ACCIS

ADVANCED CERAMIC COATED IMPLANT SYSTEM

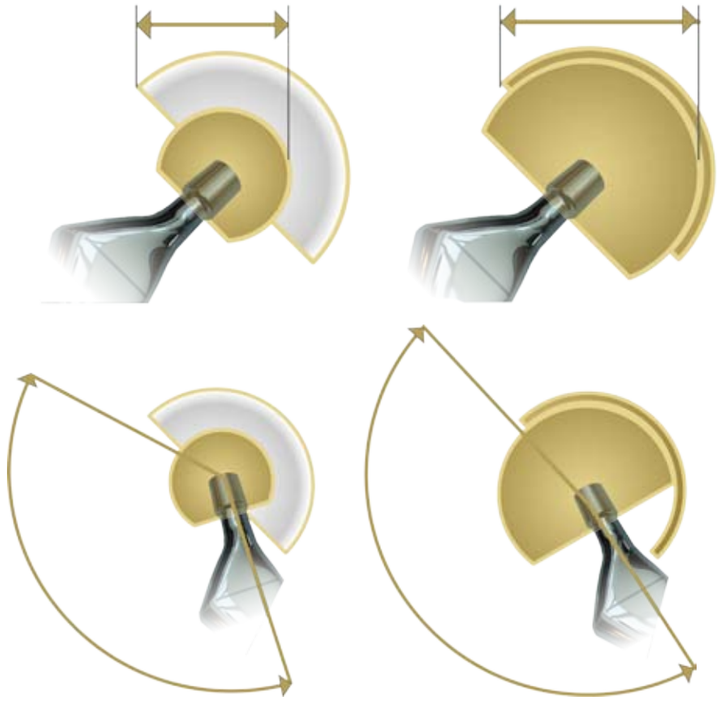
implantcast

Ceramic Coated Metal-on-Metal Large Head Total Hip Replacement Surgical Technique

Introduction

The use of femoral components with large heads and matching thin acetabular components has several advantages:

- the femoral head component is placed more deeply into the acetabular component: dislocation of the hip becomes more difficult than in prostheses with smaller femoral heads: e.g.: a Charnley 22 mm head has to make a shorter up-hill movement before dislocation may occur; when a 50 mm or bigger head is used this way is obviously much longer. (picture on the right)
- the larger head in combination with a thin walled acetabular component enhances capsular stability
- large femoral heads demonstrate a better range of motion: as the ratio of the head diameter to the neck diameter increases, the range of motion also increases
- the risk of impingement is reduced as well
- most important: in metal-on-metal articulation, the bigger the head, the lesser the wear



The *ACCIS*® Total Hip Prosthesis combines
- advantages of implants with large femoral heads:
  good range of motion, no impingement, great intrinsic stability
- with the Advantages of the ceramic coating of teh metal component:
  significant less wear than in metal-on-metal prostheses
  minimal metal ion release : normal metal ion levels in the blood !!

Large Femoral Heads.

Using large heads (over 40 mm) rules out the use of polyethylene as bearing material. A polyethylene acetabular component in combination with a large metal femoral head component would simply demonstrate extensive wear after short time follow-up. Based on the current experience with the metal-on-metal hip resurfacing prostheses, the metal-on-metal articulation is considered as a possible alternative also in total hip arthroplasty.
However clinical follow-up studies of metal-on-metal hip prostheses have revealed high metal ion concentrations in the blood and urine of patients already shortly after the operations. Further studies have demonstrated that these high serum concentrations will remain during the lifetime of the patient. Although long term epidemiological follow-up studies of patients with metal-on-metal total hip implants have not been conclusive about the long term effect of the metal ion release, concern remains about the elevated metal ion levels in the blood and urine of the patients.

