
VELYS™
Robotic-Assisted Solution
DePuy Synthes
THE ORTHOPAEDICS COMPANY OF Johnson&Johnson
SIMPLICITY
THE NEXT CHAPTER IN ROBOTICS

Current robotics in TKA are complex

Robotics in total knee arthroplasty (TKA) have shown to be cumbersome, costly, and often complicated solutions. Traditional methods such as standard cut guides and limited technologies—like burring or boundary control, add more time and complexity to the procedure.

Innovative technologies, like robotics, are critical to help meet the evolving needs in orthopaedics, but it is essential that this technology complements the surgeon's current workflow, is adaptable, and is designed for how surgeons plan, execute, and perform surgery.

VELYS™
Robotic-Assisted Solution

The solution is simple

The VELYS™ Robotic-Assisted Solution was born from the desire to create a new chapter in robotic TKA. This system not only performs with accuracy and consistency, but it also has a streamlined, efficient design that integrates into any OR.[1]

When purposeful design meets performance, even advanced workflows are made **simple**.[2]

Addressing the need for accuracy and affordability

Rising healthcare costs[3]

~2x the compound annual growth rate for global healthcare spending is expected from 2019 to 2023 (compared to the 4 years prior)

Growing global patient population[4]

56% increase between 2015 and 2030

Patient dissatisfaction[5]

~20% of patients report being dissatisfied with their TKA procedure

VELYS™
Robotic-Assisted Solution

Providing an economic benefit for TKA

Robotics can help increase the accuracy of implant alignment and surgical reproducibility while shortening patient recovery and reducing post-operative complications. Together with the ATTUNE® Knee System, the use of the VELYS Robotic-Assisted Solution during TKA can lead to clinical and economic benefits when compared to manual TKA.

Reducing overall cost of care[6]

~$2400 cost savings during 90-day episode of care with robotics

↓ 33% reduction* in re-admission rates at 90 days (*P*=0.0423)

34% **Decrease in hospital stay**[7]
Robotic: 1.8 days vs Manual: 2.72 days (*P*=0.0001)

59% **Relative decrease in discharge to rehabilitation units**[6]
Robotic: 2.7% vs Manual: 6.55% (*P*=0.0007)

42% **Relative decrease in discharge to nursing facilities**[6]
Robotic: 12.52% vs Manual: 21.7% (*P*<0.0001)

Addressing the growing demand[8]

~27.5% **of total joint replacement procedures** will be performed robotically by 2027

Improving patient satisfaction

↓ ~43% **overall reduction**† in pain with robotic procedures vs manual[9]
Robotic: 3.6% vs Manual: 6.3% (*P*<0.001)

↓ **Decreased** opiate analgesia use[9] (*P*<0.001)

Improved patient outcomes
The ATTUNE® Knee System has shown **improved patient reported outcomes** compared to certain other leading knee brands and **performed favorably to the class of TKA** in 2 national joint registries.[10-12]

*Adapted from Cool et al. †Adapted from Kayani et al. Data based on US findings.

VELYS™
Robotic-Assisted Solution

The next chapter in robotics is here

DePuy Synthes is redefining robotics in TKA—delivering a first-of-its-kind table-mounted, imageless solution designed with simplicity in mind.

Simplifying knee replacement surgery

The VELYS Robotic-Assisted Solution provides **valuable insights, versatile execution,** and **verified performance** designed to deliver efficiency and optimize patient outcomes.[1,2]

VELYS™
Robotic-Assisted Solution

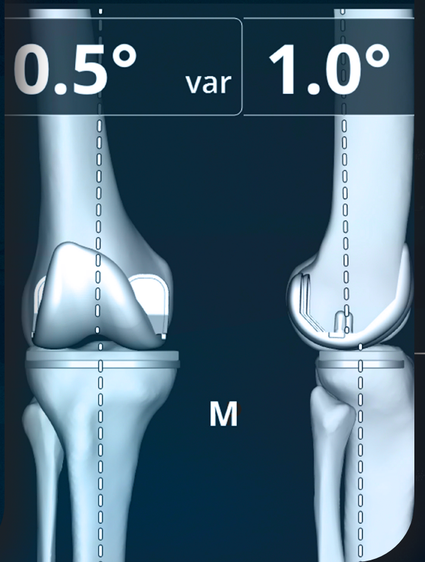
Valuable insights

Gap balance data to help surgeons visualize and predict joint stability

As a complement to the ATTUNE® Knee System, the VELYS Robotic-Assisted Solution aims to help surgeons improve the quality of life for patients.

