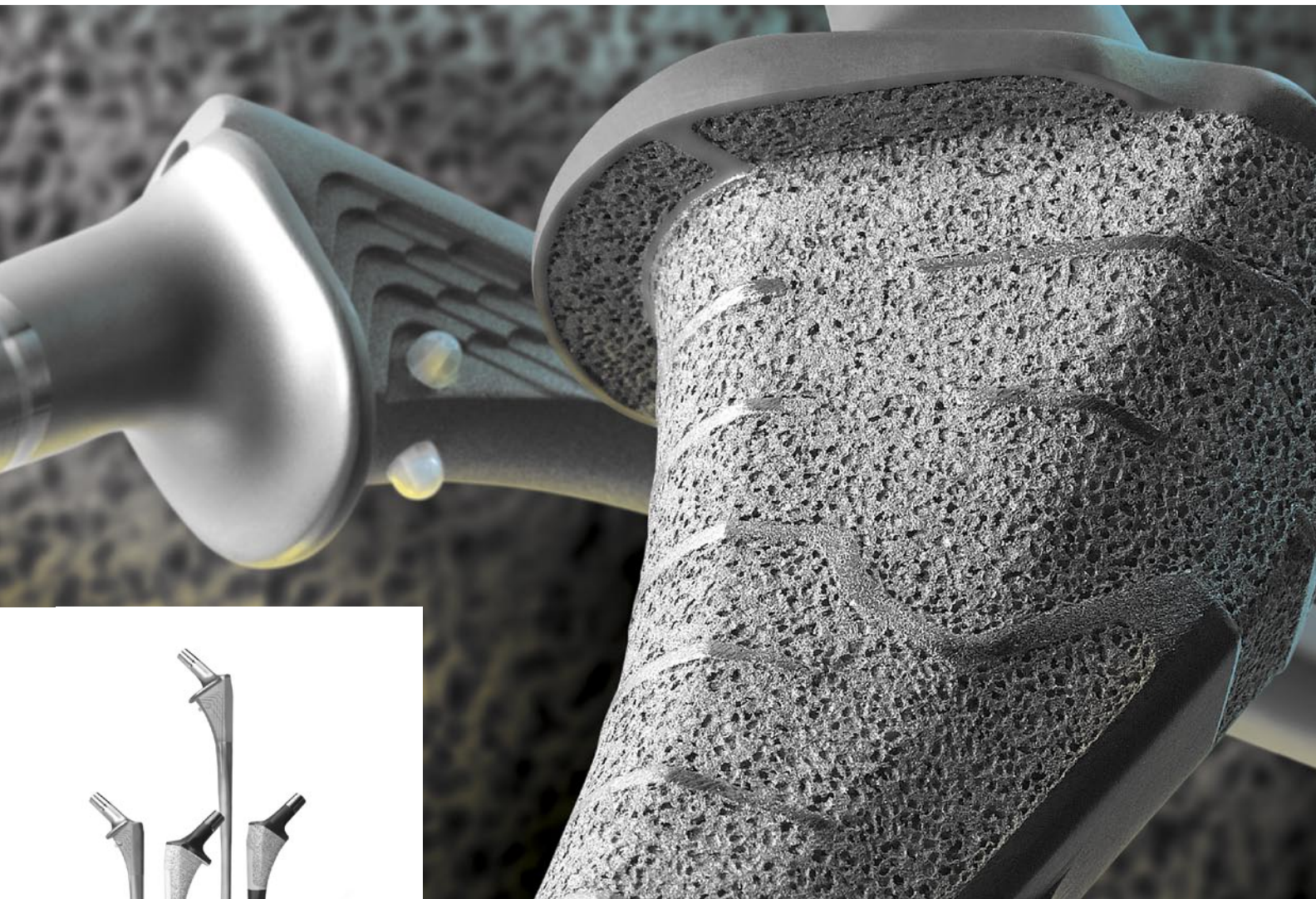




Zimmer®  
Natural-Hip™  
System



Addressing surgical concerns comprehensively

# Natural-Hip System

## Addressing surgical concerns comprehensively



Whether a surgeon performs 15 or 500 THAs annually, the *Natural-Hip* System is appealing for a variety of reasons:

### Long-term clinical performance

The *Natural-Hip* family of stems has been successfully implanted in nearly 150,000 patients and has produced more than 13 years of outstanding long-term results.<sup>1</sup>

### Comprehensive design

The *Natural-Hip* System addresses many common challenges faced by orthopaedic surgeons.

### Easy-to-use instrumentation and surgical technique

The *Natural-Hip* System helps ensure accurate and reproducible clinical results.

## Proven clinical results

Over 13 years of outstanding performance define the *Natural-Hip CSTI™* Porous-Coated Stem clinical experience.

