

MAKOplasty®

DEFINES CONFIDENCE IN THA OUTCOMES

Robotic Arm Accuracy Combined With Advanced Implant Performance



MAKOplasty® Total Hip Arthroplasty

The Confidence of Accurate, Reproducible Surgical Results

More Accurate Cup Placement Compared with Manual Procedures

Reduces potential for impingement, wear, and dislocation¹

- 6 times more accurate inclination²
- 3 times more reproducible inclination²
- Cup placement within ± 2 mm of plan³

Intimate Acetabular Cup Fit and Stability

- The porous structured technology of RESTORIS® PST™ Acetabular Shell is highly frictional and offers outer struts designed to interlock with bone

Accurate Leg Length Restoration

Reduces potential for patient discomfort, walking complications, and lawsuits⁴

- Enables leg length restoration accuracy within ± 3 mm³

Helps Avoid Impingement with More Accurate Combined Anteversion Compared with Manual Procedures

Provides the greatest protection against impingement, the #1 cause of failure in THA⁵

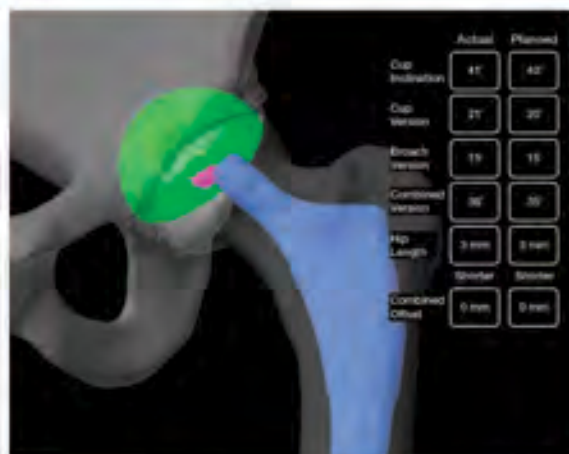
- 4 times more accurate cup anteversion²
- 4 times more reproducible cup anteversion²
- Femoral stem anteversion within $\pm 3^\circ$ ³

Optimal Restoration of Joint Kinematics

- RESTORIS® Tapered Femoral Stem offers modular heads and fixed 130° neck angle, with standard and extended offset options, enabling optimization of soft-tissue tension to establish proper restoration of joint kinematics

A New Level of Versatility

- Facilitates surgical approach of choice
 - Direct anterior
 - Postero-lateral
 - Antero-lateral
- Uniquely enables combined anteversion of the femoral stem and acetabular cup to help avoid mechanical impingement and optimize range of motion
- Range of motion is enhanced by RESTORIS® Tapered Femoral Stem's reduced A/P neck geometry and intimate medial-lateral fit and locking



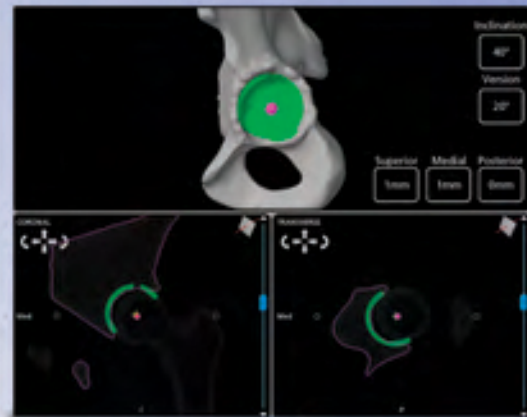
RIO® Robotic Arm Interactive Orthopedic System



MAKOplasty®

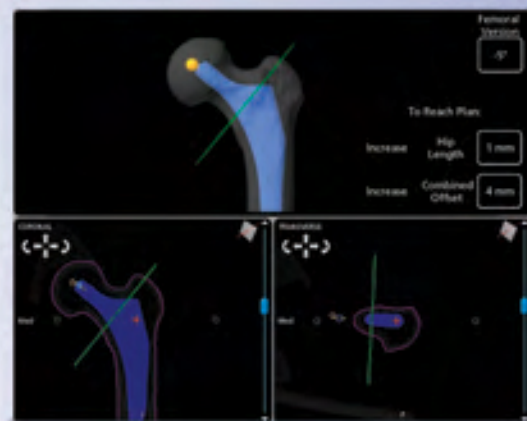
Patient-specific Pre-operative Planning

- 3-D model of patient anatomy from CT scan
- Pre-operative implant planning for size, orientation, and center of rotation of cup and stem



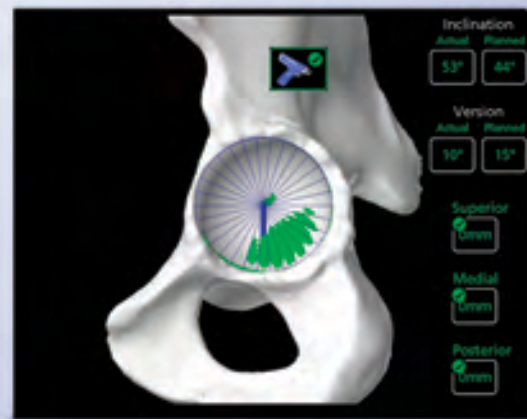
Real-time Intra-operative Adjustments

- Guided femoral neck resection
 - Femoral stem version
 - Predicted hip length
 - Predicted combined offset



