LCS® COMPLETE™

My knee. My life.™

LCS® Complete™ RPS Flexion Product Rationale

DePuy
a Johnson & Johnson company

Bringing increased flexion to the world's first and leading mobile bearing total knee system

The LCS® knee is the world's first and leading mobile bearing knee system. Introduced in 1977, it established the fundamental principles of mobile bearing design.

97.7%

Survivorship at 20 years.[1]

The advanced design and material technology of the mobile bearing knee system are clinically proven to offer patients optimum function with maximum survivorship.[1-4]

Drawing from this outstanding record of clinical experience, the LCS® Complete™ RPS Flexion knee system brings increased flexion to the LCS Complete family, while maintaining full congruency in gait.

Optimum component engagement for increased implant stability

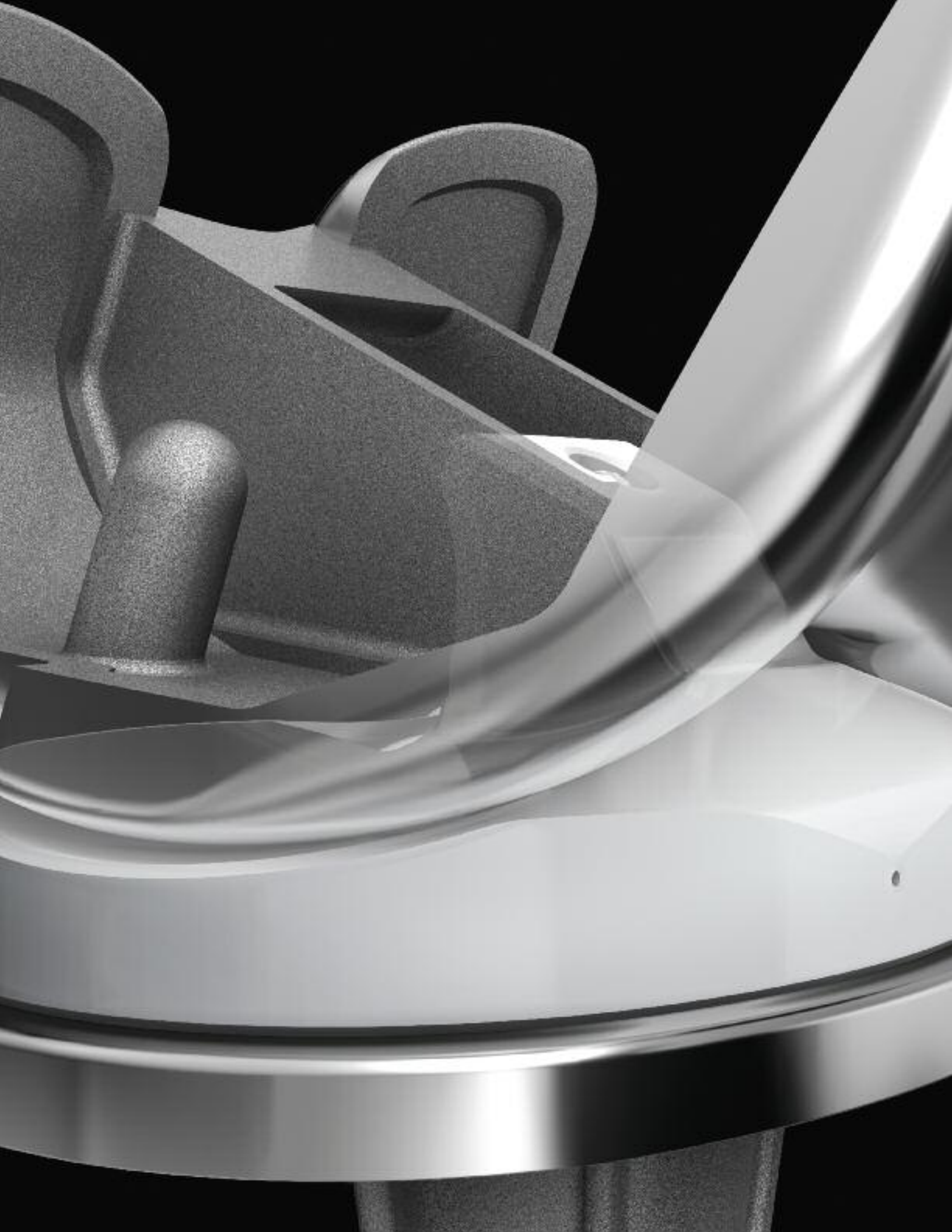
The design of the femoral cam in relation to the tibial spine controls femoral rollback to provide optimum implant stability and control.

