Design Rationale
Optimum implant geometry

Extending the 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, which offers an enhanced coefficient of friction when compared to Porocoat® porous coating. Gription is designed to help provide consistent implant seating height, and the clinical success of the Tri-Lock BPS is based on a simple reproducible surgical technique that achieves initial fixation and allows long term, durable fixation.

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.

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.

Note: The statements in this brochure only refer to the Tri-Lock® BPS system used with DePuy metal on polyethylene, metal on metal, and ceramic on polyethylene bearing combinations.
Extending the 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 clinical success
The initial axial and rotational stability of the Tri-Lock Bone Preservation Stem provide the opportunity for long-term clinical success. Initial stability limits micromotion at the implant to cortical bone interface, resulting in a higher probability for long term, durable fixation.
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**
Delivering stable, predictable performance

Gription® fixation technology

• Gription’s 1.2 coefficient of friction exceeds that of plasma spray and porous tantalum material.²

• The volume porosity of Gription reaches 80% at the surface. This increased porosity allows for higher oxygenation and revascularization of bone and/or fibrous tissue.³

• Gription provides a 300-micron average pore size, similar to DePuy’s clinically proven Porocoat® porous coating.

• Gription is highly microtextured. This microtexture provides an increased surface area for osteoblast and/or fibroblast 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 and exceptional initial stability.
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 full 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 Mrad) 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.
Enabling a simple, reproducible technique

**Step 1:** Neck osteotomy

**Step 2:** Femoral canal preparation

**Step 3:** Femoral component insertion
Supplemental Tri-Lock BPS educational materials are also available including the Clinical Compendium of five Surgeon Designer-authored white papers and Surgical Footage DVDs, which walk through insights of the technique. Contact your DePuy Sales Representative for more information.
References:


2. Data on file at DePuy


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