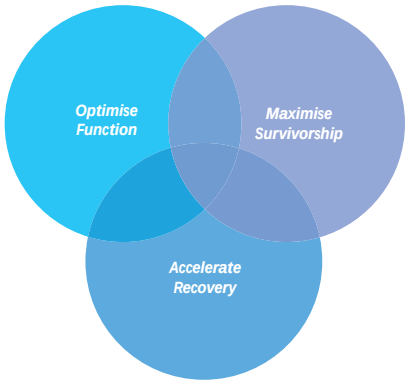
# CORAIL®

## HIP SYSTEM

Surgical Technique

DePuy
a Johnson & Johnson company




# *Intelligent* ***Surgery***

*Intelligent hip surgery is an approach to patient treatment that places equal importance on:*

*Optimising function*

*Maximising survivorship*

*Accelerating recovery*

*Its success is founded on leadership in the development of:*

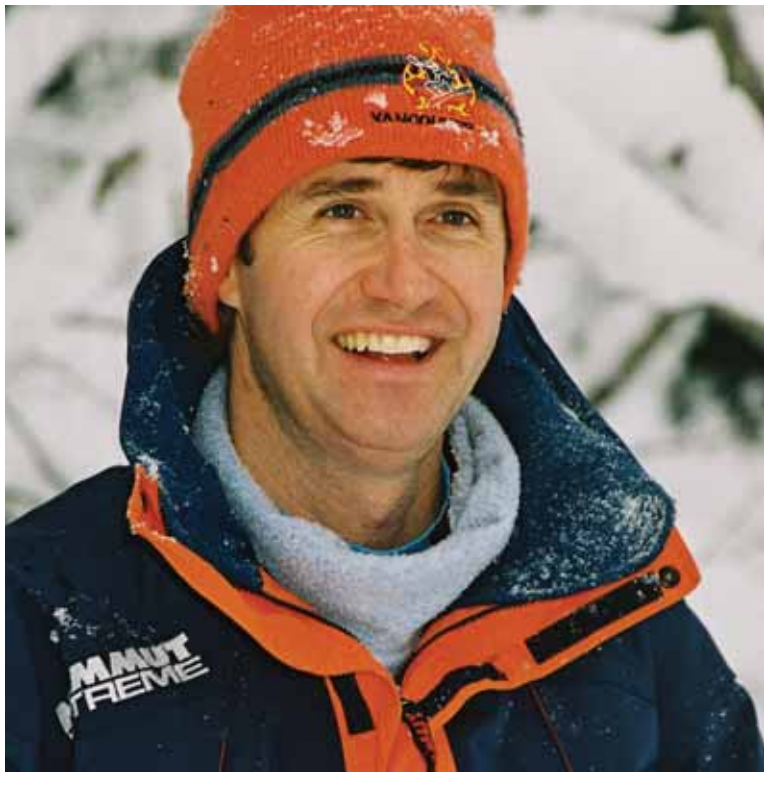
*High performance bearings*

*Clinically proven implants*

*Responsible and effective MI techniques*

“In use worldwide; FDA approved in 1996; recognised Level 10A in 2004 by the Orthopaedic Data Evaluation Panel in the UK: the Corail® stem has now become a gold standard among primary stems. The Corail® stem’s philosophy is based on simple principles: primary mechanical stability, secondary biological integration, bone preservation and harmonious stress transfer. The design, unchanged since 1986, gives the primary mechanical stability. The hydroxyapatite coating allows secondary biological integration. The combination of the design and the HA coating of the Corail® stem has proven to work perfectly.[1-3] The surgical technique is simple and allows bone preservation as we are looking for an “optimum filling” and not a close cortical contact with the implant. The restoration of bone stock occurs with the creation of newly formed bone all around the stem thanks to the effect of both the design and the hydroxyapatite. The compaction broaching surgical technique is reproducible and straightforward. We do not see any long-term radiographic changes.”

ARTRO Group
Corail® Design Surgeon Team
Clinique d’Argonay
International Visitation Centre Corail®
Annecy, France



Pre-op. A / P view.

Post-op. Corail® stem with 36 mm Ceramax™ Head and Pinnacle™ Cup System.

After twelve years of constant pain, Johan was unable to sleep through the night and facing the fact that he could no longer run his business as before, Johan’s quality of life at 44 years old was extremely poor. Life was no longer fun. Now, just seven months after his Corail® Hip surgery, he is back enjoying life with friends, skiing and ice climbing.

# CLINICALLY PROVEN HIP


## 95.1%

Survivorship in 5,130 cases* at 15 years. The Norwegian Arthroplasty Register 1987-2004, 2005 [1]

## 98.3%

Survivorship in 2,956 cases at 10 and 14 years. Vidalain JP. Artro Group., 1998 [2]

## 98.9%

Survivorship in 100 consecutive cases at 8 years. Røkkum M., J. Bone and Joint Surg., 1999 [3]

* Cohort size on Norwegian Hip Arthroplasty Register.