The ACCIS® System

The ACCIS® Total Hip System was designed to reduce wear in total hip replacement.
The system consists of acetabular and femoral head components for total hip replacement. The femoral head components may be placed on any femoral component with a 12-14 mm cone, and authorized by implantcast.
All components are made of the well known Cobalt-Chromium-Molybdenum alloy. A thin coating of the ceramic Titanium-Niobium-Nitride is applied at the articular surfaces of the components. This ceramic is very hard and has shown in pre-clinical tests to reduce 6-8 fold the volumetric wear of metal-on-metal articulations and to reduce metal ion release by 90%.
Meanwhile these findings have been confirmed by clinical investigations.

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ACCIS® Cementless Acetabular Components

- cementless cups are available with outside diameters 42-64 mm in 2 mm. increments
- the inner side of the acetabular cup is purely spherical, however the outer side has a three radial design with a wider circumference at the equator and a slightly smaller radius at the pole. The wider circumference at the equator provides a perfect press fit fixation
- a pure Titanium porous coating increases the primary stability and provides bone ingrowth capacity
- two additional fins add to the rotational stability

2912-3842	ACCIS Acetabular Component Cementless 38/42 mm
2912-3844	ACCIS Acetabular Component Cementless 38/44 mm
2912-4246	ACCIS Acetabular Component Cementless 42/46 mm
2912-4248	ACCIS Acetabular Component Cementless 42/48 mm
2912-4650	ACCIS Acetabular Component Cementless 46/50 mm
2912-4652	ACCIS Acetabular Component Cementless 46/52 mm
2912-5054	ACCIS Acetabular Component Cementless 50/54 mm
2912-5056	ACCIS Acetabular Component Cementless 50/56 mm
2912-5458	ACCIS Acetabular Component Cementless 54/58 mm
2912-5460	ACCIS Acetabular Component Cementless 54/60 mm
2912-5862	ACCIS Acetabular Component Cementless 58/62 mm
2912-5864	ACCIS Acetabular Component Cementless 58/64 mm

ACCIS® Cemented Acetabular Components

- Cemented cups are available in 48-64 mm with 2 mm increments
- the spherical design provides an even distribution of the load forces over the cement mantle
- 12 radialy placed studs enhance the cement fixation and provide an even distribution of the cement mantle

2923-3848	ACCIS Acetabular Component cemented 38/48 mm
2923-3850	ACCIS Acetabular Component cemented 38/50 mm
2923-4252	ACCIS Acetabular Component cemented 42/52 mm
2923-4254	ACCIS Acetabular Component cemented 42/54 mm
2923-4656	ACCIS Acetabular Component cemented 46/56 mm
2923-4658	ACCIS Acetabular Component cemented 46/58 mm
2923-5060	ACCIS Acetabular Component cemented 50/60 mm
2923-5062	ACCIS Acetabular Component cemented 50/62 mm
2923-5464	ACCIS Acetabular Component cemented 54/64 mm

ACCIS® Femoral Heads

- Accis femoral heads for total hip replacement (*) are available in sizes 38 to 58 mm in 4 mm increments
- the neck length of the femur may be adjusted with cone adaptors in three sizes: short (-4 mm), standard (0 mm) and large (+4 mm)
- the cone adaptor is made of a Titanium alloy and has a standard 12/14 mm cone
- cone adaptors in other dimensions and lengths are available upon request

Modular Neck and Head Assembled

2902-0038	ACCIS Femoral Head (modular) Ø 38 mm
2902-0042	ACCIS Femoral Head (modular) Ø 42 mm
2902-0046	ACCIS Femoral Head (modular) Ø 46 mm
2902-0050	ACCIS Femoral Head (modular) Ø 50 mm
2902-0054	ACCIS Femoral Head (modular) Ø 54 mm
2902-0058	ACCIS Femoral Head (modular) Ø 58 mm
2938-4400	Modular Neck Ø 38-44 mm Short
2938-4405	Modular Neck Ø 38-44 mm Standard
2938-4410	Modular Neck Ø 38-44 mm Long
2946-5000	Modular Neck Ø 46-50 mm Short
2936-5005	Modular Neck Ø 46-50 mm Standard
2946-5010	Modular Neck Ø 46-50 mm Long
2952-5800	Modular Neck Ø 52-58 mm Short
2952-5805	Modular Neck Ø 52-58 mm Standard
2952-5810	Modular Neck Ø 52-58 mm Long

