



Zimmer®
APR® Anatomical
Hip System



The anatomic solution for bone matching™

APR Anatomical Hip System

The anatomic solution for bone matching

Zimmer's *APR* Total Hip Arthroplasty System is designed to enable surgeons to perform a complete anatomic restoration regardless of the patient's bone type.

- **Proven Clinical Performance**—The *APR* Hip System has been successfully implanted in thousands of patients and has years of successful clinical results.¹⁻⁴
- **Anatomic Design Advantages**—Optimal design offers an anatomic solution that addresses a variety of demand levels and bone types, including extreme metaphyseal-to-diaphyseal mismatch, “Type A” Bone.^{1,17}
- **Extensive Product Range, Fast, Precise Instrumentation and Complete Compatibility with Multiple Acetabular Options**



APR Hip Clinical Experience

Proven Clinical Success: 100 Consecutive Hips and 10-Year Follow-up^{1,18}

The Mid-Term Study

The clinical results of 99 primary total hip arthroplasties performed at a single institution support the claim that the APR Hip design provides excellent results:¹

- Complete relief of thigh pain
- Zero stem loosening, zero stem revisions
- No measurable subsidence or migration
- No osteolysis
- 100% bone-to-stem apposition

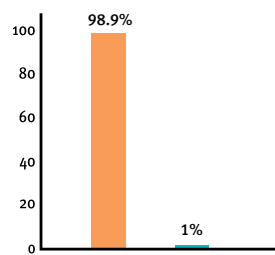
The 10-Year Follow-Up

The follow-up study showed continued, long-term success.¹⁸

- No revisions for femoral loosening
- No radiographic evidence of femoral loosening
- 100% of Harris Hip Scores were good–excellent
- 100% survivorship at 10 years

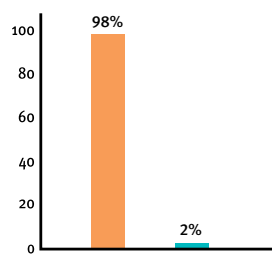


Excellent Harris Hip Score Averages^{1,2}



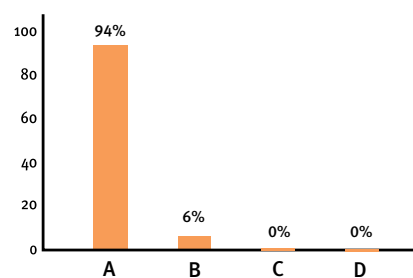
- 98.9% good–excellent results
- 1% fair results

Harris Thigh Pain Score Averages^{2,3}



- 98% no pain (>40 points on the Harris Thigh Pain Scale) Average Harris Pain Score is 42.3
- 2% mild-to-moderate pain (<40 points on the Harris Thigh Pain Scale) Four patients with mild thigh pain at 2 years, but disappearing completely at 3 years

Radiographic Evaluation^{2,3}



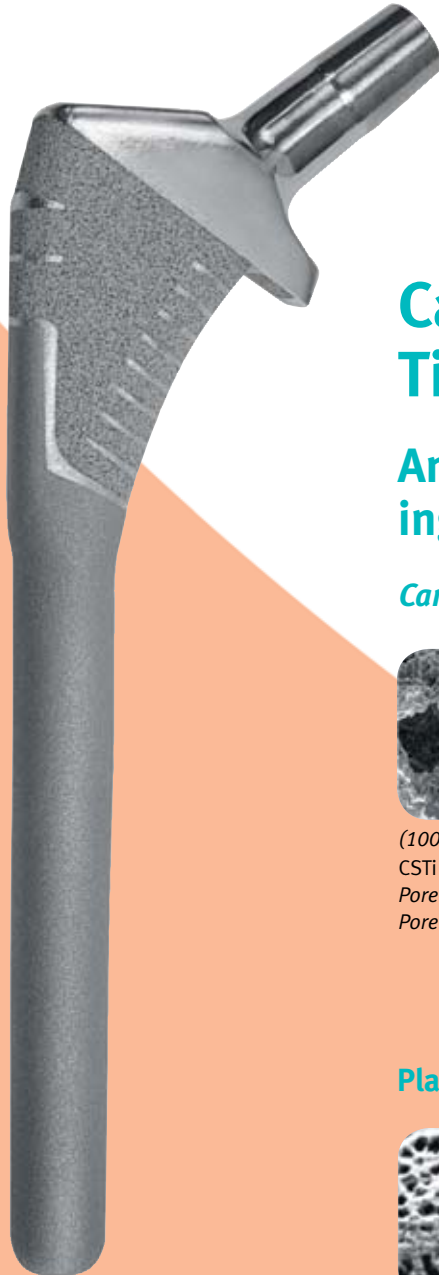
- A No radiolucencies, lines at tip in zone 4 (IA)–94%
- B Radiolucencies in zone 3–5 (IB)–6%
- C Complete radiolucent line around stem, but no prosthetic migration (II)–0%
- D Divergent radiolucencies with obvious migration (III)–0%