# PRE-OPERATIVE PLANNING

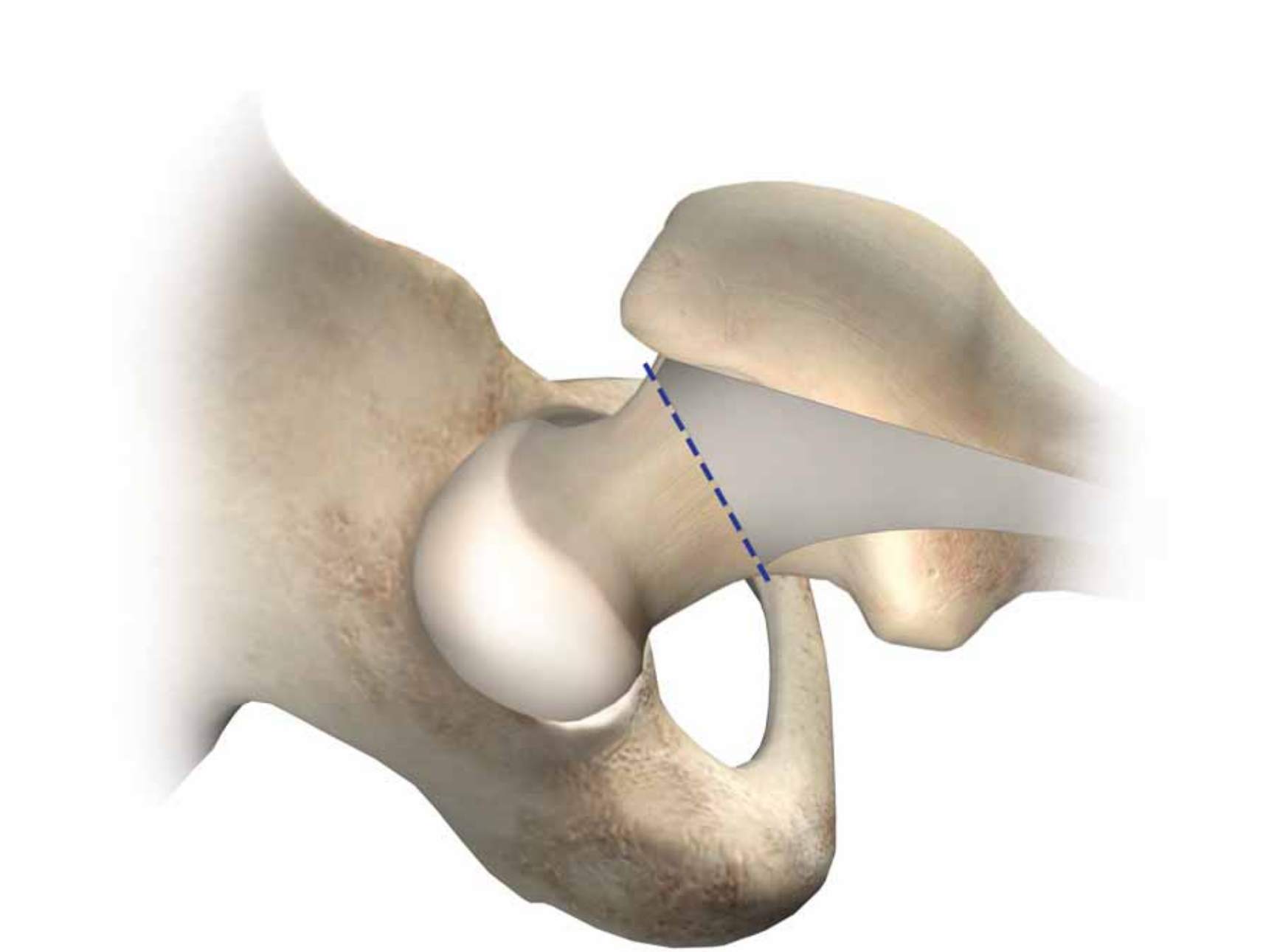
Pre-operative planning

The Corail® Hip System provides pre-operative templates at three different magnifications (100%, 115% and 120%). These are placed over the A/P and M/L radiographs to help determine the implant size in order to restore the patient's natural anatomy. The objective is not for the implant to fill the femur in close cortical contact, but to sit the stem in the compacted cancellous bone. There should be at least a 1 mm distance between the stem and the cortical bone. The pre-operative templating will also indicate the level of neck resection.

Surgical approach

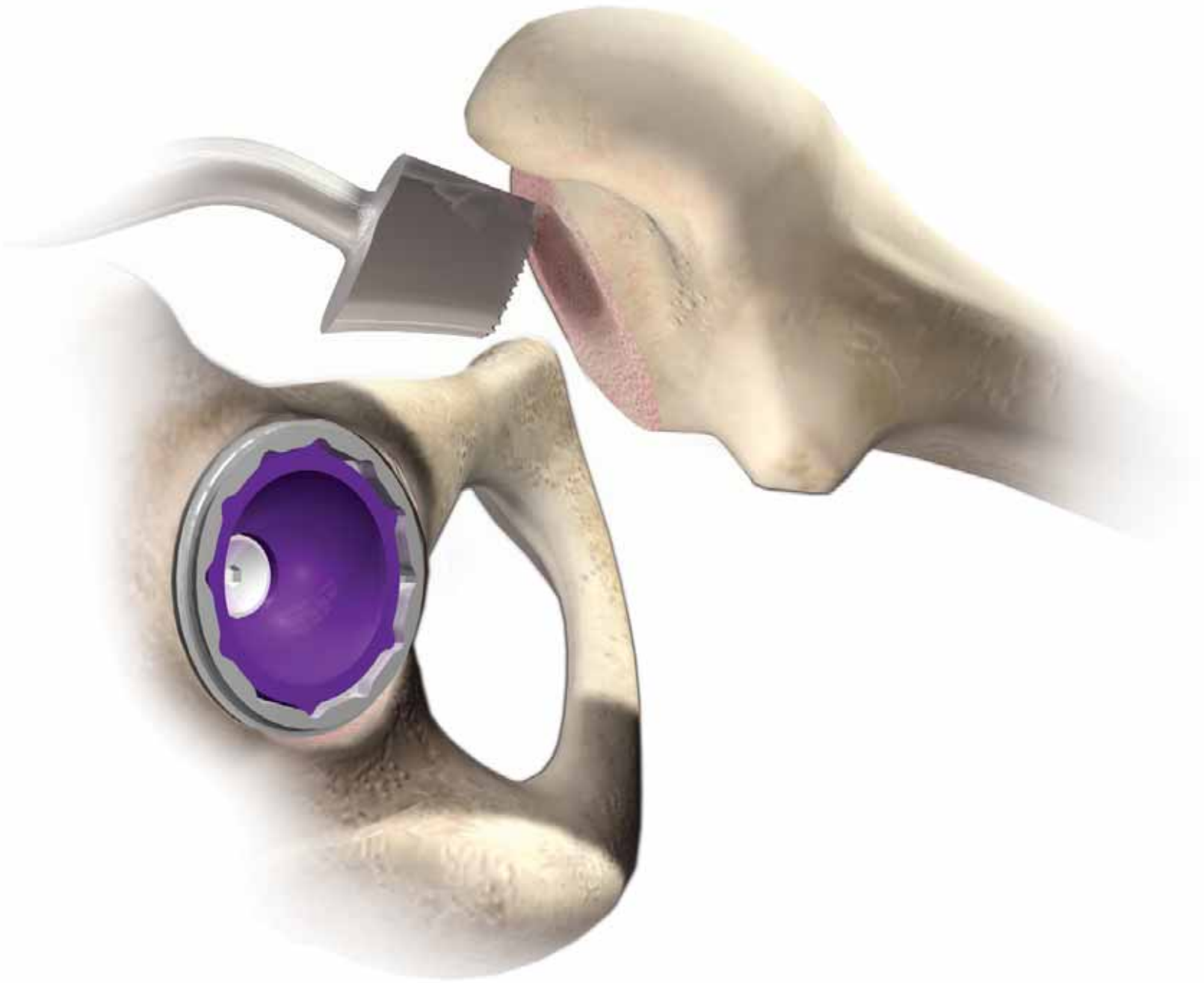
The Corail® stem can be used with any surgical approach using a conventional or a reduced incision.

