



## MS-30® Stem Cemented

Surgical Technique



Modern shaft concept for cemented anchoring

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# MS-30® Stem Cemented

## Introduction

### 3. Šlaunikaulio komponento tvirtinimas – cementinis

The philosophy of the *MS-30* stem features a **cemented** anchorage. The three-dimensional tapered design without corners or edges maintains the strength of the cement mantle in the various Gruen zones. The geometry of the cement mantle is established during the preoperative planning.

The highly polished surface, together with the hollow space design of the distal centralizer, permits debonding in the uninterrupted cement mantle.

For good long-term results for cemented stems, particular attention should be paid to the cementing technique<sup>1</sup>: Fundamental factors are insertion under pressure and ensuring a stable cement mantle particularly in the calcar region.

Different offset options allow the creation or restoration of normal anatomy and biomechanics. The standard version and the lateral version of the *MS-30* stem allow the surgeon greater intraoperative flexibility.

With the *MS-30* stem, one can choose the surgical technique of Professor Morscher for a lateral approach, or that of Professor Spotorno for a posterior approach.

Hip arthroplasties using the *MS-30* stem have been carried out since 1990. The *MS-30* stem with a matte surface was introduced on the market in 1992; in 1994, the *MS-30* stem with a polished surface<sup>2</sup> was launched internationally.

Since 1992, over 100,000 stems have been implanted worldwide with excellent ten-year results<sup>3, 4</sup>.

With these characteristics, the *MS-30* stem fulfills the demanding requirements of modern endoprosthetics.

### 5. Šlaunikaulinio komponento paviršius – poliruotas



<sup>1</sup> Barrack RL, Mulroy RD, Harris WH: Improved cementing techniques and femoral component loosening in young patients with hip arthroplasty. A 12-year radiographic review. *J Bone Joint Surg* 74B: 385–389, 1992

<sup>2</sup> Berli B, Elke R, Morscher EW: The cemented MS-30 stem in total hip replacement, matte versus polished surface: minimum of five years of clinical and radiographic results of a prospective study. In: Winters GL, Nutt MJ (ed): *Stainless steels for medical and surgical applications*. ASTM STP 1438, 2003: 249–261

<sup>3</sup> Spotorno L, Grappiolo G, Penenberg BL, Burastero G: Eight to eleven years review of hybrid THA using a femoral stem and cementless titanium acetabulum. AAOS Dallas, 2002

<sup>4</sup> Berli B, Schäfer D, Dick W: 100% 10-year survival of a hybrid total hip replacement (MS-30 cemented stem and Morscher Press-Fit cup). EFORT Helsinki, 2003

# Preoperative Planning

Preoperative planning supports the work of the surgical team and allows the surgeon optimum preparation for the operation, as well as for the purpose of self-monitoring. The objectives of preoperative planning are to determine the stem size, the ideal anchorage of the stem in the medullary cavity, and the optimum position of the acetabular and femoral components for the restoration of leg length.

## Planning objectives

- The choice and size of the implant
- Optimum cement mantle in the various Gruen zones
- Position and height of the resection of the neck of the femur
- The offset and, thus, the decision as to whether to use the standard or lateral version
- The choice of the corresponding prosthetic head
- The acetabulum, the establishment of the center of rotation, the size and the position of the acetabulum

## Determining leg length

Three horizontal lines are drawn on the AP X-ray of the pelvis: the tangent of both ischia forms the base line.

A second line is drawn over the roofs of the acetabula, and the third between the lesser trochanters.

Using the ischiometer, the center of rotation on the side that is not to be operated on is established, and the distance to the teardrop figure is measured. Finally, the pelvic axis is drawn, running through the symphysis and perpendicular to the line.

The difference in the distances measured between the connecting line of the lesser trochanters and the baseline corresponds to the correction needed to obtain equal leg lengths.

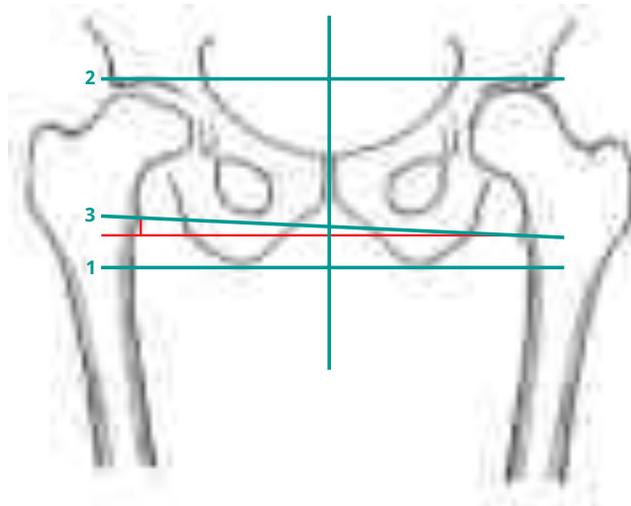
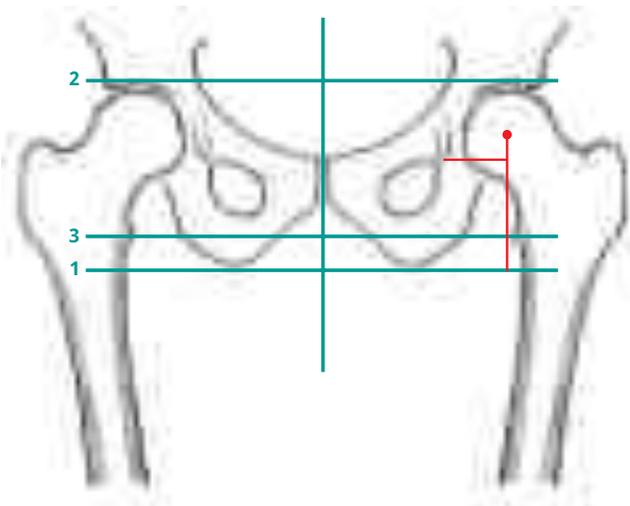
## Same leg length

All three lines run parallel.

## Dysmetry caused by the femur

The first and second lines run parallel, whilst the bitrochanteric line is divergent towards the longer leg.

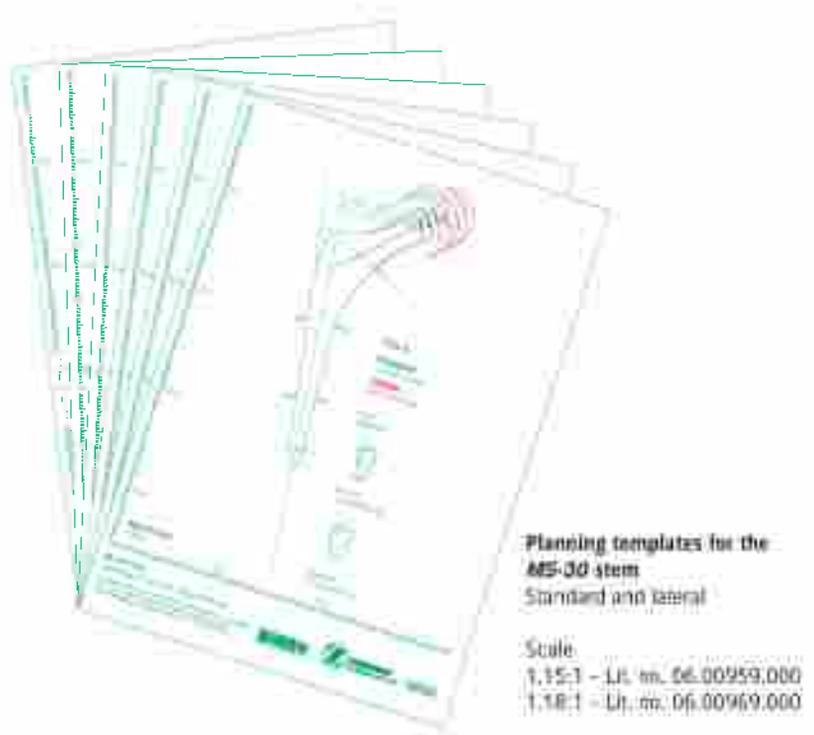
The leg length difference determined on the X-ray must be compared with the difference that is established clinically.



## Templates

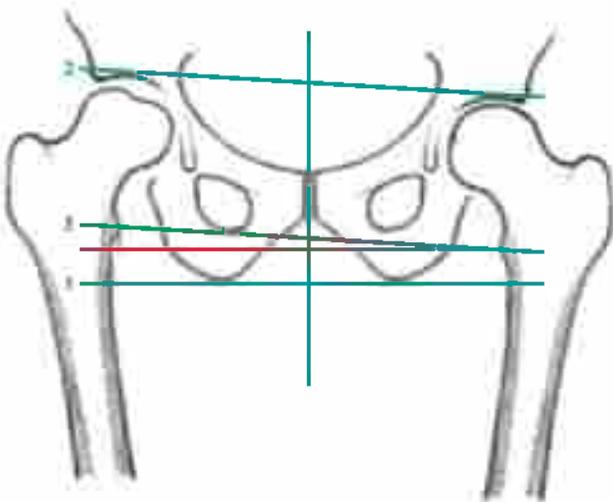
The *MS-30* templates serve as a planning aid. All sizes are clipped together to form one template set.

The essential planning information for implantation of the respective size can be found on a planning transparency: Here, the stem contours are shown with the resection line for both the standard and the lateral version of the *MS-30*. Also shown are the markings for the cement mantle and the respective distal centralizers for each stem size.



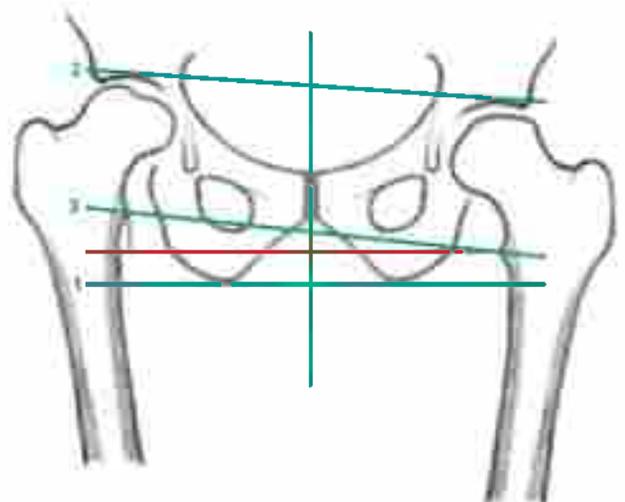
### Dysmetry caused by the joint

The second and third lines run parallel, the first line deviates.



### Combined dysmetry

All three lines are divergent.



**Cement mantle**

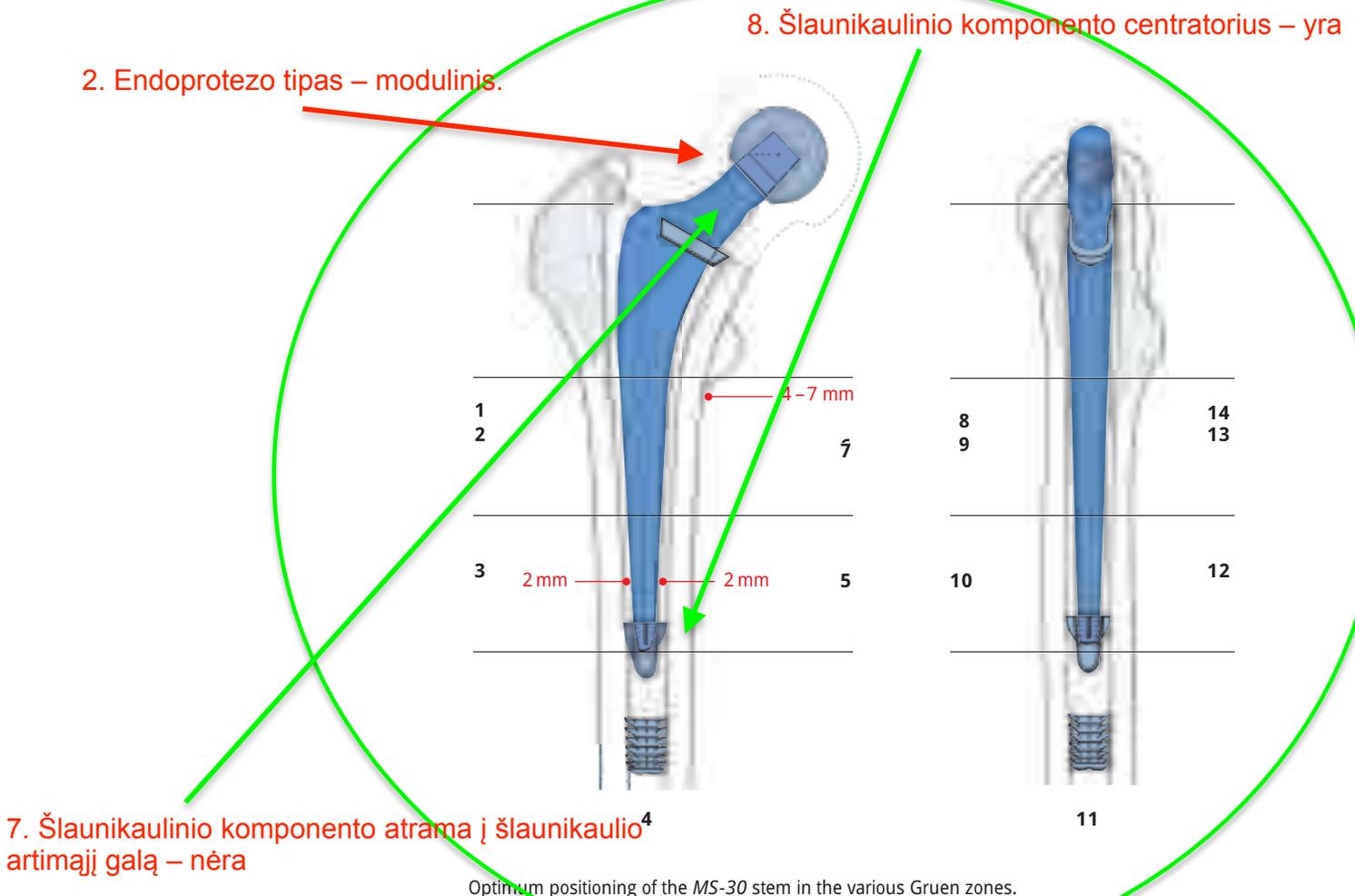
The optimum cement mantle for a highly polished stem without a collar is asymmetrical. It should be stronger or thicker in the area of primary transmission of load, i.e. in the calcar region (Gruen zone 7), as well as in the distal part of the prosthesis (zones 3 and 5). Cement mantle thicknesses greater than 7 mm should, however, be avoided, since these not only make pressurization more difficult, but they can also lead to bone necrosis as a

result of an increasing in heat during polymerization of the cement. Rotational forces that encourage loosening are absorbed by the proximal "wing", e.g. through sharp edges of the prosthesis.

In order to avoid metal/bone contact wherever possible, above all in the zones of higher stress 3, 5 and 7, a distal centralizer is an integral part of the MS-30 stem.

Reaming of the medullary canal and using the distal centralizer and possibly the proximal positioner bring the stem into a neutral position.

The proximal positioner creates a cement mantle of at least 4 mm in Gruen zone 7: with the aid of the distal centralizer, a cement mantle of 2 mm is created in both, the a/p and the lateral/ medial aspect.

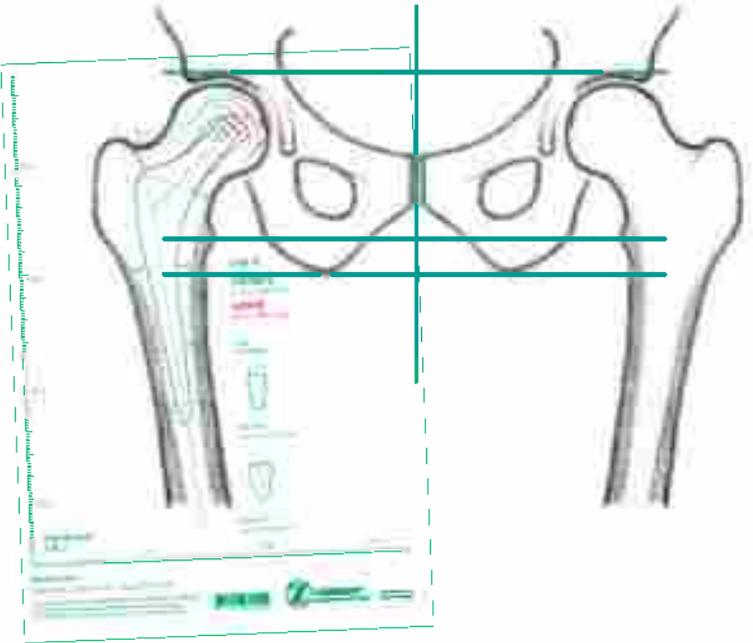




### 3. Determine the size and position of the stem

The appropriate template is placed on the femur.

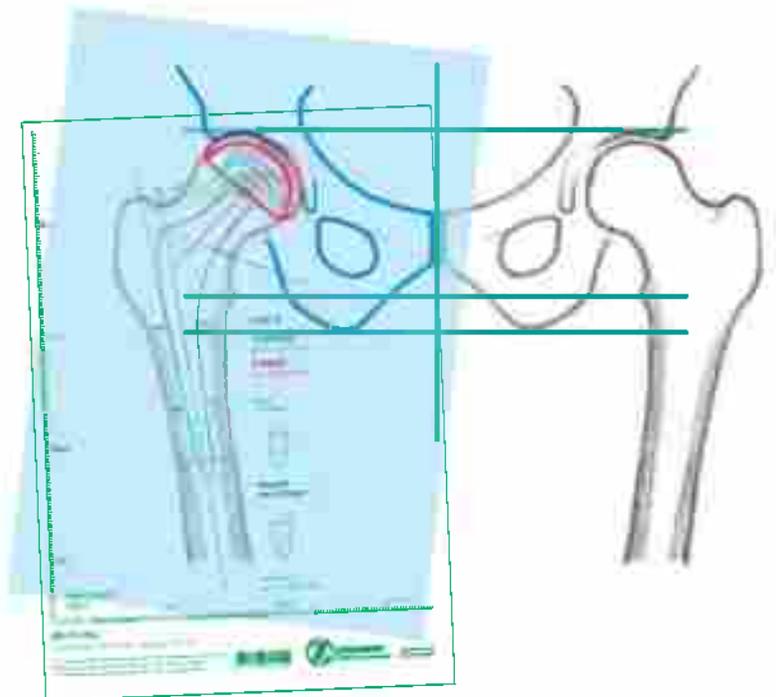
If possible, a space of 4–7 mm proximally (calcar) and 2 mm distally (tip of the prosthesis) should remain between the stem and the inner cortex layer in order to create an optimum cement thickness. This is the point at which the choice of prosthesis size and offset (standard or lateral version) is made. One of the four T-lines that run through the center of rotation should lie at the height of the greater trochanter. As a rule, the osteotomy level of the neck of the femur is 16–20 mm above the tip of the lesser trochanter.