(*) Note:
*In case the system is used to convert an ACCIS® **r**esurfacing arthroplasty into an ACCIS® **t**otal hip, additional sizes of the modular femoral heads are available, matching the ACCIS® resurfacing acetabulum components*

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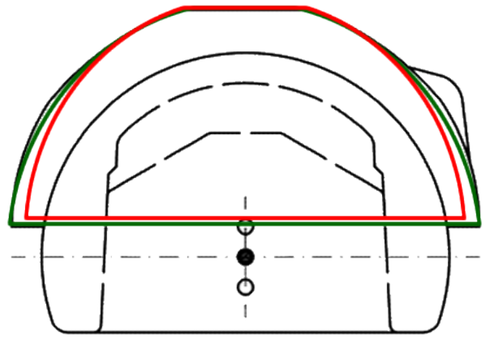
ACCIS® cementless acetabular components

- the cementless *ACCIS*® acetabular components have three radii with three distinct areas
  - the "polar area" where there is no contact between the bone and the component
  - he "fit area" where the bone is in contact to the porous coated surface for bone ingrowth
  - the "press fit area" which provides circumferential press fit at the equator for primary implant stability
- the acetabulum is reamed till the desired depth. The depth is sufficient when the reamer, and later the cup, are completely surrounded by bone to ensure adequate press fit fixation
- the size of the last reamer is the size of the implant to select (size-for-size nomenclature)
- in case hard bone is met, preventing proper seating of the component, an acetabulum reamer 1 mm bigger than the last one used, may be necessary
- if the press fit fixation is not adequate, the surgeon has three options:
  - use the last reamer again and ream slightly deeper
  - use a larger component without additional reaming
  - use a component with cemented fixation

Head Diameter	Acetabulum Reamer	Acetabulum Cup Diameter	Equatorial Diameter
38	42	42	43,6
	44	44	45,7
42	46	46	47,7
	48	48	49,7
46	50	50	51,7
	52	52	53,8
50	54	54	55.8
	56	56	57,9
54	58	58	59,9
	60	60	62,0
58	62	62	64.0
	64	64	66,1

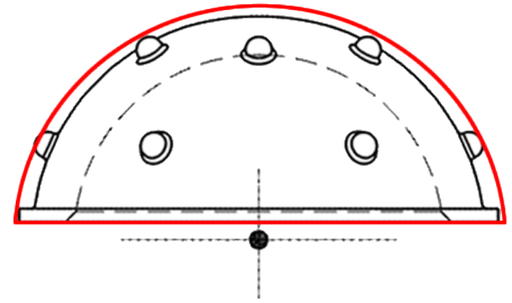


Note:
*In case the system is used to convert an ACCIS® **r**esurfacing arthroplasty into an ACCIS® **t**otal hip additional sizes of the modular femoral heads are available, matching the ACCIS® resurfacing acetabulum components*

ACCIS® acetabular components with cemented fixation

- the cemented *ACCIS*® acetabular components have one radius, making the cup hemispherical
- the cement spacers have a height of 2 mm and provide an even cement mantle around the cup
- the acetabulum is reamed till the desired depth when the reamer is completely surroundelv by bone
- additional holes may be drilled in the actebular bone to enhance cement fixation
- the size of the last reamer used, is the size of the implant to be selected (size for size nomenclature)
- the rim is 2 mm wide, providing cement pressurization upon impaction

Head Diameter	Acetabulum Cup Diameter	Acetabulum Reamer	Cement Mantle Thickness
38	48	48	2.0
	50	50	2,0
42	52	52	2,0
	54	54	2,0
46	56	56	2,0
	58	58	2,0
50	60	60	2,0
	62	62	2,0
54	64	64	2,0



