



Zimmer®  
NexGen® CR-Flex  
Mobile Bearing  
Knee System



Exercise your options with the CR-Flex Mobile Bearing Knee System



## Exercise your options so your patients can exercise theirs

Help restore natural knee kinematics and accommodate active flexion up to 155° with the *NexGen* CR-Flex Mobile Bearing Knee. The many options of the CR-Flex system offer more freedom to choose components based on the patient's willingness and ability to achieve high flexion.

An innovative medial axis of rotation for the tibial component, based on natural kinematics, is designed to accommodate asymmetrical femoral rollback during flexion.

### MINIMALLY INVASIVE SOLUTIONS™ PROCEDURES

MIS implants and procedures offer solid alternatives to traditional total knee arthroplasty through innovative, minimally invasive TKA techniques that help improve patient outcomes.

- Implants with established design features meet expectations for accurate alignment
- Instrumentation facilitates accurate, repeatable bone cuts
- Smaller incisions, less blood loss, and less pain

### GENDER SOLUTIONS™ IMPLANTS

It's all about shape. Zimmer is first in the orthopaedic industry to address the differences in female and male anatomy with the introduction of its *Zimmer Gender Solutions NexGen* High-Flex Implants. *Gender Solutions* Implants address gender differences with:

- Modified anterior flange thickness
- Increased trochlear groove angle
- Modified ML/AP aspect ratio

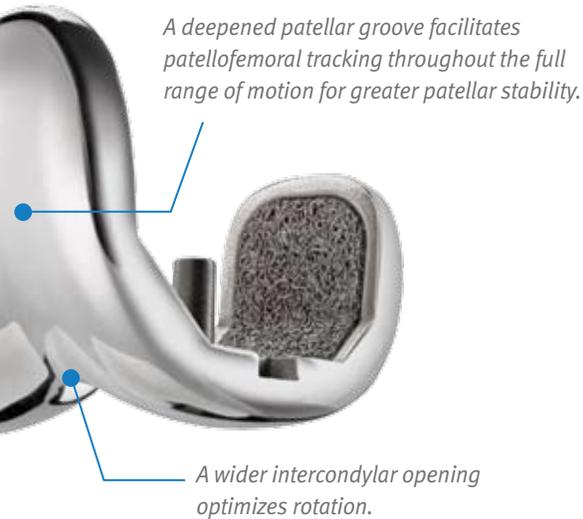
### PROLONG™ HIGHLY CROSSLINKED POLYETHYLENE

*Prolong* Highly Crosslinked Polyethylene represents a significant advance in bearing materials. *Prolong* polyethylene's proven resistance to wear provides a promising solution for TKA patients, especially today's more active, physically-demanding patient.

- Improved resistance to articular subsurface and PS spine/post delamination, pitting, and cracking
- Resistance to oxidative degradation
- Reduced wear



## A DISTINCTIVE FEMORAL COMPONENT



### Providing Gender Solutions Implants

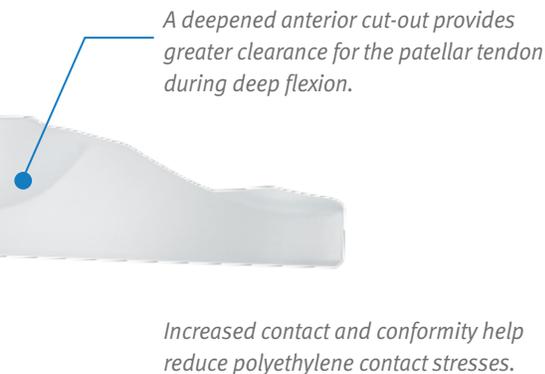
- By acknowledging male and female anatomical differences, *NexGen Gender Solutions™* High-Flex Femoral Implants allow improved implant fit and fewer intraoperative adjustments.



### Avoiding size compromises

- Minus sizing of femoral components, which are 2mm smaller in the AP dimension only, helps balance joint tension in flexion and extension without requiring more bone removal or additional soft-tissue release.