### 4. Pelvis level

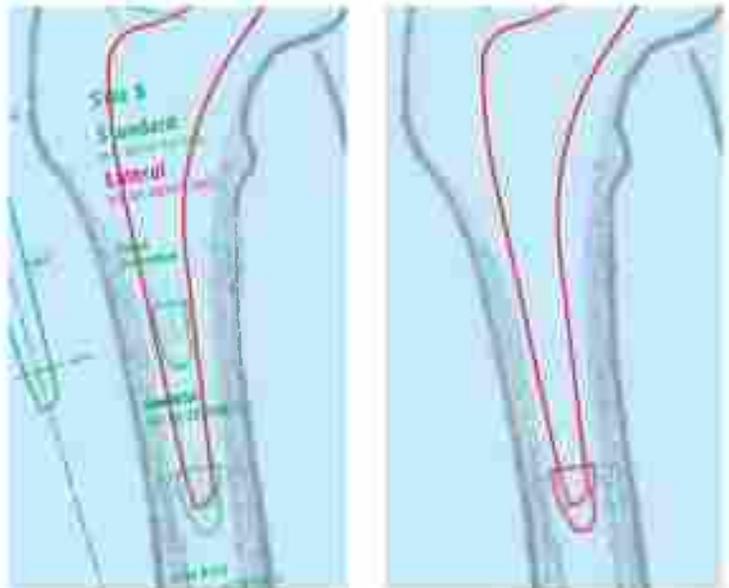
Without removing the femoral template, the tracing paper used in step 2 is placed in position, so that the inside of the cup corresponds to the mean neck length. The bitrochanteric and ischiatic lines must be parallel.

If, in the case of residual dysmetry, the lines diverge and a leg lengthening is indicated, the following options are available: using a prosthesis head with a long neck, higher femur neck resection, or driving the tip of the prosthesis stem less deeply into the femoral canal.



### 5. Determine the size of the distal centralizer

When determining the optimum size of the two sketched centralizers on the template, one should select the one that ensures lateral cortical contact when the tip of the prosthesis is centered in the medullary cavity.

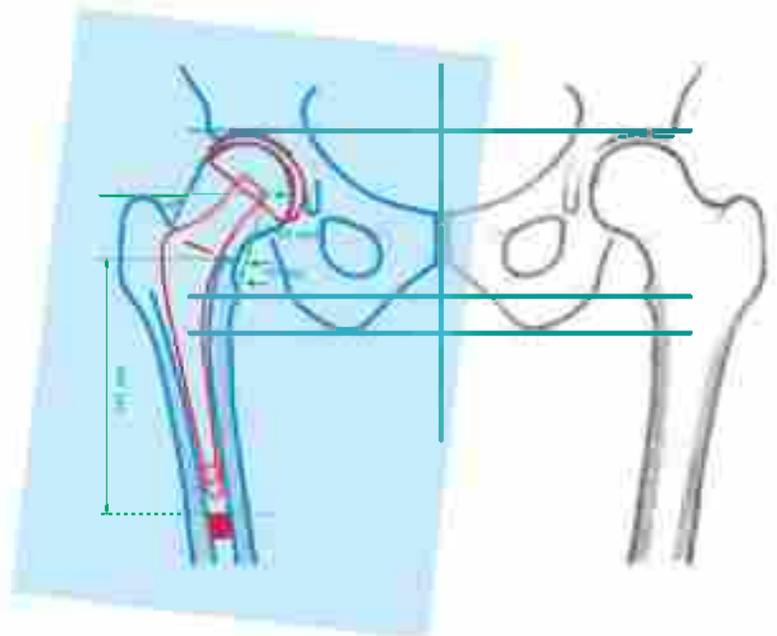


### 6. Result of preoperative planning

The femur, femoral stem, distal centralizer and medullary plug are drawn on the tracing paper. The medullary plug should be placed 1–2 cm below the tip of the centralizer. The extension of the lateral limit of the stem up to the greater trochanter is sketched in. This line determines the lateral limit of the cancellous bone to be removed in order to avoid positioning in a varus position.

The following dimensions are included in the drawing and measured:

- Lesser trochanter – osteotomy level
- Lesser trochanter – medial edge of the prosthesis neck
- Medullary plug – inner cortex layer of the osteotomy of the femur neck
- Connecting line between the center of rotation and the tip of the greater trochanter



# Variants of the Surgical Technique

## Surgical technique using a lateral approach, according to Professor E. W. Morscher

The medullary canal is prepared with rasps of ascending size. The last rasp to be used is always one size larger than the stem size that was determined in the preoperative planning. Through this, sufficient space is created for an uninterrupted circumferential cement mantle. The rasp also serves as a test prosthesis: The modular handle of the rasp is removed and a corresponding test head is mounted. After trial reduction, the test head and the rasp are removed, the medullary plug is inserted and the medullary canal is filled with cement, under pressure. A *MS-30* stem one size smaller than the last rasp used is inserted.

## Surgical technique using a posterior approach, according to Professor L. Spotorno

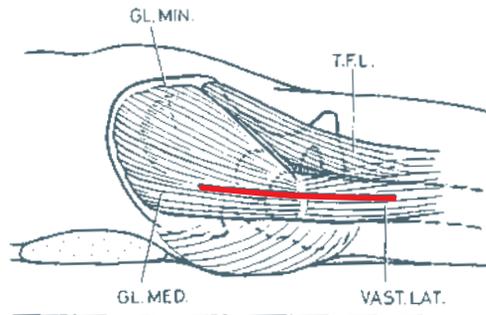
The medullary canal is prepared with rasps of ascending size. The last rasp to be used, which is driven in as far as the osteotomy level, corresponds to the stem size that was determined in the preoperative planning. The rasp handle is then removed and the test head is placed on the cone of the modular rasp. After trial reduction, the test head is removed and the rasp is driven in deeper, up to the second marking.

The Spotorno technique creates space for the cement mantle in that the rasp is driven in deeper after trial reduction.

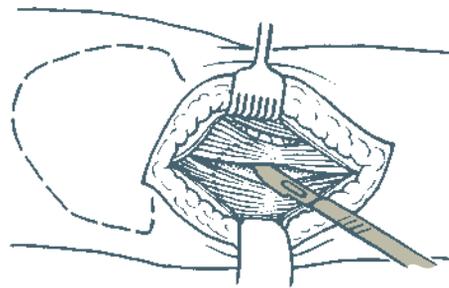
# Lateral Approach

## Surgical technique according to Professor E. W. Morscher

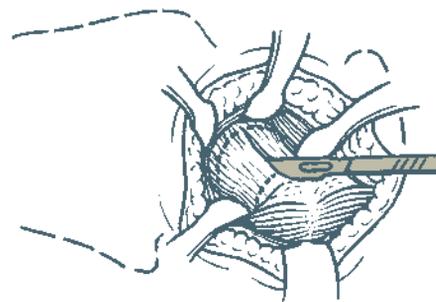
1. Patient in dorsal position, pelvis elevated with a flat cushion. Skin incision extends laterally starting 4 cm above the tip of greater trochanter extending distally along the femoral shaft.



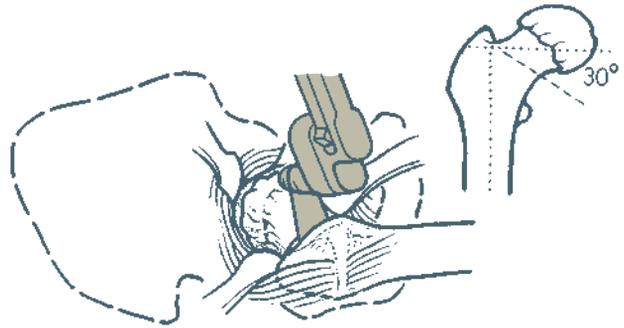
2. Separation of the fascia lata is performed. Incision and longitudinal separating of the gluteus medius and the vastus lateralis muscles on the latero-ventral circumference of the greater trochanter. The incision is extended proximally in the direction of the fibers of the tendon and dissects by bluntly pulling apart the muscle fibers of the gluteus medius muscle.



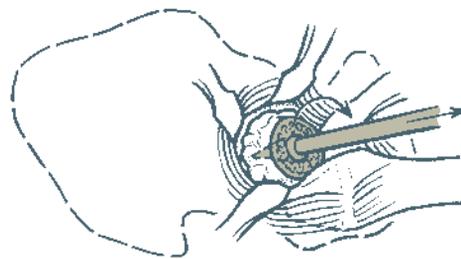
3. Preparation of the front wall of the capsule and insertion of a Hohmann lever at the front rim of the acetabulum. Scalpel detachment of the fibers attached to the capsule from the gluteus minimus muscle cranially and the vastus intermedius muscle distally. Insertion of a Hohmann lever respectively at the cranial and at the caudal circumference of the neck of the femur. After insertion or adjustment of the Hohmann lever at the rim of the acetabulum, the utmost care must be taken that the tip of the lever does not lie in the muscle tissue or tendinous tissue, but under it (femoral artery, vein, nerve!). The joint capsule is then incised longitudinally on the ventral circumference, and removed ventro-cranially and ventro-caudally through H-shaped extensions of the incision. The cranial and caudal Hohmann levers are moved to intra-articular positions.



**4.** An osteotomy of the femoral neck is performed at an angle of 30° with the leg in external rotation.



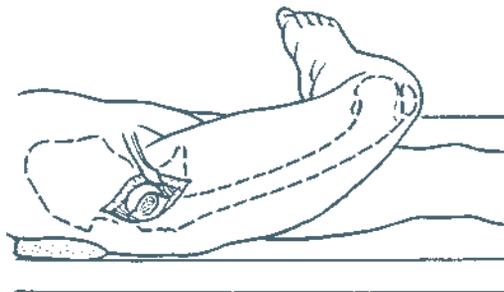
**5.** Using the osteotome, the femur head is mobilized in the osteotomy and is extracted with the femoral head extractor (REF 75.00.21).



**6.** The joint capsule is detached from the psoas tendon. Insertion of a Hohmann lever under the ventro-caudal rim of the acetabulum or under the caudal acetabular rim osteophytes. Implantation of the cup.



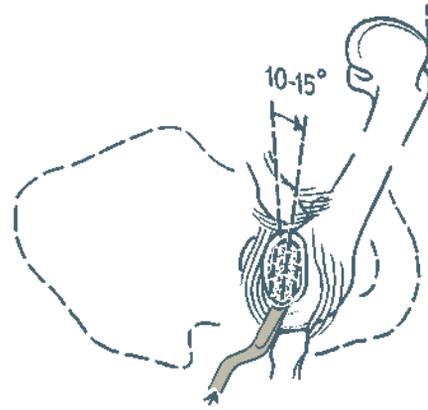
**7.** The leg is adducted and externally rotated.



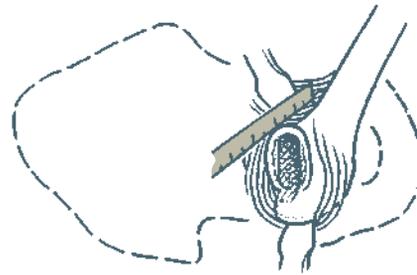
**8.** The Hohmann lever that was inserted at the start of the operation in the front of the pubic ramus remains in this position throughout the entire procedure. Where necessary, dorsal capsule excision is completed with the leg external rotation.



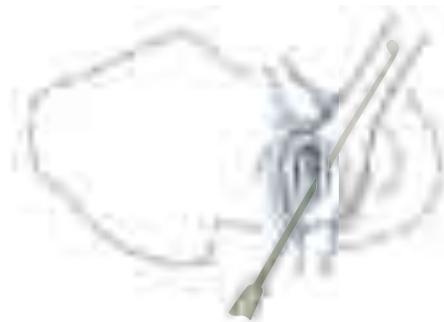
**9.** An important step is the resection of the cranio-lateral base of the femoral neck, in order to gain lateral space. Through this, insertion of the rasp and the prosthesis in a varus position is avoided.



**10.** The level of the osteotome neck is assessed by measuring the distance between the tip of the lesser trochanter and the medio-dorsal resection edge of the femoral neck (Ruler, REF 95.00.03). Further resection of the femoral neck may be necessary.



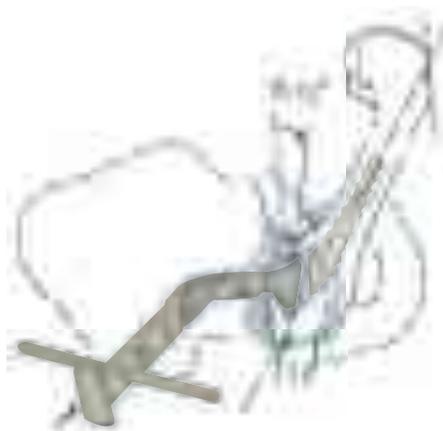
**11.** A long curette is inserted into the medullary cavity (REF 75.13.33), in order to correctly establish the rasp direction in a neutral axis. The complete removal of all cancellous bone on the inner side of the medial femoral neck base using a bone curette is very important.



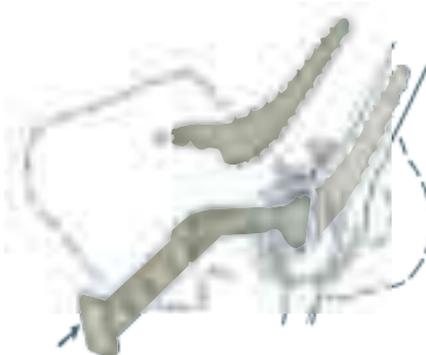
**12.** Opening of the medullary cavity with the straight awl with T-handle, in order to ensure neutral positioning of the femoral shaft.



**13.** Insertion of the smallest rasp (no. 6), already taking account of the desired antetorsion (as a rule, 10–15°). Checking the resection level, which should lie at a right angle to the rasp adapter.



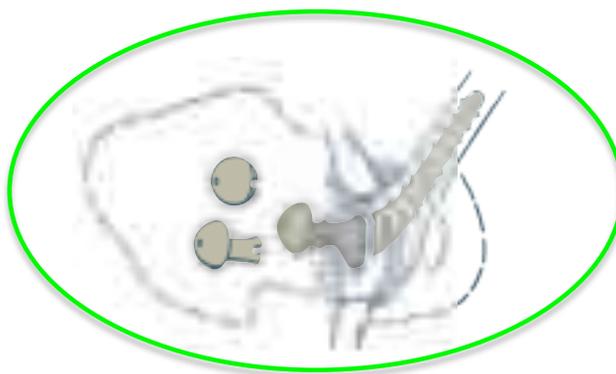
**14.** This is followed by the step-wise expansion of the medullary space using larger rasps. Torsional movements must be avoided while impacting the rasps. The largest rasp is impacted as far as the marking that corresponds to the osteotomy level. The modular rasp simultaneously serves as a test prosthesis.



**15.** After the modular rasp adapter has been removed, the appropriate trial head is mounted.

If the plan is to use the lateral version of the *MS-30* prosthesis, the eccentric test head is used. It is important that the eccentric test head is placed so that it enlarges the offset of the stem.

In order to facilitate correct positioning, the test head is marked «cranial».

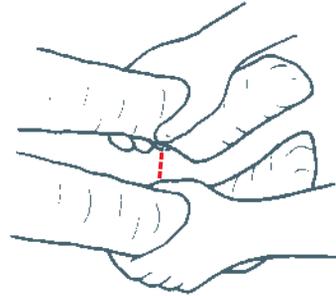


**16.** Trial reduction: The height from the tip of the lesser trochanter to the center of rotation of the femoral head is checked. The risk of dislocation is checked by inward and outward rotational movements in flexion and extension. At the same time, the head containment is verified. The position of the psoas tendon is checked. Under no circumstances may this rub on the rim of the artificial cup.

### 1.1. Endoprotezo tipas – modulinis



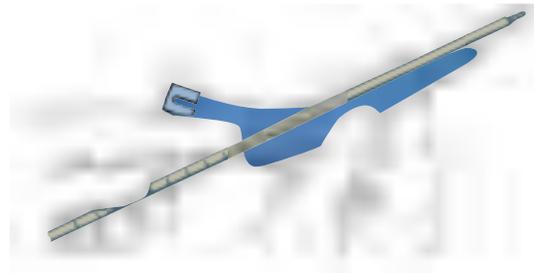
**17.** The leg lengths are checked.



**18.** On the *MS-30* prosthesis to be implanted, measure is taken with the introducing rod for the position of the medullary plug, measured from the shoulder of the prosthesis. With regard to the depth of deployment, it must be noted that the distal centralizer must be mounted on the stem, and the distance between the tip of the centralizer and the medullary plug must be approximately 1–1.5 cm.

At the same time, the size of the centralizer is established. If the plug of the next size after the stem size fits, the distal centralizer with the corresponding number is used. Experience shows that this is the right combination. In the case of larger medullary spaces, the second number of the distal centralizer is used.

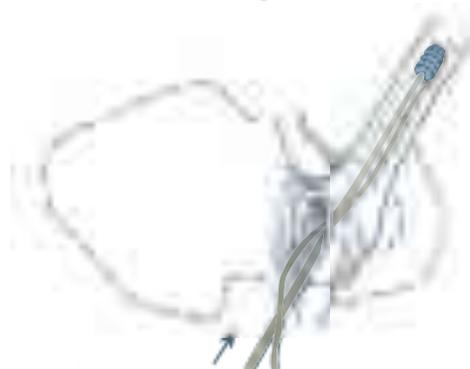
Thus, for a size 10 stem and a medullary cavity into which the plug 12 fits, a distal centralizer of size 10/12 should be used. In the case of a wider medullary canal, size 10/14 is used.



**19.** The trial rasp is removed. The femoral medullary cavity is rinsed, and the diameter of the medullary space is checked.



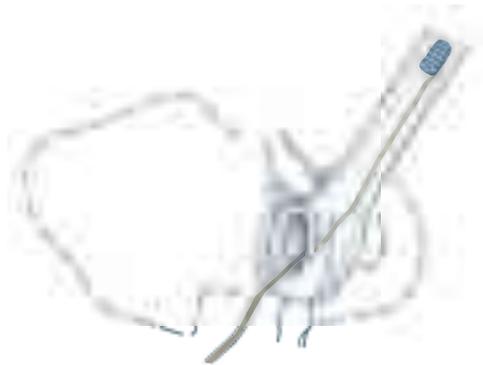
**20.** The medullary plug is inserted.



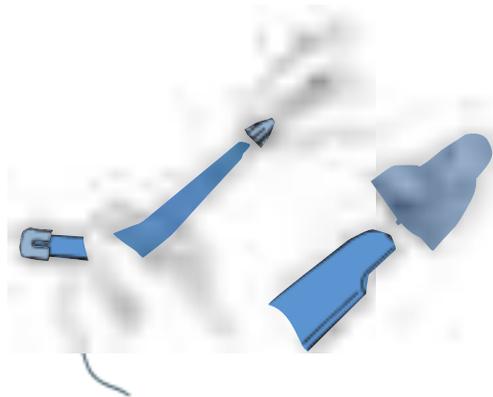
**21.** Rinse and dry the medullary canal.



