Evolution®

Medial-Pivot Knee System

The Bi-Cruciate-Substituting Knee

Key Aspects

MicroPort Orthopedics

Integrity In Motion™

MicroPort's EVOLUTION® Medial-Pivot Knee System

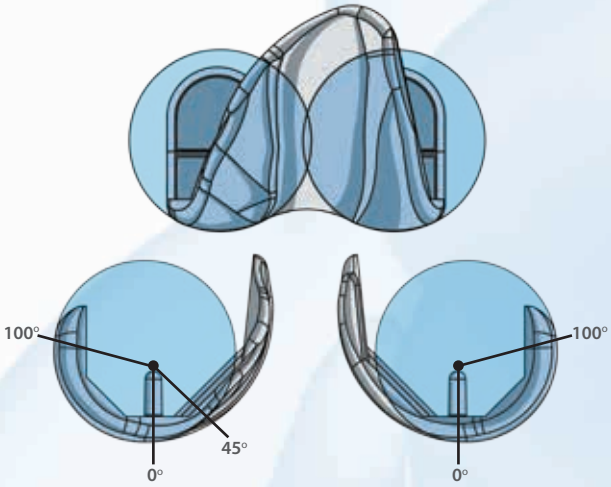
was designed to recreate the natural anatomy that is lost during a total knee arthroplasty. To provide the normal kinematics, this system features anatomic implants and a "ball-in-socket" articulation throughout the range of motion. These features work together to enhance stability, drive normal knee kinematics, and reduce wear.[1-6]

Stability
Kinematics
Reduced Wear

Stability

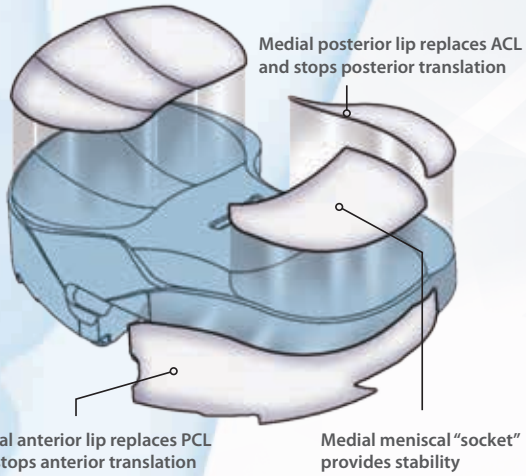
Constant Radius:

Extends from -45° to 100° on the medial condyle and 0° to 100° on the lateral condyle. This creates extension geometry on the medial condyle that is equal to the flexion geometry while preventing anterior-posterior translation, common in J-curve prosthesis.



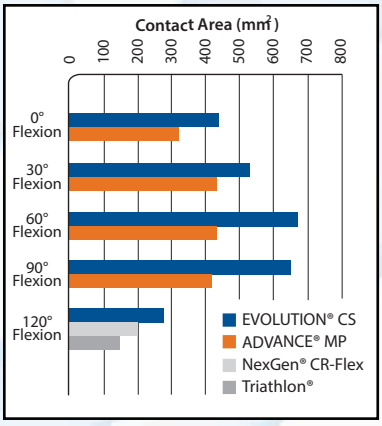
Congruent Polyethylene:

The medial compartment features a "ball-in-socket" articulation. This feature aims to reduce anterior-posterior translation based on a highly congruent medial compartment which captures the medial condyle.



Constant Contact Area:

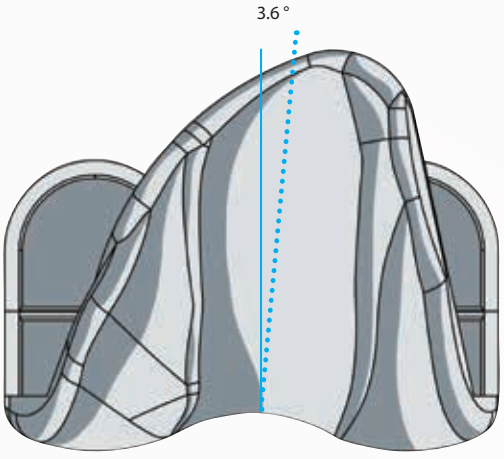
EVOLUTION® Medial-Pivot Knee System testing was compared to published results for competitor systems from Stryker and Zimmer and was found to have higher contact area from 0° to 120° flexion. Improving the contact area at the flexion angles helps to optimize stability and reduce contact stresses.[2,7]



Contact area of the EVOLUTION® Medial-Pivot Cruciate-Substituting (CS) Knee vs. ADVANCE® Medial-Pivot[2], Zimmer NexGen® CR-Flex[12], Stryker Triathlon®[12]

Patella Tracking:

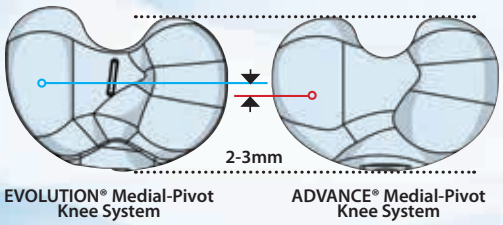
The deepened trochlear groove features a lateral anatomic flare designed to optimize patellar tracking throughout the range of motion. Removing pointed areas from the anterior lateral condylar ridge without reducing the jump height eliminates potential areas of tissue impingement, while maintaining the stability of the patella in the trochlear groove.[2]