The LCS Complete RPS Flexion will stay centrally located in the insert through engagement of the spine and cam at 70 degrees of flexion. Up to 4.5 mm of femoral rollback will occur between 90 and 140 degrees of flexion.

Anterior Cam

Allowance has been made for up to 12 degrees of hyperextension of the femoral component. This would equate to 5 degrees of hyperextension with the tibial component being implanted at 7 degrees posterior slope.

The anterior aspect of the tibial spine and the anterior cam of the femoral component have been designed in conjunction to ensure rolling contact between the tibial insert and femoral component, allowing additional flexibility into hyperextension.



Proven patellofemoral articulation

99.0%

Survivorship at 12 years.[3]

The smooth continuous sagittal curve of the femoral component maintains congruent patella contact throughout range of motion. This avoids the potential for high stresses which may occur with alternative femoral designs.

The width of the intercondylar notch has been reduced and the trochlea entrance lowered to allow for maximum patellofemoral contact, reducing the risk of patella impingement during deep flexion.

The LCS Complete RPS Flexion uses any of the LCS Complete patella bearings. The components are congruent in the load bearing phases due to the conformity built into the patella surface. The LCS Patella is an anatomic component.

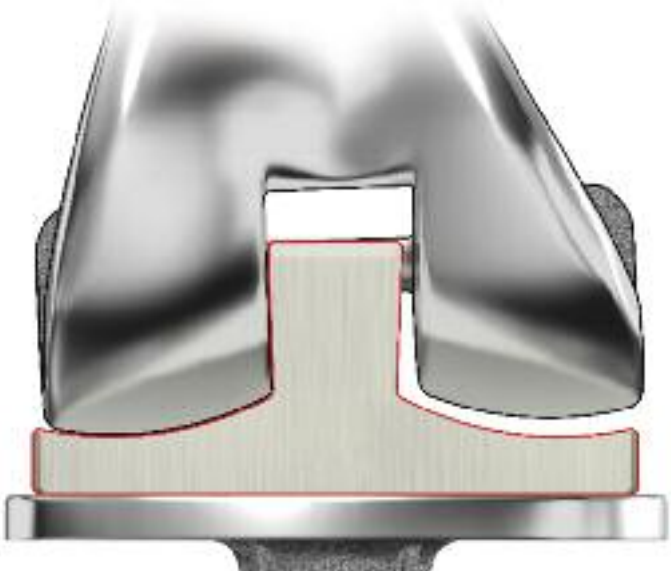
High function demands rotation

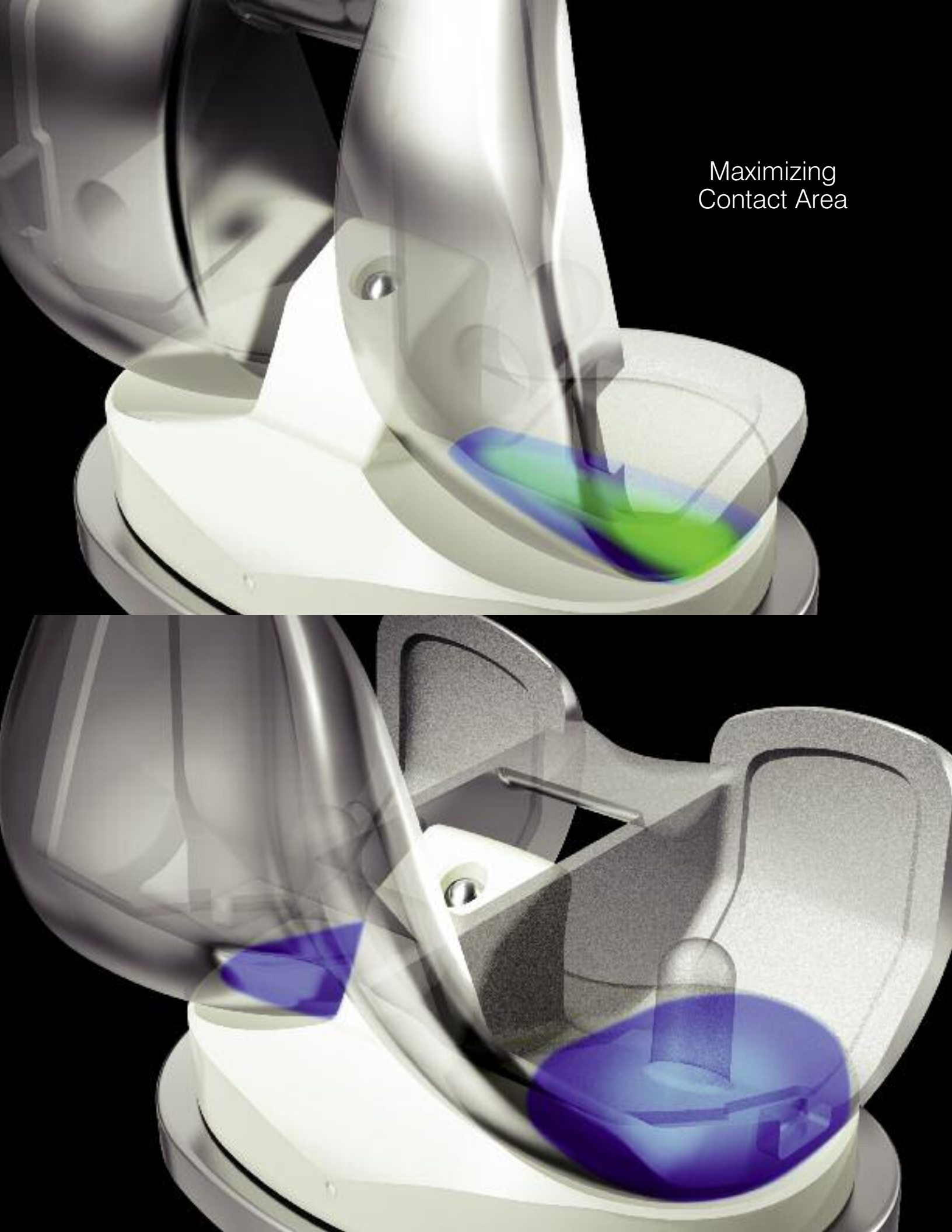
Clinical results show that bearing rotation plays an important role in helping to assure long-term implant fixation by decoupling the femoral and tibial components with a rotating insert.[1,2]