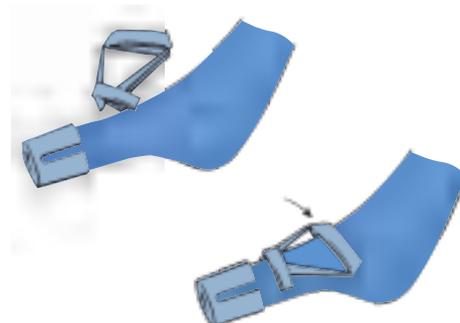
**22.** Insert of the drain.



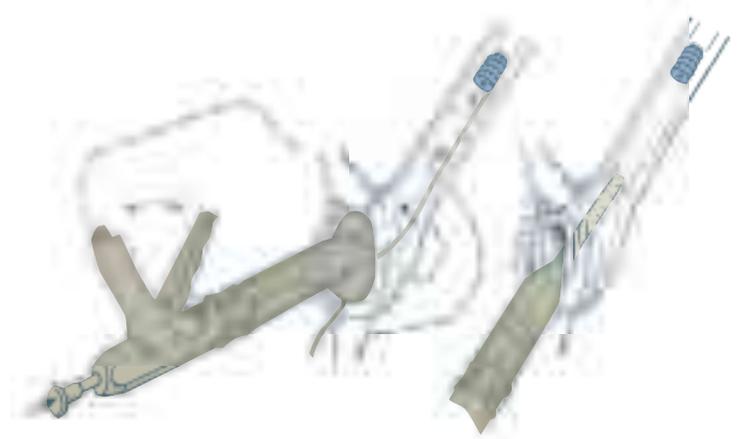
**23.** The appropriate distal centralizer is assembled to the prosthesis.  
The distal centralizer comprises four wings, one of which is longer than the others. The longer wing must be positioned on the lateral side of the stem.



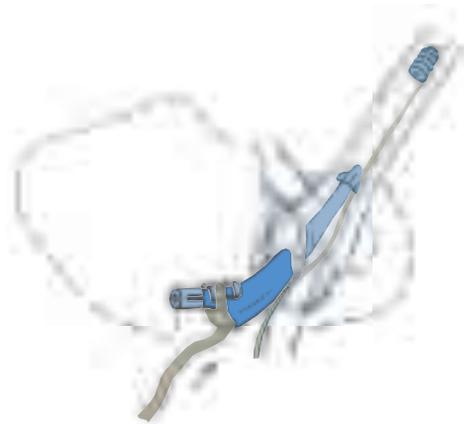
**24.** The proximal positioner is mounted.  
First of all, this is inserted into the extraction hole and only then it is brought to its final position. It is not mandatory to use the proximal positioner. However, it facilitates the generation of the optimum cement mantle thickness.



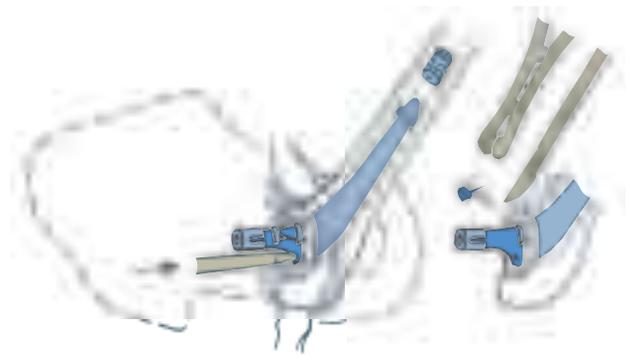
**25.** The bone cement is introduced slowly under maximum pressure. The cement is introduced antegrade, using a drain and a silicon disk for the compression. Alternatively, the cement is pressed in retrograde. This procedure requires neither a compression disk nor a drain. The planned proximal and distal cement thickness is achieved by implanting a prosthesis that is one size smaller than the final rasp.



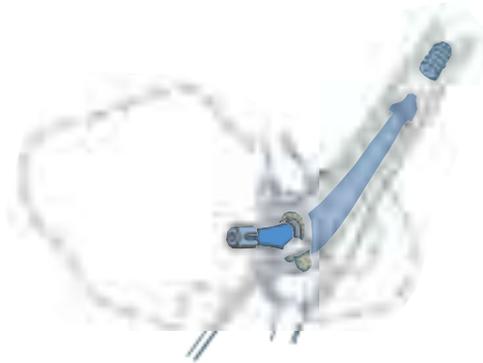
**26.** With the setting device or impactor, the MS-30 stem is inserted. Particular care must be taken to ensure that medially on the femur neck (calcar), between the cortex layer and the stem, there is a cement layer of 4–7 mm thickness.



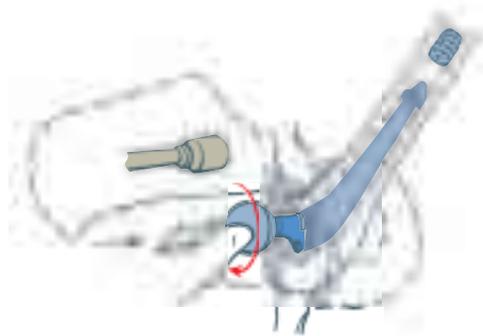
**27.** Until the cement has completely cured, the pressure with the impactor must be maintained. Immediately before final polymerization, the stem should not be impacted any further in order to prevent fractures of the cement mantle. As soon as the cement has hardened, all three legs of the proximal positioner are cut off using the scalpel or Luer's pliers (REF 100.01.840).



**28.** Excess cement is carefully removed.



**29.** The head is mounted using a rotational movement, and is locked through a light hammer blow on the repositioning lever.



**30.** Reduction of the prosthesis. Intra-articular insertion of a Redon drain.



**31.** Reinsertion of the longitudinally separated tendon of the gluteus medius muscle, including that of the gluteus minimus muscle and the vastus lateralis muscle, with strong, non-absorbable thread.

Closure of the incision on the anterolateral circumference, using individual over-and-over sutures. Insertion of a Redon drain subfascially, and closure of the iliotibial tract.

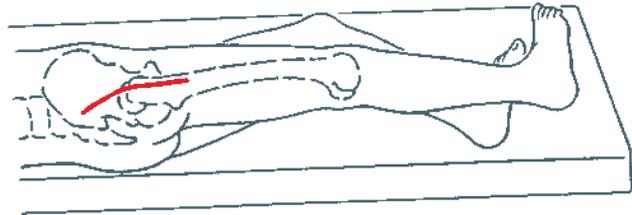
Insertion of a subcutaneous Redon drain, subcutaneous sutures, skin sutures.



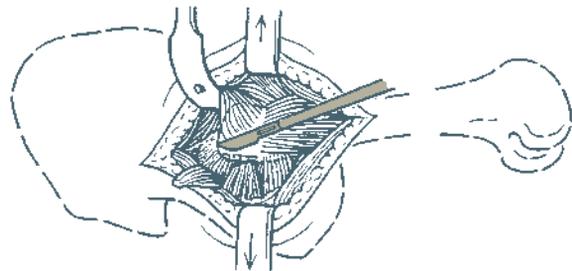
# Posterior Approach

## Surgical technique according to Professor L. Spotorno

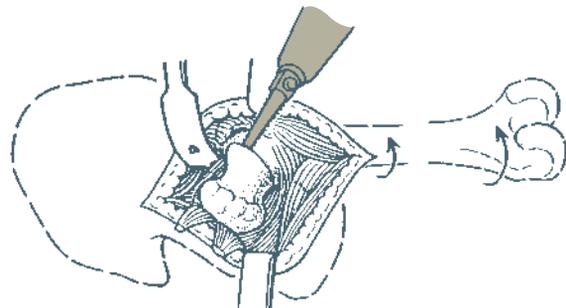
**1.** Patient in a strict lateral position. Posterolateral incision according to Austin Moore.



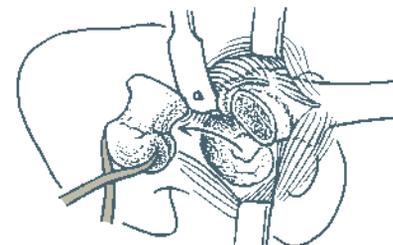
**2.** Incision of the fascia lata and partial notching of the femoral insertion of gluteus maximus muscle. Insertion of a Hohmann lever under the gluteus medius muscle on a level with the femoral neck. Exposure and division of the outer rotators and of the dorsal articular capsule.



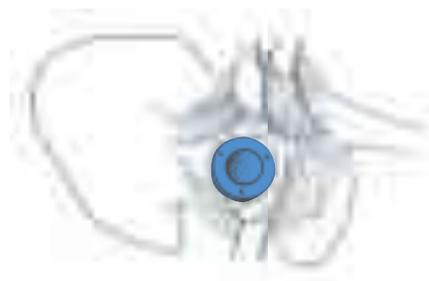
**3.** Dislocation of the hip by a combined movement with inward rotation, flexion and adduction. Resection of the residual capsule and osteotomy of the femoral neck after measuring the level in accordance with the preoperative plan. The resection level starts about 15–20 mm proximally of the lesser trochanter (running obliquely, with a 30° inclination).



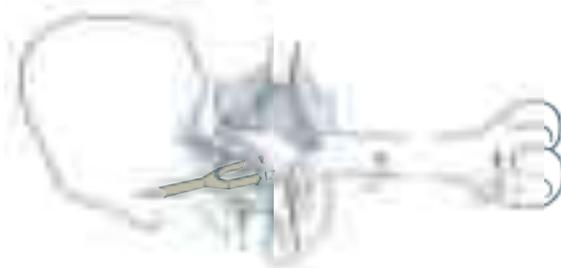
**4.** Removal of the head and neck of the femur, insertion of a Hohmann lever and exposure of the acetabulum.



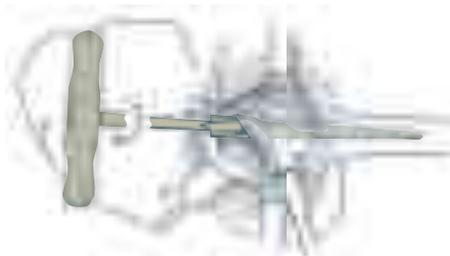
**5.** Implantation of the selected cup.



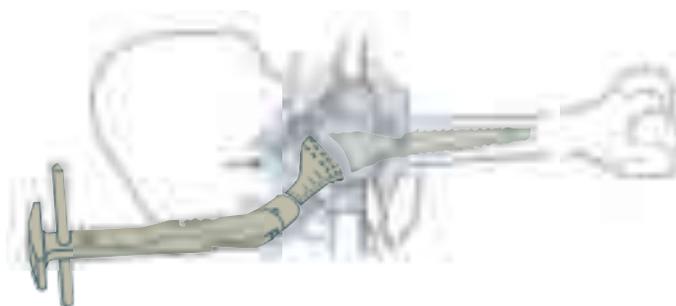
**6.** Using the boxed chisel, the trapezoidal segment of the cancellous bone is removed from the bulb as far as the lateral limit, in accordance with the preoperative planning. This permits correct insertion of the rasp, avoiding a varus position.



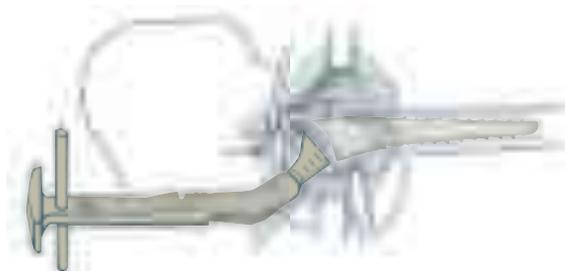
**7.** Opening of the medullary cavity using the awl, and removal of the cancellous bone.



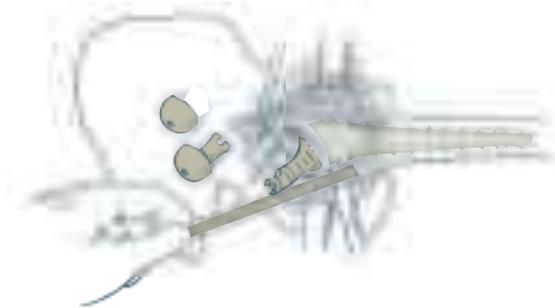
**8.** The first rasp is impacted, starting with the smallest size, and already taking account of the desired antetorsion of 10–15°.



**9.** The final rasp is impacted up to the osteotomy level.



**10.** The modular rasp simultaneously serves as a test prosthesis. Determination of the correct depth of impaction (distance between the lesser trochanter and the medial edge of the prosthesis neck as planned preoperatively), and of the correct positioning.



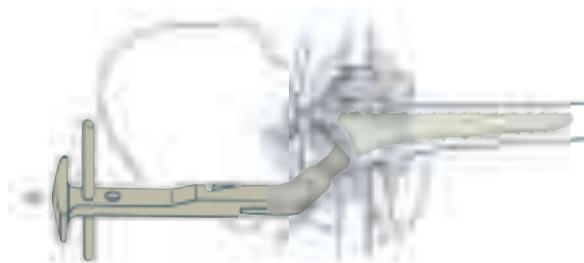
**11.** Mounting of the test head, trial reduction and assessment of leg length, muscle tension, stability and extent of movement.

If the plan is to use the lateral version of the *MS-30* prosthesis, the eccentric test head for the *MS-30* is used.

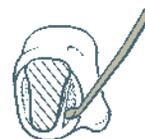
It is important that the eccentric test head is placed so that it enlarges the offset of the stem. In order to facilitate correct positioning, the test head is marked "cranial" (if the test head is wrongly placed in the opposite direction [180°], the result is a reduced offset, this means a medialization).



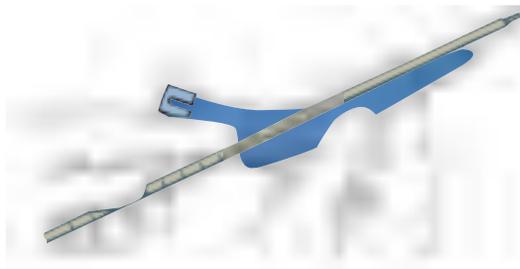
**12.** Removal of the test head and deeper impaction of the rasp until the second marking. The additional space that is generated by deeper impaction produces proximally a cement mantle thickness of at least 4 mm for the proximal positioner.



**13.** In the case of inadequate bone quality, the isthmus and the adjacent cancellous bone are removed with a curette.

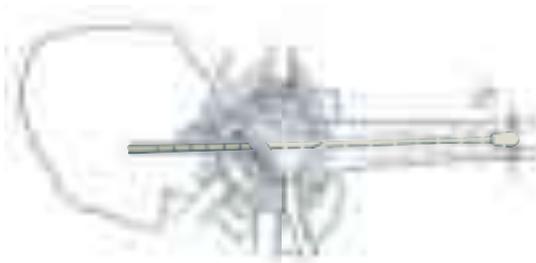


**14.** On the *MS-30* prosthesis to be implanted, measure is taken with the introducing rod for the position of the medullary plug, measured from the shoulder of the prosthesis. With regard to the depth of deployment, it must be noted that the distal centralizer must be mounted on the stem, and the distance between the tip of the centralizer and the medullary plug must be approximately 1–1.5 cm.

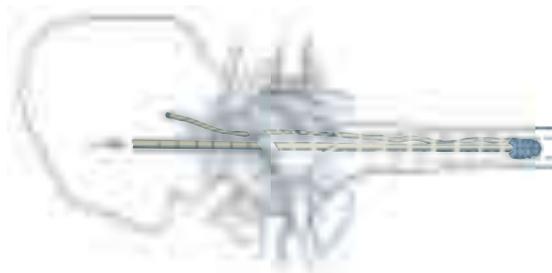


At the same time, the size of the centralizer is established. If the plug of the next size after the stem size fits, the distal centralizer with the corresponding number is used. Experience shows that this is the right combination. In the case of larger medullary spaces, the second number of the distal centralizer is used. Thus, for a size 10 stem and a medullary cavity into which the plug 12 fits, a distal centralizer of size 10/12 should be used. In the case of a wider medullary canal, size 10/14 is used.

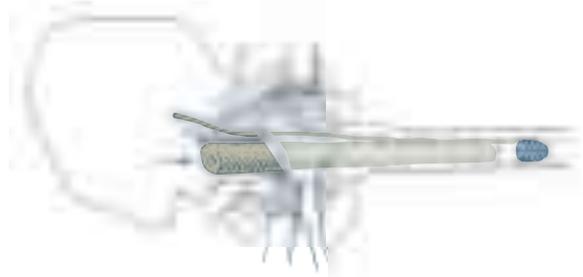
**15.** Insertion of the introducing rod with plug to determine the size of the distal centralizer and of the medullary plug (the likely size has already been determined in the course of preoperative planning).



**16.** Insertion of the medullary plug.

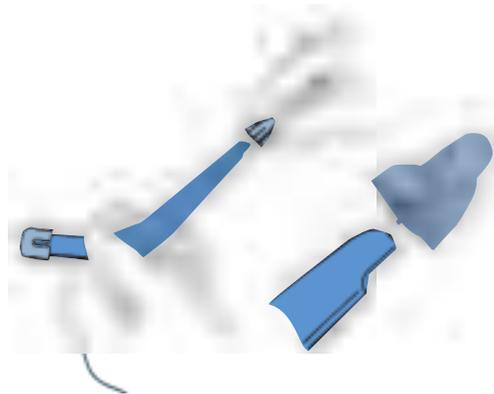


**17.** The medullary canal is rinsed and a hemostatic tamponade is inserted. This is removed and a drain is inserted.

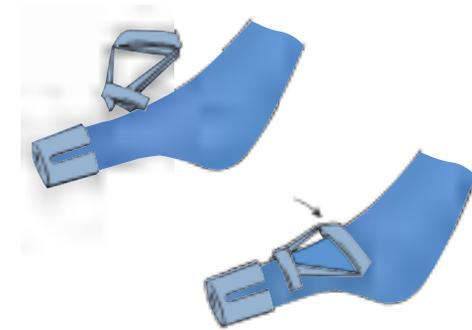


**18.** The centralizer is mounted on the prosthesis, in accordance with the planned size or the size determined using the introducing rod with plug. The centralizer must be carefully pushed onto the stem tip until it sits securely there.

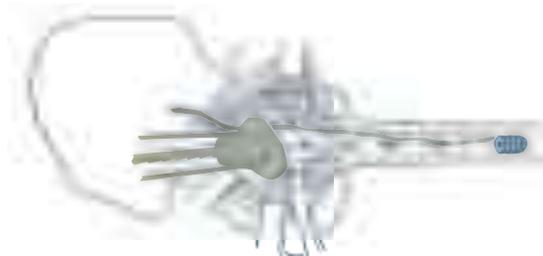
The distal centralizer comprises four wings, one of which is longer than the others. As the stem tip is not symmetrically round, the centralizer has been designed to fit exactly. The longer wing must be positioned on the lateral side of the stem.