APR Anatomical Hip System

The anatomic solution for bone matching

Anatomic Design Advantages

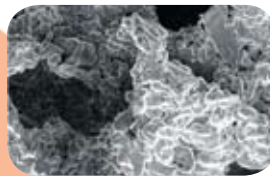
- **10° Anteversion**—Normal 10° anteversion is restored with the APR Hip
- **3-Dimensional Proximal Wedge**—Promotes proximal cortical loading for immediate rotational stability and excellent press-fit fixation^{1,18}
- **12° Proximal Anatomic Bow**—Approximates the contours of bone, providing anterior cortical contact for a more natural loading of the proximal femur^{1,18}
- **Round Distal Stem**—For maximum congruent fit
- **Left and Right Configurations**



Cancellous-Structured Titanium™ Porous Coating

An optimal structure for biological ingrowth and fixation^{5,6}

Cancellous-Structured Titanium Porous Coating

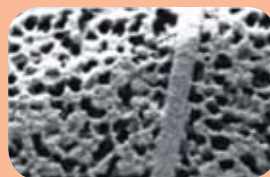


(100:1)
CSTi Porous Coating
Pore size 480–560µm
Pore volume 52–58%

CSTi™ Porous Coating—offered on APR Porous-Coated Stems—has over 15 years of clinically demonstrated success.⁵

- This porous coating mimics human cancellous bone with optimally sized, interconnected pores that allow biological ingrowth⁷ and a fine micro-roughness for secondary fixation.
- Circumferential CSTi reinforces the flow barrier between the metaphysis and the diaphysis to potentially prevent osteolytic conditions and permit optimal fixation.

Plasma-Sprayed Hydroxyapatite (HA) over CSTi Porous Coating



(25:1)
Porous HA Coating
Plasma-sprayed hydroxyapatite over CSTi Porous Coating.

Porous HA-coated surfaces enhance the Cancellous-Structured Titanium surface by encouraging an effective fill of the proximal metaphysis.¹⁵ The proximal HA coating allows for early fixation of the femoral stem, which accelerates femoral bone remodeling, increased bone density and apposition.⁸⁻¹⁴

APR Universal Instrumentation

Streamlined instrumentation for reproducible results

Fast, Precise Instrumentation

APR Hip instruments are fully compatible with the *CARE™ MIS™* Instrumentation System, designed to streamline virtually any press-fit or cemented clinical procedure and provide accurate, reproducible results. These instruments allow for intraoperative flexibility and easier handling by the surgical team, while minimizing operative inventory requirements.



Required Instrument Kits

- APRH 0100**—Straight and trochanteric reamers
- APRH 0200**—“Standard” broaches and “large” punches
- APRH 0300**—Broach holder and head/neck adapters
- APRH 0400**—General instruments
- APRH 0500**—Head trials and trochanteric burr
- APRH 0700**—“Oversized” broaches

Extensive Product Range

APR Anatomical System Features



APR Porous Coated Stems

CSTi Porous Coating

CSTi Porous Coating with HA

APR Nonporous Fully Textured Stem

	CSTi Porous Coating	CSTi Porous Coating with HA	APR Nonporous Fully Textured Stem
12° Proximal Anatomic Bow	•	•	•
10° Anteverted Neck	•	•	•
130° Neck Shaft Angle	•	•	•
12/14 Morse Taper	•	•	•
Lefts and Rights	•	•	•
Circumferential CSTi Porous Coating	•	•	
Biocompatible Titanium Alloy (Ti-6Al-4V)	•	•	•
Grit-Blasted Distal Surface	•	•	•
Distal Hollowing for Reduced Stem Stiffness (size 15 and larger)	•	•	•
+2mm Anterior Build-up Between Different Body Options (large, oversized)	•	•	•
Nonporous Stem			•
Forged CoCr Alloy			
Proximal and Distal Centralizers			
Cobra Flange			
Proximal Collar Aids in Cement Compression and Proximal Loading ¹⁶			

APR Anatomical System Sizing Options

Multiple proximal body and sizing options offer maximum metaphyseal fill and stability for all bone types.