Both in gait and in flexion the congruent articulating surfaces will decrease torsional forces and increase unidirectional motion thus maximizing contact area, minimizing contact stress and resulting in reduce wear.[5]

The LCS Complete RPS Flexion design will accommodate up to 12 degrees of internal/external rotation without the bearing hanging over the tibial tray.

The tibial spine has been designed in conjunction with the cam to provide optimal tibiofemoral kinematics. The tibial spine has a trapezoidal design to allow for medial/lateral translation in the coronal plane during gait. The contact between the components has therefore been designed to provide congruent, flat-on-flat contact, after 4 degrees of femoral condyle lift-off. This will minimize the potential for increased contact stresses at the spine/housing interface.[6]

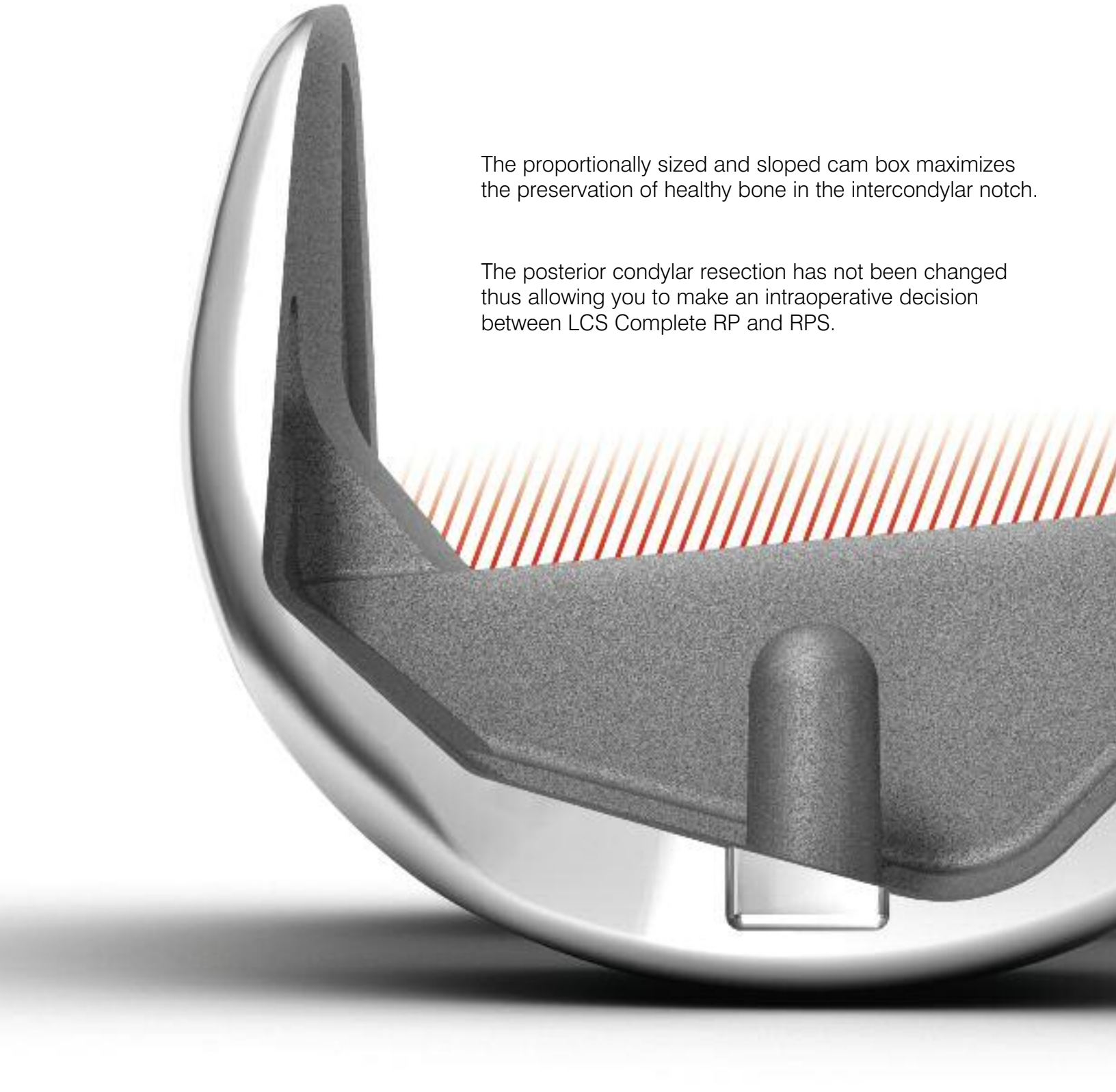



Maximizing
Contact Area

Preserving viable femoral bone

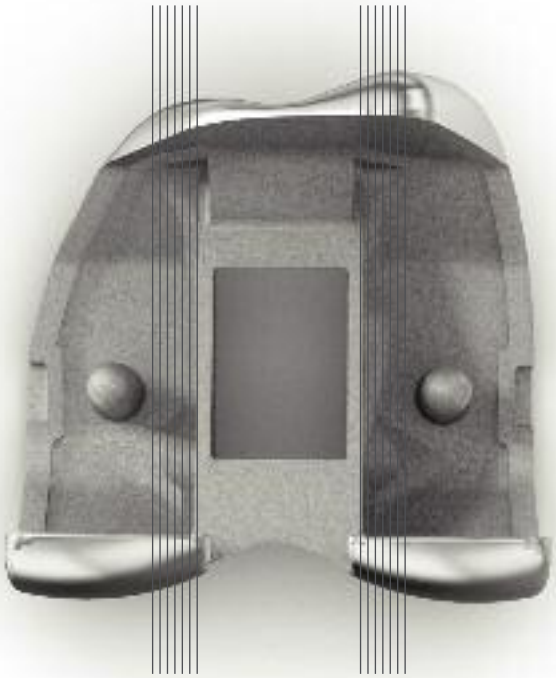
The proportionally sized and sloped cam box maximizes the preservation of healthy bone in the intercondylar notch.

The posterior condylar resection has not been changed thus allowing you to make an intraoperative decision between LCS Complete RP and RPS.

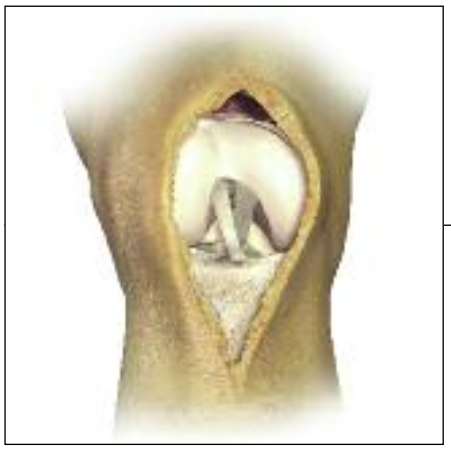


Femoral Intercondylar Box

Width (mm)		Height (mm)	
Sm	13.7	Sm	19.7
Sm+	15.1	Sm+	21.7
Med	15.8	Med	22.7
Std	16.5	Std	23.7
Std+	17.8	Std+	26.0
Lrg	19.2	Lrg	27.7
Lrg+	20.6	Lrg+	30.5



