POROUS HIP PROSTHESES

Comprehensive Versatility in Porous Fixation Solutions
Zimmer has combined the world’s best technologies, diverse surgical philosophies, and decades of experience to create the most extensive system of total hip solutions. The VerSys Hip System provides unparalleled versatility.

An essential foundation for VerSys was the ANADAT® Anatomical Database, comprising detailed anatomic measurements of cadaver femora that guided implant sizing and design. Combined with extensively researched implant materials and clinically proven features, ANADAT enabled the creation of a system designed for optimum versatility, functionality, and long-term results.

System Rasp

Based on ANADAT data, the system rasp is designed to be used with both cemented and cementless implants, providing greater intra-operative flexibility and cost-efficiency than traditional instrumentation offerings.
THE CHALLENGE OF POROUS IMPLANT FIXATION

Approximately 200,000 cementless total hip arthroplasties are performed worldwide each year. While the vast majority of these are successful, the principal challenges in cementless total hip arthroplasty include maintaining mechanical stability and minimizing bone resorption.

Long-term implant stability relies upon initial mechanical fixation to immobilize the prosthesis while bone ingrowth occurs. Studies have shown that initial stability and intimate bone/implant apposition jointly determine the measure of bone ingrowth success.\(^2\),\(^3\),\(^4\) Studies also show that stiffness matching between the implant and femur can help reduce bone resorption in cementless femoral arthroplasty.\(^5\),\(^6\),\(^7\) Furthermore, the access of the polyethylene wear particles to the bone-implant interface and the intramedullary canal can be restricted with circumferential porous coating, thus reducing the severity of macrophage-mediated osteolysis.\(^10\),\(^11\) Today’s challenge is to create porous implants to achieve secure initial fixation, maximum bone ingrowth, and reduced peri-implant bone loss.

Vast improvements have been made in total hip arthroplasty since the earliest implants were developed more than four decades ago. Yet, there are a number of key issues that orthopaedic surgeons face today. The most significant of these are:

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MEETING THE CHALLENGE WITH PROVEN DESIGNS AND TECHNOLOGIES

VerSys Porous Hip Prostheses incorporate dynamic implant designs produced from advanced technological innovation.

ANADAT

ANADAT is a proprietary anatomic database that was formed by the quantitative measurement of cadaver femora drawn from a broad patient population. Designers used ANADAT to develop the shapes and sizes of the VerSys Hip System which effectively match natural femoral geometries.

VerSys Porous Hip Prostheses. The most comprehensive offering of porous fixation solutions.
Paired progressive offsets and neck lengths facilitate leg length and offset restoration.

Porous surface to rasp press-fit from 0mm (A) to 0.5mm (B) yields a secure initial press-fit.

Stem diameters available in 1mm increments with both standard and LM proximal bodies to help improve fit.

Trapezoidal cross-section geometry improves proximal fill, promotes load transfer from stem to bone, and provides initial rotational stability.

Distal splines can be engaged into the diaphyseal cortex to augment initial rotational stability.

Rasp Alignment Tip centralizes each rasp within the reamed canal for accurate stem placement.

A solid fluted distal stem geometry provides significantly greater resistance to torsional forces than a slotted, finned, or porous coated geometry. Resistance to torsional forces helps provide initial implant stability to allow for bone ingrowth.

Bending stiffness – 15mm TiVanium stem compared to average femur.

Circumferential porous surface provides complete proximal coverage.

Note: Minimum bending stiffness for VerSys calculated in the sagittal plane.
MEETING THE UNIQUE CHALLENGE OF REVISION SURGERY

The primary goal of revision surgery is to establish fixation, thereby relieving pain and restoring function. Because virtually all revision surgeries involve bone defects and deficiencies, the major challenge is to compensate for defects while protecting the remaining bone from further damage.

VerSys Beaded FullCoat Plus Hip Prostheses address this challenge by incorporating:

• Extensive porous coating for proximal and distal ingrowth.
• A comprehensive size offering of standard and large metaphyseal (LM) revision stems to meet a spectrum of patient demands.
• Distal flutes in larger stem sizes to attenuate sagittal bending stiffness.

Beaded FullCoat Plus (6- and 8-inch) has the same neck length and offset values as the corresponding size Porous MidCoat prosthesis for those cases where an extensively porous coated prosthesis is preferred.

Beaded FullCoat Plus (11 to 14)

Beaded FullCoat Plus (15 to 20)
Requires special LM rasp for femur preparation.

Paired progressive offsets and neck lengths facilitate leg length and offset restoration.

Standard (Std) and Large Metaphyseal (LM)

The LM versions increase the medial curve by 4mm to 5mm, depending on the stem size, allowing surgeons to precisely match implant geometries to patient needs.*

Porous surface-to-rasp press-fit from 0mm (A) to 0.5mm (B) yields a secure initial press-fit.

Extensive porous coating provides opportunity for proximal and distal bone ingrowth.

Trapezoidal cross-section geometry improves proximal fill, promotes load transfer from stem to bone, and provides initial rotational stability.15

Bending Stiffness – 15mm CoCr Stems Compared To Average Femur

*Requires special LM rasp for femur preparation.
Note: Refer to published surgical technique prior to actual implantation of all VerSys Porous Hip Prostheses.
Today, surgeons face the increasing challenge of meeting the clinical needs of patients while controlling costs. The VerSys Hip System addresses these demands with:

- Innovative designs and proven technologies.
- Versatile, efficient, and uncomplicated instrumentation.
- Responsive cost management by offering the surgeon a range of options to meet the broad spectrum of patient needs.12, 13, 14

Use of ANADAT created the VerSys core matrix of implant geometries. Unlike other competitive offerings, a system-oriented rasp was then developed to support femoral contouring for the VerSys prostheses. One system...one rasp design.

The rasp design allows for:

- True intrahospital flexibility — one set of instruments common to the complete VerSys family of stems.
- Surgical diversity — multiple implants to support individual physician preference.

COST MANAGEMENT

Instrumentation

The VerSys Hip System instrumentation is designed to improve intrahospital efficiency while accommodating cemented, porous, taper, and fracture procedures.
Today’s surgeon faces the increasing challenge of meeting the clinical needs of patients with efficacious, yet cost-efficient solutions. The VerSys Hip System addresses these concerns through common instrumentation, surgical innovation, and a wide range of implant options to meet virtually all patient needs.

1. Data on file at Zimmer.

* Various components of the VerSys Hip System are covered by one or more of the following: U.S. Patents 4,281,420; 4,336,618; 4,491,987; 4,795,472; 4,963,155; 5,013,324; 5,018,285; 5,089,003; 5,156,624; 5,171,324; 5,192,323; 5,326,362; 5,480,453; 5,496,375; 5,569,255; 5,624,445. Other U.S. and Foreign Patents Pending.