APR Porous Coated Stem

CSTi Porous Coating

CSTi Porous Coating with HA

APR Nonporous Fully Textured Stem

	CSTi Porous Coating	CSTi Porous Coating with HA	APR Nonporous Fully Textured Stem
Standard Body—Collared	10.5–18	10.5–18	
Standard Body—Collarless	10.5–18		
Large Body—Collared	10.5–18	10.5–18	10.5–18
Large Body—Collarless	10.5–18		
Oversize Body—Collared Only	10.5–16.5	10.5–16.5	10.5–16.5

Sizing is in 1.5mm increments



APR CoCr Cemented Stem

		•
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CoCr Bipolar/Unipolar

The APR Nonporous Fully Textured Stem can be used with CoCr Bipolar and Unipolar components, available in sizes 38mm to 70mm. Variable neck options allow for optimal recreation of the patient's anatomy.



APR CoCr Cemented Stem

	10.5–16.5

12-Degree Proximal Anatomic Bow



Standard



Large



Oversized

Proven clinical performance

1. Kang JS, Dorr LD, Wan Z. The effect of diaphyseal biologic fixation on clinical results and fixation of the APR II stem. *J Arthroplasty*. 2000;Sep;15(6):730-735.
2. Min B, Longjohn DB, Dorr LD, Wan Z. Radiographic comparison of diaphyseal grit-blasted with smooth surface stems by matched pair analysis. *Clin Orthop*. 2000;Dec;(381):156-167.
3. Dorr LD, Wan Z. Comparative results of a distal modular sleeve, circumferential coating, and stiffness relief using the APR II. *J Arthroplasty*. 1996;Jun;11(4):419-428.
4. Dorr LD, Wan Z, Song M, Ranawat A. Bilateral total hip arthroplasty comparing hydroxyapatite coating to porous-coated fixation. *J Arthroplasty*. 1998;Oct;13(7):729-736.
5. Hofmann AA, Feign ME, Klauser W, VanGorp CC, Camargo MP. Cementless primary total hip arthroplasty with a tapered, proximally porous-coated titanium prosthesis. *J Arthroplasty*. 2000;15(7):833-839.
6. Hofmann AA, Bloebaum RD, Bachus KN. Progression of Human Bone Ingrowth into Porous-Coated Implants. *Acta Orthop Scand*. 1997;68(2):161-166.
7. Bobyn JD, Pilliar RM, Cameron HU, Weatherby GC. The optimum pore size for the fixation of porous-surfaced metal implants by the ingrowth of bone. *Clin Orthop*. 1980;150:263-270.
8. Jaffe WL, Scott DF. Total Hip Arthroplasty with hydroxyapatite-coated prostheses. *J Bone Joint Surg Am*. 1996;78(12):1918-1934.
9. Geesink RGT, Hoefnagels NHM. Six-year results of hydroxyapatite-coated total hip replacement. *J Bone Joint Surg Am*. 1995;77(4):534-547.
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11. Hofmann AA, et al. Comparative study of human cancellous bone remodeling to titanium and hydroxyapatite-coated implants. *J Arthroplasty*. 1993;8(2):157-166.
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13. Bauer TW, et al. Hydroxyapatite-coated femoral stems; Histological analysis of components retrieved at autopsy. *J Bone Joint Surg Am*. 1991;73-A(10):1439-1452.
14. Bloebaum RD, Bachus KN, Rubman MH, Dorr LD. Post mortem comparative analysis of titanium and hydroxyapatite porous-coated implants retrieved from the same patient. *J Arthroplasty*. 1993;8(2):203-211.
15. Scott DF, Jaffe WL. Host-bone response to porous-coated cobalt-chrome and hydroxyapatite-coated titanium femoral components in hip arthroplasty. *J Arthroplasty*. 1996;11(4):429-437.
16. Wan Z, Dorr LD, Woodsome T, Ranawat A, Song M. Effect of stem stiffness and bone stiffness on bone remodeling in cemented total hip replacement. *J Arthroplasty*. 1999;Feb;14(2):149-158.
17. Dorr LD, Absatz M, Gruen TA, Saberi MT, Doerzbacher JF. Anatomic Porous Replacement Hip Arthroplasty: first 100 consecutive cases. *Seminars Arthroplasty*. 1990; Jul;1(1):77-86.
18. Harris M, Dorr LD, Wan Z. Total Hip Arthroplasty with the APR Stem and Cup: Follow-up of a Previous Report. *J Arthroplasty*. 2005;Oct;20(7):828-831.

Acetabular cups

Zimmer's APR Anatomical Hip System is complemented by an entire line of fully compatible acetabular cups, liners and femoral head products.

- **Trabecular Metal™** Acetabular Systems
- **Trilogy®** Acetabular System
 - **Longevity®** Highly Crosslinked Polyethylene
- **Converge®** Porous Acetabular Cup System
 - **Metasul®** Metal-on-Metal Tribological Solution
 - **Durasul®** Highly Crosslinked Polyethylene



Contact your Zimmer representative or visit us at www.zimmer.com