ACCIS® Femoral heads and neck cones

- one size of titanium cones is suited for three head sizes
- each cone is available in three different neck lengths in 4 mm increments
- additional neck lengths such as XL and XXL on request
- cones are suited for femoral components with a 12 / 14 mm cone

Head Size	Cone	Neck Lengths
38		short
42	38/44	standard
44		long
46		short
48	46/50	standard
50		long
52		short
54	52/58	standard
58		long

Modular Head

ACCIS® Modular Neck and Head Assembled

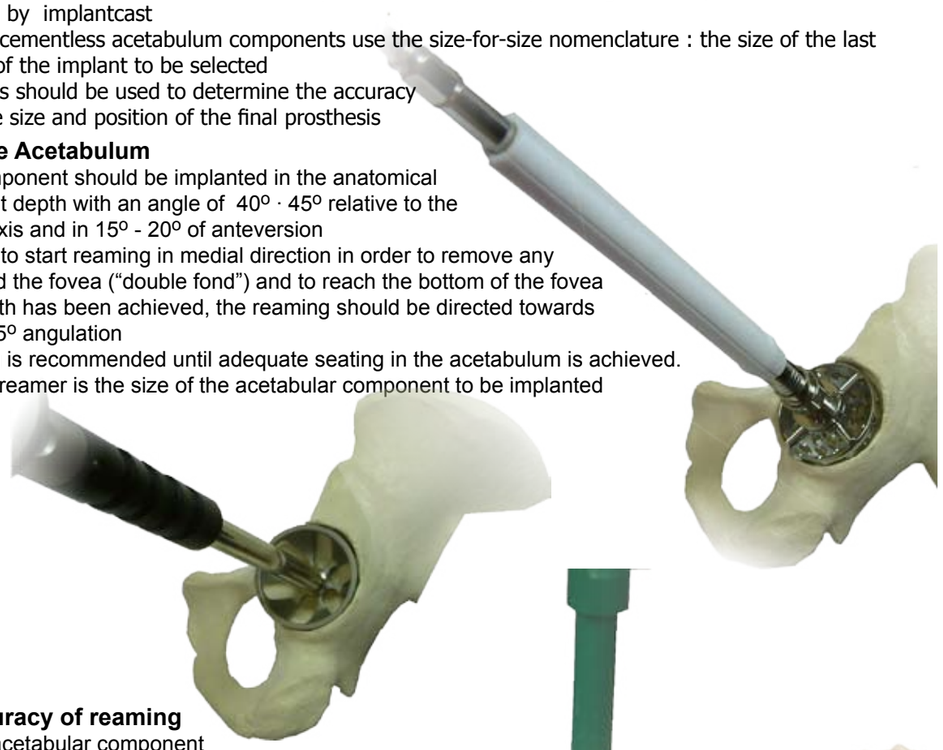
Modular Neck

Surgical Technique

- accurate preoperative planning and templating are essential for obtaining a successful outcome
- the acetabular size is estimated using the *ACCIS*® X-ray templates in the A/P and the L/M view
- the surgical approach, head resection, and acetabular exposure are left to the surgeon's preference: *ACCIS*® instrumentation is compatible with all routine hip exposures
- the cone of *ACCIS*® femoral heads fit the cone of any femoral component providing it is a 12/14 mm cone and it has been approved by implantcast
- the cemented and cementless acetabulum components use the size-for-size nomenclature : the size of the last reamer is the size of the implant to be selected
- the acetabular trials should be used to determine the accuracy of the reaming, the size and position of the final prosthesis

Preparation of the Acetabulum

- the acetabular component should be implanted in the anatomical position at sufficient depth with an angle of 40º · 45º relative to the longitudinal body axis and in 15º - 20º of anteversion
- it is recommended to start reaming in medial direction in order to remove any osteophytes around the fovea ("double fond") and to reach the bottom of the fovea
- once sufficient depth has been achieved, the reaming should be directed towards the desired 40º - 45º angulation
- sequential reaming is recommended until adequate seating in the acetabulum is achieved.
- the size of the last reamer is the size of the acetabular component to be implanted