# FEMORAL NECK RESECTION



The angle of resection should be 45°. The neck resection guide should be used to determine the level of the femoral neck resection in conjunction with pre-operative templating. If the resection is too high, it may result in a varus positioned stem. *Note: the osteotomy can be performed in one or two planes depending on the surgeon's preference.*

# PROXIMAL CANCELLOUS BONE COMPACTION

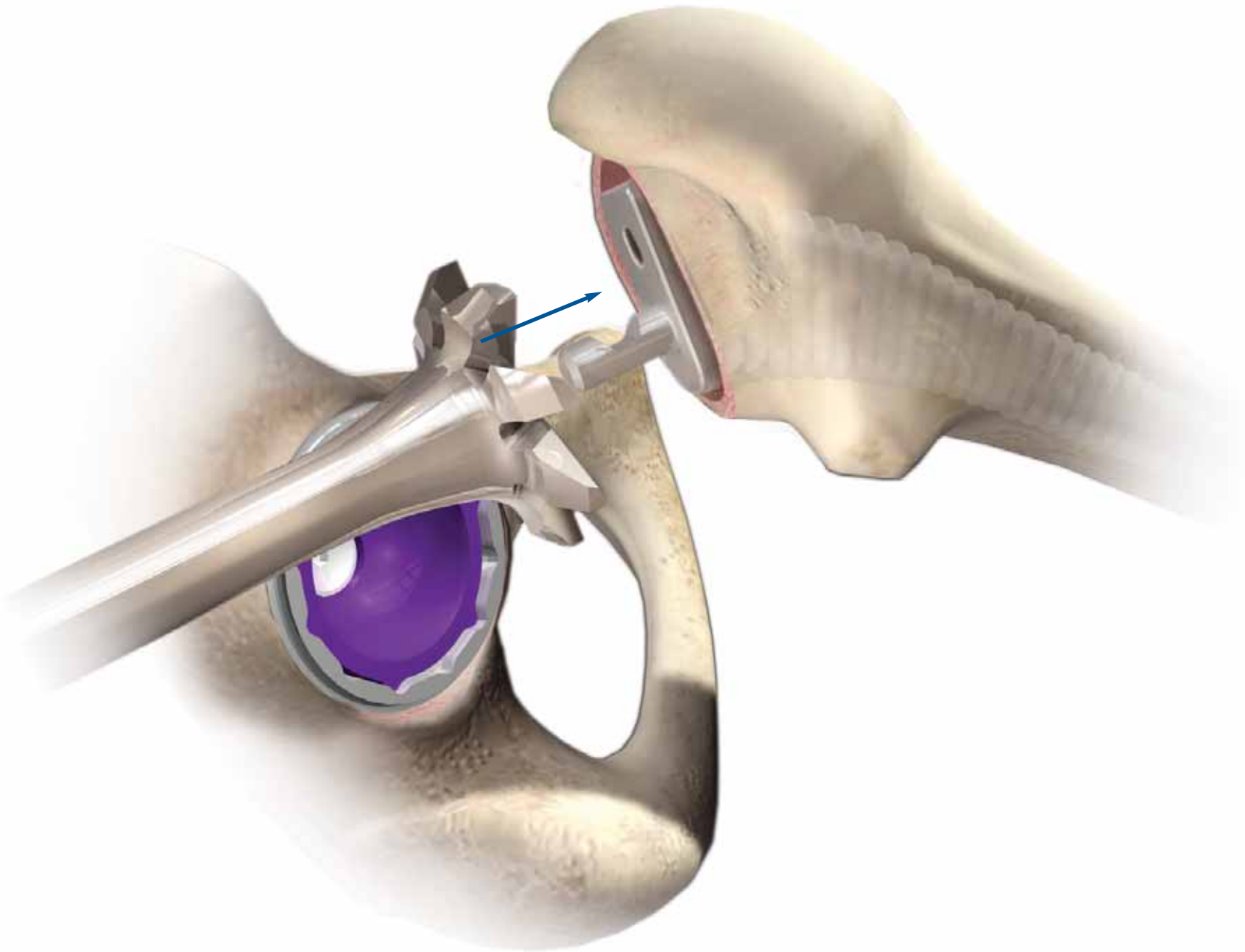


Enter the femoral canal as laterally as possible with a chisel to avoid varus positioning. Use the bone tamp to compact the cancellous bone proximally. This is an important step as the philosophy of the Corail® stem is based on bone preservation. Please refer to the Pinnacle™ Surgical Technique for full details with regards to the acetabulum preparation (cat no: 9068-80-050).