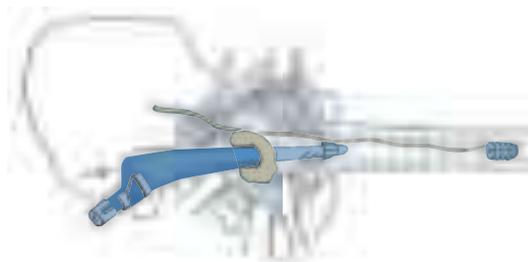
**19.** The proximal positioner is mounted. First of all, this is inserted into the extraction hole and only then is it brought into its final position. It is not mandatory to use the proximal positioner. However, it facilitates the generation of the optimum cement mantle thickness. It is particularly recommended in the case of a steep femoral neck, where there is more likely to be a risk of a too thin cement mantle in zone 7, as well as a risk of direct bone/metal contact.



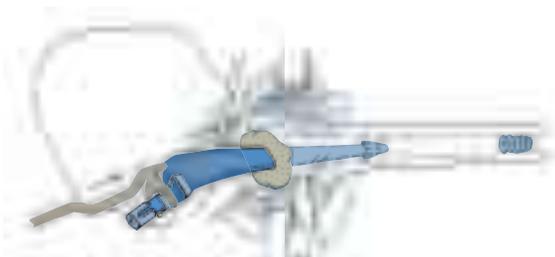
**20.** The bone cement is pressed in using maximum pressure. The cement is introduced antegrade, using a drain and a silicon disk for compression. Alternatively, the cement can be pressed in retrograde. This procedure requires neither a compression disk nor a drain.



**21.** Insertion of the *MS-30* stem with the distal centralizer and the proximal positioner.



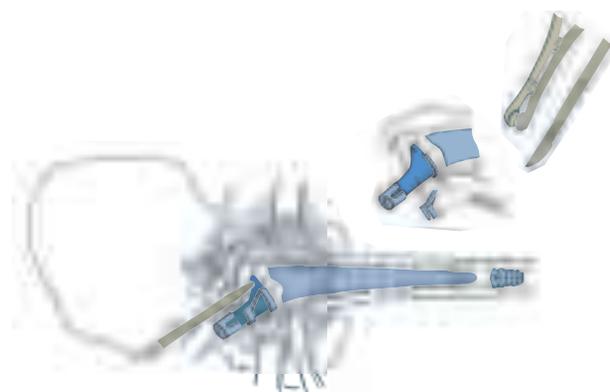
**22.** With the setting device, the stem is pushed in a distal-lateral direction, in order to avoid a varus position.



**23.** When the proximal centralizer is used, particular care must be taken that the stem is somewhat lateral and is not inserted too late in the polymerization process. This procedure encourages the formation of a cement mantle with sufficient medial thickness.

In order to achieve this, the impactor is aligned obliquely in a lateral direction, and not strictly axially, during insertion. Until the cement has completely hardened, the pressure must be maintained with the impactor. Immediately before final polymerization, the prosthesis must under no circumstances be impacted further, due to the risk of the cement mantle breaking.

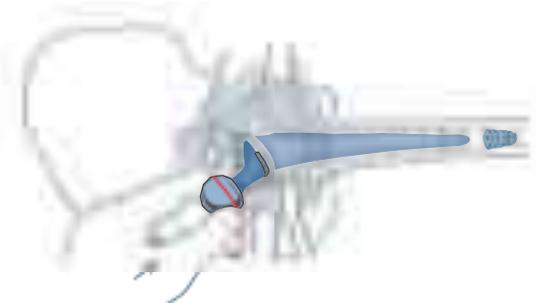
As soon as the cement has hardened, all three legs of the proximal positioner are removed using a scalpel or Luer's pliers.



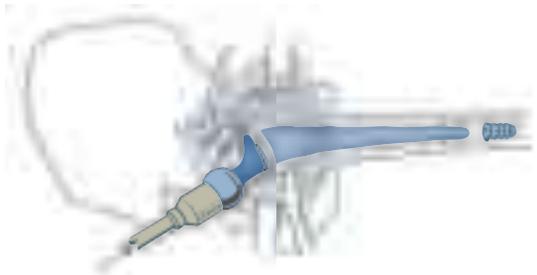
**24.** The cement is carefully removed as far as the lower web of the proximal element, i.e. as far as the resection level.



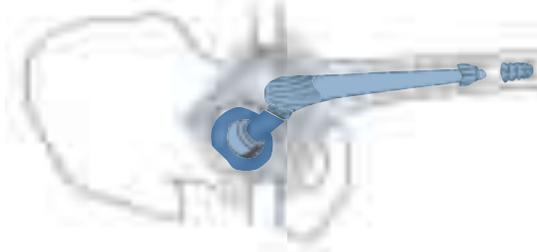
**25.** After careful cleaning of the cone, the prosthesis head is mounted using a rotational movement.



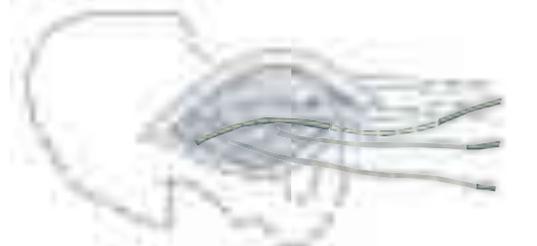
**26.** The head is locked on the cone through a light hammer blow on the repositioning lever.



**27.** Reduction and function check.



**28.** Redon drainage and closure of the wound.



## Case Study by Professor E. W. Morscher

### 63-year-old female patient with marked coxarthrosis

Implantation of a *MS-30* stem and a Morscher *Press-Fit™* Cup. At the time of the ten-year follow-up, the patient had no problems. The clinical evaluation showed excellent mobility of the hip joint.



Preoperative



Postoperative



10 years postoperative

## Case Study by Professor L. Spotorno

### Primary osteoarthritis in a 68-year-old female patient

The one-month post-operative X-ray demonstrates excellent biomechanical reconstruction of the hip, with a perfectly cemented *MS-30* stem in combination with a Wagner Standard Cup. The X-ray taken at the follow-up examination 12 years later is impressive: it shows no change over this period. From a clinical point of view, there is neither restriction with regard to ability to walk, nor limping or pain in this 80-year-old patient.



Preoperative



Postoperative (1 month)

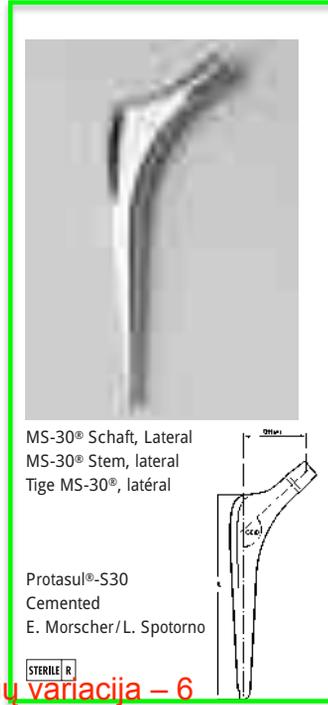
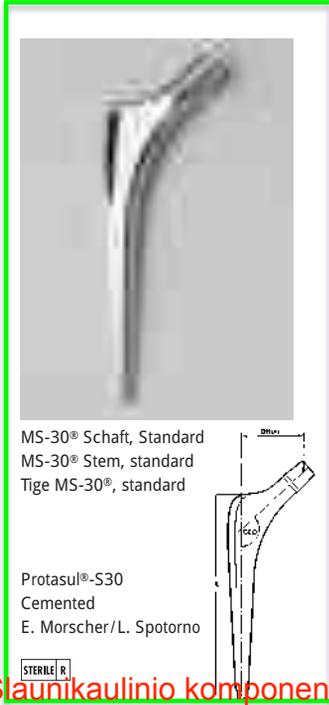


12 years postoperative

# Implants

## 9. Šlaunikaulio-kaklo-galvos kampo (CCD) pasirinkimo variacija – ne mažiau 2

### Centratorius



Distales Zentrierelement  
Distal centralizer\*\*  
Centralisateur distal

STERILE R

Größe/Size/Taille	D mm	REF
6/8	8.1	01.00356.008
6/10	10.1	01.00356.010
8/10	10.1	01.00358.010
8/12	12.1	01.00358.012
10/12	12.1	01.00351.012
10/14	14.1	01.00351.014
12/14	14.1	01.00351.214
12/16	16.1	01.00351.216
14/16	16.1	01.00351.416
14/18	18.1	01.00351.418
16/18	18.1	01.00351.618
16/20	20.1	01.00351.620

## 12. Šlaunikaulinio komponento dydžių variacija – 6

Size	Offset	L mm	CCD	REF	Size	Offset	L mm	CCD	REF
6	37.7	115.0	130	30.00.49-060	6	42.2	115.0	124.3	01.00351.001
8	38.9	132.0	131	30.00.49-080	8	43.6	132.0	125.3	01.00351.002
10	40.1	136.0	132	30.00.49-100	10	44.9	136.0	126.3	01.00351.003
12	41.3	140.5	133	30.00.49-120	12	46.2	140.5	127.3	01.00351.004
14	42.3	146.0	134	30.00.49-140	14	47.3	146.0	127.7	01.00351.005
16	43.3	152.5	135	30.00.49-160	16	48.4	152.5	128.0	01.00351.006



Proximales Positionierelement  
Proximal positioner\*  
Élément de positionnement proximal



Standard

Größe/Size/Taille	H mm	REF
6	22.2	01.00356.055
8	23.2	01.00358.055
10	24.2	01.00351.055
12	25.2	01.00351.255
14	26.2	01.00351.455
16	27.2	01.00351.655

Lateral

Größe/Size/Taille	H mm	REF
6	24.6	01.00356.065
8	25.6	01.00358.065
10	26.6	01.00351.065
12	27.7	01.00351.265
14	28.7	01.00351.465
16	29.7	01.00351.665

## 10. Šlaunikaulinio komponento kaklo ilgio koregavimo variacija (Offset) – ne mažiau 5

## 1. CCD variacija, atitinkanti rentgenoanatominius CCD kampus ne mažiau 130° - 135°

\* U.S. Patent No. 6, 669, 734

\*\* U.S. Patent No. 6, 342, 077

# Instrumentation



MS-30® Kunststoffsieb (komplett)  
MS-30® plastic tray (complet)  
Plateau MS-30® en plastique (complet)  
REF  
99.27.00-00

MS-30® Kunststoffsieb (leer)  
MS-30® plastic tray (empty)  
Plateau MS-30® en plastique (vide)  
REF  
01.00359.100

Einsatz für MS-30® Kunststoffsieb (leer)  
Insert for MS-30® plastic tray (empty)  
Insert pour plateau MS-30® en plastique (vide)  
REF  
01.00359.200

Deckel für MS-30® Kunststoffsieb  
Cover for MS-30® plastic tray  
Couvercle pour plateau MS-30® en plastique  
REF  
01.00029.029



Abgekröpfter Hohlmeißel  
Double-curved gouge  
Ciseau-gouge à double courbure  
Grösse/Size/Taille REF  
9 mm 75.09.15



Handgriff mit Schnellkupplung  
Handle with quick coupling  
Poignée à verrouillage rapide  
REF  
75.00.25



Reibahle zu 75.00.25  
Awl for 75.00.25  
Alésoir pour 75.00.25  
REF  
72.00.35



Griff zu modularen Raspeln  
Handle for modular rasps  
Poignée pour râpes modulaires  
REF  
70.00.94

Langer Querstab  
Long bar  
Barre longue  
REF  
70.00.01



Raspel MS-30®, modular  
Rasp MS-30®, modular  
Râpe MS-30®, modulaire  
Size REF  
6 72.13.94-060  
8 72.13.94-080  
10 72.13.94-100  
12 72.13.94-120  
14 72.13.94-140  
16 72.13.94-160  
18 72.13.94-180



**Konusas 12/14**  
Testkopf für HTP, Konus 12/14  
Test head for THR, cone 12/14  
Tête d'essai pour PTH, cône 12/14  
Grösse/Size/Taille ø mm REF  
S 28 01.01559.128  
M 28 01.01559.228  
L 28 01.01559.328  
XL 28 01.01559.428



Exzentrischer Testkopf für lateralen Schaft MS-30®  
Eccentric test head for MS-30® lateral  
Tête d'essai excentrique pour MS-30® latéral  
Grösse/Size/Taille ø mm REF  
S 28 01.00359.128  
M 28 01.00359.228  
L 28 01.00359.328  
XL 28 01.00359.428

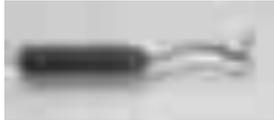


Reponieraufsatz  
Repositioning top  
Calotte de réduction  
ø mm REF  
28 78.00.38-28



Messdorn zu Markraumstößel  
 Plug for introducing rod  
 Mandrin de mesure pour poussoir  
 pour cavité médullaire

ø mm	REF
8	75.04.57-080
10	75.04.57-100
12	75.04.57-120
14	75.04.57-140
16	75.04.57-160
18	75.04.57-180



Setzinstrument MS-30®  
 Setting device MS-30®  
 Instrument de pose MS-30®

REF  
72.00.40



Ein-/Ausschläger  
 Impactor/extractor  
 Impacteur/extracteur

REF  
75.00.36



Markraumstößel  
 Introduction rod for medullary plug  
 Poussoir pour cavité médullaire

REF  
75.04.56



Ausschlaginstrument  
 Extraction instrument  
 Instrument d'extraction

REF  
75.85.75



Reponierhebel  
 Repositioning lever  
 Levier de réduction

REF  
75.01.38



Kunststoffaufsatz  
 Synthetic top  
 Calotte synthétique

REF  
78.00.38

Zementstößel, klein  
 Cement pusher, small  
 Poussoir pour ciment, petit

REF  
75.00.50

**Auf Anfrage**  
**On request**  
**Sur demande**



Führungsinstrument MS-30®  
 Guiding device MS-30®  
 Instrument de guidage MS-30®  
 REF  
 01.00353.300



Inbusschlüssel (für Messdorn)  
 Allen key (for introducing plug)  
 Clé inbus (pour mandrin de mesure)  
 REF  
 75.00.51



Reponieraufsatz  
 Repositioning top  
 Calotte de réduction  
 ø mm REF  
 22 78.00.38-22  
 32 78.00.38-32  
 36 78.00.38-36

**Handgriff**  
**Handle**  
**Poignée**

REF  
 72.00.94-01



**Gewindestange**  
**Threaded rod**  
**Tige filetée**

REF  
 72.00.94-02

Testkopf für HTP, Konus 12/14  
 Trial head for THR, cone 12/14  
 Tête d'essai pour PTH, cône 12/14

Grösse/Size/Taille	ø mm	REF
S	22	73.11.22-05
M	22	73.11.22-06
L	22	73.11.22-07



Adapter  
 Adapter  
 Adaptateur  
 REF  
 70.00.50

**Standardverriegelungsstück**  
**Standard bolt**  
**Pièce de verrouillage standard**

REF  
 72.00.94-03

S	32	01.01559.132
M	32	01.01559.232
L	32	01.01559.332
XL	32	01.01559.432



**Laterales Verriegelungsstück**  
**Lateral bolt**  
**Pièce de verrouillage latérale**

REF  
 01.00359.301

S	36	01.01559.136
M	36	01.01559.236
L	36	01.01559.336
XL	36	01.01559.436

Kastenmeissel  
 Ciseau rectangulaire  
 Boxed chisel

REF  
 72.13.02-10

**Zielgerät**  
**Positioning guide**  
**Guide de positionnement**

REF  
 72.00.94-04



Exzentrischer Testkopf für lateralen Schaft MS-30®  
 Eccentric test head for MS-30® lateral  
 Tête d'essai excentrique pour MS-30® latéral

Grösse/Size/Taille	ø mm	REF
S	32	01.00359.132
M	32	01.00359.232
L	32	01.00359.332
XL	32	01.00359.432
S	36	01.00359.136
M	36	01.00359.236
L	36	01.00359.336
XL	36	01.00359.436

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



[www.zimmer.com](http://www.zimmer.com)

Lit.-Nr. 06.01189.012 – Ed. 06/2005 WL



# Materials, Surface Finishes and Coatings

## Units and Conversions

Micrometer = m x 10<sup>-6</sup> = micron = μm  
 Micro-inch = in x 10<sup>-6</sup> = μ in = .0254 μm  
 R<sub>a</sub> = Symbol for roughness, μ in or μm

Materials* Medžiagos apibūdinimas	Medžiagos sudėtis	Didžiausias stiprumas	Standumas	Produktas
Material Description	Material Composition	Ultimate Strength ksi (1000lbs.sq-in)	Stiffness MON/m <sup>2</sup>	Products
Titanium Alloy (Protasul™-64)	Ti6Al4V	120 ksi	16.5 M-N/m <sup>2</sup>	APR®, Converge®, Natural-Hip™, Precedent™
Titanium Alloy (Protasul-100)	Ti6Al7Nb	130 ksi	15.2 M-N/m <sup>2</sup>	Alloclassic®, S-L Revision™ (Wagner)
<b>Cobalt-Chrome Alloy</b> Kobalto chro- mo lydinys	<b>Co,Cr,and Mo</b>	170 ksi	30.0 M-N/m <sup>2</sup>	APR, Natural-Hip, <b>Femoral Heads</b> (šlaunikaulio galva)
Titanium (Protasul-Ti)	cp Ti	80 ksi	15.5 M-N/m <sup>2</sup>	Allofit™, CSTi™ Porous Coatings, Cages
<b>Stainless Steel (Protasul-S30)</b> Nerūdijantis plienas	<b>FeCr22Ni10</b> <b>MnMo2NNb</b>		<b>MS-30™</b>	

## 4. Slaunikaulinio komponento medžiaga – medicininis nerūdijantis plienas

\* Materials for each implant design are selected for their strength, flexibility, bearing properties, and biocompatibility. Processes such as casting, forging, sintering, geometry, and surface finish affect strength and stiffness.

## Surface Finish\*\*

Surface Finish Description	R <sub>a</sub> (Approximate)		Products
	Titanium	Cobalt-Chrome	
Grit Blast	250 μ in (6 μm)	190 μ in (5 μm)	APR (distally textured, fully textured), APR Cobalt-Chrome (Proximally), Precedent, S-L Revision (Wagner), Alloclassic, Allofit, Reinforcement Cages, Natural-Hip Cobalt-Chrome (Proximally)
Bead Blast	60 μ in (1.6 μm)	40 μ in (1 μm)	Natural-Hip Cobalt-Chrome (distally), APR Cobalt-Chrome (distally)
400 Grit Blast	20 μ in (.5 μm)	N/A	Natural-Hip Porous (distally)
<b>Polish</b>	2 μ in (.05 μm)	2 μ in (0.05 μm)	<b>Femoral Heads, MS-30</b>
Machine Finish	16-32 μ in (.4-.8 μm)	16-32 μ in (0.4-0.8 μm)	Polyethylene inserts are machined to 16μ in

\*\* A number of different surface finishes are used on Centerpulse Orthopedics Inc. femoral and acetabular components. Blast finishes are used to improve mechanical interface and cosmetic appearance, as well as for production purposes.

## Poliruotas





**AVANTAGE®**

Acetabulum  
System

Double Mobility  
Acetabular Cups

15. Gūžduobės komponentas – dvigubo mobilumo

**BIOMET**



TOTAL ACETABULUM SOLUTIONS  
**Avantage**<sup>®</sup>  
since 1998

Double Mobility cups were devised by Pr. G. Bousquet in St-Etienne, France in the mid-70's.

