TRI·LOCK®

BONE PRESERVATION STEM

Design Rationale

DePuy
a Johnson & Johnson company

FEATURING GRIPTION™ TECHNOLOGY

Optimum implant geometry

Extending proven Tri-Lock® heritage

The original Tri-Lock® was introduced in 1981. This implant was the first proximally coated tapered-wedge hip stem available to orthopaedic surgeons and their patients. Since its introduction, Tri-Lock has demonstrated 98% survivorship.[1]

Preserving the natural anatomy

The reduced lateral shoulder, thin geometry and optimized length of the Tri-Lock Bone Preservation Stem minimize the amount of bone removed from the patient. These same features, along with approach enabling instrumentation, allow the surgeon to perform minimally invasive techniques.

Delivering stable, predictable performance

The Tri-Lock Bone Preservation Stem incorporates Gription™ fixation technology. Gription is designed to help provide consistent implant seating height and additional initial stability that helps maximize the potential for long-term bony ingrowth.

Restoring high level function

The Tri-Lock Bone Preservation Stem neck geometry has been optimized to improve range-of-motion. Progressive dual offsets with direct lateralization provide the ability to optimize soft tissue tension. An extensive size range and consistent intervals between sizes help achieve proper fit and aid in recreating leg length.

Providing advanced bearing options

The Tri-Lock Bone Preservation Stem's 12/14 Articul/eze® taper enables the use of the most advanced bearing options available today. The Pinnacle® Acetabular Cup System gives the surgeon a choice of bearing materials, and the option for screw fixation. The DePuy ASR™ XL metal-on-metal system maximizes head-to-shell ratio, providing an exceptional range-of-motion and outstanding hip stability.

Enabling a simple, reproducible technique

Today's total hip surgeon demands proven performance, OR efficiency, and surgical approach flexibility. The new Tri-Lock Bone Preservation Stem delivers on all fronts. The broach-only technique and wide range of instrumentation enable both traditional and less-invasive surgical approaches.

Extending proven Tri-Lock® heritage

98%

Survivorship at 10 years.[1]

The original Tri-Lock was introduced in 1981. This implant was the first proximally coated tapered wedge hip stem available to orthopaedic surgeons and their patients. Since its introduction, the success of Tri-Lock has been well documented in published studies. Using component revision for aseptic loosening as the end point, the numbers are convincing.