# FEMORAL CANAL PREPARATION

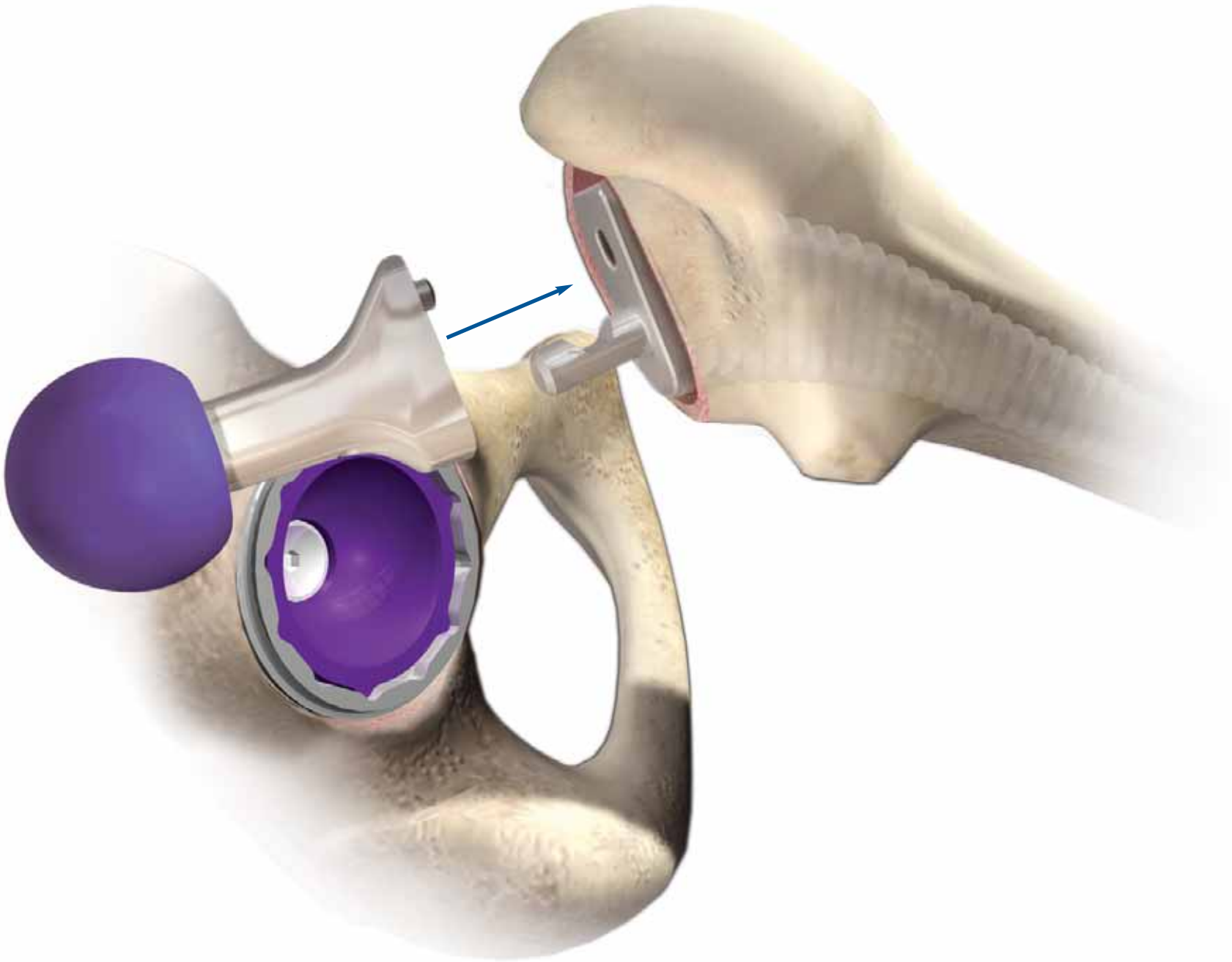
Begin with the smallest broach attached to the broach handle and increase the size of broach one at a time until axial and rotational stability is achieved. Stop broaching when it is felt that the broach is stable longitudinally and rotationally. Careful pre-operative planning is key to help selection of the final broach size. Anteversion is automatically set during the broaching with the flared broaches.