4- to 8-Year Retrospective Review<sup>2</sup> of the *Natural-Hip CSTI* Porous-Coated Stem—Aaron Hofmann, M.D.<sup>1</sup>

- A consecutive series of 100 primary total hip arthroplasties were performed at a single institution on 87 patients using a cementless, collared, porous-coated, titanium, press-fit stem with distal-slot.
- Average postoperative hip score was 94, compared with an average preoperative hip score of 42.
- No femoral component loosening or revisions.
- No evidence of stem subsidence or instability.
- Mid-term results are encouraging with this stem design.

Clinical evaluation of a new total hip prosthetic design: 100 consecutive cementless total hip arthroplasties using Sulzermedica's "*Natural-Hip*" with 2–6 year clinical and radiographic follow-up.

- One hundred consecutive THAs were performed on 96 patients.
- Follow-up of the results with a minimum of 2 years is reported.
- No stems were revised for loosening or pain.
- The only revisions were for infection (2), and minimal bone loss occurred with removal of this proximal ingrowth stem.
- Thigh pain was present in only one patient at 2 years, and none with longer follow-up.
- There were no cases of osteolysis, proximal stress shielding, or aseptic radiolucent lines with the cementless stems.

## Designed to address potential surgical challenges

- Immediate Fixation
- Rotational Stability
- Thigh Pain
- Stress Shielding
- Osteolysis



## Precision instrumentation & surgical technique

The streamlined set of precision, universal *Natural-Hip* instruments is designed to help ensure reproducible and predictable clinical results. It is a complete system that makes use of one core set of instruments for primary press-fit, primary cemented, fracture and revision cases. Furthermore, the prosthesis can be changed intraoperatively from press-fit to cemented without additional broaching.

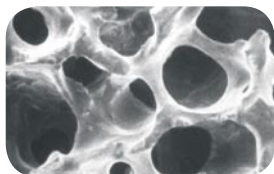
# Natural-Hip Primary... designed to address potential challenges

The comprehensive range of *Natural-Hip* press-fit and cemented stem options for primary THA addresses a variety of potential surgical challenges... by design.

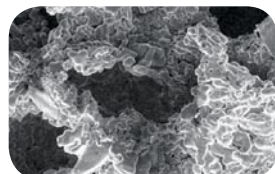
## Initial fixation

### Cancellous-Structured Titanium™ (CSTi) Porous Coating

A novel porous coating—with over 13 years of clinically demonstrated success—that has optimally sized, interconnected pores and a fine micro-roughness, allows bone ingrowth and secondary fixation<sup>4</sup>



(100:1)  
Human Cancellous Bone<sup>5</sup>  
Pore size 400–500µm  
Pore volume 60–77%



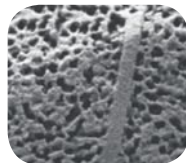
(100:1)  
CSTi Porous Coating  
Pore size 480–560µm  
Pore volume 52–58%

### CSTi Coating with Plasma-Sprayed Hydroxyapatite (HA)

HA-coated surfaces have over 19 years of clinical application and enhance the *CSTi* surface by encouraging an effective fill of the proximal metaphysis<sup>6</sup>



(25:1)  
Porous HA Coating



(25:1)  
Plasma-sprayed hydroxyapatite  
over *CSTi* porous coating

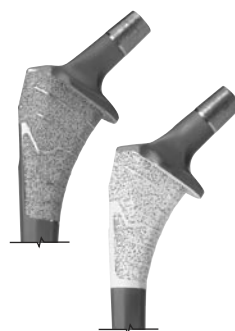
### 3.5mm Anterior Proximal Build-Up

Allows for optimal metaphyseal fit<sup>2</sup>

### Flared Distal Slot

Assures better contact to cortical bone distally<sup>2, 7, 8</sup>

## Rotational stability



### CSTi Coating and CSTi Coating with HA

Biological fixation for exceptional rotational stability<sup>4</sup>

### 3.5mm Anterior Proximal Build-Up

Allows for optimal metaphyseal fit<sup>2</sup>



### Tri-Wedge Geometry

Three-plane design helps to prevent subsidence



### Flared Distal Slot

Flare of coronal slot enhances contact of the distal rib and flutes with cortical bone, ensuring greater stability



## Thigh pain

### Flared Distal Slot

The stem “flexes” as the patient moves, adjusting to the natural movement of the living bone<sup>7-9</sup>

## Stress shielding

### Proximal CSTi Coating/CSTi Coating with HA

Primarily loads proximally, providing an even load distribution, calcar maintenance, and a cortical seal against debris<sup>4</sup>

### 3.5mm Anterior Proximal Build-Up

Results in circumferential contact with cortical bone and more natural load transfer<sup>2</sup>