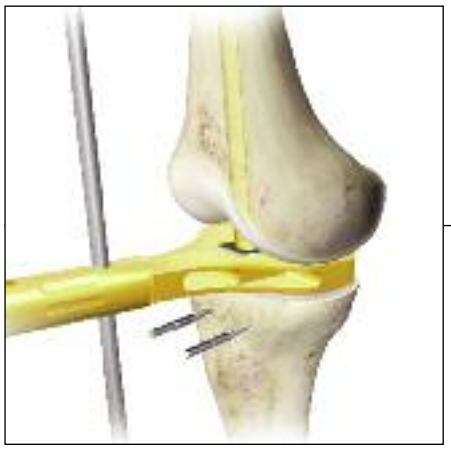
Surgical Summary



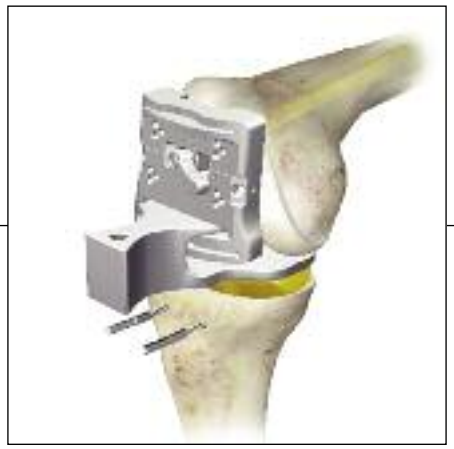
Step 1: Incision and exposure

Step 2: Patellar resection

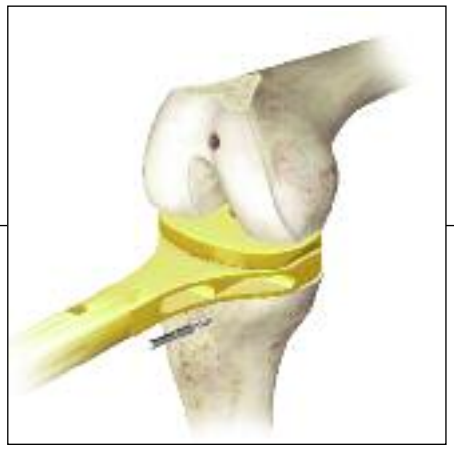
Step 3: Lower leg alignment



Step 7: Long leg alignment



Step 8: Femoral rotation and A/P resection



Step 9: Flexion gap assessment

Step 13: PS trial reduction

Step 14: Final component implantation

Step 4: Tibial resection

Step 5: Femoral sizing

Step 6: I.M. hole preparation

Step 10: Distal femoral resection

Step 11: Femoral chamfer cuts

Step 12: PS notch guide

PS Final Femoral Preparation

Figure 1

Femoral Chamfer Cuts

Select the appropriate sized femoral 4-in-1 cutting block and position on the resected anterior and distal surfaces of the femur (Figure 1).

Pin the block in place through the fixation pinholes with at least two pins before any bone cuts are made.

Ensure the cutting block sits flush on the anterior and distal resections.

Chamfer cuts are made using a 1.47 mm saw blade (Figure 2).

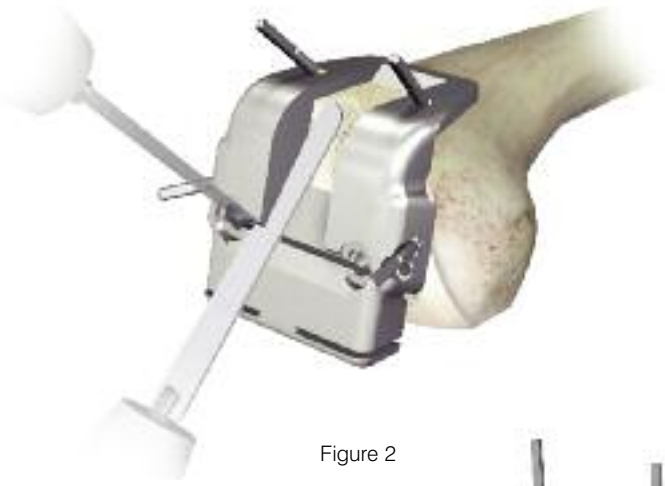


Figure 2

Alternative Femoral Cutting Block

Select the appropriate sized femoral cutting block with feet and position on the resected anterior, posterior and distal surfaces of the femur (Figure 3).

The posterior chip cut can be taken guided from the posterior distal edge of the block.