Axial stability

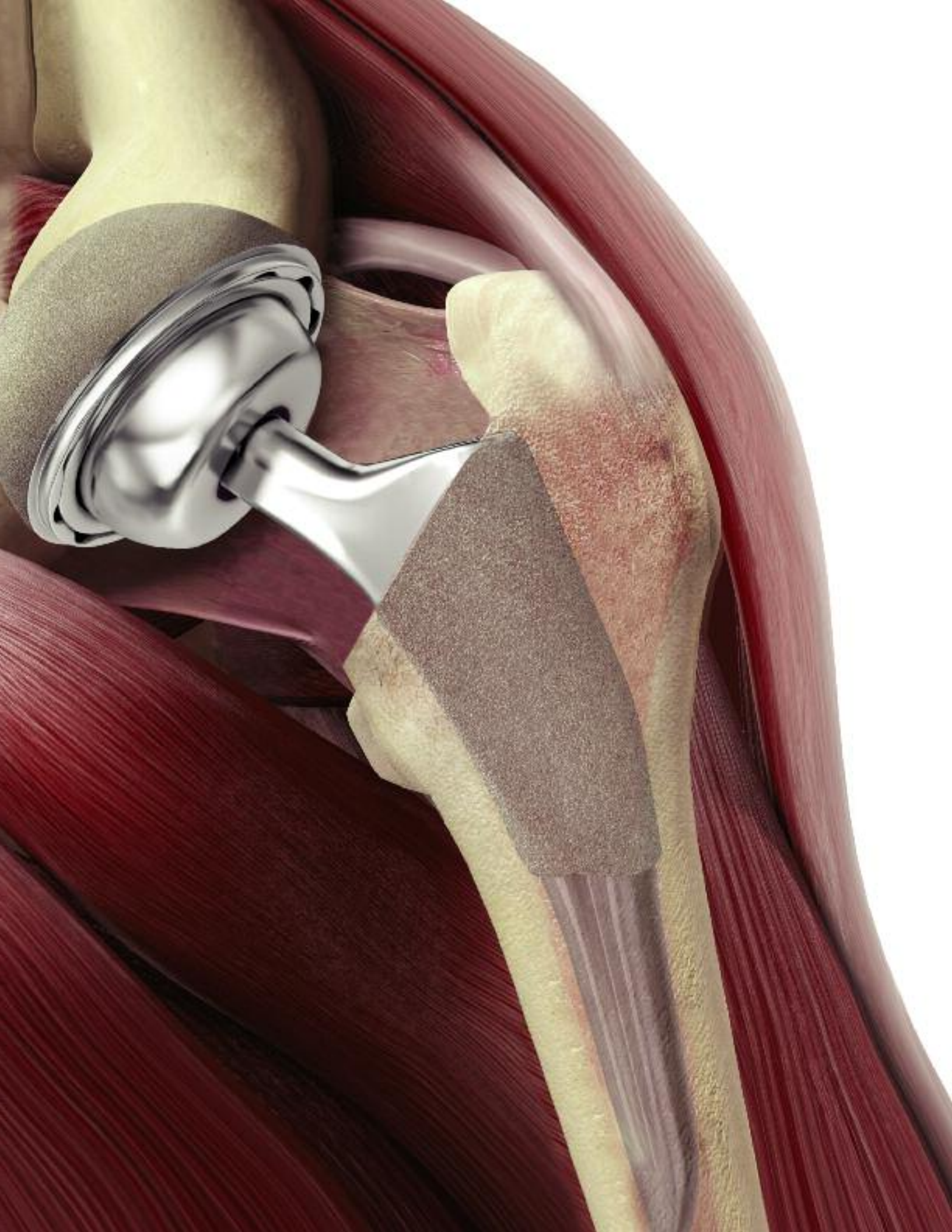
The Tri-Lock Bone Preservation Stem achieves axial stability within the femur by making intimate cortical contact at the medial and lateral endosteal cortices. The natural taper of the femoral canal is reflected in Tri-Lock's proximal-to-distal taper, as viewed in an A/P radiograph. This taper prohibits distal migration when cortical contact is achieved.