### Tri-Wedge Geometry

Three-plane design helps prevent subsidence and improves load transfer

### Flared Distal Slot

Self-adjusting slot compresses easily, enabling adjustment to various bone types and also adjusts as the patient moves (living bone moves as the patient moves)<sup>2,7,8</sup>

## Osteolysis

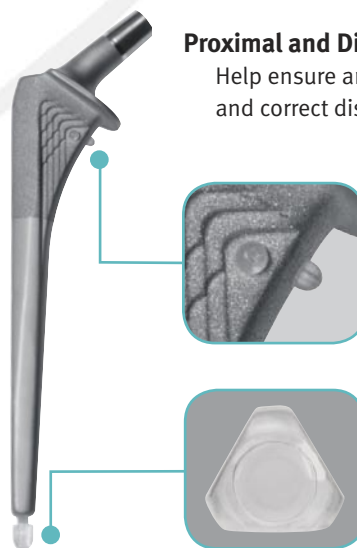
### 3.5mm Anterior Proximal Build-Up and Proximal CSTi Coating

The tight proximal circumferential seal of the 3.5mm proximal build-up and the initial fixation provided by the bone-ingrowth to *CSTi* Porous Coating provide an excellent barrier to help prevent third-party debris from migrating into the metaphysis<sup>4</sup>

## Centralization

### Proximal and Distal Centralizers

Help ensure an even cement mantle and correct distal alignment<sup>10</sup>



# Natural-Hip Revision... for More Predictable Results

*Natural-Hip* Stem options have been designed to address the unpredictability of total revision and joint reconstruction procedures.

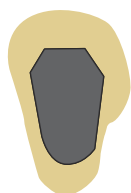
TOTAL  
R E V I S I O N  
A B I L I T Y

## Immediate fixation

### Cementation

Normalization steps facilitate cement compression<sup>11</sup>

## Rotational stability



### Tri-Wedge Geometry

Three-plane design helps prevent subsidence



### Medial Horizontal Keel

Stabilizes the stem for rotational control and proximal centralization



### Flange Cutouts

Accommodate wiring of the greater trochanter, if needed

## Thigh pain<sup>1</sup>



### Bowed Stem

The lengthened, slightly bowed distal geometry resembles the natural anterior bow of the femur and accommodates a wide variety of revision THA situations



## Stress shielding



### Proximal Collar

Aids in providing an even load distribution

### Tri-Wedge Geometry

Three-plane design helps prevent subsidence

### Bowed Stem

The lengthened, slightly bowed distal geometry resembles the natural anterior bow of the femur and accommodates a wide variety of revision THA situations

## Osteolysis

### Tri-Wedge Geometry and Cementation

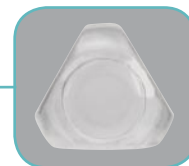
The tight proximal seal of the tri-wedge geometry and the immediate fixation provided by the cement provide an excellent barrier to help prevent third-party debris from migrating into the metaphysis