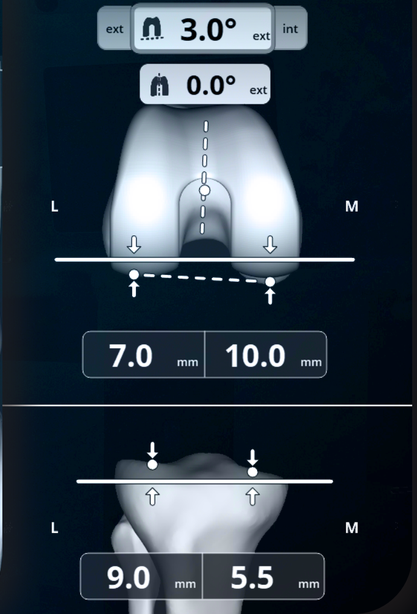
Natural Joint Assessment

Pre-resection assessment of alignment and predicted gap balance to help surgeons plan for **optimal ATTUNE® Knee System implant position.**



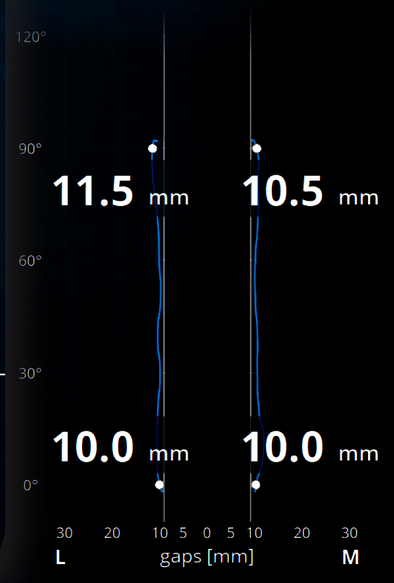
PROADJUST™ Planning

Single-page planning to easily adjust parameters helping surgeons **personalize alignment and balance relative to soft tissues.**



ACCUBALANCE™ Graph

Soft tissue stability graph provides balancing data throughout the full range of motion prior to execution of bony cuts to help surgeons **visualize and predict joint stability.**



VELYS™
Robotic-Assisted Solution

Versatile execution

Instinctive, integrated design to optimize daily OR flow[2]

The VELYS Robotic-Assisted Solution gives surgeons the control they are used to, adapts to their workflow, and reduces procedural steps without the increased risk of damage to the soft tissue envelope.[1]

NATURAL CONTROL™ Technology

A proprietary technology that maintains the saw cut plane to help **execute precise, reproducible surgeon-controlled cuts** without the need for a cutting block.[1]

Instinctive User Interface

Clear interface, streamlined clinical application, adaptable workflow, and fast registration process **aim to improve procedural efficiency.**[2]

Integrated Operating Platform

ATTUNE® Knee INTUITION® Instrumentation and an easily maneuverable robotic design **help to streamline OR integration and improve daily OR flow.**[2]

VELYS™
Robotic-Assisted Solution

Verified performance

Accurate, consistent plan execution supporting the ATTUNE® Knee System[1]

Maintaining cut plane position as the bone is resected and eliminating system interruption are key to helping maintain accuracy of the cut without the use of cut blocks. The VELYS Robotic-Assisted Solution tracks bone position at a high frequency while repositioning the saw at the resection plane.

ADAPTIVE TRACKING™ Technology

High-speed camera, triple-drive motion technology, and PURESIGHT™ Hydrophobic Optical Reflectors work together to **adjust and control the resection plane for accurate, consistent execution to plan**.[1]

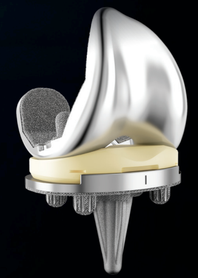
Procedural Joint Verification

Post-resection assessment to help surgeons verify final gap balance and overall leg alignment for **intra-operative confirmation of ATTUNE® Knee System implant position**.

ATTUNE® Knee System Performance

Works exclusively with the ATTUNE® Knee System, which has been shown to **improve patient-reported outcomes** by working in harmony with the patient's anatomy to deliver both stability and motion.[10,13-15]

Attune®
Knee System



VELYS™
Digital Surgery

Going beyond robotics

There's an opportunity to improve the overall orthopaedic experience beyond the OR for healthcare professionals and patients. That's why DePuy Synthes created VELYS™ Digital Surgery, a platform of connected technologies powered by data insights and designed to elevate the orthopaedic experience before, during, and after TKA.

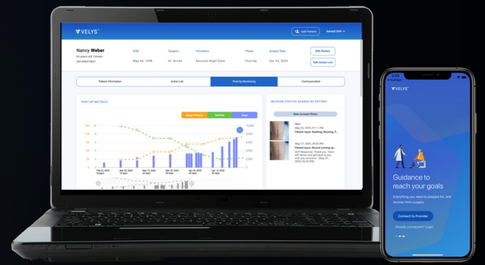
The VELYS Robotic-Assisted Solution is part of this broader platform, which also offers additional solutions, including:

PATIENT SOLUTIONS AND OPTIMIZATION

SURGICAL PLANNING

SURGICAL IMPLEMENTATION

POST-OP MONITORING



VELYS Digital Surgery also offers an integrated solution for remote patient care management

- VELYS™ Insights portal for healthcare teams includes digital care management capabilities to help support and monitor the progress of patients before and after total knee replacement surgery
- Through its companion mobile app, VELYS™ Patient Path engages patients with action plans, education, and direct feedback from the provider to help manage expectations, prepare for surgery, and set realistic goals after surgery
- VELYS Patient Path integrates with activity trackers such as Fitbit and Apple's Health app

VELYS™
Robotic-Assisted Solution

Ongoing commitment to customer excellence in service, education, and performance

Customized Offering

Full-service maintenance

Customers rely on advanced technology. The service and maintenance offerings for the VELYS Robotic-Assisted Solution provide comprehensive coverage that enable procedures to stay on schedule.