Rotational stability

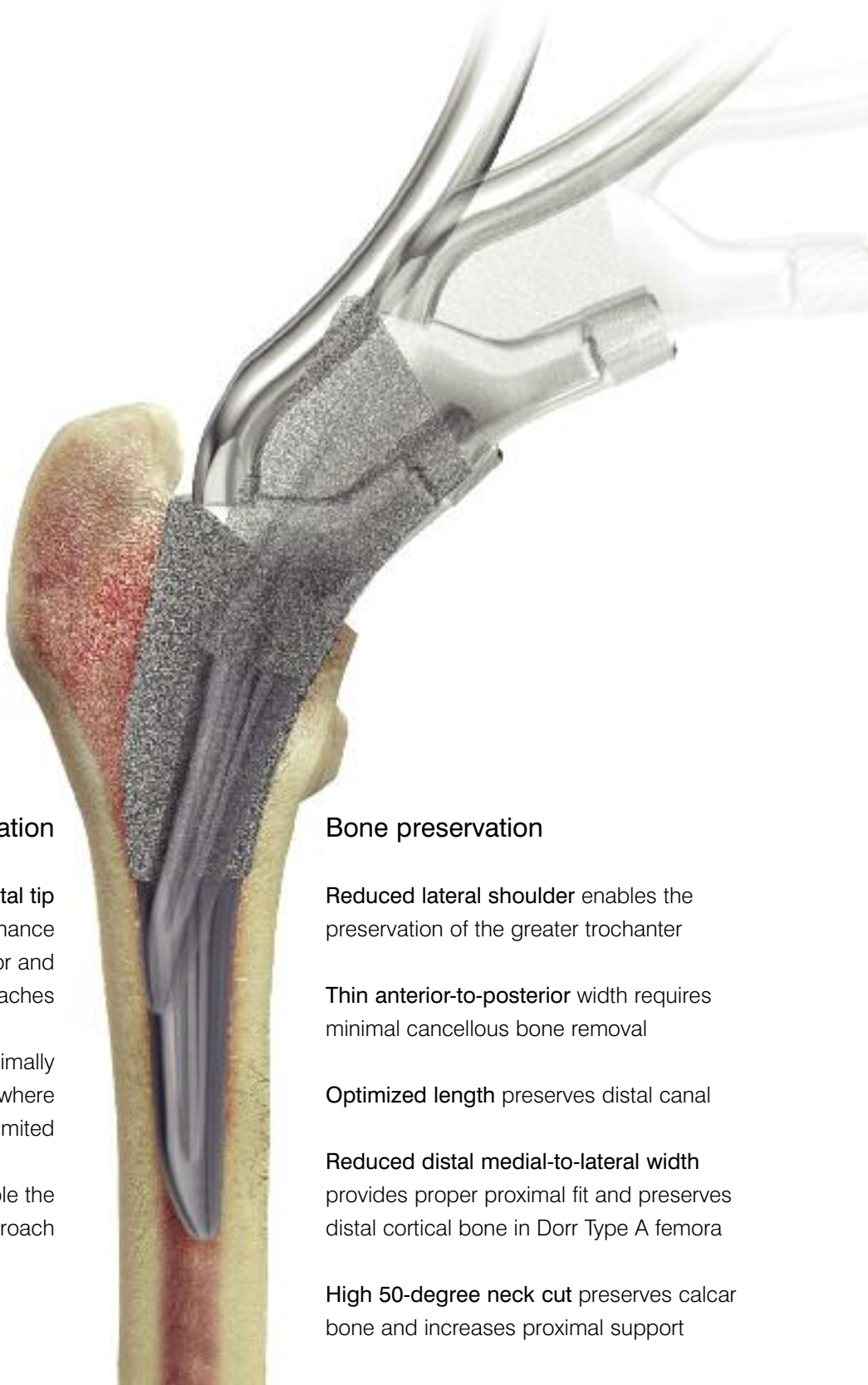
The inherent rotational stability of the Tri-Lock Bone Preservation Stem is a result of the narrow anterior-to-posterior width of the stem. This narrow geometry allows the stem to be sized to fill the largest dimension of the femoral canal (the medial-to-lateral width). Since the M/L width of the implant is larger than the A/P width of the femoral canal, the Tri-Lock Bone Preservation Stem maintains excellent rotational stability.

Long-term osteointegration

The initial axial and rotational stability of the Tri-Lock Bone Preservation Stem provide the opportunity for long-term osteointegration. Initial stability limits micromotion at the implant to cortical bone interface, resulting in a higher probability for bony ingrowth.



Preserving the natural anatomy



Soft tissue preservation

Optimized length, contoured distal tip and reduced lateral shoulder enhance stem insertion through the anterior and antero-lateral approaches

Broach only technique enables minimally invasive surgical approaches where access with straight reamers is limited

Instrumentation designed to enable the surgeons' preferred approach

Bone preservation

Reduced lateral shoulder enables the preservation of the greater trochanter

Thin anterior-to-posterior width requires minimal cancellous bone removal

Optimized length preserves distal canal

Reduced distal medial-to-lateral width provides proper proximal fit and preserves distal cortical bone in Dorr Type A femora

High 50-degree neck cut preserves calcar bone and increases proximal support

Delivering stable, predictable performance

GRIPTION™ fixation technology

- Gription's predicted 1.2 coefficient of friction exceeds that of plasma spray and porous tantalum material.[2]