## Centralization

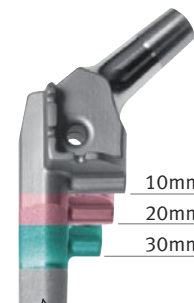


### Proximal and Distal Centralizers

Help ensure an even cement mantle and correct distal alignment<sup>10</sup>



## Calcar reconstruction

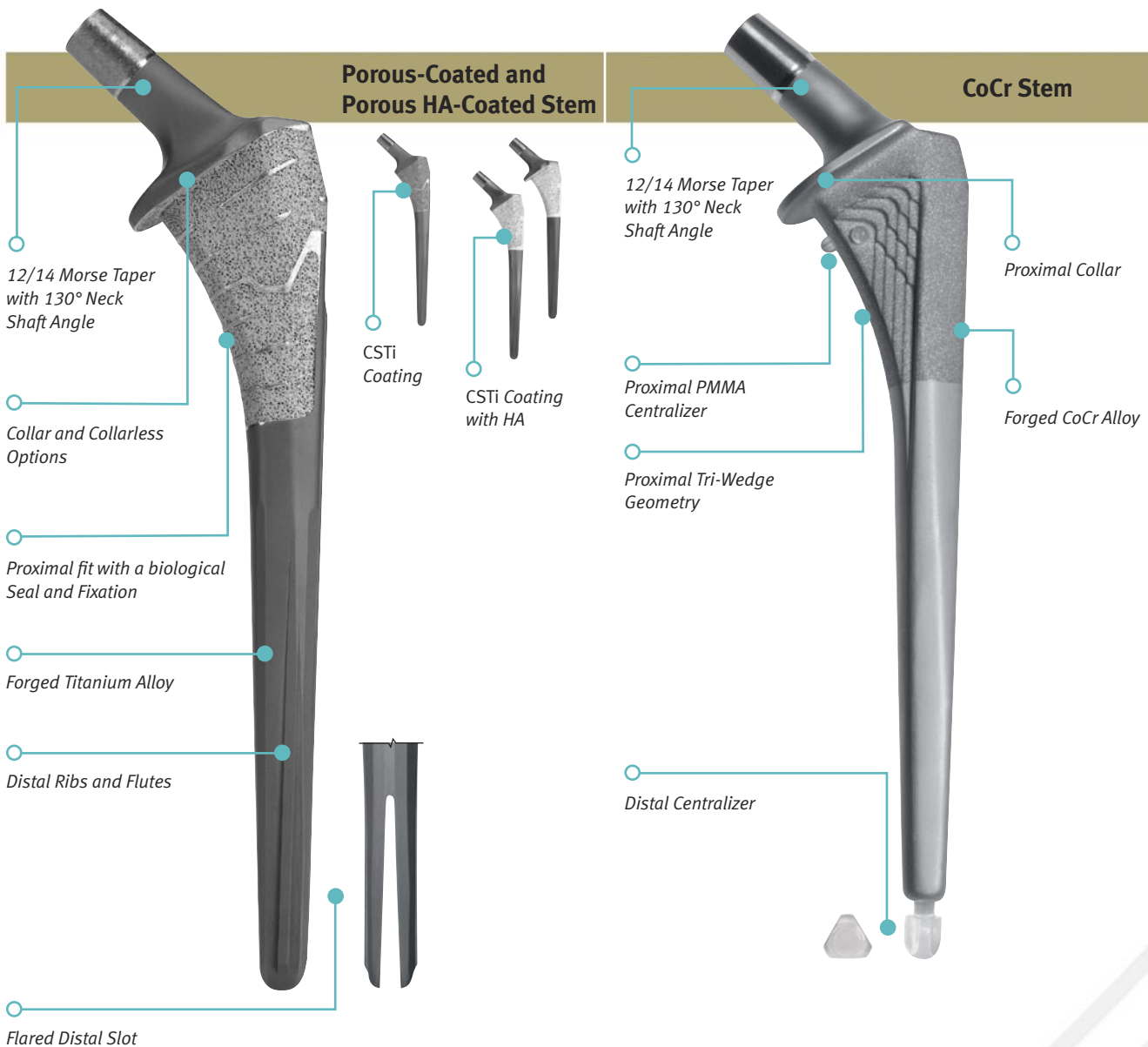


Mild-to-moderate calcar reconstruction may be effectively achieved with three options of calcar proximal heights—10mm, 20mm and 30mm

10mm  
20mm  
30mm

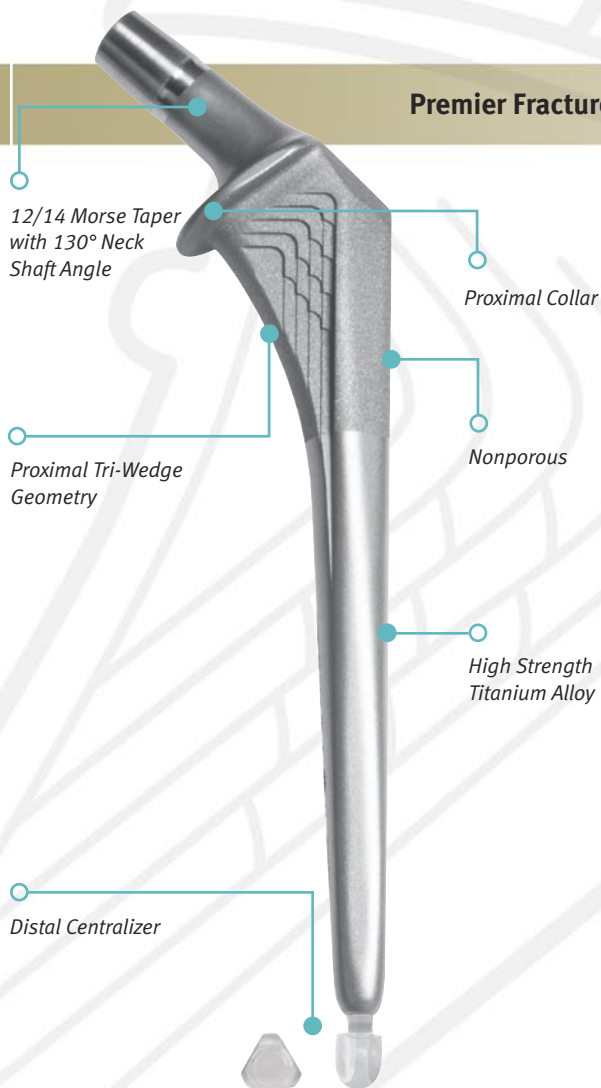
# Natural-Hip System Primary Stems

Natural-Hip Stem options for primary THA have been designed to provide patient-specific solutions and address individual surgeons' philosophies and preferences.