The principle is to combine high joint stability through a large diameter of rotating liner, and reduced shear stresses through low friction **22.2 or 28mm heads**.

**12. Šlaunikaulio galvos diametras – 22 mm ir 28 mm**

A lot of scientific evaluation works have been conducted to emphasise:

- **High intrinsic stability achieved by the mobile liner, for recurrent dislocations indications.**

(Repeating Dislocations Treatment with the Bousquet Cup, SOFCOT 1999 - Pr Leclercq, P. Marechal, F. Menguy, J.H. Aubriot).

- **High survival rates and reduced wear.**

(Clinical Study and Wear Measures on Explants. Farizon, Maatougui, Beguin, Fessy, CHU Lyon St-Etienne Journées Lyonnaises de Chirurgie de la Hanche, Lyon December 1999).

# The **AVANTAGE**<sup>®</sup> Versatility

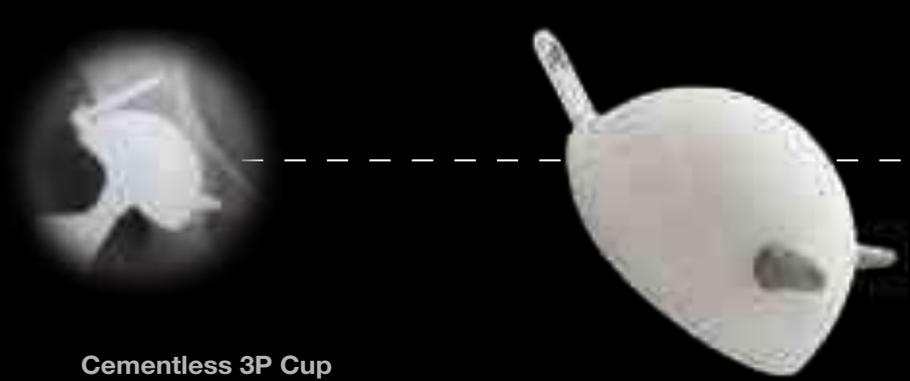
From primary to more complex revision and reconstruction cases, the

## 16. Gūžduobės tvirtinimas – cementinis ir becementinis

 <p><b>Cementless Reload Cup</b> Paprosky grade 1 to 2A</p> <ul style="list-style-type: none"><li>• Easy cup positioning.</li><li>• Vacuum plasma spray Titanium coating + HA for enhanced cup stability.</li><li>• Circumferential wings for primary fixation.</li><li>• Cyliandro-spherical design with anatomic aperture: limits PE creep and risk of dislocation. Makes the cup positioning more forgiving.</li></ul>	 <p><b>Cemented Cup</b> Paprosky grade 1 to 2A</p> <ul style="list-style-type: none"><li>• Fully polished.</li></ul>
--	---

## 19. Gūžduobės dizainas - cilindrinis-sferinis dizainas su padidinta judesių amplitudė, anatomiškas. Apskritimi sparnai pirminiam stabilumui pagerinti.

### Classification of Paprosky

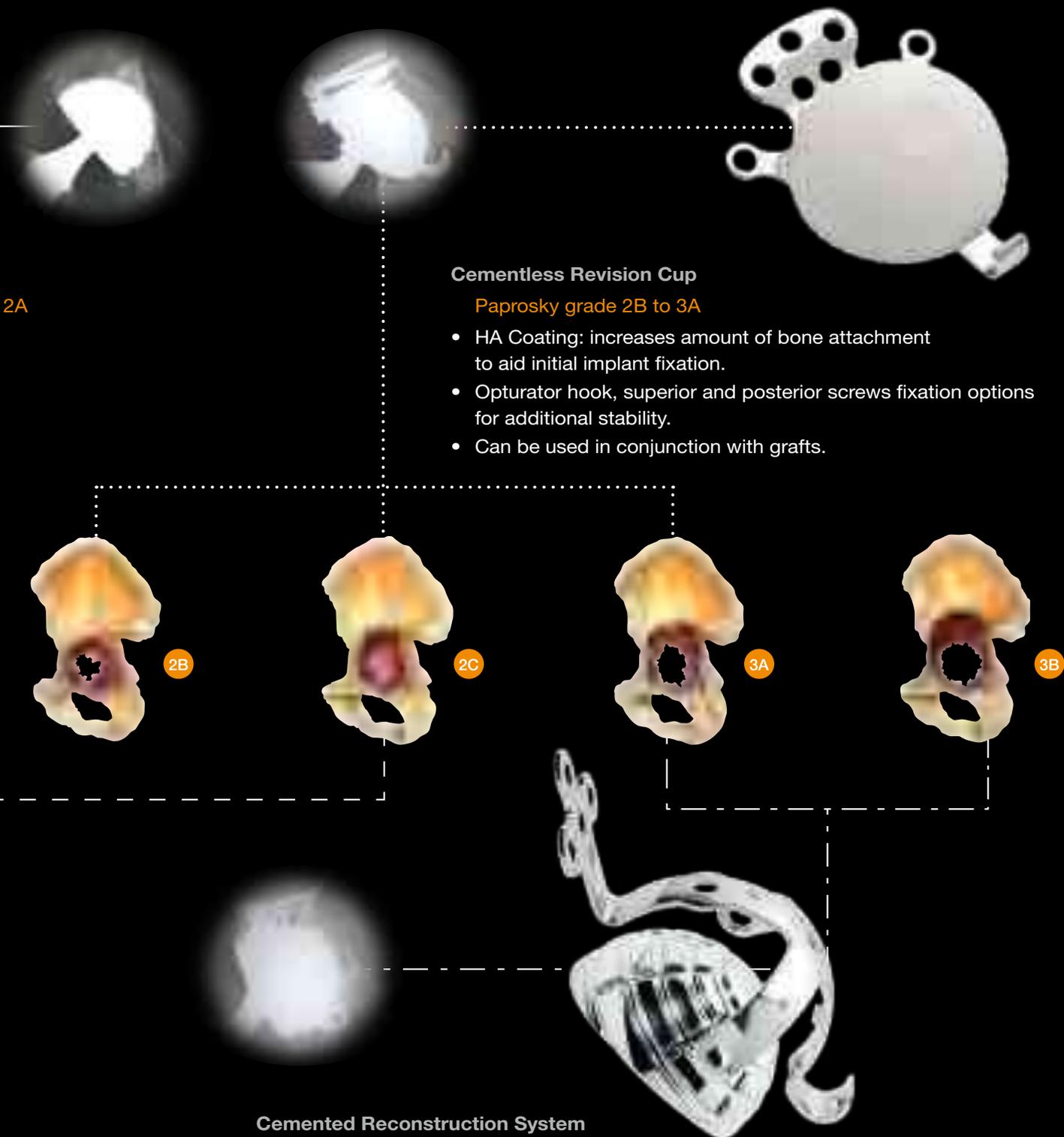


### Cementless 3P Cup

Paprosky grade 1, 2A and 2C

- Ischial and pubic pegs combined with a Ø 4.5mm cortical screw for greater primary stability.
- HA coating: “Increases attachment of bone and lead to a more even distribution of bone over the surface of the implant.” (1)

comprehensive AVANTAGE® System addresses most surgical needs.



### Cementless Revision Cup

Paprosky grade 2B to 3A

- HA Coating: increases amount of bone attachment to aid initial implant fixation.
- Opturator hook, superior and posterior screws fixation options for additional stability.
- Can be used in conjunction with grafts.

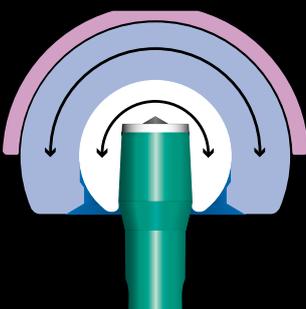
### Cemented Reconstruction System

Paprosky grade 3A to 3B

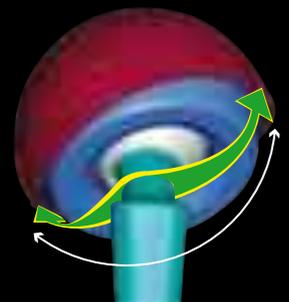
- The AVANTAGE® Cemented Cup can be used in combination with a reinforcement plate to rebuild the acetabulum and support grafts.
- A PMMA layer helps even stress distribution on grafts.
- 4 sizes allow for acetabular reconstruction which closely matches the patient anatomy.

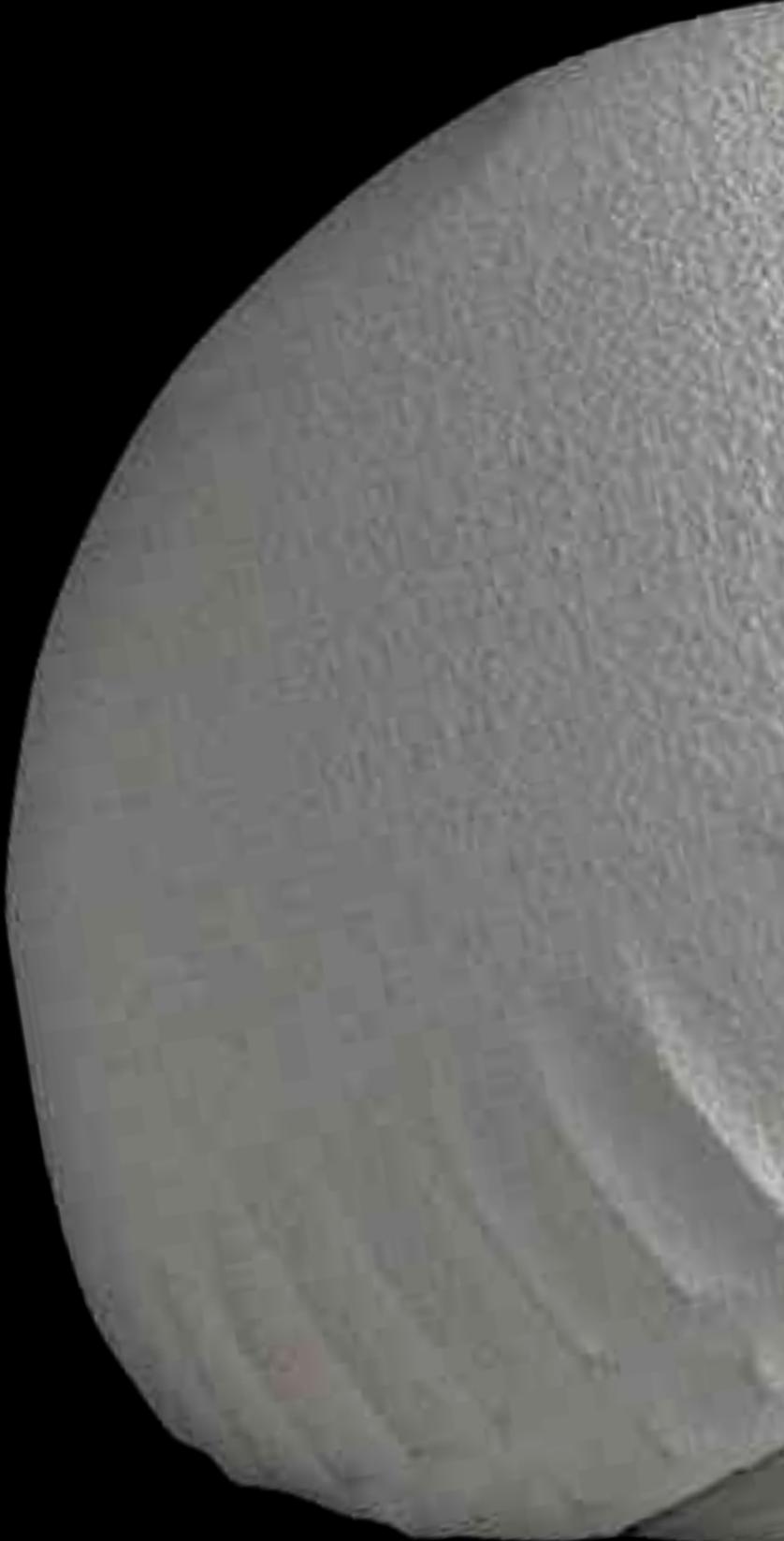


The double mobility principle is aimed to provide intra-joint stability to reduce dislocation risk (mobility of the liner inside the metal cup) while maintaining an important range of motion.



The double mobility principle improves the results in revision surgeries, for which joint stability and respect of the function of the joint are very important.





1. Blunn, et al. JBJS Vol.83-B #1, January 2001.

AVANTAGE® implants have been developed in collaboration with the AVANTAGE® group of surgeons.

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MED ISO 13485



**AVANTAGE<sup>®</sup>**  
Acetabulum System

**Surgical Technique**





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# 1. Pre-Operative Planning

Pre-operative planning can be achieved with AVANTAGE® X-ray templates or digitally by means of a PAC system.

It is necessary to use a magnification marker with a known dimension to carry out accurate templating of the anatomy.



# 2. Surgical Exposure

The AVANTAGE® hip system can be implanted using any of the standard approaches for total hip replacement.



### 3. Acetabular Reaming

It is important to start reaming with the smallest diameter grater reamer available, perpendicular to the acetabulum, in order to find the true acetabular floor.



Sequential reaming then follows, ensuring that the reamer handle is angled at the same orientation of the component to be implanted, 40 to 45 degrees of inclination and 10 to 15 degrees of anteversion (Figure 1).



Figure 1

### 4. Acetabular Gauging

**The AVANTAGE® cup is implanted size to size:**

**Reaming diameter = Gauging diameter  
= Definitive implant diameter**

Assemble the appropriate trial cup onto the trial cup positioner. The gauge selected should correlate directly with the size of acetabular component.



Impact the trial cup in the reamed acetabulum. A 5mm slot on the trial cup indicates the future position of the superior rim of the definitive implant. This slot must be positioned towards the superior rim of the acetabulum (Figure 2).

Once impacted, the trial cup should remain stable in the acetabulum. Should the trial cup be unstable, it may be necessary to increase the diameter of the final grater reamer. Should the stability of the trial cup remain unsatisfying, it is recommended to use the **AVANTAGE® 3P**.

The supplementary pegs & the 4.5mm screw of the 3P cup will enhance the acetabular primary fixation.



Figure 2

## 5. Acetabular Implant Insertion

Assemble the black impactor tips, corresponding to the definitive acetabular component size, with the impaction handle using the expansion rod.



Partially engage the thread of the tip of the expansion rod into the impaction handle through the black impactor tip. Care must be taken not to expand the diameter of the black impactor tip.

Mount the final implant onto the impaction assembly. Align one of the black impactor tip slots with the laser mark on the superior rim of the definitive implant, and fully screw the impaction handle until the cup is secured on the expanded tip (Figure 3).

Care must be taken to position the flat surface of the black impactor tip flush with the superior rim of the cup.



Figure 3

### Cup impaction

The 45-degree angulation guide can be mounted onto the impaction handle for an accurate cup inclination (Figure 4).

Partially unscrew the impaction handle and tap it gently to release the black impactor tip from the cup.



Figure 4

Should the cup be inadequately oriented, the orientation nozzle can be used as shown (Figure 5).



Should there be need to carry out additional impaction of the acetabular component, the final impaction tip can be used.



Figure 5

## 6. Trial Inserts

The trial inserts are available in 22mm diameter (green inserts) and 28mm (blue inserts).

Select the appropriate trial head and seat it inside the trial insert corresponding to the implanted cup size.

Sit the trial assembly onto the trial stem or definitive femoral implant (Figure 6).

Use the head pusher to reduce the trial into the AVANTAGE® cup.

The usual assessment of joint stability, range of motion and leg length should be carried out (Figure 7).



Figure 6



Figure 7

## 7. Definitive Implants Reduction

Assemble the appropriate femoral head and polyethylene insert using the press.

Open the press completely.

Slide the press base plate over the fork of the press to assemble a modular femoral head and insert. Tighten the base plate with the adjusting knob. Should a monobloc femoral implant be implanted, the fork of the press must be positioned under the femoral head (Figure 8).

Place the press assembly on the instrumentation table and position the femoral head on the black lug of the base plate.

Position and hold the insert above the femoral head.

Rotate the press handle clockwise until the head is forced into the insert (Figure 9).

A distinctive “pop” sound should be heard.

Open the press by rotating the press handle anticlockwise and check that the femoral head rotates freely in the insert (Figure 10).

Use the press again should the femoral head be inappropriately assembled into the polyethylene insert.



Figure 8



Figure 9



Figure 11

Impact the assembled femoral head and insert on the neck of the final femoral implant and gently impact them using the head reducer (Figure 11).

Finally, reduce the final implants into the AVANTAGE® cup (Figure 12).



Figure 10



Figure 12

## 3P Cup

### Preparation / Impaction

The assembly of the AVANTAGE® 3P on the impaction device is similar to that of the AVANTAGE® RELOAD (See page 5).

When using the 3P cup, the superior rim laser mark is replaced by the superior plate.

Prior to impaction, it is necessary to bend the superior plate so that it fits the anatomy of the acetabulum contour. Use the bending iron whilst securely holding the cup (Figure 13).

The cup is positioned, oriented and impacted in the same fashion as the AVANTAGE® RELOAD implant (See page 5) (Figure 14).



Figure 13

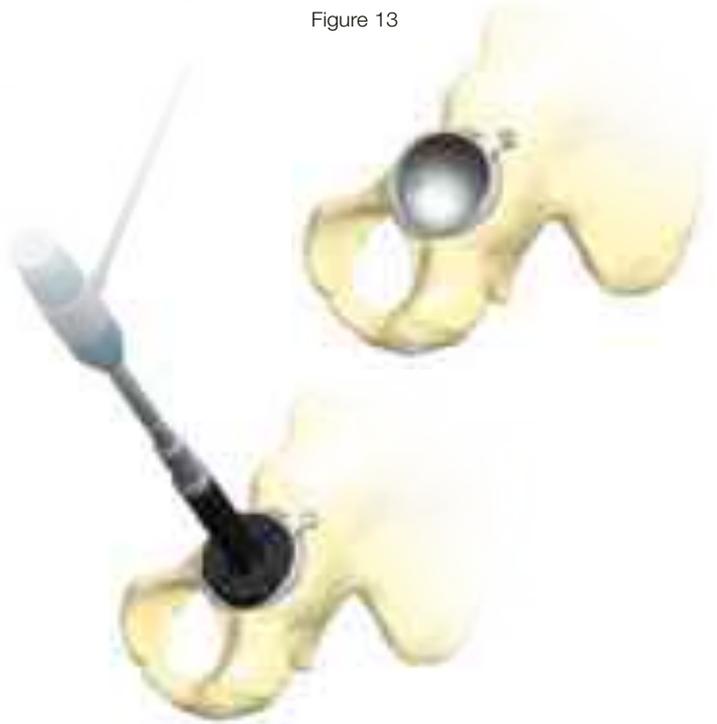


Figure 14

### Pegs positioning

The 2 pegs should be implanted prior to the 4.5mm screw insertion.

Using the flexible drill shaft, the short drill and the drill guide, drill through the cup holes. Finalise the peg preparation with the peg shaper (Figure 15).



Figure 15

Introduce the peg with the peg clamp. Gently impact the peg into its final position with the straight or curved peg impactor (Figure 16).