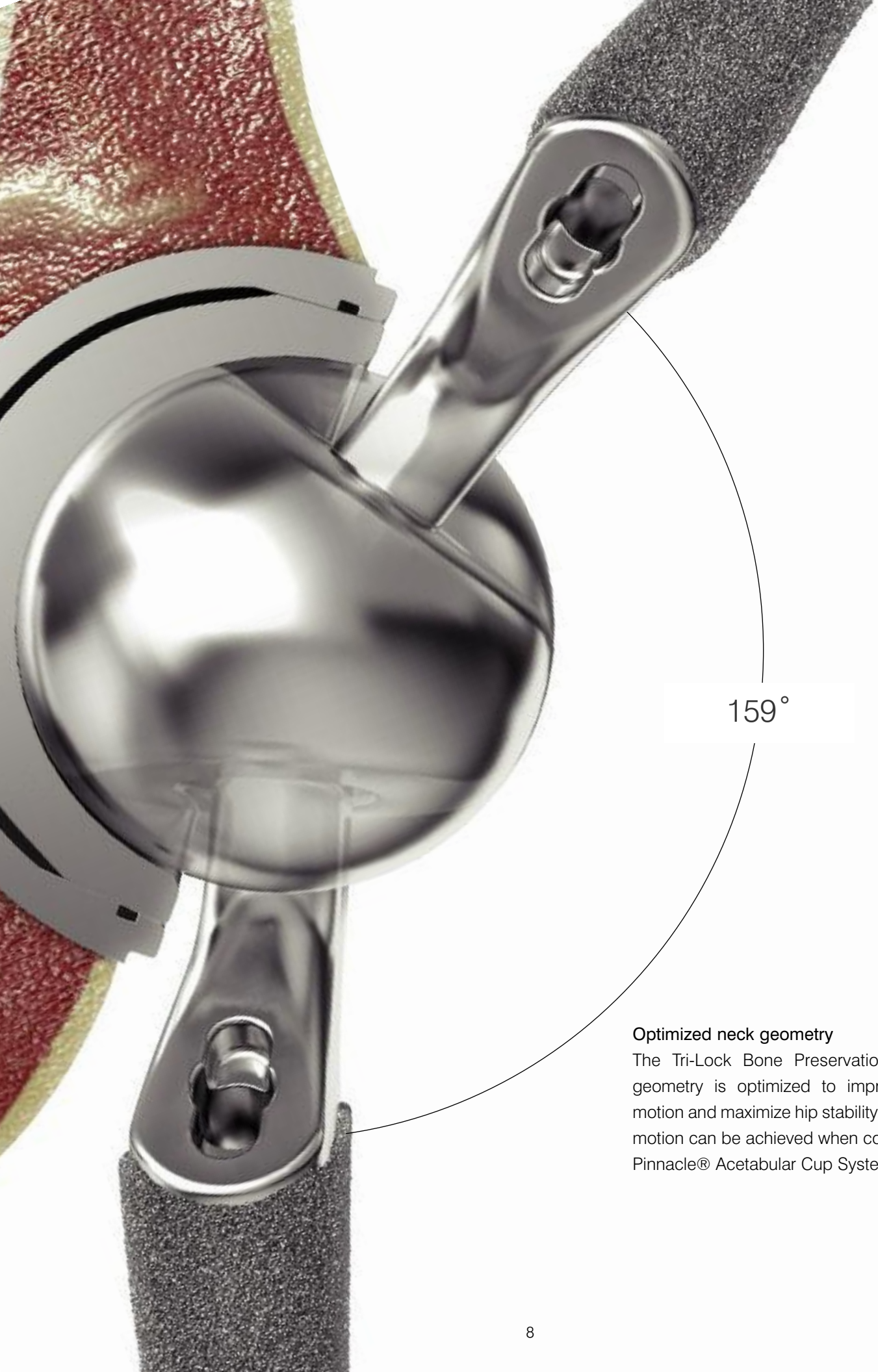
- The volume porosity of Gription reaches 63% at the surface. This increased porosity allows for higher oxygenation and revascularization of bony tissue.