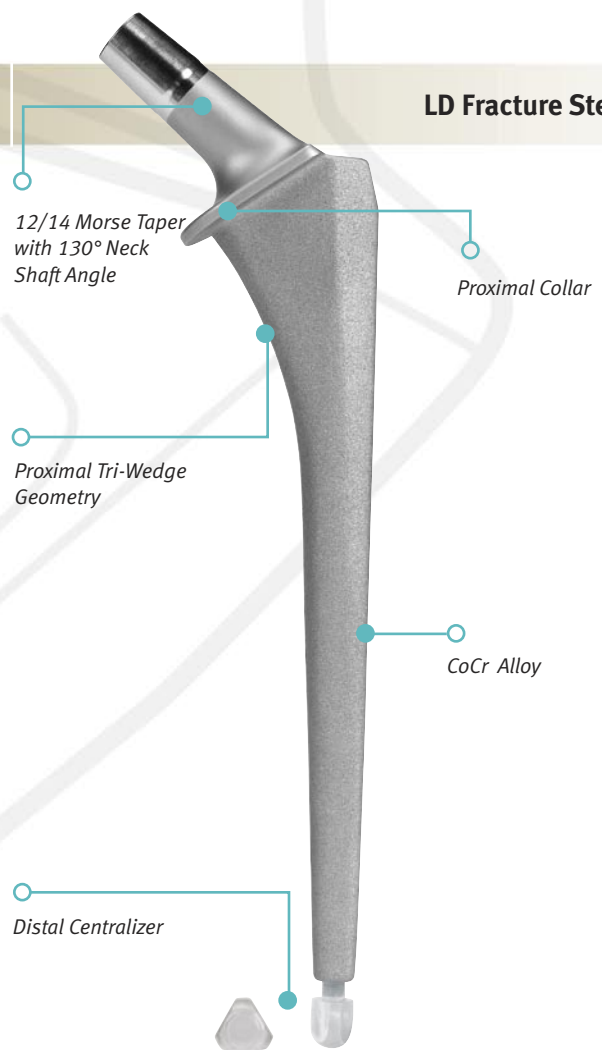


**Designed as a press-fit prosthesis to fulfill the performance demands of highly active patients.**

**Designed as a cemented prosthesis to fulfill the performance demands of less-active patients.**



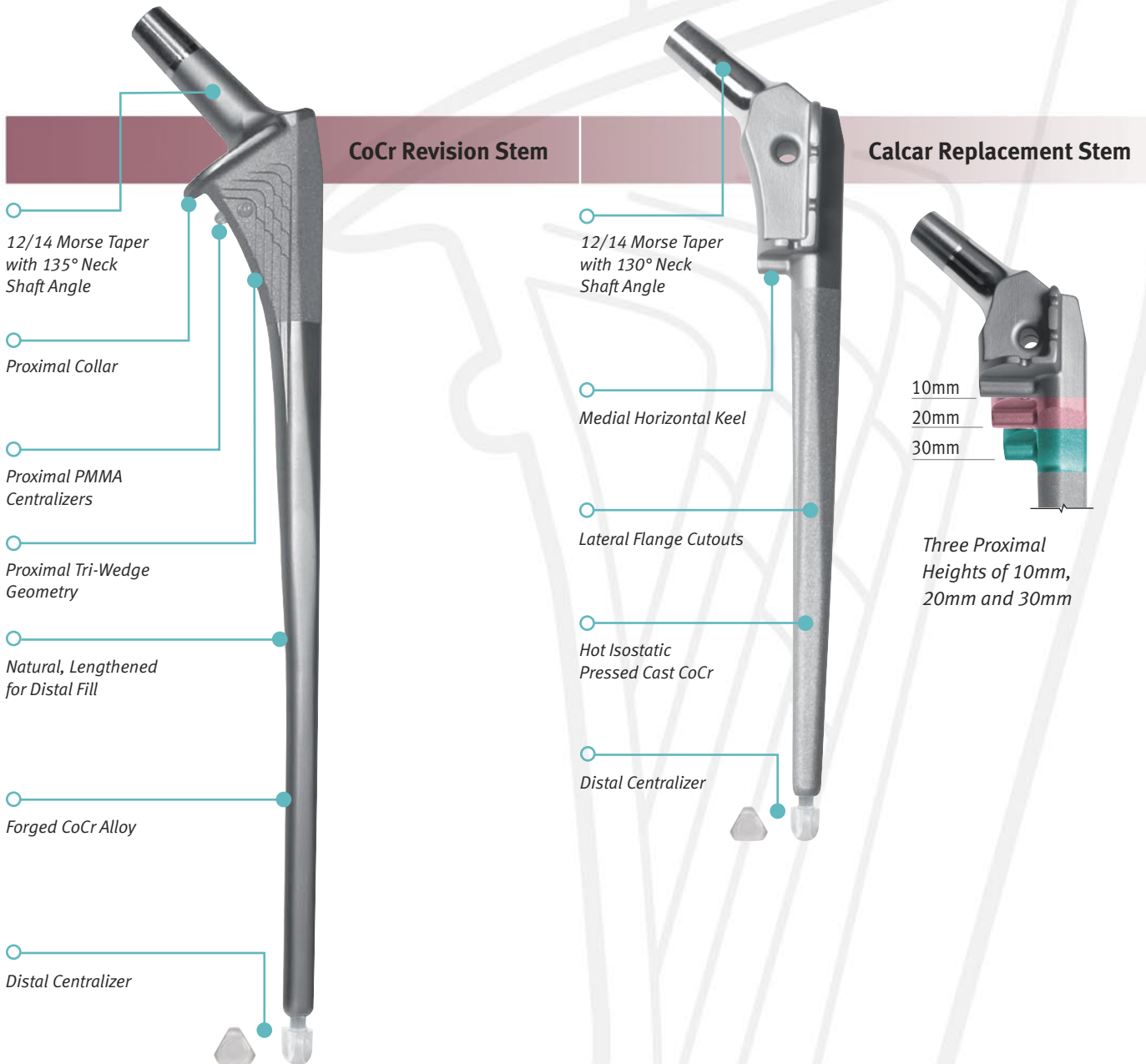
Designed as a press-fit or cemented prosthesis to address the less-active, low-demand patient population.