Figure 16

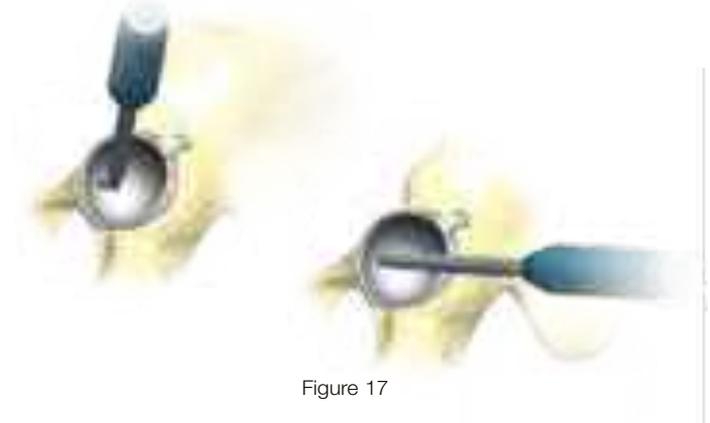


Figure 17

Ensure that the pegs are sufficiently inserted and do not protrude nor disturb the insert mobility (Figure 17).

### Screw position and reduction

Cortical screw positioning (4.5mm diameter).

Drill the superior rim of the acetabulum with the long 3.2mm diameter drill through the drill guide (Figure 18).

Measure the screw length with the depth gauge.

Insert the 4.5mm screw and tighten it firmly with the screwdriver (Figure 19).

Assemble the definitive femoral head and poly insert and reduce the joint as shown page 7 (Figure 20).



Figure 18

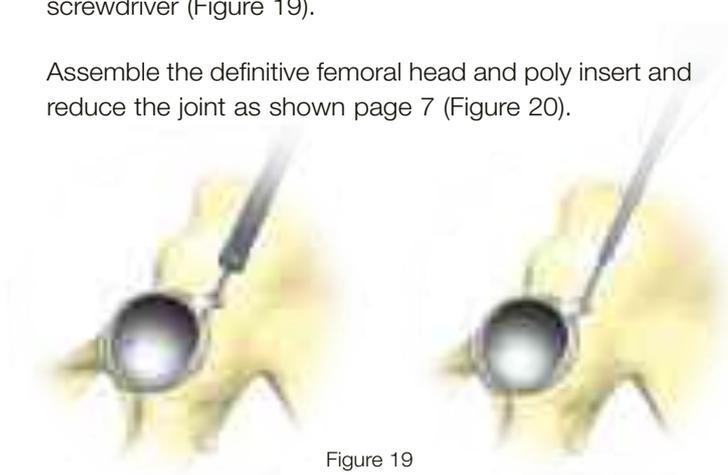


Figure 19

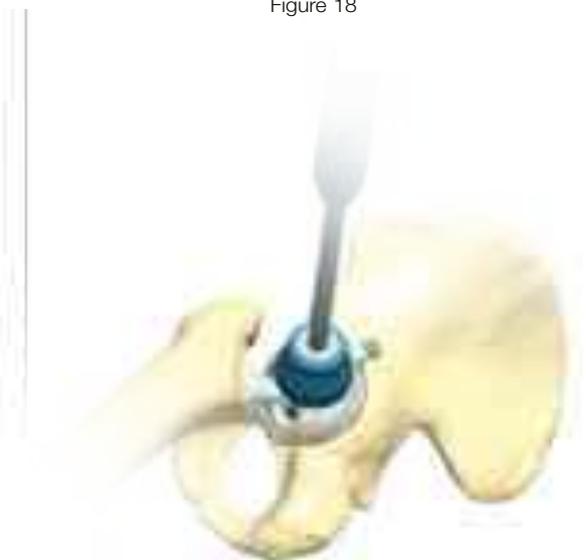


Figure 20

# Cemented Cup

When using the cemented cup, it is important to note the operative technique differs to the cementless version.

To select the final implant size, it is recommended to choose a cup smaller than the trial cup in order to allow a minimal cement mantle around the implant.

The final implant and impaction device assembly remains unchanged. However, the impaction tip should be one size smaller than that of the final cup.



Example	
Reamer	= 54mm
Trial cup	= 54mm
Definitive implant	= 52mm
Impaction tip	= 50mm

After cementing of the reamed acetabulum, the cemented AVANTAGE® cup is positioned and inserted as shown page 5 (Figure 21).

Release and remove the impaction tip without waiting for the cement to become hard (Figure 22).



Figure 23



Figure 21



Figure 22



Figure 24

Pressurise the implant until the cement hardens using the final impactor (Figure 23).

During cement pressurisation, remove the surplus of cement from around the implant (Figure 24).

Carry out the trial reduction to assess leg length and joint stability.

Assemble and insert the definitive femoral head, then reduce the joint as shown page 7 (Figure 25).



Figure 25

# Revision Cup

## Impaction

Impaction of the AVANTAGE® Revision cup assembly is achieved in a similar fashion to the AVANTAGE® RELOAD cup.

When using a Revision cup, the superior rim laser mark is replaced with the superior plate.

Prior to impaction, it is necessary to bend the superior and the posterior plates so that they fit the anatomy of the acetabulum.

Use the bending iron whilst securely holding the cup (Figure 26).

Position the inferior obturator hook, then orient and impact the implant in the same fashion as described page 5 (Figure 27).



Figure 26



Figure 27



Figure 28



Figure 29

## Screw positioning and reduction

4.5mm cortical screw positioning.

Drill using the long 3.2mm diameter drill and the drill guide; you can insert 5 screws through the superior plate and one through the posterior plate (Figure 28).

Measure the screw length with the depth gauge.

Thread the screws and firmly tighten them with the screw driver (Figure 29).

Assemble the definitive femoral head & insert, then reduce the joint as shown page 7 (Figure 30).

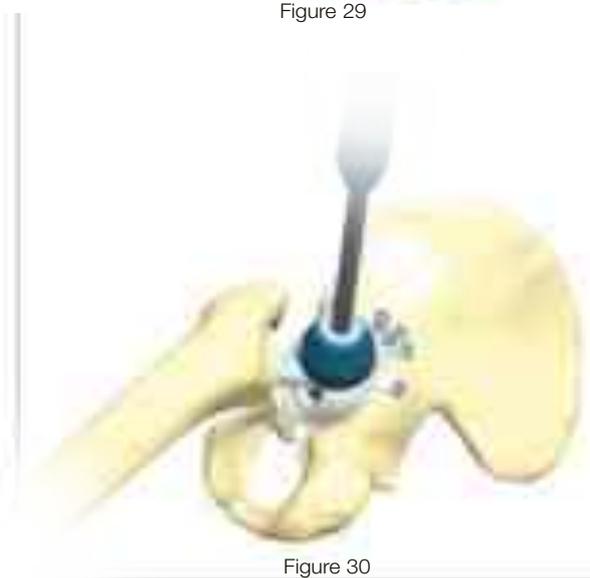


Figure 30

# Reconstruction System

## Positioning and reduction

The cemented cup combined with the reinforcement plate enables the reconstruction of the acetabulum.

Position the obturator hook of the reinforcement plate and impact the plate (Figure 31).

4.5mm cortical screw positioning.

Drill using the long 3.2mm diameter drill and the drill guide; 4 screws can be implanted through the superior part of the reinforcement plate (Figure 32).

Cement and pressurise the AVANTAGE® cemented cup using the same operative technique described page 10 (Figure 33).

Carry out the trial reduction to assess leg length and joint stability.

Assemble the definitive femoral head and insert, then reduce the joint as shown page 7 (Figure 34).



Figure 31



Figure 32



Figure 33



Figure 34

## Removal of the Insert

In revision cases, the polyethylene insert can be disassembled from the femoral head.

**ATTENTION!**

**The removed insert must not be re-implanted.**

Adjust the jaws of the insert extractor around the insert. Close the jaws tightly onto the insert, making sure the sharp pin penetrates the insert and that the femoral head is securely attached to the femoral stem (Figure 35).

Lever the handle of the insert extractor to disassemble the insert from the femoral head (Figure 36).

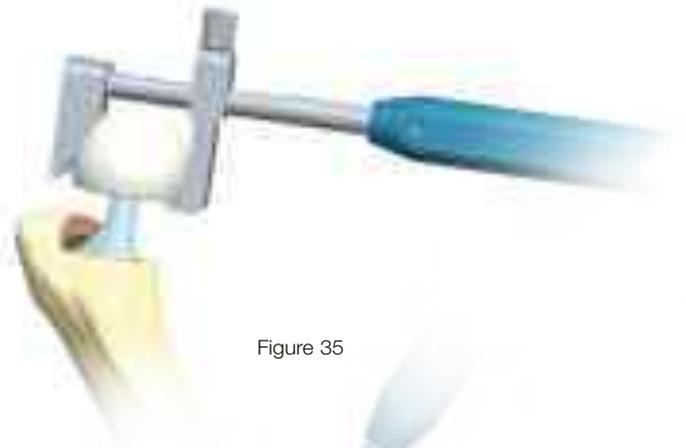


Figure 35



Figure 36

## Removal of 3P Pegs

In revision cases, the pegs can be removed by threading the tip of the peg extractor inside the pegs (Figure 37).



Figure 37

# AVANTAGE® Acetabulum System

## Implants References

### 18. Gūžduobių dydžių variacija – ne mažiau 9 dydžių

Product	Reference	Description	Size
	P0460P44	AVANTAGE® RELOAD Acetabular Cup Cementless	44
	P0460P46		46
	P0460P48		48
	P0460P50		50
	P0460P52		52
	P0460P54		54
	P0460P56		56
	P0460P58		58
	P0460P60		60
	P0460P62		62
	P0460P64		64
	P0461044	AVANTAGE® 3P Acetabular Cup Cementless	44
	P0461046		46
	P0461048		48
	P0461050		50
	P0461052		52
	P0461054		54
	P0461056		56
	P0461058		58
	P0461060		60
	P0461062		62
	P0461064		64
	P0461070	AVANTAGE® Peg	
	P0463044	AVANTAGE® Cemented Acetabular Cup	44
	P0463046		46
	P0463048		48
	P0463050		50
	P0463052		52
	P0463054		54
	P0463056		56
	P0463058		58
	P0463060		60
	P0464454	AVANTAGE® Reinforcement Plate	44-54
	P0464858		48-58
	P0465262		52-62
	P0465666		56-66
	P0464H48	AVANTAGE® Revision Cup	48
	P0464H52		52
	P0464H54		54
	P0464H56		56
	P0464H58		58
	P0464H62		62
	P0464H66		66

Product	Reference	Description	Size
	P0560044	AVANTAGE® Insert Ø 22.2mm	44
	P0560046		46
	P0560048		48
	P0560050		50
	P0560052		52
	P0560054		54
	P0560056		56
	P0560058		58
	P0560060		60
	P0560062		62
	P0560064		64
	P0560066		66
	P0561050	AVANTAGE® Insert Ø 28mm	50
	P0561052		52
	P0561054		54
	P0561056		56
	P0561058		58
	P0561060		60
	P0561062		62
	P0561064		64
P0561066	66		
	P0560E44	AVANTAGE® Insert E1™ Ø 22.2mm	44
	P0560E46		46
	P0560E48		48
	P0560E50		50
	P0560E52		52
	P0560E54		54
	P0560E56		56
	P0560E58		58
	P0560E60		60
	P0560E62		62
	P0560E64		64
	P0560E66		66
	P0561E50	AVANTAGE® Insert E1™ Ø 28mm	50
	P0561E52		52
	P0561E54		54
	P0561E56		56
	P0561E58		58
	P0561E60		60
	P0561E62		62
	P0561E64		64
P0561E66	66		

# AVANTAGE® Acetabulum System

## Implants References

Product	Reference	Description	Size
	P0606020	AVANTAGE® Ø 4.5mm Screw	20
	P0606022		22
	P0606024		24
	P0606026		26
	P0606028		28
	P0606030		30
	P0606032		32
	P0606034		34
	P0606036		36
	P0606038		38
	P0606040		40
	P0606042		42
	P0606044		44
	P0606046		46
	P0606048		48
	P0606050		50
	P0606052		52
	P0606054		54
	P0606056		56
	P0606058		58
P0606060	60		
P0606062	62		
P0606064	64		

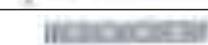
## Instrumentation References

<b>A0900046</b>	<b>AVANTAGE® Instrumentation</b>
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Product	Reference	Description	Size
	A4610044	AVANTAGE® Trial Cup	44
	A4610046		46
	A4610048		48
	A4610050		50
	A4610052		52
	A4610054		54
	A4610056		56
	A4610058		58
	A4610060		60
	A4610062		62
	A4610064		64
	A4620044	AVANTAGE® Trial Insert Ø 22mm	44
	A4620046		46
	A4620048		48
	A4620050		50
	A4620052		52
	A4620054		54
	A4620056		56
	A4620058		58
	A4620060		60
	A4620062		62
	A4620064		64
	A4630050	AVANTAGE® Trial Insert Ø 28mm	50
	A4630052		52
	A4630054		54
	A4630056		56
	A4630058		58
	A4630060		60
	A4630062		62
	A4630064		64
	A4640044	AVANTAGE® Impactor Tip	44
	A4640046		46
	A4640048		48
	A4640050		50
	A4640052		52
	A4640054		54
	A4640056		56
	A4640058		58
	A4640060		60
	A4640062		62
	A4640064		64
	A4650001	AVANTAGE® Cup Impaction Handle	
	A4650002	AVANTAGE® Expanding Rod	
	A4650004	AVANTAGE® Peg Shaper	
	A4650019	AVANTAGE® Drill Guide	
	A0208002	Twist Drill Ø 3.5mm Long	70
	A4650020	Small Drill Ø 3.5mm	35

# AVANTAGE® Acetabulum System

## Instrumentation References

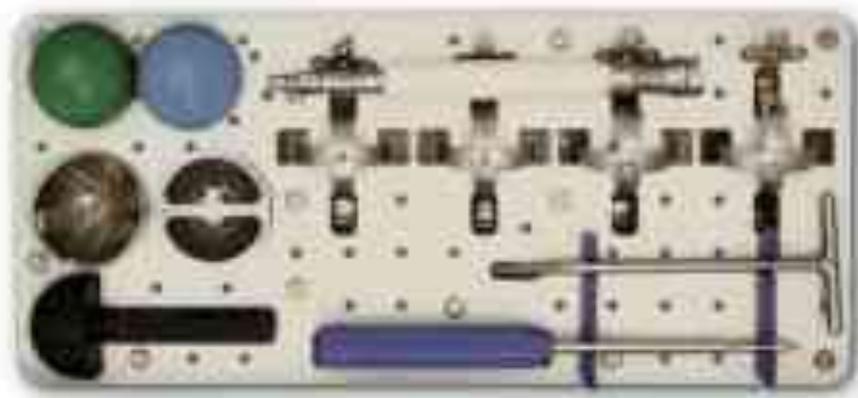
Product	Reference	Description	Size
	A0208004	Drill Flexible Shaft	
	A4650008	Straight Peg Inserter	
	A4650009	Curved Peg Inserter	
	A4650010	Peg Clamp	
	A4650012	Insert Extractor	
	A4650014	Peg Extractor	
	A0310074	Plate Bender	
	A4650013	AVANTAGE® Trial Cup Positioner	
	A4650011	AVANTAGE® Insert Press	
	A4650015	AVANTAGE® Final Orientation/Impaction Tip	
	A4650016	AVANTAGE® Head/Liner Pusher Tip	
	A4650024	AVANTAGE® Cup Positioner V3	
	A4650017	AVANTAGE® Impaction Handle	L. 250
	A0207007	ALIZE® 45° Angulation Guide Rod	
	A0305003	Drill	Ø 3.2
	A4650071	Long Screwdriver	H. 3.5
	MJP310010	Depth Gauge for Acetabular Screws	
	31-100644	Concept Grater Reamer	44
	31-100646		46
	31-100648		48
	31-100650		50
	31-100652		52
	31-100654		54
	31-100656		56
	31-100658		58
	31-100660		60
	31-100662		62
31-100664	64		
	31-100637-3	Modified AO Reamer Handle 9" V.3	

# AVANTAGE® Acetabulum System

## Revision Complement Instrumentation References

<b>A0900067</b>	<b>AVANTAGE® Revision Complement Instrumentation</b>
-----------------	--

Product	Reference	Description	Size
	A4654454	AVANTAGE® Trial Revision Cage	44/54
	A4654858		48/58
	A4655262		52/62
	A4655666		56/66
	A4610066	AVANTAGE® Trial Cup	66
	A4620066	AVANTAGE® Trial Insert Ø 22mm	66
	A4630066	AVANTAGE® Trial Insert Ø 28mm	66
	A4640066	AVANTAGE® Impactor Tip	66
	3542.300	CMK3 Trial Cup Pusher	
	31-100637-3	Modified AO Reamer Handle 9" V.3	
	31-100666	Concept Grater Reamer	66



**A4650101** AVANTAGE® Revision Tray Only

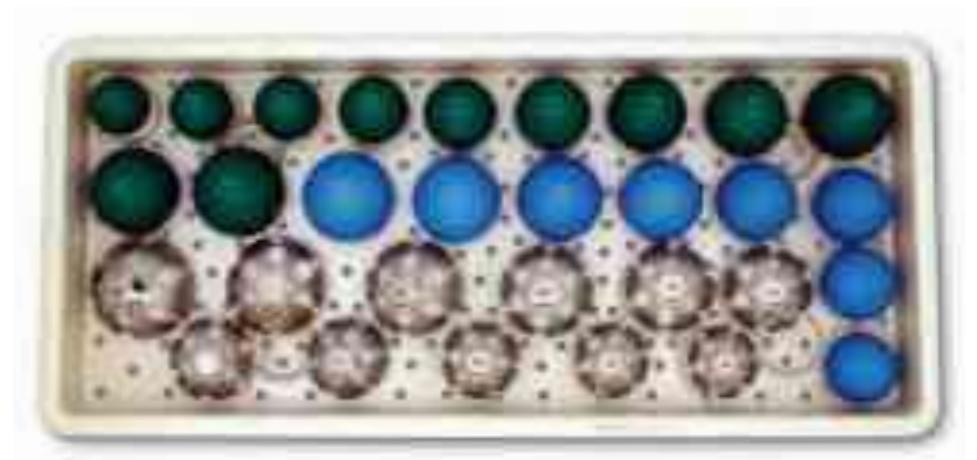
Reference	Description
A4650102	AVANTAGE® Revision Tray Lid
E01C0013	Cont 600 x 300 x 110 Alu 1F Ref B037

# AVANTAGE® Acetabulum System

## Tray References



**A4650090** AVANTAGE® Primary Instr Tray 1 Only



**A4650092** AVANTAGE® Primary Instr Tray 2 Only



**A4650094** AVANTAGE® Primary Instr Tray 3 Only



**A4650096** AVANTAGE® Primary Instr Tray 4 Only



**A4650098** Acetabular Reamers Case

Reference	Description
A4650091	AVANTAGE® Primary Instr Tray 1 Lid
A4650093	AVANTAGE® Primary Instr Tray 2 Lid
A4650095	AVANTAGE® Primary Instr Tray 3 Lid
A4650097	AVANTAGE® Primary Instr Tray 4 Lid
A4650099	Acetabular Reamers Case Cover
E01C0022	Cont 600 x 300 x 210 Alu 1F Ref B039
E01C0013	Cont 600 x 300 x 110 Alu 1F Ref B037



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MED ISO 13485

# CoCr Femoral Heads

## Ordering Information

### Implants

#### Spherical CoCr Femoral Heads

Product	Description
	Zimmer Biomet® 12/14 CoCr Heads

11. Šlaunikaulinio komponento kaklo konusas – 12/14

14. Šlaunikaulio galvutės kaklo ilgio variacija – ne mažiau 4

Šlaunikaulio galvutės kaklo ilgio variacija  
13. Šlaunikaulio galvos diametras – 22 ir 28 mm.

