<td>VVC or hinge</td>
<td>Hinge</td>
</tr>
<tr>
<td>T3/F3</td>
<td></td>
<td>Hinge</td>
<td>Hinge</td>
<td>Hinge</td>
<td>Hinge or LPS</td>
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P.F.C. SIGMA TC3

- Provides constraint needed with reduced tibial tray loosening forces
- Compatible with both the rotating platform revision tray and the fixed bearing options
- Addresses the majority of commonly recognized defects

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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.
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.
- Unique 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.

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Trays: M.B.T. Revision Tray with Orthogenesis LPS insert for mobile-bearing revision (recommended); S-ROM Noiles tray available.

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

Sleeves: Recommend sleeves for all T3/F3 defects.
LPS (Limb Preservation System)

- Most comprehensive lower extremity system
- 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
- Offer a variety of surgical options, including stems, metaphyseal and diaphyseal 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
- Fewer instruments and cases
LCS® Complete™ – P.F.C.® Sigma™ RP Mobile-bearing Total Knee System

IMPORTANT
This Essential Product Information sheet does not include all of the information necessary for selection and use of a device. Please see full labeling for all necessary information.

INDICATIONS
CEMENTED USE:
The LCS® Complete™ – P.F.C.® Sigma™ RP Mobile Bearing Total Knee System is indicated for cemented use in cases of osteoarthritis and rheumatoid arthritis. The RP-F insert and femoral component are indicated where a higher than normal degree of postoperative flexion is required. The rotating platform prosthesis and modular revision components are indicated for revision of failed knee prostheses.

UNCEMENTED USE:
The porous coated Keeled and Non Keeled M.B.T.™ (Mobile Bearing Tibial) Tray configurations of the LCS Total Knee System are indicated for noncemented use in skeletally mature individuals undergoing primary surgery for reconstructing knees damaged as a result of noninflammatory degenerative joint disease (NIDJD) or either of its composite diagnoses of osteoarthritis and post-traumatic arthritis pathologies. The Rotating Platform device configuration is indicated for use in knees whose anterior and posterior cruciate ligaments are absent or are in such condition as to justify their sacrifice. The P.F.C. Sigma RP Curved bearings when used with the P.F.C. Sigma Cruciate Retaining Femoral Component can be used in posterior cruciate ligament retaining procedures.

CONTRAINDICATIONS
The use of the LCS Complete – P.F.C. Sigma RP Mobile Bearing Total Knee System is contraindicated in:

- the presence of osteomyelitis, pyrogenic infection or other overt infection of the knee joint;
- patients with any active infection at sites such as the genitourinary tract, pulmonary system, skin or any other site. Should a patient have any infection prior to implantation, the foci of the infection must be treated prior to, during and after implantation.
- patients with loss of musculature or neuromuscular compromise leading to loss of function in the involved limb or in whom the requirements for its use would affect recommended rehabilitation procedures.
- patients with severe osteoporosis or other metabolic bone diseases of the knee.
- patients with any of the following conditions:
  - lesions of the supporting bone structures (e.g. aneurysmal or simple bone cysts, giant cell tumor or any malignant tumor),
  - systemic and metabolic disorders leading to progressive deterioration of solid bone support,
  - the presence of severe instability secondary to advanced loss of osteochondral structure or the absence of collateral ligament integrity, fixed deformities greater than 60° of flexion, 45° of genu varus or valgus,
  - known drug or alcohol addiction,
  - skeletal immature individuals and the presence of allergic reaction to implant metals or polyethylene are also contraindications for the noncemented, porous coated, M.B.T. and LCS Complete – P.F.C. Sigma RP Mobile Bearing device configurations, and for the cemented use of all device configurations of the LCS Complete – P.F.C. Sigma RP Mobile Bearing Total Knee System.

For more information about DePuy products, visit our website at www.depuyknees.com

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CONTRAINDICATIONS FOR USE WITHOUT CEMENT
Noncemented use of the Porous Coated Keeled or Non-Keeled M.B.T. Tray device configurations is contraindicated in patients with sufficient loss in quantity or quality of bone stock (as determined on x-ray) such that successful noncemented fixation is unlikely. Additional contraindications may become apparent at the time of surgery. These include:

- vascular deficiency at the bone site;
- inadequate bone stock to assure both a firm press fit and close apposition of the cut bone surfaces to the prosthesis;
- the inability to make bone cuts so as to assure both correct component position and intimate apposition of bone and prosthetic surfaces;
- inadequate bone quality (e.g. severe osteoporosis) and lack of stability of the implanted components.

In the presence of any of the above conditions the components should be fixed with cement.

WARNINGS AND PRECAUTIONS
Components labeled for “Cemented Use Only” are to be implanted only with bone cement. The following conditions tend to adversely affect knee replacement implants: excessive patient weight, high levels of patient activity, likelihood of falls, poor bone stock, metabolic disorders, disabilities of other joints.

ADVERSE EVENTS
The following are the most frequent adverse events after knee arthroplasty: change in position of the components, loosening, bending, cracking, fracture, deformation or wear of one or more of the components, infection, tissue reaction to implant materials or wear debris; pain, dislocation, subluxation, flexion contracture, decreased range of motion, lengthening or shortening of leg caused by improper positioning, looseness or wear of components; fractures of the femur or tibia.

References