# CALCAR REAMING



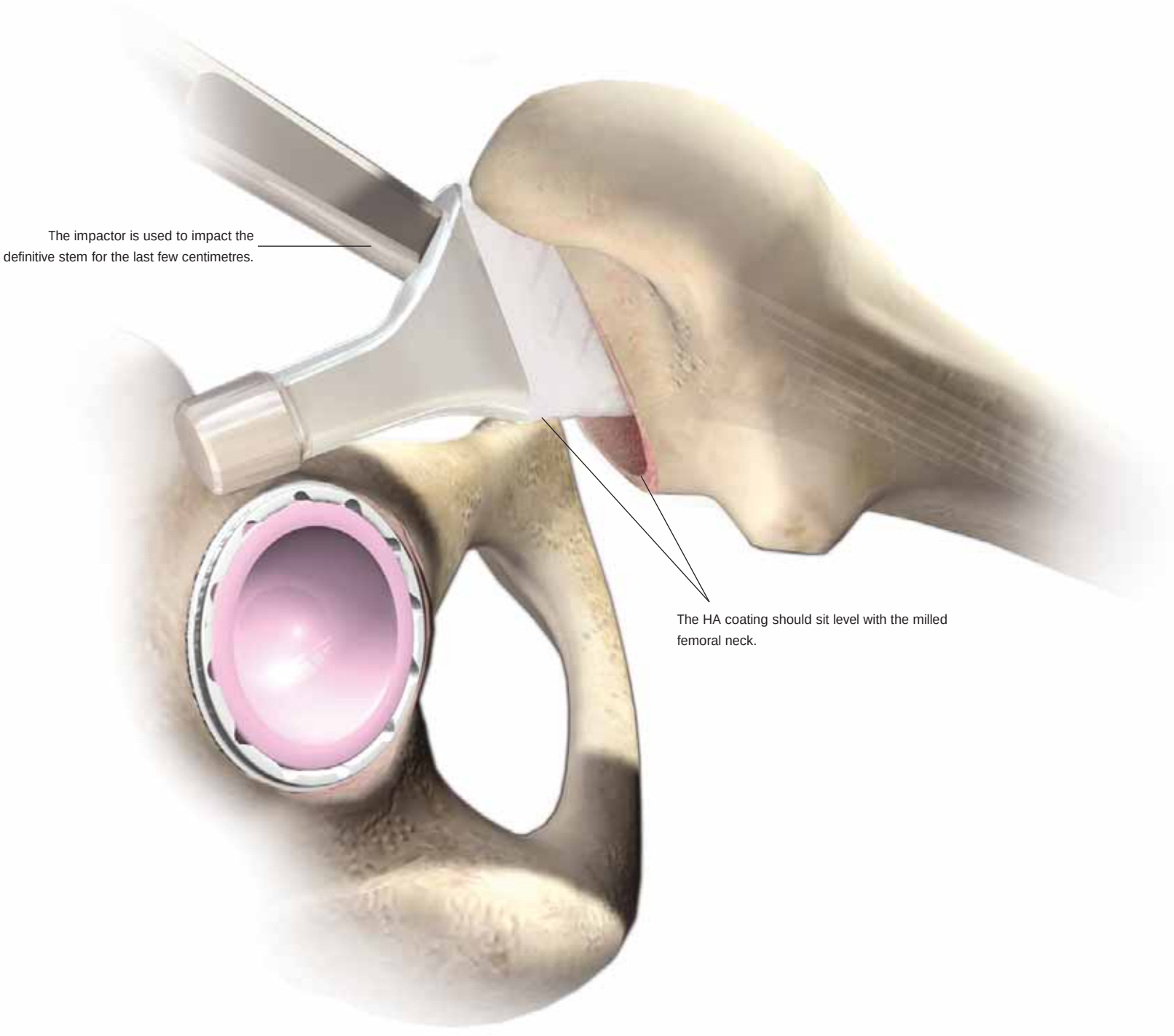
Leave the last broach in place and use the calcar mill to achieve a flat resection surface. If a collared stem is used, the calcar reaming should allow an optimised fit of the collar on the calcar.

# TRIAL REDUCTION



With the last broach in situ, attach the appropriate trial neck and trial head. Reduce the hip and assess what adjustments, if any, are required to ensure stability through a full range of motion. Remove the femoral head, neck trial and broach. Do not irrigate or dry the femoral canal. This will help to preserve the compacted cancellous bone quality and encourage osteointegration of the stem.