Designed as a press-fit or cemented prosthesis to address the less-active, low-demand patient population.

# Natural-Hip System Revision Stems

*Natural-Hip* Stem options for revision THA have been designed to accommodate individualized patient demand requirements and surgeon philosophies.



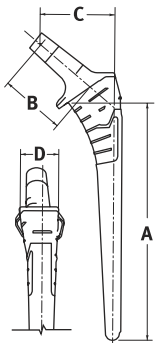
The *Natural-Hip* CoCr Revision is an excellent choice to fulfill the performance standards of less-active patients who require revision total-hip arthroplasty.

Enables the surgeon to effectively achieve reproducible results for hip trauma and revision situations characterized by absent, compromised or non-viable proximal medial calcar bone.

# Ordering Information

Zimmer offers a wide range of *Natural-Hip* Stem options for primary and revision THA, each of which is designed to address a particular set of surgical challenges.

## Porous-Coated and Porous HA-Coated Stem



### Porous Collared

Prod. No.	Prod. No. HA	Stem Size	A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	Add'l Neck Offset (mm)	D Prox. Width M/L View (mm)
7354-01/02-210	—	00	115	33	36	—	18
7354-01/02-200	7356-01/02-200	0	125	37	40	46	19
7354-01/02-201	7356-01/02-201	1	135	37	40	46	20
7354-01/02-202	7356-01/02-202	2	145	37	40	46	21
7354-01/02-203	7356-01/02-203	3	155	41	43	50	22
7354-01/02-204	7356-01/02-204	4	165	41	43	50	23
7354-01/02-205	7356-01/02-205	5	175	41	43	50	24
7354-01/02-206	7356-01/02-206	6	185	41	43	50	25
7354-01/02-207	—	7	195	41	43	—	26

### Porous Collared Offset

Prod. No.	Prod. No. HA	Stem Size	A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	Add'l Neck Offset (mm)	D Prox. Width M/L View (mm)
7359-01/02-200	7356-01/02-400	0	125	37	40	46	19
7359-01/02-201	7356-01/02-401	1	135	37	40	46	20
7359-01/02-202	7356-01/02-402	2	145	37	40	46	21
7359-01/02-203	7356-01/02-403	3	155	41	43	50	22
7359-01/02-204	7356-01/02-404	4	165	41	43	50	23
7359-01/02-205	7356-01/02-405	5	175	41	43	50	24
7359-01/02-206	7356-01/02-406	6	185	41	43	50	25

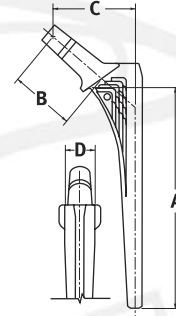
### Porous Collarless

Prod. No.	Prod. No. HA	Stem Size	A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	Add'l Neck Offset (mm)	D Prox. Width M/L View (mm)
7354-01/02-110	—	00	115	33	36	—	18
7354-01/02-100	7356-01/02-100	0	125	37	40	46	19
7354-01/02-101	7356-01/02-101	1	135	37	40	46	20
7354-01/02-102	7356-01/02-102	2	145	37	40	46	21
7354-01/02-103	7356-01/02-103	3	155	41	43	50	22
7354-01/02-104	7356-01/02-104	4	165	41	43	50	23
7354-01/02-105	7356-01/02-105	5	175	41	43	50	24
7354-01/02-106	7356-01/02-106	6	185	41	43	50	25
7354-01/02-107	—	7	195	41	43	—	26