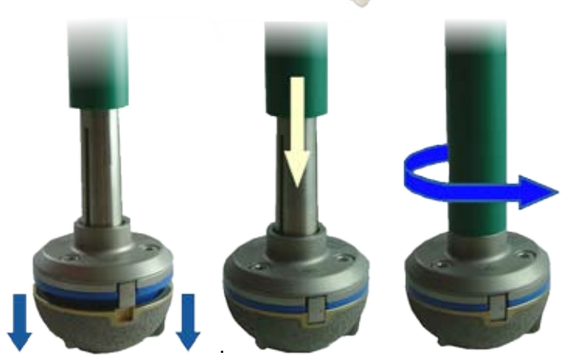


Determining accuracy of reaming

the open-cage trial acetabular component gives good visibility to ensure that the acetabular component can be seated properly

Insertion of the acetabulum component without cement

- the cup is fixed by placing the three prongs on the cup and advancing the sleeve on the impactor
- once the impactor is seated, it is locked by turning the sleeve half a turn,either way
- the two fins to secure press-fit fixation have to be im planted caudally on both sides of the original fovea.
- the cup is placed on the corresponding colour coded self-holding cup inserter
- when impacting the cup, it is recommended to use a hammer of sufficient weight to adequately seat the component and to acquire the desired equatorial press-fit
- the impaction should be performed in a gentle manner
- to loosen the inserter after placing the cup the inserter must be turned half a turn after which the sleeve is pulled back
- for final seating of the cup the non-coupled colour coded impactor can be used



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Insertion of the acetabulum component with cement

- the cemented *ACCIS*® cup is a single radius design intended to achieve stable fixation with acrylic bone cement
- the size of the last reamer is the size of the acetabular component to be implanted
- the cup is placed on the inserter with rim with the corresponding color coding and inserted
- the cup is held in place with the cup pusher without rim till the cement has hardened

Determining the neck length

- the last broach for the femoral component is left in the femoral canal (or a trial femoral component is used)
- the neck trial is screwed into the trial ball of the desired diameter.
- the trial ball with the trial neck are placed on the broach (or on the femoral trial) and the joint is reduced
- if not sufficient tension is met, the trial neck is replaced with a longer trial neck
- when statisfactory reposition is acquired, the trial components and the broach are removed
- the femoral component is inserted and the neck and head components are selected

Assembly of the head and neck cone

- the cone of the determined size and neck length is selected and inserted into the selected femoral head
- the asssemled neck / head is placed on the cone of the femoral stem
- the cup is fixed to the femoral stem with the femoral head impactor

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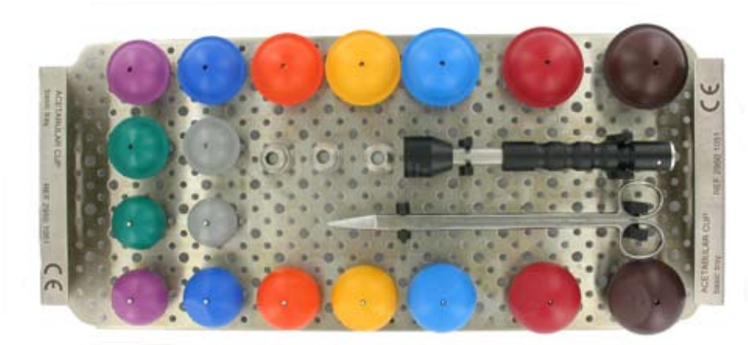
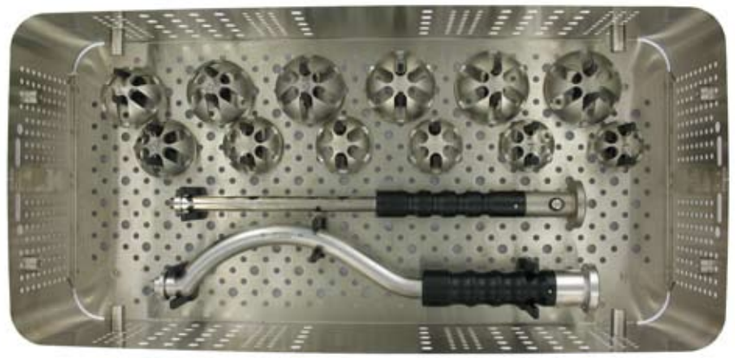
ACCIS® Instrument Trays