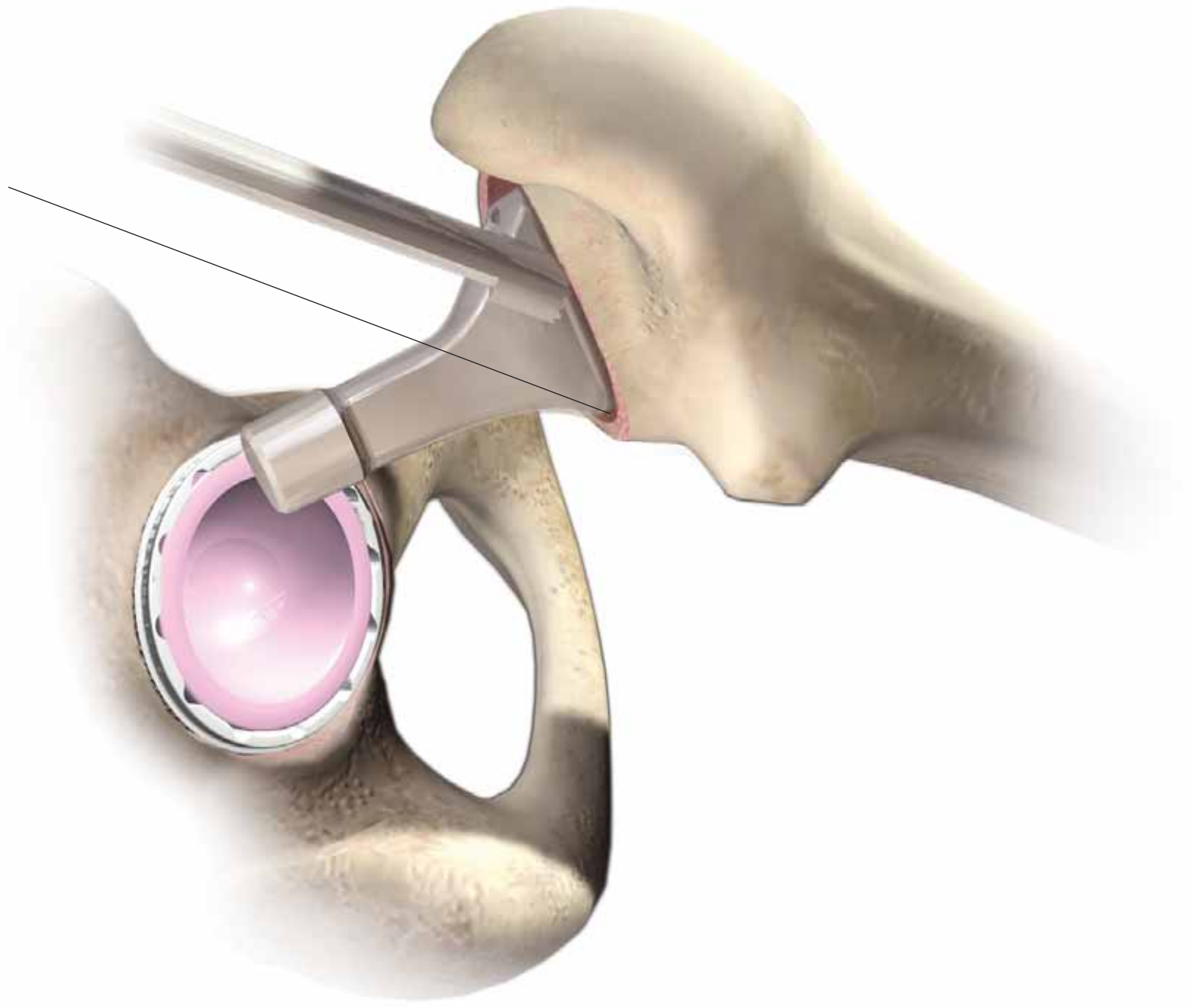
# FEMORAL COMPONENT INSERTION




Engage the Corail® stem (that has the same size as the last used broach) in the femoral canal by hand and finish its introduction with the impactor for the last few centimetres.

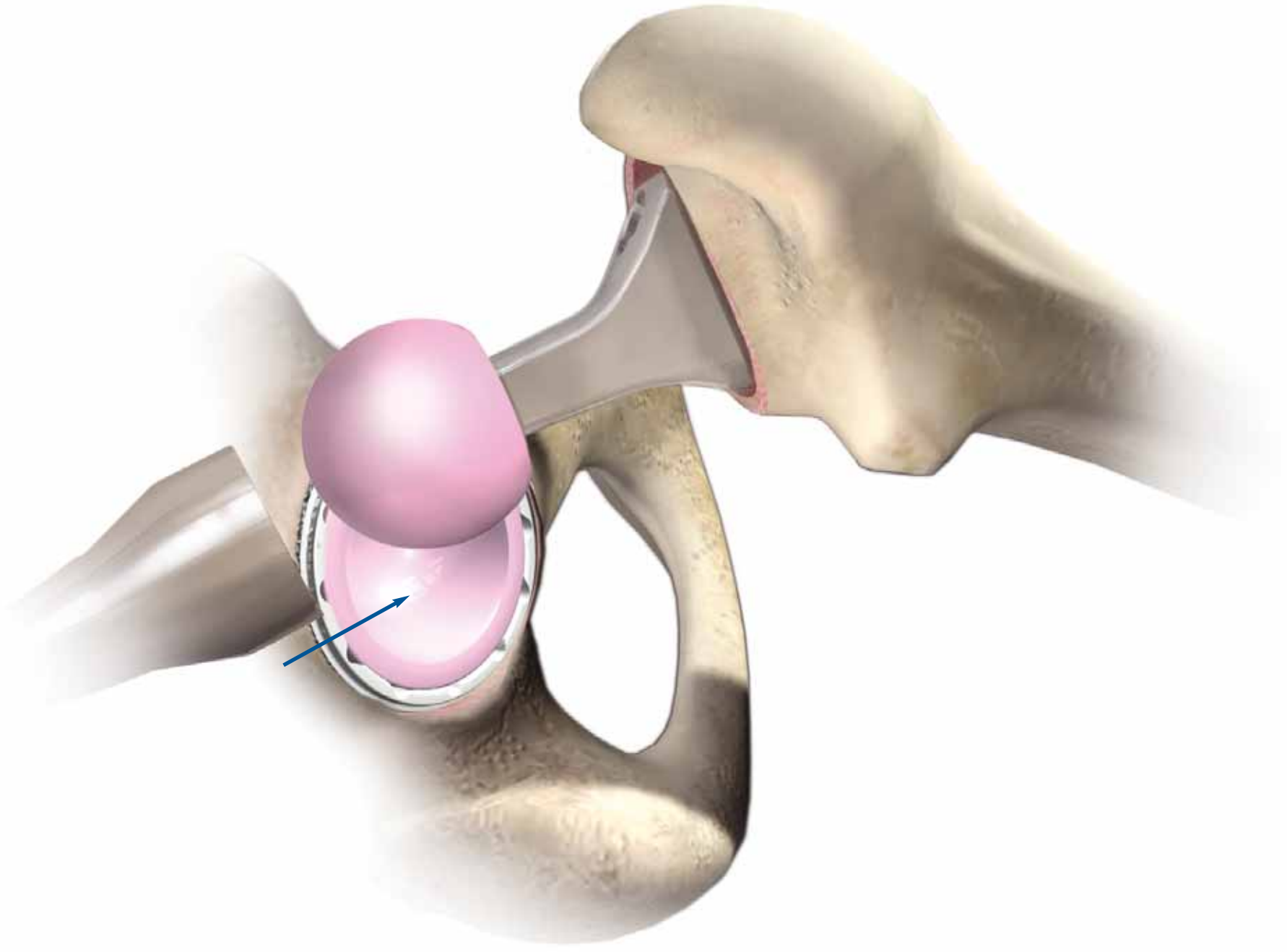
*Note: The stem is 0.31 mm thicker than the broach to allow the necessary press-fit.*

# ADDITION OF BONE GRAFT




Once the Corail® stem is seated, cancellous bone from the resected femoral head is added around the proximal part of the stem using the bone tamp to seal the femoral canal and to reduce the time for osteointegration which provides definitive stability.

