ATTUNE™ KNEE SYSTEM
VALUE ANALYSIS BRIEF

VALUE SUMMARY

**Designed to Solve Unmet Patient Needs**
The ATTUNE™ Knee System’s proprietary technologies are designed to deliver a high level of stability and motion and patellofemoral function for patients. The extensive size offering provides better patient matching for today’s diverse population.

**Designed for Durability**
Implant geometry and polyethylene material are designed to increase durability of the implants.

**Designed for Efficiency**
Intuitive instrumentation combined with optimal sizing is designed to deliver more efficiencies in the OR.

BACKGROUND

**Unmet patient needs**
Total knee arthroplasty helps to relieve pain and restore function and mobility for arthritis pain sufferers and is widely recognized as one of the most performed and successful surgical procedures. However, following the procedure some patients are still limited in their activities of daily living. Patient research shows 58% are “limited a lot” when kneeling, and 38% are “limited a lot” when squatting after knee replacement surgery.¹ This makes simple tasks difficult, such as walking up and down stairs, and effects the quality of life for patients.

Knee Patients Limited in Activities One Year Following Total Knee Arthroplasty

The ATTUNE Knee System is designed to address the unmet needs of patients, surgeons, and hospital providers around the world. Extensive research and science has gone into the design to help improve functional outcomes for patients, performance for surgeons, and efficiency for providers.
The ATTUNE™ Knee System is designed to deliver a high level of stability and motion.

*DePuy Synthes Joint Reconstruction* has recently applied for extensive patent protection in countries throughout the world for the ATTUNE System implants, instruments, and surgical methods. In the US alone, as of this writing, there are already eight patents granted for key inventions related to the ATTUNE Implants.¹

The patented ATTUNE GRADIUS™ Curve is designed with a gradually reducing femoral radius. The exclusive design of this curve creates a smooth transition during knee bend and produces high stability of the knee by minimizing unnatural sliding of the femur on the tibia.²

For the Posterior Stabilized design, the interaction between the cam and spine, the articular surface geometry, and the collateral ligaments is both complex and essential to the function of the knee in deep flexion. The proprietary s-curve design of the SOFCAM™ Contact provides a smooth engagement for gradual femoral rollback and stability in flexion, while reducing the forces transferred to the tibial spine.³

Differentiated to current offerings, the Fixed Bearing design allows for independent femoral and tibial sizing due to the patented LOGICLOCK™ Tibial Base. With the ATTUNE Knee, surgeons will be able to match femur to insert size to achieve the highest conformity and optimized stability.

The patellofemoral interaction is one of the most studied and challenging aspects of total knee arthroplasty.⁴ The GLIDERIGHT™ Articulation encompasses a trochlear groove designed to accommodate patient variation and soft tissue interaction, and patella components designed to optimize patella tracking while maintaining bone coverage.

The ATTUNE Knee System introduces innovative instrumentation for all common surgical approaches. The INTUITION™ Instrumentation combines the surgical process with intuitive and efficient instruments to allow the surgeon to balance the soft tissue and precisely control the implant position and fit for each patient.
ATTUNE Cruciate Retaining Knee

Zimmer® NexGen® Cruciate Retaining Knee

Stryker® Triathlon® Cruciate Retaining Knee

With current designs, there is a trade off between achieving motion and achieving stability. The ATTUNE System is designed to deliver a high level of stability and motion. The charts above depict the anterior stability and rotational freedom at different stages of knee bend across designs. The ATTUNE Knee provides a greater degree of stability during lower flexion angles than less constrained designs and avoids rotational constraint in higher flexion angles. The result is a balanced level of stability and motion that more closely matches that found in the native knee. This aids in patient performance during dynamic activities such as going up and down the stairs.

The proprietary s-curve design of SOFCAM Contact provides a smooth engagement for gradual femoral rollback and stability in flexion, while reducing the forces transferred to the tibial spine.
The ATTUNE Knee System provides an extensive range of sizes for better patient matching for today’s diverse population

The ATTUNE System sizing is based on extensive human research using a global database of 353 patients. Based upon the many shapes and sizes of the body types analyzed, DePuy Synthes Joint Reconstruction created a sizing portfolio to meet the needs of the diverse worldwide patient population. There are 10 standard sizes of femoral and tibial components and 4 additional narrow femoral component sizes. The number of sizes, in conjunction with the INTUITION instruments and the consistent increments between sizes allow the surgeon to quickly and easily choose a size that best fits each individual patient.

**Development of the ATTUNE Femoral Size**

![Chart showing ATTUNE Knee sizing line against measurements of 353 patients](image)

**Extensive size offering for diverse population.** The chart above depicts the ATTUNE Knee sizing line against the measurements of the 353 patients studied. Sizing was developed to eliminate instances of femoral component overhang (rationale for patient subjects above the line but not below).