- Gription provides a clinically advantageous 300-micron average pore size. This pore size has been proven optimal for osteointegration.[3]

- Gription is highly microtextured. This microtexture provides an increased surface area for osteoblast cells to adhere and proliferate.

- The Tri-Lock Bone Preservation Stem and Gription coating are composed of titanium, a material with proven biocompatibility and a low modulus of elasticity.

The Tri-Lock Bone Preservation Stem incorporates Gription fixation technology. Gription is an evolutionary advancement in implant coating technology. This advanced coating technology builds upon DePuy's 30-year tradition of cementless implant excellence. The critical coating properties that Porocoat® has proven effective for long-term survivorship have been replicated in Gription. Advanced technology has allowed DePuy to optimize Gription's properties, providing consistent implant seating height, exceptional initial stability and a maximized potential for long-term osteointegration.



Optimized neck geometry

The Tri-Lock Bone Preservation Stem neck geometry is optimized to improve range of motion and maximize hip stability. 159˚ range of motion can be achieved when coupled with the Pinnacle® Acetabular Cup System.

Restoring high level function

Progressive dual offset

Stem offset is proportional to stem size. Each stem size offers a standard and high offset option. The high offset option lateralizes the stem 6 – 8 mm depending on size. By maintaining a constant 130˚ neck angle, tissue tension can be increased without affecting leg length.

Extensive size range

The Tri-Lock Bone Preservation Stem system features 13 stem sizes, allowing the surgeon to address the larger patient population. Consistent intervals between each stem size help achieve proper fit within the femur. Component sizing can also be used to fine tune seating height and adjust leg length.

Providing advanced bearing options

Pinnacle® with Marathon™. Marathon polyethylene combines mechanical integrity with wear resistance. This moderately cross-linked (5 Mrad) polyethylene is manufactured to have zero oxidative potential.

Pinnacle® with AltrX™. This moderately cross-linked polyethylene (7.5 megarads) demonstrates mechanical toughness and zero oxidative potential, while providing a 92 percent reduction in wear.[2]

Pinnacle® with Ultamet®. Ultamet metal-on-metal bearings are designed and manufactured to reduce wear and increase stability, while offering modularity and adjunct fixation. Made with highly polished, high-carbon cobalt chrome, Ultamet bearings have optimized diametrical clearance and sphericity to provide true fluid film lubrication and low wear.

DePuy ASR XL. As a monoblock metal-on-metal system, ASR XL provides the largest head size possible for a given acetabulum. Large head metal-on-metal articulation improves hip stability and enhances fluid film lubrication.

The Tri-Lock Bone Preservation Stem 12/14 Articul/eze taper enables the use of the most advanced bearing options available today. The Pinnacle Acetabular Cup System gives the surgeon choice in bearing materials. The DePuy ASR XL metal-on-metal system maximizes head-to-shell ratio, providing an exceptional range of motion and outstanding hip stability.

Enabling a simple, reproducible technique

Step 1: Neck osteotomy

Step 2: Femoral canal preparation

Step 3: Femoral component insertion

Straight

Straight-long

Curved

Dual-offset

Approach enabling broach handle options

Threaded

Straight modular

Curved modular

Offset modular

Bullet-tip modular

Approach enabling stem inserter options

References:

1. Burt CF et al. A Femoral Component Inserted without Cement in Total Hip Arthroplasty. A Study of the Tri-Lock Component with an Average Ten Year Duration of Follow-up. JBJS 1998 Jul 80(7) 952-60.
2. Data on file at DePuy
3. Bolyn, et al. The Optimum Pore Size for the Fixation of Porous Surfaced Metal Implants by the Ingrowth of Bone. CORR, 150, 1980.

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