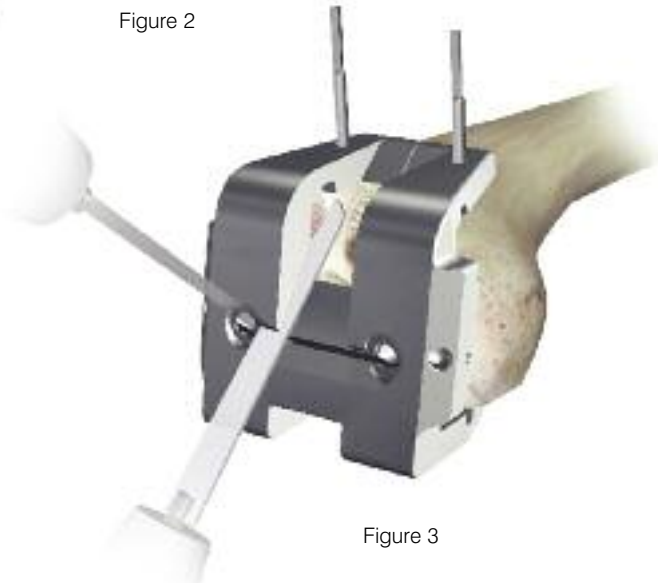


Figure 3

Femoral Sulcus and PS Box Cut

Select the appropriate sized femoral PS notch guide and position on the resected anterior and distal surfaces of the femur (Figure 4).

Ensure the notch guide sits flush on the resected femur.

The M/L edges on each side of the block correspond exactly to the M/L dimension of the final implant (Figure 4).

Note: This M/L position should be checked before final positional cuts and lug holes are made.

PS Block

Figure 4

Make final resections using a 1.47 mm saw blade in the following order:

Notch cuts (Figures 5 and 6)

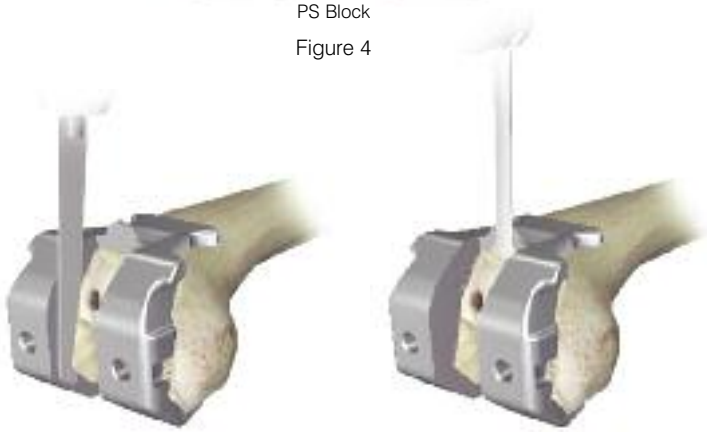
Sulcus cut (Figure 7)

Peg (Lug) holes (Figure 8).

Posterior chip cuts can also be made at this time.

Note. Take care to ensure the saw blade remains within the box cut window and does not stray into the condyles.

Note: After femoral preparation and before implantation, it is essential to irrigate the surgical site to remove any potential debris.



Figures 5 and 6

Figure 7

Figure 8

PS Trial Reduction

Figure 9

Trialing

Remove the punch impactor from the punch by pressing the side button and also remove the drill tower. Place the appropriate RPS tibial insert trial onto the M.B.T. trial tray (Figure 9). Place the knee in deep flexion.

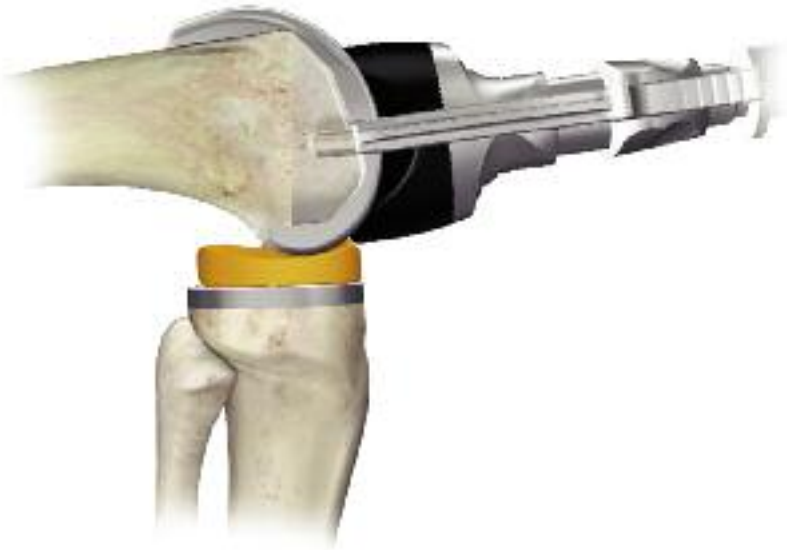


Figure 10

Impact the appropriate RPS femoral trial onto the distal femur using the femoral impactor (Figure 10).