Offset	Diameter	Part Number
-2 mm	22.2 mm	802202201
0 mm		802202202
+3 mm		802202203
-3.5 mm	28 mm	802202801
0 mm		802202802
+3.5 mm		802202803
+7 mm		802202804
+10.5 mm		802202805
-3.5 mm	32 mm	802203201
0 mm		802203202
+3.5 mm		802203203
+7 mm		802203204
+10.5 mm		802203205
-3.5 mm	36 mm	802203601
0 mm		802203602
+3.5 mm		802203603
+7 mm		802203604
+10.5 mm		802203605
-3.5 mm	40 mm	802204001
0 mm		802204002
+3.5 mm		802204003
+7 mm		802204004
+10.5 mm		802204005
-3.5 mm	44 mm	802204401
0 mm		802204402
+3.5 mm		802204403
+7 mm		802204404
+10.5 mm		802204405

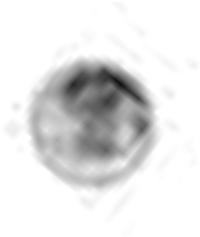
**Implants (cont.)**

## Spherical CoCr Femoral Heads (cont.)

Product	Description	Offset	Diameter	Part Number
	Zimmer Biomet Type 1 CoCr Heads	-5 mm	22.2 mm	163652
		-3 mm		163653
		0 mm		163651
		-6 mm	28 mm	163660
		-3 mm		163661
		0 mm		163662
		+3 mm		163663
		+6 mm		163638
		+9 mm		163665
		+12 mm		163666
		-6 mm	32 mm	163667
		-3 mm		163668
		0 mm		163669
		+3 mm		163670
		+6 mm		163674
		+9 mm		163672
		+12 mm		163673
		-6 mm	36 mm	11-363660
		-3 mm		11-363661
		0 mm		11-363662
		+3 mm		11-363663
		+6 mm		11-363664
		+9 mm		11-363665
		+12 mm		11-363666
		-6 mm	40 mm	010001037
		-3 mm		010001036
		0 mm		010001035
+3 mm	010001034			
+6 mm	010001033			
+9 mm	010001032			
+12 mm	010001031			
-6 mm	44 mm	010001044		
-3 mm		010001043		
0 mm		010001042		
+3 mm		010001041		
+6 mm		010001040		
+9 mm		010001039		
+12 mm		010001038		

**Implants** (cont.)

## Freedom® CoCr Femoral Heads

Product	Description	Offset	Diameter	Part Number			
	Zimmer Biomet 12/14 CoCr Freedom Heads	-3 mm	32 mm	802403201			
		0 mm		802403202			
		+3 mm		802403203			
		+6 mm		802403204			
	Zimmer Biomet Type 1 CoCr Freedom Heads		-6 mm	36 mm	802403601		
			-3 mm		802403602		
			0 mm		802403603		
			+3 mm		802403604		
			+6 mm		802403605		
			+9 mm		802403606		
			Zimmer Biomet Type 1 CoCr Freedom Heads		-6 mm	32 mm	110025133
					-3 mm		110025132
					0 mm		110025131
					+3 mm		110025130
+6 mm		110025134					
Zimmer Biomet Type 1 CoCr Freedom Heads		-6 mm	36 mm	11-107016			
		-3 mm		11-107017			
		0 mm		11-107018			
		+3 mm		11-107019			
		+6 mm		11-107020			
		+9 mm		11-107021			

## Instruments

### Provisional Femoral Heads

Product	Description	Part Number
	Zimmer Biomet 12/14 Spherical Heads Tray	110040312
	Zimmer Biomet 12/14 Trial Heads Lid	110040314

Product	Description	Offset	Diameter	Part Number
	Zimmer Biomet 12/14 Provisional Heads	-2 mm	22.2 mm	803302201
		0 mm		803302202
		+3 mm		803302203
		-3.5 mm	28 mm	803302801
		0 mm		803302802
		+3.5 mm		803302803
		+7 mm		803302804
		+10.5 mm		803302805
		-3.5 mm	32 mm	803303201
		0 mm		803303202
		+3.5 mm		803303203
		+7 mm		803303204
		+10.5 mm		803303205
		-3.5 mm	36 mm	803303601
		0 mm		803303602
		+3.5 mm		803303603
		+7 mm		803303604
		+10.5 mm		803303605
		-3.5 mm	40 mm	803304001
		0 mm		803304002
		+3.5 mm		803304003
		+7 mm		803304004
		+10.5 mm		803304005
		-3.5 mm	44 mm	803304401
0 mm	803304402			
+3.5 mm	803304403			
+7 mm	803304404			
+10.5 mm	803304405			

**Instruments** (cont.)

## Provisional Femoral Heads (cont.)

Product	Description	Part Number
	Zimmer Biomet 12/14 Freedom Heads Tray	110040313
	Zimmer Biomet 12/14 Trial Heads Lid	110040314

Product	Description	Offset	Diameter	Part Number	
	Zimmer Biomet 12/14 Freedom Provisional Heads	-3 mm	32 mm	802503201	
		0 mm		802503202	
		+3 mm		802503203	
		+6 mm		802503204	
			-6 mm	36 mm	802503601
			-3 mm		802503602
			0 mm		802503603
			+3 mm		802503604
			+6 mm		802503605
			+9 mm		802503606

**Instruments (cont.)**

## Provisional Femoral Heads (cont.)

Product	Description	Part Number
	Head Provisional Type 1 Half Tray (Empty)	110002768

Product	Description	Offset	Diameter	Part Number
	Zimmer Biomet Type 1 Provisional Heads	-5 mm	22.2 mm	010002484
		-3 mm		010002483
		0 mm		010002482
		-6 mm	28 mm	010002491
		-3 mm		010002490
		0 mm		010002489
		+3 mm		010002488
		+6 mm		010002487
		+9 mm		010002486
		+12 mm		010002485
		-6 mm	32 mm	010002498
		-3 mm		010002497
		0 mm		010002496
		+3 mm		010002495
		+6 mm		010002494
		+9 mm		010002493
		+12 mm		010002492
		-6 mm	36 mm	010002505
		-3 mm		010002504
		0 mm		010002503
		+3 mm		010002502
		+6 mm		010002501
		+9 mm		010002500
		+12 mm		010002499
-6 mm	40 mm	010002512		
-3 mm		010002511		
0 mm		010002510		
+3 mm		010002509		
+6 mm		010002508		
+9 mm		010002507		
+12 mm		010002506		
-6 mm	44 mm	010002519		
-3 mm		010002518		
0 mm		010002517		
+3 mm		010002516		
+6 mm		010002515		
+9 mm		010002514		
+12 mm		010002513		



- ✓ Indicates "Combination has been assessed as functionally compatible by Zimmer Biomet"
- Indicates "Combination has either not been assessed or is not functionally compatible"

**Femoral Stems**

	G7 Liners Non-Constrained	G7 Liners Constrained
Alloclassic SL and SLO	✓	■
Alloclassic SLL Revision Stem	✓	■
Alloclassic Variall SLV Stem	✓	■
Avenir Cemented	✓	■
Avenir Muller Stem	✓	■
Avenir Complete Stem	✓	■
CLS Sportorno	✓	■
CPT 12/14	✓	■
CPT 12/14 Long Stem	✓	■
CPT 6 degree	✓	■
Fitmore Stem	✓	■
M/L Taper Stem - Standard and Reduced Neck Length	✓	■
M/L Taper with Kinectiv Technology	✓	■
Metabloc Cemented	✓	■
Metabloc Cementless	✓	■
MS-30 stem	✓	■
Original M.E. Muller Stem	✓	■
TM Primary Hip Stem	✓	■
VerSys Advocate Stem	✓	■
VerSys CEM/REV/CALCAR (CRC)	✓	■
VerSys Fiber Metal Midcoat	✓	■
VerSys Fiber Metal Taper	✓	■
Versys Beaded Fullcoat (6in 7.5in and 8in)	✓	■
Versys Heritage stem	✓	■
VerSys LD/Fx cemented	✓	■
VerSys LD/Fx Press-Fit	✓	■
Wagner Cone Prosthesis Stem	✓	■
Wagner SL Revision stem	✓	■
CLS Brevius Stem with Kinectiv Technology	✓	■
Exafit Stem	✓	■
Exafit Revision Stem	✓	■
PF Primary Stem	✓	■
PF Revision Stem	✓	■
Revitan Revision System	✓	■
Weber Fix Cemented Stem	✓	■
ZMR Revision System	✓	■

**CoCr Femoral Heads**

		G7 Liners Non-Constrained	G7 Liners Constrained
00-8018-028-01	12/14 COCR FEMORAL HEAD 28MM -3.5	✓	■
00-8018-028-02	12/14 COCR FEMORAL HEAD 28MM +0	✓	■
00-8018-028-03	12/14 COCR FEMORAL HEAD 28MM +3.5	✓	■
00-8018-028-14	12/14 COCR FEMORAL HEAD 28MM +7	✓	■
00-8018-028-05	12/14 COCR FEMORAL HEAD 28MM +10.5	✓	■
00-8018-032-01	12/14 COCR FEMORAL HEAD 32MM -3.5	✓	■
00-8018-032-02	12/14 COCR FEMORAL HEAD 32MM +0	✓	■
00-8018-032-03	12/14 COCR FEMORAL HEAD 32MM +3.5	✓	■
00-8018-032-14	12/14 COCR FEMORAL HEAD 32MM +7	✓	■
00-8018-032-05	12/14 COCR FEMORAL HEAD 32MM +10.5	✓	■
00-8018-036-01	12/14 COCR FEMORAL HEAD 36MM -3.5	✓	■
00-8018-036-02	12/14 COCR FEMORAL HEAD 36MM +0	✓	■
00-8018-036-03	12/14 COCR FEMORAL HEAD 36MM +3.5	✓	■
00-8018-036-04	12/14 COCR FEMORAL HEAD 36MM +7	✓	■
00-8018-036-05	12/14 COCR FEMORAL HEAD 36MM +10.5	✓	■
00-8018-040-01	12/14 COCR FEMORAL HEAD 40MM -3.5	✓	■
00-8018-040-02	12/14 COCR FEMORAL HEAD 40MM +0	✓	■
00-8018-040-03	12/14 COCR FEMORAL HEAD 40MM +3.5	✓	■
00-8018-040-04	12/14 COCR FEMORAL HEAD 40MM +7	✓	■
00-8018-040-05	12/14 COCR FEMORAL HEAD 40MM +10.5	✓	■
00-9026-028-00	6 DEGREE COCR FEMORAL HEAD 28MM +0 (S)	✓	■
00-9026-028-35	6 DEGREE COCR FEMORAL HEAD 28MM +3.5 (S+)	✓	■
00-9026-029-00	6 DEGREE COCR FEMORAL HEAD 28MM +7 (M)	✓	■
00-9026-029-35	6 DEGREE COCR FEMORAL HEAD 28MM +10.5 (M+)	✓	■
00-9026-030-00	6 DEGREE COCR FEMORAL HEAD 28MM +14 (L)	✓	■
00-9026-032-00	6 DEGREE COCR FEMORAL HEAD 32MM +0 (S)	✓	■
00-9026-032-35	6 DEGREE COCR FEMORAL HEAD 32MM +3.5 (S+)	✓	■
00-9026-033-00	6 DEGREE COCR FEMORAL HEAD 32MM +7 (M)	✓	■
00-9026-033-35	6 DEGREE COCR FEMORAL HEAD 32MM +10.5 (M+)	✓	■
00-9026-034-00	6 DEGREE COCR FEMORAL HEAD 32MM +14 (L)	✓	■
00-9026-036-00	6 DEGREE COCR FEMORAL HEAD 36MM +0 (S)	✓	■
00-9026-036-03	6 DEGREE COCR FEMORAL HEAD 36MM +3.5 (S+)	✓	■
00-9026-036-07	6 DEGREE COCR FEMORAL HEAD 36MM +7 (M)	✓	■
00-9026-036-10	6 DEGREE COCR FEMORAL HEAD 36MM +10.5 (M+)	✓	■
00-9026-036-14	6 DEGREE COCR FEMORAL HEAD 36MM +14 (L)	✓	■
01.01002.285	8/10 COCR FEMORAL HEAD 28MM -4 DURASUL	✓	■
01.01002.286	8/10 COCR FEMORAL HEAD 28MM +0 DURASUL	✓	■
01.01002.287	8/10 COCR FEMORAL HEAD 28MM +4 DURASUL	✓	■
01.01012.288	12/14 COCR FEMORAL HEAD 28MM +8 DURASUL	✓	■
01.01012.328	12/14 COCR FEMORAL HEAD 32MM +8 DURASUL	✓	■
01.01012.365	12/14 COCR FEMORAL HEAD 36MM -4 DURASUL	✓	■
01.01012.366	12/14 COCR FEMORAL HEAD 36MM +0 DURASUL	✓	■
01.01012.367	12/14 COCR FEMORAL HEAD 36MM +4 DURASUL	✓	■
01.01012.368	12/14 COCR FEMORAL HEAD 36MM +8 DURASUL	✓	■
01.01012.444	12/14 COCR FEMORAL HEAD 44MM -8mm DURASUL	✓	■
01.01012.445	12/14 COCR FEMORAL HEAD 44MM -4mm DURASUL	✓	■
01.01012.446	12/14 COCR FEMORAL HEAD 44MM +0 DURASUL	✓	■
01.01012.447	12/14 COCR FEMORAL HEAD 44MM +4mm DURASUL	✓	■
01.01012.448	12/14 COCR FEMORAL HEAD 44MM +8mm DURASUL	✓	■

**CoCr Femoral Heads (Cont.)**

		G7 Liners Non-Constrained	G7 Liners Constrained
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14.28.05-20	12/14 COCR FEMORAL HEAD 28MM -4 (S) DURASUL	✓	
14.28.06-20	12/14 COCR FEMORAL HEAD 28MM +0 (M) DURASUL	✓	
14.28.07-20	12/14 COCR FEMORAL HEAD 28MM +4 (L) DURASUL	✓	
14.32.05-20	12/14 COCR FEMORAL HEAD 32MM -4 (S) DURASUL	✓	
14.32.06-20	12/14 COCR FEMORAL HEAD 32MM +0 (M) DURASUL	✓	
14.32.07-20	12/14 COCR FEMORAL HEAD 32MM +4 (L) DURASUL	✓	
7210-28-000	12/14 COCR FEMORAL HEAD 28MM +0 DURASUL	✓	
7210-28-004	12/14 COCR FEMORAL HEAD 28MM -4 DURASUL	✓	
7210-28-400	12/14 COCR FEMORAL HEAD 28MM +4 DURASUL	✓	
7210-28-800	12/14 COCR FEMORAL HEAD 28MM +8 DURASUL	✓	
7210-32-000	12/14 COCR FEMORAL HEAD 32MM +0 DURASUL	✓	
7210-32-004	12/14 COCR FEMORAL HEAD 32MM -4 DURASUL	✓	
7210-32-400	12/14 COCR FEMORAL HEAD 32MM +4 DURASUL	✓	
7210-32-800	12/14 COCR FEMORAL HEAD 32MM +8 DURASUL	✓	

		G7 Liners Non-Constrained	G7 Liners Constrained
<b>Ceramic Femoral Heads</b>			
00-8775-028-01	12/14 BIOLOX DELTA FEMORAL HEAD 28MM -3.5MM	✓	
00-8775-028-02	12/14 BIOLOX DELTA FEMORAL HEAD 28MM +0	✓	
00-8775-028-03	12/14 BIOLOX DELTA FEMORAL HEAD 28MM +3.5	✓	
00-8775-032-01	12/14 BIOLOX DELTA FEMORAL HEAD 32MM -3.5	✓	
00-8775-032-02	12/14 BIOLOX DELTA FEMORAL HEAD 32MM +0	✓	
00-8775-032-03	12/14 BIOLOX DELTA FEMORAL HEAD 32MM +3.5	✓	
00-8775-032-04	12/14 BIOLOX DELTA FEMORAL HEAD 32MM +7	✓	
00-8775-036-01	12/14 BIOLOX DELTA FEMORAL HEAD 36MM -3.5	✓	
00-8775-036-02	12/14 BIOLOX DELTA FEMORAL HEAD 36MM +0	✓	
00-8775-036-03	12/14 BIOLOX DELTA FEMORAL HEAD 36MM +3.5	✓	
00-8775-036-04	12/14 BIOLOX DELTA FEMORAL HEAD 36MM +7	✓	
00-8775-040-01	12/14 BIOLOX DELTA FEMORAL HEAD 40MM -3.5	✓	
00-8775-040-02	12/14 BIOLOX DELTA FEMORAL HEAD 40MM +0	✓	
00-8775-040-03	12/14 BIOLOX DELTA FEMORAL HEAD 40MM +3.5	✓	
00-8775-040-04	12/14 BIOLOX DELTA FEMORAL HEAD 40MM +7	✓	
00-8777-028-01	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 28MM -3.0	✓	
00-8777-028-02	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 28MM +0	✓	
00-8777-028-03	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 28MM +3.5	✓	
00-8777-028-04	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 28MM +7	✓	
00-8777-032-01	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 32MM -3.0	✓	
00-8777-032-02	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 32MM +0	✓	
00-8777-032-03	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 32MM +3.5	✓	
00-8777-032-04	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 32MM +7	✓	
00-8777-036-01	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 36MM -3.0	✓	
00-8777-036-02	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 36MM +0	✓	
00-8777-036-03	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 36MM +3.5	✓	
00-8777-036-04	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 36MM +7	✓	
00-8777-040-01	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 40MM -3.0	✓	
00-8777-040-02	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 40MM +0	✓	
00-8777-040-03	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 40MM +3.5	✓	
00-8777-040-04	12/14 BIOLOX DELTA OPTION FEMORAL HEAD 40MM +7	✓	
00-8778-028-01	8/10 BIOLOX OPTION Hd/Adpt 28MM -3.0	✓	
00-8778-028-02	8/10 BIOLOX OPTION Hd/Adpt 28MM +0	✓	
00-8778-028-03	8/10 BIOLOX OPTION Hd/Adpt 28MM +4.0	✓	
00-8778-032-01	8/10 BIOLOX OPTION Hd/Adpt 32MM -3.0	✓	
00-8778-032-02	8/10 BIOLOX OPTION Hd/Adpt 32MM +0	✓	
00-8778-032-03	8/10 BIOLOX OPTION Hd/Adpt 32MM +4.0	✓	
00-8778-036-01	8/10 BIOLOX OPTION Hd/Adpt 36MM -3.0	✓	
00-8778-036-02	8/10 BIOLOX OPTION Hd/Adpt 36MM +0	✓	
00-8778-036-03	8/10 BIOLOX OPTION Hd/Adpt 36MM +4.0	✓	
00-8778-040-01	8/10 BIOLOX OPTION Hd/Adpt 40MM -3.0	✓	
00-8778-040-02	8/10 BIOLOX OPTION Hd/Adpt 40MM +0	✓	
00-8778-040-03	8/10 BIOLOX OPTION Hd/Adpt 40MM +4.0	✓	
00-6428-028-01	12/14 ALUMINA CERAMIC FEMORAL HEAD 28MM -3.5	✓	
00-6428-028-02	12/14 ALUMINA CERAMIC FEMORAL HEAD 28MM +0	✓	
00-6428-028-03	12/14 ALUMINA CERAMIC FEMORAL HEAD 28MM +3.5	✓	
00-6428-032-01	12/14 ALUMINA CERAMIC FEMORAL HEAD 32MM -3.5	✓	
00-6428-032-02	12/14 ALUMINA CERAMIC FEMORAL HEAD 32MM +0	✓	
00-6428-032-03	12/14 ALUMINA CERAMIC FEMORAL HEAD 32MM +3.5	✓	
12.28.05	12/14 BIOLOX FORTE FEMORAL HEAD 28MM -3.5	✓	
12.28.06	12/14 BIOLOX FORTE FEMORAL HEAD 28MM +0	✓	
12.28.07	12/14 BIOLOX FORTE FEMORAL HEAD 28MM +3.5	✓	
12.32.05	12/14 BIOLOX FORTE FEMORAL HEAD 32MM -4	✓	
12.32.06	12/14 BIOLOX FORTE FEMORAL HEAD 32MM +0	✓	
12.32.07	12/14 BIOLOX FORTE FEMORAL HEAD 32MM +4	✓	
<b>Stainless Steel Femoral Heads</b>			
		G7 Liners Non-Constrained	G7 Liners Constrained

