# ROSA®
Knee System

ZIMMER BIOMET

ROSA KNEE

Patients are becoming increasingly aware of their healthcare options, especially when it comes to robotic-assisted surgery and the inherent value it brings. Meanwhile, healthcare providers are expected to continually increase patient volume, deliver patient quality and increase efficiency. To help address these critical concerns, Zimmer Biomet offers solutions to modernize your practice through efficient, easy-to integrate technology.

ROSA Knee was designed by surgeons for surgeons as an accurate and efficient surgical assistant that also produces data. We keep you in the driver's seat by letting you maintain your current approach, philosophy and technique, including Personalized Alignment™, so you can focus on achieving the optimal outcome for your patients.

72%
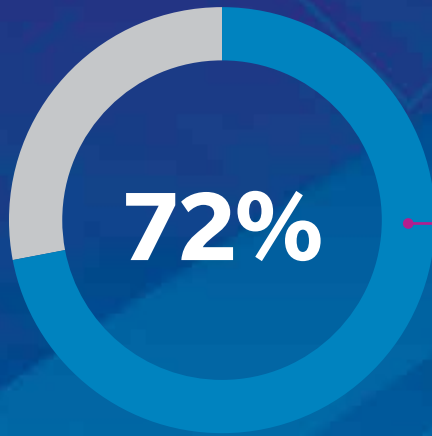
IN A 2016 GLOBAL SURVEY ASSESSING PUBLIC PERCEPTIONS ABOUT ROBOTIC-ASSISTED SURGERY, 72% OF RESPONDENTS INDICATED ROBOTIC-ASSISTED SURGERY WAS

SAFER, FASTER AND LESS PAINFUL OR OFFERED BETTER RESULTS THAN MINIMALLY INVASIVE CONVENTIONAL SURGERY.[1]

SURGEON-CENTERED

ACCURATE[2]

EFFICIENT

DATA DRIVEN

SURGEON-CENTERED

IMPLANTS DESIGNED TO IMPROVE OUTCOMES

Technologies are only as good as the implants they are used with. ROSA Knee provides you the flexibility to utilize our leading knee brand: Persona® The Personalized Knee®. The Persona Knee system is Zimmer Biomet's most comprehensive primary knee system, incorporating personalized implants, precise instrumentation and proven technology.[3–7]

Since its introduction in 2012, surgeons around the world have implanted over 1,000,000 Persona Total Knees[8]

PERSONALIZED IMPLANTS

- Anatomic implants in standard and narrow sizes developed to more closely match the shape and size of various patient ethnicities, genders and statures.

PRECISE INSTRUMENTATION

- Ergonomic instruments designed for precision with greater ease of use.

PROVEN TECHNOLOGY

- Trabecular Metal™ Technology and Vivacit-E® HXPLE Material provide clinically proven solutions to help improve efficiency and implant longevity[3-7]
- Built on the heritage of the NexGen® Knee System, the most widely used and clinically proven total knee system in the world.[9]

PERSONALIZED WORKFLOW

- ROSA Knee offers a simple user interface that adapts to your current workflow, philosophy and approach, including Personalized Alignment.

Perform a variety of approaches with ROSA Knee

Personalized Alignment

Measured Resection

Gap Balancing

Hybrid Approach

COLLABORATION DRIVEN BY YOU

Factoring in soft-tissue balance is not a new concept in knee replacement, but finding the right soft-tissue balance with static, traditional instruments is highly subjective.

With ROSA Knee, surgeons are able to objectively measure soft-tissue feedback and virtually conduct a knee replacement before performing any resections.

- In the Planning screen, surgeons receive live feedback of soft-tissues, femoral rotation and ligament tension

- Dynamic patient data throughout the range of motion

- Live cut values ensure resections remain on plane

ACCURATE

DELIVERING HIGHLY ACCURATE RESECTIONS AND LIMB ALIGNMENT[2,10]

Inaccurate implantation rates of up to 30 percent have been reported using the conventional technique in TKA, independent of the surgeon's experience.[11] ROSA Knee offers surgeons precision and accuracy through the cut flow and validation feature, which is designed to ensure proper alignment in real-time. A recent study shows ROSA Knee enables more accurate and more reproducible resections than conventional instrumentation.[10]

- Provides high levels of precision in regard to targeted angles and resection thickness [2]

- Less outliers and 100% of cases within 3° of the targeted neutral alignment [10]

- Validates all resection mean differences between the target resection and the measured resection were below 0.7 and had standard deviations below 1.1 mm [2]

- Fewer outliers for ROSA Knee cases for all bone resection angles [10]

SOFT-TISSUE MANAGEMENT

With ROSA Knee real-time soft-tissue balancing, surgeons can determine resections based on each patient's soft-tissue as well as bony anatomy. This also allows the surgeon to personalize rotation of the femoral component based on ligament tension. Other robotic systems on the market collect soft-tissue information by taking snapshots of the knee in two positions (flexion and extension), so the surgeon cannot collect data about how the knee is responding as it is being manipulated in the procedure.