Figure 11

A curved osteotome can be used to take the posterior chip cuts (Figure 11).

It is important to take the posterior chip cuts and remove any remaining osteophytes, as it may influence flexion.

Final Component Implantation

Tibial Implantation

Attach the M.B.T. tibial impactor by inserting the plastic cone into the implant and tighten by rotating the locking knob clockwise. Carefully insert the tibial tray avoiding malrotation (Figure 12). When fully inserted, several mallet blows may be delivered to the top of the tray inserter. Remove all extruded cement using a curette.

Figure 12

Femoral Implantation

Hyperflex the femur and sublux the tibia forward. Attach the slaphammer or universal handle to the femoral inserter/extractor. Position the appropriately sized femoral component on the inserter/extractor by depressing the two triggers to separate the arms and push the femoral component against the conforming polyethylene. Release the triggers so that the arms engage in the slots on the femoral component and rotate the handle clockwise to lock (Figure 13).

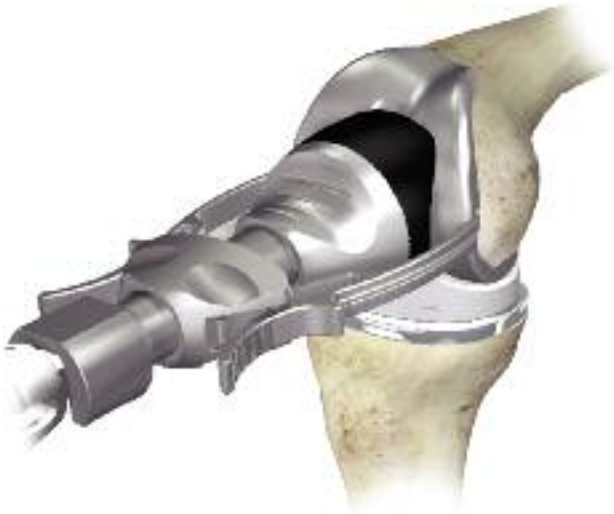


Figure 13

Polyethylene Implantation

Remove loose fragments or particulates from the permanent tibial tray. The appropriate permanent tibial insert can be inserted.

Patella Implantation

Any of the LCS Complete 3 peg patella can now be implanted if required.

Extend the knee to approximately 90 degrees for final impaction. Release the inserter/extractor by rotating the handle counterclockwise and push the two triggers with thumb and index finger. For final femoral impaction, use the femoral notch impactor to seat the femoral component (Figure 14). Clear any extruded cement using a curette.

Note: Before closure it is essential to irrigate the surgical site to remove any potential debris.

Figure 14

Ordering Information

(The following instruments are additional to the standard LCS instrumentation.)