00-8011-001-28	6 DEGREE CPT SST FEMORAL HEAD 28MM SHT NECK	✓	
00-8011-001-32	6 DEGREE CPT SST FEMORAL HEAD 32MM SHT NECK	✓	
00-8011-002-28	6 DEGREE CPT SST FEMORAL HEAD 28MM MED NECK	✓	
00-8011-002-32	6 DEGREE CPT SST FEMORAL HEAD 32MM MED NECK	✓	
00-8011-003-28	6 DEGREE CPT SST FEMORAL HEAD 28MM LNG NECK	✓	
00-8011-003-32	6 DEGREE CPT SST FEMORAL HEAD 32MM LNG NECK	✓	
01.01102.285	8/10 PROTASUL S-30 FEMORAL HEAD 28MM -4 (S)	✓	
01.01102.286	8/10 PROTASUL S-30 FEMORAL HEAD 28MM +0 (M)	✓	
01.01102.287	8/10 PROTASUL S-30 FEMORAL HEAD 28MM +4 (L)	✓	
30.28.05	12/14 PROTASUL S-30 FEMORAL HEAD 28MM -4 (S)	✓	
30.28.06	12/14 PROTASUL S-30 FEMORAL HEAD 28MM +0 (M)	✓	
30.28.07	12/14 PROTASUL S-30 FEMORAL HEAD 28MM +4 (L)	✓	
30.32.05	12/14 PROTASUL S-30 FEMORAL HEAD 32MM -4 (S)	✓	
30.32.06	12/14 PROTASUL S-30 FEMORAL HEAD 32MM +0 (M)	✓	
30.32.07	12/14 PROTASUL S-30 FEMORAL HEAD 32MM +4 (L)	✓	

# Zimmer Biomet EMEA Cement and Infection Product Portfolio

## Ordering Information

### Optipac® Refobacin® Bone Cement R

Product	Description	Part Number	Units/Box
	Optipac 40 Refobacin® Bone Cement R	4710500394-3	8
	Optipac 60 Refobacin® Bone Cement R	4711500396-3	8
	Optipac 80 Refobacin® Bone Cement R	4712500398-3	8

### Optipac® Refobacin® Plus Bone Cement

Product	Description	Part Number	Units/Box
	Optipac 40 Refobacin® Plus Bone Cement	4720502083-3	8
	Optipac 60 Refobacin® Plus Bone Cement	4721502084-3	8
	Optipac 80 Refobacin® Plus Bone Cement	4722502117-3	8

## Bone Cement

### Refobacin® Bone Cement R

Product	Description	Part Number	Units/Box
	Refobacin® Bone Cement R 2 x 20	3003920002-3	20
	Refobacin® Bone Cement R 1 x 40	3003940001-3	20
	Refobacin® Bone Cement R 2 x 40	3003940002-3	20

### Biomet Bone Cement R

Product	Description	Part Number	Units/Box
	Biomet Bone Cement R 1 x 40	3035890011-3	20
	Biomet Bone Cement R 2 x 40	3035890022-3	20

## Bone Cement (cont.)

### Refobacin® Plus Bone Cement

Product	Description	Part Number	Units/Box
	Refobacin® Plus Bone Cement 2 x 20	3021180001-3	20
	Refobacin® Plus Bone Cement 1 x 40	3020830401-3	20
	Refobacin® Plus Bone Cement 2 x 40	3021170001-3	20

### Refobacin® Revision

Product	Description	Part Number	Units/Box
	Refobacin® Revision 1 x 40	3011630001-3	20

20. Turi būti komplektuojamas su kauliniu cementu, cemento maišymo sistema ir plovimo sistema. Kiekis 3 dozės (po 40 g)

### Hi-Fatigue Bone Cement

Product	Description	Part Number	Units/Box
	Hi-Fatigue Bone Cement 1 x 40	00-1120-140-01	20
	Hi-Fatigue Bone Cement 2 x 40	00-1120-240-01	15
	Hi-Fatigue G Bone Cement (with Gentamicin) 1 x 20	00-1121-120-01	20
	Hi-Fatigue G Bone Cement (with Gentamicin) 1 x 40	00-1121-140-01	20
	Hi-Fatigue G Bone Cement (with Gentamicin) 2 x 20	00-1121-220-01	15
	Hi-Fatigue G Bone Cement (with Gentamicin) 2 x 40	00-1121-240-01	15

### Flux Bone Cement

Product	Description	Part Number	Units/Box
	Flux Bone Cement	110043027	1
	Flux G Bone Cement	110043028	1

20. Turi būti komplektuojamas su kauliniu cementu, cemento maišymo sistema ir plovimo sistema. Kiekis 3 dozės (po 40 g)

## Vacuum Mixing Cartridges

### Optivac® Mixing Systems

Product	Description	Part Number	Units/Box
	Optivac S	4161	10
	Optivac M	4160	10
	Optivac L	4152	10
	Optivac Hip Set	4150	10

## Vacuum Mixing Bowls

### Quick-Vac® Bowls\*

Product	Description	Part Number	Units/Box
	Quick-Vac Mixing Bowl	00-5049-001-00	1
	Quick-Vac Mixing Bowls	00-5049-001-15	15

\* Not for sale in UK.

## Open Mixing Bowls

Product	Description	Part Number	Units/Box
	Disposable Mixing Bowls with Spatula	00-5049-011-00	20
	Disposable Mixing Bowls with Spatula (Non-Sterile)	93.00.56	12

## Injection Cartridge Systems

### Miller™ Cement Delivery System

Product	Description	Part Number	Units/Box
	Miller Cartridge Kits	00-5069-052-00	10

### Optivac and Optipac Cartridge Accessories

Product	Description	Part Number	Units/Box
	Optigun™	4193	1
	Optigun Ratchet	4195	1
	Optivac Vacuum Pump	4232	1
	Optivac Vacuum Pump without Hose	4235	1
	Hose 5 M	4236	1
	Slim Nozzle	4154	5
	Small Diameter Cement Nozzle	414991	5
	Revision Nozzle	4155	5
	Knee Nozzle	4146	5
	23-Degree Pressurizing Nozzle	4148	5
	Knee Cementation Nozzle	431-2	10

## Cartridge Accessories

Product	Description	Part Number	Units/Box
	Power-Flo® Bone Cement Injector	00-5069-008-00	1
	Zimmer Vacuum Foot Pump II-Nitrogen Connector	00-5049-085-00	1
	Zimmer Vacuum Foot Pump II-Air Connector	00-5049-086-00	1
	Zimmer Vacuum Foot Pump II-BSP Connector	00-5049-087-00	1
	90 Degree Breakaway Nozzle	00-5069-045-00	10
	Miller Bone Cement Injector Flex Nozzle 12 x 0.25in	00-5069-054-00	10
	Miller Bone Cement Injector Flex Nozzle 16 x 0.38in	00-5069-056-00	10
	Miller Femoral Canal Pressurizer Small	00-5069-071-00	10
	Miller Femoral Canal Pressurizer Medium	00-5069-051-00	10
	Miller Femoral Canal Pressurizer Large	00-5069-081-00	10
	CPT® MIS Pressurizer Small	00-8334-084-01	1
	CPT MIS Pressurizer Medium	00-8334-084-02	1
	CPT MIS Pressurizer Large	00-8334-084-03	1

## Bioresorbable Bone Plugs

### Rex Cement Stop™

Product	Description	Part Number	Units/Box
	Sterile Rex Cement STOP / D 9.0 mm	REX-0709-9	1
	Sterile Rex Cement STOP / D 10.0 mm	REX-0709-10	1
	Sterile Rex Cement STOP / D 11.5 mm	REX-0709-11.5	1
	Sterile Rex Cement STOP / D 13.5 mm	REX-0709-13.5	1
	Sterile Rex Cement STOP / D 16.0 mm	REX-0709-16	1
	Rex Reamer D 9.0 mm	REX-0208-08	1
	Rex Reamer D 10.0 mm	REX-0208-09	1
	Rex Reamer D 11.5 mm	REX-0208-10	1
	Rex Reamer D 13.5 mm	REX-0208-11	1
	Rex Reamer D 16.0 mm	REX-0208-12	1
	Rex Handpiece (Part of Instrument)	REX-0601-03-A	1
	Rex Screw Nut (Part of Instrument)	REX-0601-03-B	1
	Rex Inner Rod (Part of Instrument)	REX-0601-03-C	1
	Rex Outer Tube (Part of Instrument)	REX-0601-03-D	1
Rex Sterilization Tray	REX-0802-02	1	

## Polyethylene Bone Plugs

### Stühmer/Weber Bone Plugs

Product	Description	Part Number	Units/Box
	Stühmer/Weber Intramed Plug W/out Drain, Size 1	0961	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 2	3202	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 2.5	3208	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 3	3203	1
	Stühmer/Weber Intramed Plug w/out Drain,G Size 3.5	3209	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 4	3204	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 5	3205	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 6	3206	1
	Stühmer/Weber Intramed Plug w/out Drain, Size 7	3207	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 1	0981	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 2	3222	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 2.5	3228	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 3	3223	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 3.5	3229	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 4	3224	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 5	3225	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 6	3226	1
	Stühmer/Weber Intramed Plug w/ Drain, Size 7	3227	1

### Instrumentation

Product	Description	Part Number	Units/Box
	Plug Inserter	5950	1
	Ø 7.1 mm Measuring Cone, Size 1.0	5951	1
	Ø 9.1 mm Measuring Cone, Size 2.0	5952	1
	Ø 9.8 mm Measuring Cone, Size 2.5	5958	1
	Ø 11.5 mm Measuring Cone, Size 3.0	5953	1
	Ø 12.7 mm Measuring Cone, Size 3.5	5959	1
	Ø 13.9 mm Measuring Cone, Size 4.0	5954	1
	Ø 16.4 mm Measuring Cone, Size 5.0	5955	1
	Ø 19 mm Measuring Cone, Size 6W	5961	1
	Ø 22 mm Measuring Cone, Size 7W	5962	1

### TPA-18 and TPA-24

Product	Description	Part Number	Units/Box
	Cement Restrictor (12-18 mm) + Inserter	TPA-18	1
	Cement Restrictor (18-24 mm) + Inserter	TPA-24	1



## Bone Bed Preparation

### Quik-Use® Femoral Bone Prep Kits

Product	Description	Part Number	Units/Box
	Femoral Bone Brushes	00-5059-013-00	10
	Ortho-Dri® Absorbent Packing	00-5059-080-00	5
	Quik-Use Curette	00-5049-053-00	10

## Manual Pressurizers

### Acetabular Pressurizers

Product	Description	Part Number	Units/Box
	Acetabular Pressurizer 50 mm	4316	1
	Acetabular Pressurizer 57 mm	4317	1
	Acetabular Pressurizer 63 mm	4321	5
	Acetabular Pressurizer 71 mm	432-2	1
	Handle For Acetabular Pressurizer 4321, 432-2	4327	1
	Handle For Acetabular Pressurizer 4316, 4317	4318	1

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**ZIMMER BIOMET**

Your progress. Our promise.®

# Pulsavac® Plus Wound Debridement Family

Versatile from Grip to Tip



## The Pulsavac Plus Family

The Pulsavac Plus, Pulsavac Plus AC, and Pulsavac Plus LP Wound Debridement Systems come equipped with up to nine different tips. Surgeons can use a pistol-grip or handle-grip for each hand piece, making it easier and more convenient to use. All three models feature a lightweight design, trigger-controlled pressure settings, and a powerful cleaning action for bone, or a gentle lavage for soft tissue. The system also gives surgeons a choice by offering two types of power supply – a traditional battery pack and a reusable power pack.



### The Anatomy of the Pulsavac Plus

- 1 Tip Retaining Mechanism** provides a positive lock for secure attachments and tips.
- 2 Textured Surface** near tip to help provide a sure grip and firm control, even in awkward positions.
- 3 Rocker Switch** provides convenient pressure control at your fingertips.
- 4 Textured Pistol-Grip Handle** provides a secure, comfortable grip to facilitate control.
- 5 Ergonomic, Lightweight Design** fits comfortably into the palm of your hand, facilitating use in tight areas.
- 6 Independent Fluid and Suction Tubes** provide concurrent fluid delivery and suction.

### Pulsavac Plus with Battery ●

The Pulsavac Plus combines convenience and power for smooth, efficient irrigation and debridement. The external battery pack hangs outside the sterile field. The variety of tips, along with trigger-controlled pressure, offers either powerful cleaning or gentle lavage. The primary application site is the operating room for orthopaedic surgery and trauma cases. The Pulsavac Plus System operates on eight AA batteries.



### Pulsavac Plus AC ▲

The dependability you're used to from the Pulsavac Plus, now with a reusable power pack. Designed for use in orthopaedic and trauma cases, the Pulsavac Plus AC promotes green initiatives. The Reusable AC Adapter eliminates the need for alkaline batteries, reducing the amount of waste and cost of batteries.

The reusable AC Adapter power pack must be purchased separately.



### Pulsavac Plus LP ■

The Pulsavac Plus LP System provides gentle lavage for soft tissue debridement. The low pressure Pulsavac Plus LP delivers an adjustable, gentle lavage for wound cleaning and therapies, and is an outstanding alternative to traditional whirlpool therapy treatments. Primary application may occur in the OR, ER, wound care clinics, nursing homes or long-term care facilities. Therapy can be done in the patient's room or at the patient's home.



### Tips and Shields

Debridement tips include the dual-cone splash shield, designed to minimize splash-back and help control the dangers associated with translucent spray. The shapes to the left of the tips indicate system compatibility.



00-5150-175-00 High Capacity Spray w/ Splash Shield, 12.7cm length



00-5150-195-00 High Capacity Shower Spray w/ Splash Shield, 12.7cm length

00-5150-395-00 Without Splash Shield



00-5150-181-00 High Capacity Four Orifices, 20.32cm x 1.27cm



00-5150-182-00 High Capacity Radial Spray, 22.86cm x .89cm



00-5150-183-00 High Capacity Brush Tip Radial Spray, 22.86cm x .89cm x 1.52cm



00-5150-184-00 High Capacity Hip Revision Tip, 23cm length



00-5150-185-00 High Capacity Four Orifices, 30.48cm x 1.27cm



00-5150-187-00 High Capacity Tibial Plateau Brush Tip, 7cm length



00-5150-155-00 High Capacity Single Stream, w/Splash Shield, 12.7cm length

20. Turi būti komplektuojamas su kauliniu cementu, cemento maišymo sistema ir plovimo sistema. Kiekis 3 dozės (po 40 g)

## Specifications

<b>Pulsavac Plus Kits (Box 10)</b>	00-5150-420-00	Pulsavac Plus Component Kit
	00-5150-475-00	Pulsavac Plus Fan Kit
	00-5150-482-00	Pulsavac Plus Hip Kit
	00-5150-495-00	Pulsavac Plus Shower Kit
<b>Pulsavac Plus Kits (Box 1)</b>	00-5150-420-01	Pulsavac Plus Component Kit
	00-5150-475-01	Pulsavac Plus Fan Kit
	00-5150-482-01	Pulsavac Plus Hip Kit
	00-5150-495-01	Pulsavac Plus Shower Kit
<b>Pulsavac Plus AC Kits (Box 1)</b>	00-5150-350-00	Pulsavac Plus AC Power Supply (US)
	00-5150-426-01	Pulsavac Plus AC Component Kit
	00-5150-476-01	Pulsavac Plus AC Fan Spray Kit
	00-5150-486-01	Pulsavac Plus AC Hip Kit
	00-5150-496-01	Pulsavac Plus AC Shower Spray Kit
<b>Pulsavac Plus LP Kits (Box 10)</b>	00-5150-920-00	Pulsavac Plus LP Component Kit
	00-5150-975-00	Pulsavac Plus LP Fan Spray Kit
	00-5150-995-00	Pulsavac Plus LP Shower Spray Kit
<b>Multi-Orifice Tips (Box 10)</b>	00-5150-175-00	High Capacity Fan Spray Tip w/Splash Shield, 12.7 cm length
	00-5150-195-00	High Capacity Shower Spray w/Splash Shield, 12.7 cm length
	00-5150-395-00	High Capacity Shower Spray w/out Splash Shield, 10 cm length
<b>Debridement/Suction Tips (Box 10)</b>	00-5150-155-00	High Capacity Single Stream Tip w/Splash Shield, 12.7 cm length
<b>Femoral Tips (Box 10)</b>	00-5150-181-00	High Capacity IM Tip Four Orifices, 20.32 cm x 1.27 cm
	00-5150-182-00	High Capacity IM Tip w/Radial Spray, 22.86 cm x .89 cm
	00-5150-183-00	High Capacity IM Brush Tip w/Radial Spray, 22.86 cm x .89 cm x 1.52 cm
	00-5150-184-00	High Capacity IM Hip Revision Tip, 23 cm length
	00-5150-185-00	High Capacity IM Tip Four Orifices, 30.48 cm x 1.27 cm length
	00-5150-187-00	High Capacity Tibial Plateau Brush Tip, 7 cm length

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