ROSA Knee is designed to offer surgeons precision and accuracy through the cut flow and validation feature, which is designed to ensure proper alignment in real-time.

ROSA

EFFICIENT

FLEXIBLE IMAGING OPTIONS

Based on surgeon preference, ROSA Knee offers both image-based and image-free options for greater flexibility. This reduces the time between image acquisition and pre-operative planning, addresses reimbursement concerns, limits patient's exposure to radiation and minimizes scheduling requirements.

2D X-rays are submitted to your assigned Personalized Solutions Planning Expert
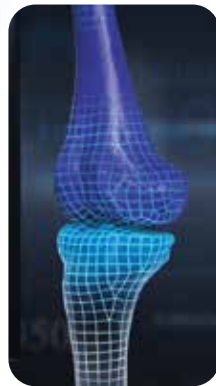
X-rays are transformed into a digital, 3D replication of the patient's anatomy

**A plan is created and displayed on the user interface based on the patient's unique anatomy**

REDUCED INSTRUMENTATION

The Efficient Care program and X-Atlas technology lowers the cost to serve through experienced case planning and unique modular instrument trays that provide you with all the instrumentation you need – while eliminating the instruments you don't.

POTENTIAL SAVINGS[12]
FOR EACH CASE

Six Trays
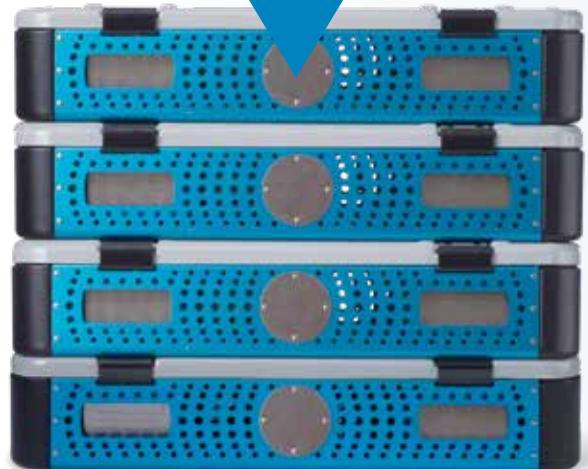
Four Trays

DATA-DRIVEN

ROSA Knee is a cornerstone of ZBEdge™, Zimmer Biomet's integrated digital and robotic technologies purposefully engineered to deliver data-powered clinical insights across the patient journey. Part of these integrated digital and robotic technologies include ROSA Knee, mymobility® Care Management Platform and OrthoIntel Orthopedic Intelligence Platform.

ORTHOINTEL ORTHOPEDIC INTELLIGENCE PLATFORM

OrthoIntel Orthopedic Intelligence Platform combines **pre-, intra- and post-operative data** from ZBEdge Connected Intelligence Suite to help surgeons **uncover clinical insights effortlessly.** This meaningful data is intended to help health care professionals **optimize care** by efficiently **exploring the connections between surgery and outcomes.**

ORTHOINTEL INTERACTIVE REPORTS

OrthoIntel Interactive provides interactive and customizable reports that allow clinicians to explore data across the continuum of care to enable insights on variables that impact outcomes and experience.

OrthoIntel Interactive Reports are available to all mymobility customers. The data can be further enriched with intra-operative metrics from ROSA Robotics.

OPTIMIZE CARE THROUGHOUT THE SURGICAL JOURNEY

The following data metrics are currently captured in OrthoIntel Orthopedic Intelligence Platform

PRE- AND POST-OPERATIVE METRICS GATHERED THROUGH MYMOBILITY:

Mobility/Functional Data Collected

- Steps
- Stairs Climbed
- Stand Hours
- Exercise Completion

Gait Quality Data

- Gait Speed
- Double Support Percentage
- Step Length*
- Speed Ascending and Descending Stairs*
- Asymmetry*

Engagement Data Collected

- Exercise Adherence
- PROMs Adherence
- Patient Reported Pain Management Tracking**
- Patient Reported Narcotic/ Non-narcotic Tracking**
- Education Adherence

Additional Data Collected

- Falls Detection*
- Sleep*

* Available separately upon request

** Via prompted patient-reported check-ins

These data points are collected and connected in OrthoIntel Orthopedic Intelligence Platform, but not currently displayed: Engagement data, exercise completion, Step Length, Speed Ascending/ Descending Stairs, Asymmetry, Falls Detection or Sleep.