The patented LOGICLOCK allows for independent femoral and tibial sizing without sacrificing femoral kinematics. The extensive femoral and tibial sizes paired with 1 mm increment insert thickness offerings delivers 4,554 potential sizing combinations.

![LOGICLOCK Tibial Base](image)

The ATTUNE System sizing is indicated for 2 sizes up or 2 sizes down.
The ATTUNE Knee System is designed to increase durability

The ATTUNE System utilizes DePuy Synthes Joint Reconstruction’s advanced AOX™ Antioxidant Polyethylene Technology. The fourth generation material with proprietary synthetic COVERNOX™ Antioxidant, provides a balance of wear resistance, mechanical integrity, and long-term oxidative stability.

Total Knee Arthroplasty wear evaluation is a key stage in the preclinical analysis of new implant designs. Computational wear prediction has shown that the ATTUNE Knee’s tibio-femoral geometry has improved wear related to sliding and cross-shear for various activities when compared to current alternative implant systems.

Wear Rate: High Demand Activity

Robust wear properties: The stability provided by the articular geometry of the ATTUNE System is designed to reduce the excess of sliding and cross shear which may lead to increased wear in other less stable implants.¹¹ The ATTUNE System is robust to wear mechanisms during high-demand activities such as going up and down the stairs.

Patented LOGICLOCK for Fixed Bearing

The LOGICLOCK Tibial Base has a patented central locking design that provides the architecture for the system that optimizes kinematics, while reducing backside micromotion to the lowest reported levels in the industry.¹²

Lower Micromotion

The ATTUNE System exhibits lower micromotion. Micromotion is the movement of the insert on the tibial tray. More movement leads to wear of the polyethylene so less movement is desired.¹³
The ATTUNE Knee System is designed to deliver a high level of patellofemoral function and reduce knee pain.

The ATTUNE System was designed with patellofemoral function in mind to provide controlled stability and motion. The GLIDERIGHT encompasses a trochlear groove designed to accommodate patient variation and soft tissue interaction, and patellar components designed to optimize patellar tracking while maintaining bone coverage.

With many current systems, patella implants are designed as a symmetrical dome which does not reflect the shape of the native patella. This creates the need to manually offset the implant on the bone during implantation. Offsetting the symmetrical dome leaves exposed bone and can cause soft tissue disruption.

The ATTUNE Knee’s patella is designed with an offset or medialized dome. This offset is designed to reflect the native patellar shape and enhance patellofemoral function. The asymmetric design allows for more opportunities to use a larger size patella to provide optimal bone coverage. The small and consistent increments between component sizes gives surgeons flexibility to avoid overstuffing the patellar joint.

The shape of the ATTUNE Knee femoral component is designed to complement the patient’s native anatomy. Based on the human study, the angle of the ATTUNE System patellar groove was designed to match patients of different statures. The ATTUNE Knee System patella tracks appropriately relative to each implant size and relative to the stature of patients.

Traditional patella designs versus the ATTUNE Knee approach for patella medialization. The ATTUNE Knee’s medialized dome patella offers surgeons the opportunity to achieve a high level of patella function without leaving bone exposed. As a result of this medialization and subsequent bone coverage there is a greater chance that the implant will go through the full range of motion with optimal articulation and without disruptions.
The INTUITION™ Instruments reduce the effort from start to finish.

The ATTUNE Knee System combines intuitive instruments for all common surgical approaches with the minimum number of instruments and instrument trays in one kit as compared to previous instruments. This was done by combining functionality in the instrument designs.

**Efficient Path**

With the inclusion of highly engineered polymers, INTUITION Instrument weight was reduced by 51% as compared to current instrumentation. This reduction was designed to help hospitals comply with safety requirements around manual handling of heavy objects. By minimizing the number of instruments and instrument trays, the effort and cost associated with the management of instruments is reduced.

**Designed Clarity**

*DePuy Synthes Joint Reconstruction* believes that in an operating environment where staff have to perform and support multiple surgical procedures, the reduction of learning curve is critical. The INTUITION Instruments introduce innovative design features such as red actuators, high-contrast markings, and quick set/release functions for more certainty and a reduced learning curve from the moment a surgeon or OR staff pick them up.

**Precise Control**

Extensive research has shown the variability of size and shape within the diverse patient population. The ATTUNE Knee System and its INTUITION Instrumentation is unique in its ability to combine the surgical process with a comprehensive implant sizing line to allow the surgeon to balance the soft tissue and precisely control the implant position and fit for each patient.
References


For more information, contact your DePuy Synthes Joint Reconstruction Sales Consultant today.

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