### Porous Collarless Offset

Prod. No.	Prod. No. HA	Stem Size	A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	Add'l Neck Offset (mm)	D Prox. Width M/L View (mm)
7359-01/02-100	7356-01/02-300	0	125	37	40	46	19
7359-01/02-101	7356-01/02-301	1	135	37	40	46	20
7359-01/02-102	7356-01/02-302	2	145	37	40	46	21
7359-01/02-103	7356-01/02-303	3	155	41	43	50	22
7359-01/02-104	7356-01/02-304	4	165	41	43	50	23
7359-01/02-105	7356-01/02-305	5	175	41	43	50	24
7359-01/02-106	7356-01/02-306	6	185	41	43	50	25

## CoCr Stem



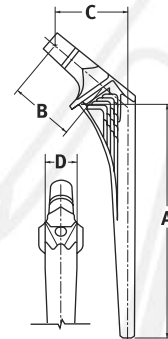
### CoCr

Prod. No.	Stem Size
7352-35-010	00
7352-35-000	0
7352-35-001	1
7352-35-002	2
7352-35-003	3
7352-35-004	4
7352-35-005	5
7352-35-006	6
7352-35-007	7

### CoCr Offset

Prod. No.	Stem Size
7359-35-000	0
7359-35-001	1
7359-35-002	2
7359-35-003	3
7359-35-004	4
7359-35-005	5
7359-35-006	6

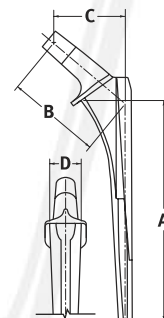
## Premier Fracture Stem



### Prod. No.

Prod. No.	Stem Size
7352-65-000	0
7352-65-001	1
7352-65-002	2
7352-65-003	3
7352-65-004	4
7352-65-005	5
7352-65-006	6

## LD Fracture Stem

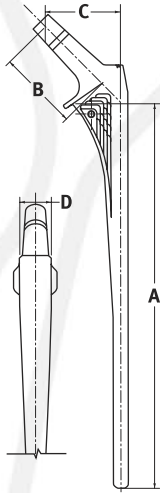


### Prod. No.

Prod. No.	Stem Size
7352-75-000	0
7352-75-001	1
7352-75-002	2
7352-75-003	3
7352-75-004	4
7352-75-005	5
7352-75-006	6

## CoCr Revision Stem

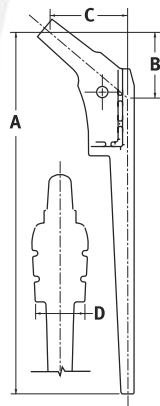
A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	Add'l Offset Neck Offset (mm)	D Prox. Width M/L View (mm)
105	33	36	—	14
110	37	40	46	16
120	37	40	46	17
130	37	40	46	18
140	41	43	50	19
150	41	43	50	20
160	41	43	50	21
170	41	43	50	22
180	41	43	—	23



Prod. No.	Stem Size	A Anterior Bow (mm)	B Stem Length (mm)	C Neck Length (mm)	Std. Neck Offset (mm)	D Prox. Width M/L View (mm)
7352-01/02-002	2	2	210	45	42	18
7352-01/02-003	3	3	230	48	45	19
7352-01/02-004	4	3	250	48	45	20

A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	Add'l Offset Neck Offset (mm)	D Prox. Width M/L View (mm)
110	37	40	46	16
120	37	40	46	17
130	37	40	46	18
140	41	43	50	19
150	41	43	50	20
160	41	43	50	21
170	41	43	50	22

## Calcar Replacement Stem



Prod. No.	Stem Size	A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	D Prox. Width M/L View (mm)
7380-00-001	1-10	140	37	40	31
7380-00-002	1-20	140	37	40	31
7380-00-003	1-30	140	37	40	31
7380-00-004	3-10	160	41	43	38
7380-00-005	3-20	160	41	43	38
7380-00-006	3-30	160	41	43	38

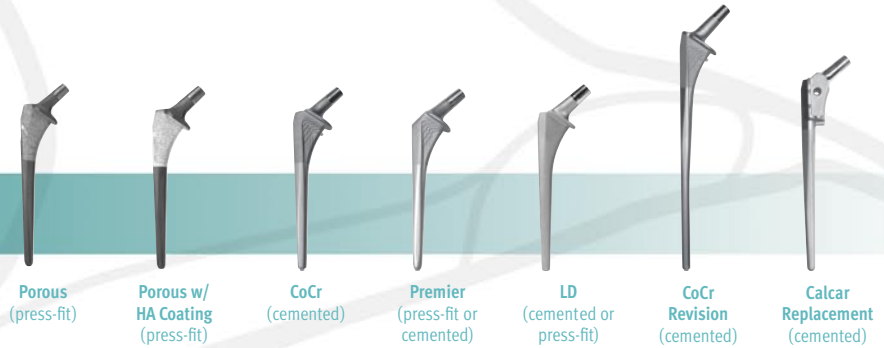
A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	D Prox. Width M/L View (mm)
110	37	40	16
120	37	40	17
130	37	40	18
140	41	43	19
150	41	43	20
160	41	43	21
170	41	43	22