# FEMORAL HEAD IMPACTION



Clean the stem taper carefully to remove any particulate debris. Place the femoral head onto the taper and lightly tap it (especially if a ceramic head is used) using the head impactor. Ensure bearing surfaces are clean, and finally reduce the hip.

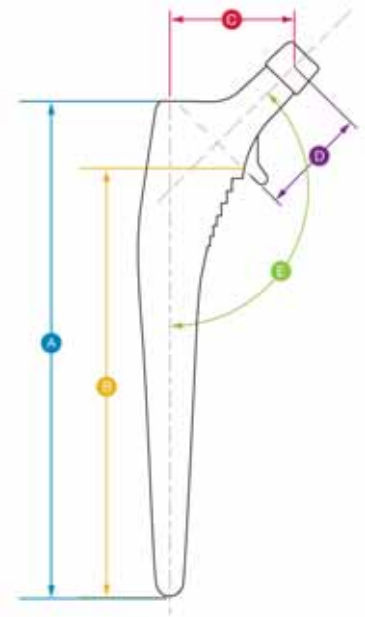
# ORDERING INFORMATION

Corail® Implants

*All the Corail® stems have the Articul/eze™ neck, characterised by a thin antero-posterior dimension, a polished surface and a 12/14 mini-taper.*

Corail® Standard Stem (Collarless)

| | |
|---|---|
| 3L92507 | Corail® Size 8 |
| 3L92509 | Corail® Size 9 |
| 3L92510 | Corail® Size 10 |
| 3L92511 | Corail® Size 11 |
| 3L92512 | Corail® Size 12 |
| 3L92513 | Corail® Size 13 |
| 3L92514 | Corail® Size 14 |
| 3L92515 | Corail® Size 15 |
| 3L92516 | Corail® Size 16 |
| 3L92518 | Corail® Size 18 |
| 3L92520 | Corail® Size 20 |




Corail® Standard Stem (Collared)

| | |
|---|---|
| 3L92498 | Corail® Size 8 |
| 3L92499 | Corail® Size 9 |
| 3L92500 | Corail® Size 10 |
| 3L92501 | Corail® Size 11 |
| 3L92502 | Corail® Size 12 |
| 3L92503 | Corail® Size 13 |
| 3L92504 | Corail® Size 14 |
| 3L92505 | Corail® Size 15 |
| 3L92506 | Corail® Size 16 |
| 3L92508 | Corail® Size 18 |
| 3L92521 | Corail® Size 20 |

Corail® Coxa Vara Lateralised Stem (Collared)

| | |
|---|---|
| 3L93709 | Corail® Size 9 |
| 3L93710 | Corail® Size 10 |
| 3L93711 | Corail® Size 11 |
| 3L93712 | Corail® Size 12 |
| 3L93713 | Corail® Size 13 |
| 3L93714 | Corail® Size 14 |
| 3L93715 | Corail® Size 15 |
| 3L93716 | Corail® Size 16 |
| 3L93718 | Corail® Size 18 |
| 3L93720 | Corail® Size 20 |

Corail® High Offset Lateralised Stem (Collarless)

| | |
|---|---|
| L20309 | Corail® Size 9 |
| L20310 | Corail® Size 10 |
| L20311 | Corail® Size 11 |
| L20312 | Corail® Size 12 |
| L20313 | Corail® Size 13 |
| L20314 | Corail® Size 14 |
| L20315 | Corail® Size 15 |
| L20316 | Corail® Size 16 |
| L20318 | Corail® Size 18 |
| L20320 | Corail® Size 20 |

## STANDARD - COLLARLESS / COLLARED

| Size | Stem Length (mm) (A) | Stem Length (mm) (B) | Offset (mm) (C) | Neck Length (mm) (D) | Neck Shaft Angle (E) |
|---|---|---|---|---|---|
| 8 | 115 | 95 | 38.0 | 38.5 | 135º |
| 9 | 130 | 110 | 38.5 | 38.5 | 135º |
| 10 | 140 | 120 | 39.5 | 38.5 | 135º |
| 11 | 145 | 125 | 40.0 | 38.5 | 135º |
| 12 | 150 | 130 | 41.0 | 38.5 | 135º |
| 13 | 155 | 135 | 41.5 | 38.5 | 135º |
| 14 | 160 | 140 | 42.0 | 38.5 | 135º |
| 15 | 165 | 145 | 43.0 | 38.5 | 135º |
| 16 | 170 | 150 | 43.5 | 38.5 | 135º |
| 18 | 180 | 160 | 44.5 | 38.5 | 135º |
| 20 | 190 | 170 | 45.5 | 38.5 | 135º |