Education and training

The vision for training healthcare professionals is always the same: focused, professional, and comprehensive. Throughout the journey—from independent learning to peer-to-peer engagements to hands-on training—DePuy Synthes is committed to helping improve the overall care experience.

Marketing opportunities

Patients seek the best possible care for joint pain. Advanced technologies, like robotics, may offer advantages related to patient outcomes and overall experience. DePuy Synthes provides a suite of resources and support to help educate and engage patients about the VELYS Robotic-Assisted Solution.

VELYS™

Robotic-Assisted Solution

Begin the next chapter with simplicity[2]

Valuable insights

Gap balance data to help surgeons visualize and predict joint stability.

Versatile execution

Instinctive, integrated design to give surgeons the control they're used to while optimizing daily OR flow.[2]

Verified performance

Accurate, consistent plan execution supporting ATTUNE® Knee System in providing better patient outcomes.[10, 13-15]

Ask a DePuy Synthes representative for more information.

References: 1. Doan G, Curtis P, Wyss J, Clary C. Resection Accuracy Improved during Robotic-Assisted Total Knee Arthroplasty (December 2020). Internal Report 103720852. **2.** User experience evaluation of the VELYS Robotic-Assisted Solution for total knee (July 2020). Internal Report 103744839. **3.** Allen S. 2020 global health care outlook: laying a foundation for the future. Deloitte Global Health Care. Accessed November 5, 2020. https://www2.deloitte.com/ global/en/pages/life-sciences-and-healthcare/articles/global-health-care-sector-outlook.html. **4.** Haseltine WA. Aging populations will challenge healthcare systems all over the world. *Forbes*. April 2, 2018. Accessed October 16, 2020. https://www.forbes.com/sites/williamhaseltine/2018/04/02/aging populations-will-challenge-healthcare-systems-all-over-the-world/#62aa73cd2cc3. **5.** Bourne RB, Chesworth B, Davis A, Mahomed N, Charron K. Comparing patient outcomes after THA and TKA: is there a difference? *Clin Orthop Relat Res*. 2010;468:542-546. **6.** Cool CL, Jacofsky DJ, Seeger KA, Sodhi N, Mont MA. A 90-day episode-of-care cost analysis of robotic-arm assisted total knee arthroplasty. *J Comp Eff Res*. 2019;8(5):327-336. **7.** Pierce J, Needham K, Adams C, Coppolecchia A, Lavernia C. Robotic arm-assisted knee surgery: an economic analysis. *Am J Manag Care*. 2020;26(7):e205-e210. **8.** Millennium Research Group, Inc. Orthopaedic Surgical Robotic Devices. 2018; M360SU0001. **9.** Kayani B, Konan S, Tahmassebi J, Pietrzak JRT, Haddad FS. Robotic-arm assisted total knee arthroplasty is associated with improved early functional recovery and reduced time to hospital discharge compared with conventional jig-based total knee arthroplasty: a prospective cohort study. *Bone Joint J*. 2018;100-B(7):930-937. **10**. Hamilton WG, Brenkel I, Clatworthy M, et al. Comparison of existing and new total knee arthroplasty implant systems from the same manufacturer: a prospective, multicenter study, 2019. Poster presented at: American Academy of Orthopaedic Surgeons 2019 Annual Meeting; March 12–16, 2019; Las Vegas, NV. Poster PO614. **11.** National Joint Registry for England, Wales, Northern Ireland and the Isle of Man. 14th Annual Report 2017. Data to 31 December 2016, Table 3.25(a), Table 3.28. Accessed January 22, 2021. https://reports.njrcentre.org.uk/portals/0/pdfdownloads/njr%2016th%20annual%20report%202019.pdf. **12.** Australian Orthopaedic Association National Joint Replacement Registry. 2017 Annual Report. Tables KT7, KT22, KT 23. Full summary: Accessed January 22, 2021. https://aoanjrr.sahmri.com/annual-reports-2017. **13.** Fisher D, Parkin D. Optimizing the value of your patients' TKA: how to leverage data from patient reported outcomes. Becker's Hospital Review webinar. October 3, 2019. Accessed October 18, 2019. www.ATTUNEevidence.com/clinical-evidence.
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