A Stem Length (mm)	B Neck Length (mm)	C Std. Neck Offset (mm)	D Prox. Width M/L View (mm)
110	37	40	16
120	37	40	17
130	37	40	18
140	41	43	19
150	41	43	20
160	41	43	21
170	41	43	22

# The Natural-Hip Product Line

## Extensive product offering

The range of *Natural-Hip* Stem sizes, neck lengths and offset options allows an automatic fit with optimal soft-tissue balancing.



9° Anteverted Neck	lefts & rights	lefts & rights					
3.5mm Proximal Anterior Build-up	lefts & rights	lefts & rights					
Distal Anterior Bow						lefts & rights	
Symmetric			•	•	•		•
130° Neck Angle	•	•	•	•	•	135°	•
CST Proximal Coating	•	•					
Roughened Distally			•	•	•	•	•
Normalization Steps			•	•		•	
Distal Coronal Slot/Flare	•	•					
Tri-Wedge Geometry			•	•	•	•	
Collared & Collarless	•	•					
Collared Only			•	•	•	•	3 calcar options
Distal Centralizer			•	•	•	•	•
Proximal Centralizer			•			•	
Titanium Material	•	•		•			
CoCr Material			•		•	•	•
Standard Offset (progressive)	sizes 00–7	sizes 0–6	sizes 00–7	sizes 0–6	sizes 0–6	sizes 2–4	sizes 1 & 3
Extended Offset (progressive)	sizes 0–6	sizes 0–6	sizes 0–6				
Standard Neck Length (progressive)	sizes 00–7	sizes 0–6	sizes 00–7	sizes 0–6	sizes 0–6	sizes 2–4	sizes 1 & 3
Short Neck Length (progressive)	sizes 0–3		sizes 0–3				
Add'l Instrumentation Required				if press-fit	if press-fit	yes	yes

## Proven clinical performance

- 1 Aaron Hofmann, M.D., at the University of Utah Medical Center in Salt Lake City conducted a 4- to 8-year retrospective clinical review of the *Natural-Hip CSTI Coating*.
- 2 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):833-9.
- 3 Thomas B. Pace, M.D., at the University of Utah Medical Center in Salt Lake City conducted a 2- to 6-year clinical and radiographical follow-up of the *Natural-Hip*.
- 4 Bobyn JD, Pilliar RM, Camaron HU, Weatherby GC. The optimum pore size for the fixation of porous-surfaced metal implants by the ingrowth of bone. *Clin Orthop*. 1980, 150:263-70.
- 5 Bloebaum RD, Bachus KN, Mitchell W, Hoffman G, Hofmann AA. Analysis of the bone surface area in resected tibia. Implications in tibial component subsidence and fixation. *Clin Orthop*. 1994, 309:2-10.
- 6 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):429-37.
- 7 Fritz MJ. Main challenge for hip implants is matching stiffness of femur. *Ortho Today*. 1988.
- 8 Cameron HU. The 3- 6-year results of a modular noncemented low-bending stiffness hip implant. A preliminary study. *J Arthroplasty*. 1993, 8:239-43.
- 9 Musgrave DS, et al. Effects of coronally slotted femoral prosthesis on cortical bone strain. *J Arthroplasty*. 1997, 12(6):657-68.
- 10 Hanson PB, Walker RH. Total hip arthroplasty cemented femoral component distal stem centralizer. *J Arthroplasty*. 1995, 10(5):683-8.
- 11 Jaffe WL, Hawkins CA. Normalized and proportionalized cemented femoral stem survivorship at 15 years. *J Arthroplasty*. 1999, 14(6):708-13.

## Acetabular cups

The *Zimmer Natural-Hip Stems* are complemented with an entire line of Acetabular cups, liners and femoral head products.

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



## Orthopaedic Surgical Products

Zimmer offers a full complement of Orthopaedic Surgical Products for THA.

- *OrthoPAT*®† Orthopedic Perioperative Autotransfusion System
- *Palacos*® R & R+G Bone Cement††
- *Zimmer Ambulatory Pump*



† Trademark of Haemonetics Corporation

†† Palacos® is a trademark of Heraeus Kulzer GmbH Under license from Heraeus Kulzer GmbH, Wehrheim, Germany

Contact your Zimmer representative or visit us at [www.zimmer.com](http://www.zimmer.com)