## HIGH OFFSET - COLLARLESS

| Size | Stem Length (mm) (A) | Stem Length (mm) (B) | Offset (mm) (C) | Neck Length (mm) (D) | Neck Shaft Angle (E) |
|---|---|---|---|---|---|
| 9 | 130 | 110 | 45.5 | 43.2 | 135º |
| 10 | 140 | 120 | 46.5 | 43.2 | 135º |
| 11 | 145 | 125 | 47.0 | 43.2 | 135º |
| 12 | 150 | 130 | 48.0 | 43.2 | 135º |
| 13 | 155 | 135 | 48.5 | 43.2 | 135º |
| 14 | 160 | 140 | 49.0 | 43.2 | 135º |
| 15 | 165 | 145 | 50.0 | 43.2 | 135º |
| 16 | 170 | 150 | 50.5 | 43.2 | 135º |
| 18 | 180 | 160 | 51.5 | 43.2 | 135º |
| 20 | 190 | 170 | 52.5 | 43.2 | 135º |

## COXA VARA - COLLARED

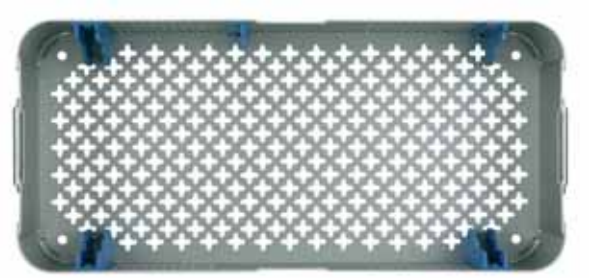
| Size | Stem Length (mm) (A) | Stem Length (mm) (B) | Offset (mm) (C) | Neck Length (mm) (D) | Neck Shaft Angle (E) |
|---|---|---|---|---|---|
| 9 | 130 | 110 | 45.5 | 40,3 | 125º |
| 10 | 140 | 120 | 46.5 | 40,3 | 125º |
| 11 | 145 | 125 | 47.0 | 40,3 | 125º |
| 12 | 150 | 130 | 48.0 | 40,3 | 125º |
| 13 | 155 | 135 | 48.5 | 40,3 | 125º |
| 14 | 160 | 140 | 49.0 | 40,3 | 125º |
| 15 | 165 | 145 | 50.0 | 40,3 | 125º |
| 16 | 170 | 150 | 50.5 | 40,3 | 125º |
| 18 | 180 | 160 | 51.5 | 40,3 | 125º |
| 20 | 190 | 170 | 52.5 | 40,3 | 125º |

*Note: All measurements are based on a 28 mm +5.0 Articul/eze® head, which is the middle length of non-skirted femoral heads*

Corail® Instrumentation

CONTK2 Sterilisation Case

L20500 Base Aluminium Basket



L20504 Top Basket


L20503 Superior Thermoformed Tray

| | | |
|---|---|---|
| 9653-68-000 | Anteversion Axis |  |
| L20440 | Neck Resection Guide |  |
| L93606 | Bone Tamp |  |
| L93205 | Bone Impactor |  |
| 2002-31-000 | Osteotome |  |
| 9522-11-500 | Curved Broach Handle |  |
| 9522-10-500F | Straight Broach Handle |  |
| 9522-12-500F | Extra Curved Broach Handle |  |

L20502 Middle Thermoformed Tray

L20501 Inferior Thermoformed Tray

| | | |
|---|---|---|
| L20408 | Broach 8 | |
| L20409 | Broach 9 | |
| L20410 | Broach 10 | |
| L20411 | Broach 11 | |
| L20412 | Broach 12 | |
| L20413 | Broach 13 | |
| L20414 | Broach 14 | |
| L20415 | Broach 15 | |
| L20416 | Broach 16 | |
| L20418 | Broach 18 | |
| L20420 | Broach 20 | |

| | | |
|---|---|---|
| L20431 | Standard Neck Segment | |
| L20432 | Lateralised Neck Segment (Coxa Vara) | |
| L20433 | High Offset Neck Segment | |

| | | |
|---|---|---|
| 2570-04-200 | Calcar Mill Large | |
| 2570-04-100 | Calcar Mill Small | |

| | | |
|---|---|---|
| 2570-05-000 | Positioner | |

| | | |
|---|---|---|
| 2570-05-100 | Stem Impactor | |

| | | |
|---|---|---|
| 2001-65-000 | Head Impactor | |

Pre-operative Templates

Pre-operative Templates (100%)

| | |
|---|---|
| CALQ861 | Corail® Standard (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |
| CALQ862 | Corail® Coxa Vara (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |
| CALQ863 | Corail® High Offset (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |

Pre-operative Templates (120%)

| | |
|---|---|
| CALQ864 | Corail® Standard (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |
| CALQ865 | Corail® Coxa Vara (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |
| CALQ866 | Corail® High Offset (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |

Pre-operative Templates (115%)

| | |
|---|---|
| CALQ858 | Corail® Standard (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |
| CALQ859 | Corail® Coxa Vara (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |
| CALQ860 | Corail® High Offset (28 mm, 32 mm, 36 mm, ASR™ XL Heads) |

Digital Templates

The availability of digital templates depends on DePuy International’s agreement with the vendors. Please contact DePuy International for more information.

## References:


1. The Norwegian Arthroplasty Register 1987-2004, Prospective Studies of Hip and Knee Prostheses. http://www.haukeland.no/nrl/, AAOS, 2005.

2. Vidalain JP. Corail® Stem Long-Term Results Based upon the 15-Years ARTRO Group Experience. Fifteen Years of Clinical Experience with Hydroxyapatite Coatings in Joint Arthroplasty, Ed. Springer, 217-224, 2004.

3. Røkkum M, Brandt M, Bye K, Hetland KR, Waage S, Reigstad A. Polyethylene Wear, Osteolysis and Acetabular Loosening with an HA Coated Hip Prosthesis. J. Bone and Joint Surg. 81-B, No4, 1999.





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