Surgeon-controlled Robotic Arm Assisted Reaming and Cup Impaction

- Tactile feedback, 3-D visualization, and auditory guidance facilitate controlled reaming
 - Assures accurate center of rotation placement
 - Maximize cup fixation with hemispherical reaming
- Robotic arm constrained cup impaction
 - Optimizes acetabular cup alignment within 5° of plan³



Results Summary

- Summary screen confirms results are accurate and according to plan before you leave the OR
 - Cup inclination and version
 - Combined hip version
 - Hip length and combined offset





RESTORIS® Tapered
Femoral Stem and
RESTORIS® PST™ Acetabular
Cup Hip Implant System



RESTORIS® MetaFix® and
RESTORIS® Trinity® Hip
Implant System



RESTORIS® Z
Hip Implant System

Diverse Family of RESTORIS® Hip Implant Systems

- 3 clinically proven stem design philosophies
- Broad range of stem sizes to ensure maximum fit and fill, with standard and extended offset options
- Broad range of acetabular shell sizes to maximize optimal fit and fixation
- Acetabular liner options that include: multiple face and offset configurations, and highly cross-linked polyethylene with vitamin E

The Confidence of Accurately Placed Advanced Implants

RESTORIS® PST™ Acetabular Cup

RESTORIS® PST™ Acetabular Shell is engineered with cutting-edge technology, PST™ (Porous Structured Technology), designed for strength and biologic fixation.



Decreased Potential for Liner Micromotion

- Tightly toleranced locking taper to achieve maximum shell-to-liner contact
- Acetabular shell mating grooves and rim-locking liner increase stability

Intimate Fit

- Outer struts and highly frictional PST™ are designed to interlock with bone for an intimate fit
- Initial stability is further enhanced from the highly frictional PST™ bone-interfacing surface

Designed for Long-term Fixation

- Provides up to 70% fully interconnected porosity for long-term biologic fixation potential

Versatile Modular Design

- 5 liner face and offset configurations provide surgeon options

Wear Resistance and Oxidative Stability

- RESTORIS® XLVE™ vitamin E polyethylene liners are highly cross-linked for increased resistance to oxidative degradation and wear

RESTORIS® Tapered Femoral Stem

A stem design philosophy you can trust. Tapered wedge design femoral stems have over 30 years of clinical experience and have demonstrated a 99% survivorship.⁶



Bone Conserving

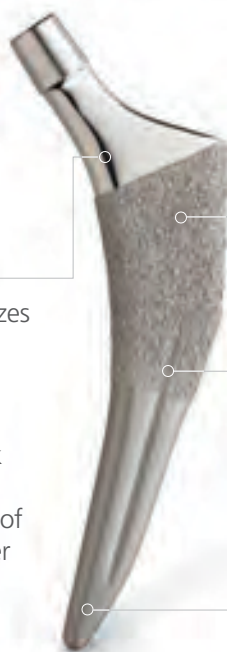
- Flat tapered geometry with reduced A/P width

Optimized Range of Motion

- Reduced anterior/posterior neck geometry
- Highly polished tapered neck minimizes potential for wear debris generation

Joint Kinematics Restoration

- Modular heads and fixed 130° neck angle, with standard and extended offset options, enable optimization of soft-tissue tension to establish proper restoration of joint kinematics



Secure Bone Interface and Stability

- Proximal Ti-Plasma coating enables a secure interlocking press fit
- The feathered, gradual coating transition distally reduces potential for mid-stem hang-up on implantation

Versatility

- 11 stem sizes, each with a standard and extended offset option

Promotes Proximal Locking

- Contoured distal tip avoids distal wedging and ensures proper proximal and mid-stem seating



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CONSISTENTLY REPRODUCIBLE PRECISION

References

1. Kennedy JG, Rogers WB, Soffe KE, Sullivan RJ, Griffen DG, Sheehan LJ. Effect of acetabular component orientation on recurrent dislocation, pelvic osteolysis, polyethylene wear, and component migration. *J Arthroplasty*. 1998;13:530-534.
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3. Data on file.
4. Bozic KJ, Kurtz SM, Lau E, Ong K, Vail TP, Berry DJ. The epidemiology of revision total hip arthroplasty in the United States. *J Bone Joint Surg Am*. 2009;91:128-133.
5. Malik A, Maheshwari A, Dorr LD. Impingement with total hip replacement. *J Bone Joint Surg Am*. 2007;89:1832-1842.
6. McLaughlin JR, Lee KR. Uncemented total hip arthroplasty with a tapered femoral component: A 22- to 26- year follow-up study. *Orthopedics*. 2010;33(9):639.

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