Instruments

217857010	LCS HP RPS Flexion Notch Guide Sm
217857020	LCS HP RPS Flexion Notch Guide Sm+
217857030	LCS HP RPS Flexion Notch Guide Med
217857040	LCS HP RPS Flexion Notch Guide Std
217857050	LCS HP RPS Flexion Notch Guide Std+
217857060	LCS HP RPS Flexion Notch Guide Lg
217857070	LCS HP RPS Flexion Notch Guide Lg+
229411010	LCS Complete RPS Flexion Femoral Trial R Sm
229412010	LCS Complete RPS Flexion Femoral Trial L Sm
229411020	LCS Complete RPS Flexion Femoral Trial R Sm+
229412020	LCS Complete RPS Flexion Femoral Trial L Sm+
229411030	LCS Complete RPS Flexion Femoral Trial R Med
229412030	LCS Complete RPS Flexion Femoral Trial L Med
229411040	LCS Complete RPS Flexion Femoral Trial R Std
229412040	LCS Complete RPS Flexion Femoral Trial L Std
229411050	LCS Complete RPS Flexion Femoral Trial R Std+
229412050	LCS Complete RPS Flexion Femoral Trial L Std+
229411060	LCS Complete RPS Flexion Femoral Trial R Lg
229412060	LCS Complete RPS Flexion Femoral Trial L Lg
229411070	LCS Complete RPS Flexion Femoral Trial R Lg+
229412070	LCS Complete RPS Flexion Femoral Trial L Lg+
229416110	LCS Complete RPS Insert Trial Sm 10 mm
229416112	LCS Complete RPS Insert Trial Sm 12.5 mm
229416115	LCS Complete RPS Insert Trial Sm 15 mm
229416117	LCS Complete RPS Insert Trial Sm 17.5 mm
229416120	LCS Complete RPS Insert Trial Sm 20 mm
229416210	LCS Complete RPS Insert Trial Sm+ 10 mm
229416212	LCS Complete RPS Insert Trial Sm+ 12.5 mm
229416215	LCS Complete RPS Insert Trial Sm+ 15 mm
229416217	LCS Complete RPS Insert Trial Sm+ 17.5 mm
229416220	LCS Complete RPS Insert Trial Sm+ 20 mm
229416310	LCS Complete RPS Insert Trial Med 10 mm
229416312	LCS Complete RPS Insert Trial Med 12.5 mm
229416315	LCS Complete RPS Insert Trial Med 15 mm
229416317	LCS Complete RPS Insert Trial Med 17.5 mm
229416320	LCS Complete RPS Insert Trial Med 20 mm
229416410	LCS Complete RPS Insert Trial Std 10 mm
229416412	LCS Complete RPS Insert Trial Std 12.5 mm
229416415	LCS Complete RPS Insert Trial Std 15 mm
229416417	LCS Complete RPS Insert Trial Std 17.5 mm
229416420	LCS Complete RPS Insert Trial Std 20 mm
229416510	LCS Complete RPS Insert Trial Std+ 10 mm
229416512	LCS Complete RPS Insert Trial Std+ 12.5 mm
229416515	LCS Complete RPS Insert Trial Std+ 15 mm
229416517	LCS Complete RPS Insert Trial Std+ 17.5 mm
229416520	LCS Complete RPS Insert Trial Std+ 20 mm
229416610	LCS Complete RPS Insert Trial Lg 10 mm
229416612	LCS Complete RPS Insert Trial Lg 12.5 mm
229416615	LCS Complete RPS Insert Trial Lg 15 mm
229416617	LCS Complete RPS Insert Trial Lg 17.5 mm
229416620	LCS Complete RPS Insert Trial Lg 20 mm
229416710	LCS Complete RPS Insert Trial Lg+ 10 mm
229416712	LCS Complete RPS Insert Trial Lg+ 12.5 mm
229416715	LCS Complete RPS Insert Trial Lg+ 15 mm
229416717	LCS Complete RPS Insert Trial Lg+ 17.5 mm
229416720	LCS Complete RPS Insert Trial Lg+ 20 mm

Implants

129411010	LCS Complete RPS Flexion Femur Cemented R Sm	129416320	LCS Complete RPS Insert Med 20 mm
129412010	LCS Complete RPS Flexion Femur Cemented L Sm	129416410	LCS Complete RPS Insert Std 10 mm
129411020	LCS Complete RPS Flexion Femur Cemented R Sm+	129416412	LCS Complete RPS Insert Std 12.5 mm
129412020	LCS Complete RPS Flexion Femur Cemented L Sm+	129416415	LCS Complete RPS Insert Std 15 mm
129411030	LCS Complete RPS Flexion Femur Cemented R Med	129416417	LCS Complete RPS Insert Std 17.5 mm
129412030	LCS Complete RPS Flexion Femur Cemented L Med	129416420	LCS Complete RPS Insert Std 20 mm
129411040	LCS Complete RPS Flexion Femur Cemented R Std	129416510	LCS Complete RPS Insert Std+ 10 mm
129412040	LCS Complete RPS Flexion Femur Cemented L Std	129416512	LCS Complete RPS Insert Std+ 12.5 mm
129411050	LCS Complete RPS Flexion Femur Cemented R Std+	129416515	LCS Complete RPS Insert Std+ 15 mm
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129411060	LCS Complete RPS Flexion Femur Cemented R Lg	129416520	LCS Complete RPS Insert Std+ 20 mm
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129416215	LCS Complete RPS Insert Sm+ 15 mm		
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129416310	LCS Complete RPS Insert Med 10 mm		
129416312	LCS Complete RPS Insert Med 12.5 mm		
129416315	LCS Complete RPS Insert Med 15 mm		
129416317	LCS Complete RPS Insert Med 17.5 mm		

References:

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Total Knee Prostheses

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 RPF and RPS inserts and femoral component are indicated where a higher than normal degree of post-operative 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,
- skeletally 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.

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. The P.F.C. stem extensions can only be used with M.B.T. revision trays and LCS Complete Revision and Modular femoral components.

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.

For more information on DePuy knees, please visit our website at www.depuyknees.com.

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