## WEAR-RESISTANT, CONFORMING ARTICULATION



## Two articulations designed for different patient needs

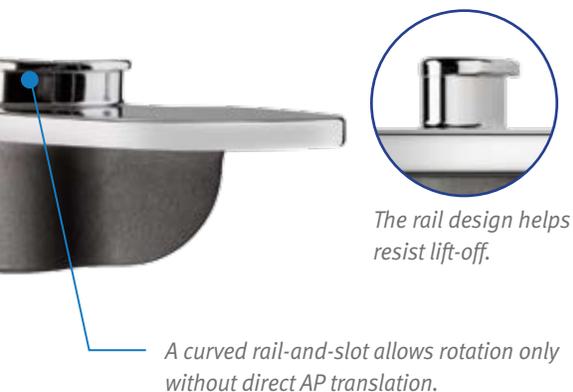


- The CR-Flex option balances the need for greater conformity and reduced contact stresses with an articulation that permits femoral motion in concert with the intact PCL.

- The UC-Flex option provides increased anterior constraint for patients with an absent or deficient PCL.

## MEDIAL AXIS TIBIAL BASE PLATE

The CR-Flex is a rotation-only mobile-bearing design with a physiologic medial axis of rotation.



### Reducing articular friction

- Radiused edges reduce stresses that can lead to polyethylene wear.
- Allowing only unidirectional, rotational motion potentially reduces cross-shear and consequent wear.<sup>3</sup>



### Respecting anatomy

- Right and left tibial base plates facilitate a medial axis of rotation, which is more physiologic than the central axis of rotation found in most mobile bearing knees.<sup>4-7</sup>



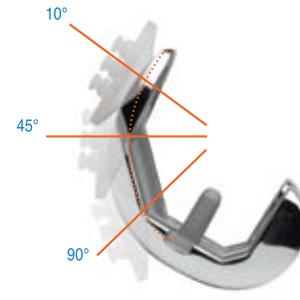
### Assisting natural posterior rollback

- By mimicking natural anatomy, the slightly larger lateral distal femoral condyle of the CR-Flex permits more natural posterior rollback and axial rotation.<sup>8-9</sup>



### Designing for deep flexion

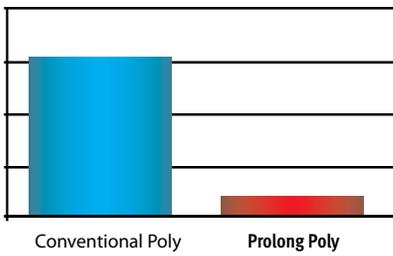
- The extended posterior flanges of the femoral component safely accommodate tibiofemoral contact during deep flexion of 155°.



### Smooth patellar tracking

- *Gender Solutions* High-Flex Femoral Implants replicate the Q-angle by increasing the trochlear groove angle of the implant by three degrees.
- A deepened patellar groove relieves pressure on the patella, reducing forces that can cause premature wear.
- At the surgeon's discretion, the patella need not be resurfaced.

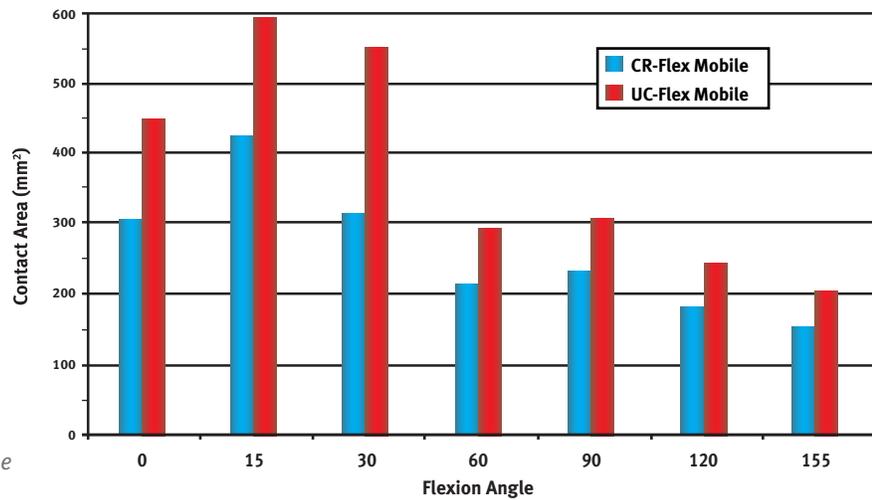
### Wear Rates (Conventional PE vs. Prolong XLPE)



Joint simulation wear rates measured during testing for non-crosslinked and crosslinked tibial components.