Heart Rate Data Collected

- Average Resting Heart Rate
- Average Walking Heart Rate Variability
- VO2 Max*

INTRA-OPERATIVE METRICS GATHERED BY ROSA KNEE

Hip-Knee-Ankle Angle

Medial Laxity at Full Extension

Medial Laxity at 90˚ Flexion

Max Varus/ Valgus at Full Extension

Max Varus/ Valgus at 90˚ Extension

References

1. Boys, J. A., Alicuben, E. T., DeMeester, M. J., Worrell, S. G., Oh, D. S., Hagen, J. A., & DeMeester, S. R. (2016). Public perceptions on robotic surgery, hospitals with robots, and surgeons that use them. Surgical endoscopy, 30(4), 1310–1316. 2016. https://doi.org/10.1007/s00464-015-4368-6

2. Parratte, S., et al. Instability After Total Knee Arthroplasty. Journal of Bone Joint Surgery (America). 90(1): 184, 2008. Cadaveric testing is not necessarily indicative of clinical performance.

3. Zhang, Y., et al. Interfacial Frictional Behavior: Cancellous Bone, Cortical Bone, and a Novel Porous Tantalum Biomaterial. Journal of Musculoskeletal Research. 3(4):, 245-251, 1999.

4. Bobyn, J.D., et al. Characteristics of Bone In-growth and Interface Mechanics of a New Porous Tantalum Biomaterial. Journal of Bone and Joint Surgery (British). 81-B(5): 907, 1999.

5. Shirazi-Adl, A., et al. Experimental Determination of Friction Characteristics at the Trabecular Bone / Porous-coated Metal Interface in Cementless Implants. The Journal of Biomedical Research. 27: 167- 175, 1993.

6. Levine, B. et al. Experimental and Clinical Performance of Porous Metal Tantalum in Orthopedic Surgery. Biomaterials. 27: 4671-81, 2006.

7. Zimmer ZRR_WA_2537_12.

8. Internal Persona Knee Cumulative Sales Report – Sales Globally as of May 2019.

9. Statement based on: 5 million implantations[9h] 300+ Publications[9g] 100% Survivorship at 17 Years[9a] Lowest revision rate[9b-e] Benchmark for PROMs[9f] 10A* ODEP rating for CR and PS knees both with and without patella[9g] Every 90 seconds a patient receives a NexGen knee[9h] 1 in 5 knees implanted globally is a NexGen Knee[9i]

    9a. Kim, Y.H., et al. Cementless and cemented total knee arthroplasty in patients younger than fifty five years. Which is better? International Orthopaedics (SICOT) (2014) 38:297–303.

    9b. Australian Orthopaedic Association National Joint Replacement Registry. Annual Report. Adelaide.AOA 2016: Table KT9 Cumulative Percent Revision of Primary Total Knee Replacement with Cement Fixation.

    9c. Australian Orthopaedic Association National Joint Replacement Registry. Annual Report. Adelaide.AOA 2016: Table KT10 Cumulative Percent Revision of Primary Total Knee Replacement with Cementless Fixation.

    9d. Australian Orthopaedic Association National Joint Replacement Registry. Annual Report. Adelaide. AOA 2016: Table KT11 Cumulative Percent Revision of Primary Total Knee Replacement with Hybrid Fixation.

    9e. Select variants from the 2016 Swedish National Registry available at http://myknee.se/en/ (pgs 42-43).

    9f. Baker, P.N., et al. The effect of surgical factors on early patient-reported outcome measures (PROMs) following total knee replacement. J Bone Joint Surg Br. 94:1058, 2012.

    9g. Latest ODEP ratings can be found at http://www.odep.org.uk.

    9h. 2015 Sales data available at Zimmer Biomet.

    9i. EMBASE search: «NexGen» AND «Knee».

10. Seidenstein A, Birmingham M, Foran J, Ogden S. Better accuracy and reproducibility of a new robotically-assisted system for total knee arthroplasty compared to conventional instrumentation: a cadaveric study. Knee Surg Sports Traumatol Arthrosc. 2020 May 24. doi: 1007/s00167-020-06038-w. Epub ahead of print. PMID: 32448945. Cadaveric testing is not necessarily indicative of clinical performance.

11. Daniilidis, K., & Tibesku, C. O. (2014). A comparison of conventional and patient-specific instruments in total knee arthroplasty. International Orthopaedics, 38(3), 503–508. 2014 https://doi.org/10.1007/s00264-013-2028-9.

12. Persona® Instrument Tray Reduction. November 2018.

ZIMMER BIOMET
Moving You Forward.™