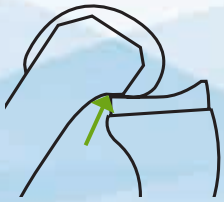


Kinematics

Posterior Dwell Point:

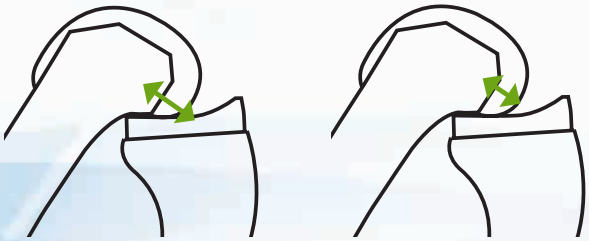
As the EVOLUTION® Medial-Pivot Knee System provides anatomic tibial bases rather than symmetric bases, the dwell point of the component can be positioned more posterior without adversely affecting the rotational freedom of the femur relative to the tibia. By placing the femur more posterior, the incidence of femorotibial impingement is minimized and flexion potential is maximized.[8, 9]





Posterior Offset:

Allows the femur to flex deeper without the femoral shaft impinging on the posterior portion of the tibial component.[8] A smaller offset has the potential for impingement. Due to the dwell point placed more posterior and thicker posterior condyles, the posterior offset is increased in the EVOLUTION® Medial-Pivot Knee.



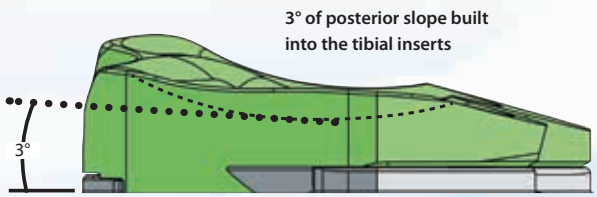
Variables that increase maximum flexion

Variables that decrease maximum flexion

Reduced Wear

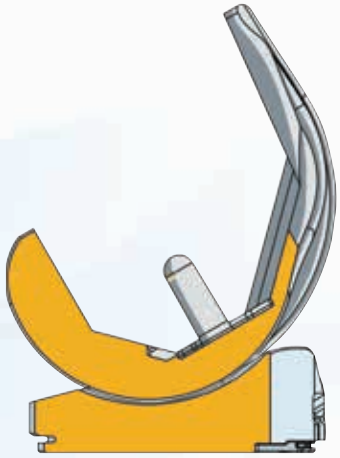
Slope Angle:

Previous studies have indicated that increasing the posterior slope of the tibial insert component directly affects the potential for increased flexion. The articulating geometry for the insert includes 3° of posterior slope built into the component.[8, 10]



Conformity and Contact Area:

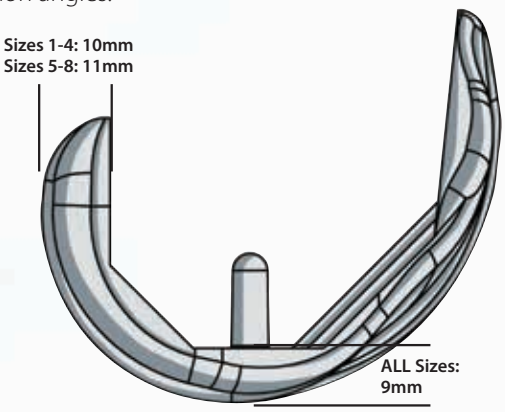
The high level of conformity between the articulating surfaces throughout flexion increases the contact area, thereby reducing contact stresses. This, in turn, theoretically reduces the potential for fatigue wear and the formation of polyethylene debris.[11]



Medial section of the EVOLUTION® Medial-Pivot Cruciate-Substituting Knee flexed at 30°

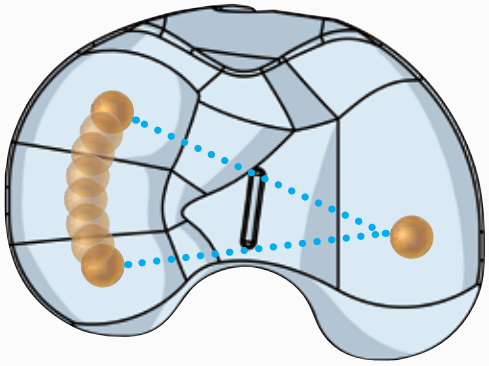
Thick Posterior Condyles:

Thick posterior condyles allow the removal of posterior osteophytes, which have been known to reduce maximum flexion potential, while also increasing the posterior condylar offset. Additionally, a smoother blending radius may be obtained which increases the contact area in increased flexion angles.[8]



Predictable Motion:

The EVOLUTION® Medial-Pivot Knee is unique in that is it designed to move repetitively in the same 15° lateral arcuate path while simply spinning in the medial compartment. This not only reproduces the kinematics of the natural knee but resists the multi-directional sliding between the tibia and femur which increases polyethylene wear. [12-14]



EVOLUTION® Medial-Pivot System

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