In laboratory testing, conventional polyethylene components exhibited almost 8x more wear than the Prolong Polyethylene samples.\*

### Contact Area (Conventional PE)<sup>10</sup>



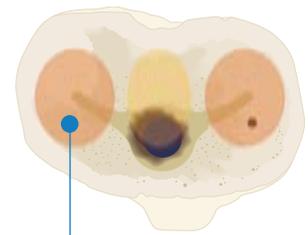
### MIS CR-Flex Mobile Tibial Component

- Designed to address the challenges and demands of MIS TKA.
- Broad proximal fins.
- Located in the region with highest cancellous bone density.
- Designed to provide secure implant fixation.
- Provides resistance to bending moments and resistance to rotation and lift-off.

- Keel length less than 20mm to facilitate insertion through a minimally invasive arthrotomy.
- Provides a better fit in irregular or deformed tibial medullary canals.



Fins shaded to show best bone engagement.



Wide fins engage the bone in the region of the proximal tibia with the highest density.<sup>11</sup>

\*Note: The results of in vitro wear testing have not been shown to correlate with clinical wear mechanisms.



**ACCOMMODATING SAFE FLEXION TO 155°**

The many implant options of the CR-Flex system offer more freedom to select components based on the patient's willingness and ability to achieve high flexion. Specific design features help to maintain adequate tibiofemoral contact during high flexion and provide greater clearance for the patellar tendon.



*The extended posterior flanges of the femoral component safely accommodate tibiofemoral contact during deep flexion of 155°.*

**ALLOWING ANATOMICAL ROTATION**

The CR-Flex Femoral Component retains the condylar asymmetry of the normal distal femoral condyles, allowing external rotation of the femur as the flexion angle increases. This rotation is crucial in maintaining proper posterior cruciate and collateral ligament tension. As the knee is extended, the screw-home mechanism results in external rotation of the tibia relative to the femur.



*Replicating the asymmetric femoral rollback of a normal knee during flexion helps to restore the joint's natural kinematics.*

**RESTORING NATURAL KINEMATICS**

The CR-Flex is a rotation-only mobile-bearing design with a physiologic medial axis of rotation. Clinical data demonstrate that patients with cruciate-retaining prostheses can climb stairs more naturally because the normal rollback of the femur is sustained by the intact posterior cruciate ligament.<sup>1,2</sup>



*A deepened anterior cut-out on the articulating surface reduces extensor mechanism tension and provides greater clearance for the patellar tendon during deep flexion.*



## A MINIMALLY INVASIVE CHOICE

- MIS surgical techniques help protect key muscles and tendons to reduce tissue trauma.
- The MIS CR-Flex Mobile Tibial Component accommodates any surgical approach, including a preference for balancing in flexion first.
- Available instrumentation includes your choice of the *NexGen Multi-Reference*® 4-in-1 Instrumentation System or the Intramedullary Instrumentation System.



## ZIMMER GENDER SOLUTIONS NEXGEN HIGH-FLEX KNEE

*Zimmer Gender Solutions NexGen High-Flex Implants* are revolutionary in the way they compensate for the most important differences between women's and men's knees. It isn't strictly a matter of size; it's a matter of shape.

## PROLONG HIGHLY CROSSLINKED POLYETHYLENE

*Prolong Highly Crosslinked Polyethylene* represents a significant advance in bearing materials. *Prolong* polyethylene's proven resistance to wear provides a promising solution for TKA patients, especially today's more active, physically demanding patient.



## ZIMMER COMPUTER ASSISTED SOLUTIONS (CAS)

*Zimmer Computer Assisted Solutions* products include advanced tools and cutting-edge technologies that work with minimally invasive and traditional surgical procedures and put *Confidence in your hands*®.

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7. Dennis, D.A. et al. In vivo determination of normal and anterior cruciate ligament-deficient knee kinematics. *J Biomechanics*, 2005;38:241-253.
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10. Data on file at Zimmer.
11. Hvid, I. et al. Trabecular bone strength patterns at the proximal tibia epiphysis. *J Orthopaedic Research*, 1985;3:464-472.

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