ACCIS® Acetabular Cup
Basic Instrument Tray, upper tray
REF 2950-1051



ACCIS® Acetabula Cup Basic
Instrument Tray, bottom tray
REF 2950-1051



Acetabular Reamer Set
Contains reamers 42-64 mm with
1 mm increments
REF 2950-1048

ACCIS® Cemented Acetabular Cup
Instrument Tray
REF 2950-1054

Literature about large head arthroplasty

- Alberton - Morrey “ Dislocation after Revision Total Hip Arthroplasty”
  JBJS 2002 Vol 84A pp 1788-1793.
- Amstutz H “ Prevention and Treatment of Dislocation with Large Diameter Balls “
  CORR 2004 Vol 429 pp 108-116.
- Bartz - Tullos “ The Effect of Femoral Components Head Size on Posterior Dislocation of THA “
  BJS 2000 Vol 82A pp 1300-1308 .
- Beaule Schmalzrief Amstutz “ Jumbo Femoral Head for the Treatment of Recurrent Dislocations”
  JBJS 2002 Vol 84A pp 256-264.
- Berry - Schleck - Harmsen “ The Cumulative Long Term Risk of Dislocation after Charnley Total Hip Arthroplasty”
  JBJS 2004 Vol 86A pp 9-15.
- Berry- Schleck - Harmsen “ Effect of Femoral Head Diameter at Risk of Dislocation in Primary THA”
  JBJS 2005 Vol 87A pp 2456-2464.
- Bystrom - Havelin “ Femoral Head Size is a Risk Factor for Total Hip Luxation”
  Acta Orthop 2003 Vol 74 No 5 pp 514-524.
- Crowningshield R” Biomechanics of Large Femoral Heads “
  CORR 2994 Vol 429 pp 102-107 .
- Cuckler John M Large Versus Small Femoral Heads in Metal-on-Metal Total Hip Arthroplasty”
  J Arthr 2004 Vol 19 No 8 Suppl 3.
- Dorr - Conaty “ Classification and Treatment of Dislocations in Total Hip Arthroplasty”
  CORR 1983 Vol 173 pp 150-158HA.
- Fackler - Poss “ Dislocation in Total Hip Arthroplasty”
  CORR 1980 Vol 151 pp 168-178 .
- Hedlundh - Fredin “ Dislocations and the Femoral Head Size in Primary Total Hip Arthroplasty “
  CORR 1996 Vol 333 pp 226-233.
- Kelly- Paterno “ Relationship of Femoral Head Size and Prevalence of Dislocation“
  CORR 1998 Vol 355 pp 163-170.
- Khan - Reynolds “ Dislocation following Total Hip Arthroplasty“
  JBJS Vol 63B pp 7-12.
- Knoch - Berry - Harmsen - Morrey “ Late Dislocation after Total Hip Arthroplasty”
  JBJS 2002 Vol 84A pp 1949-1954.
- Kung - Ries “ Effect of Femoral Head Size and Abductors on Dislocation after Revision THA”
  CORR 2007 Vol 465 pp 170-174.
- McCollum - Gray “ Dislocation after Total Hip Arthroplasty”
  CORR 1990 Vol 261 pp 158-170.
- Morrey BF “ Results of Reoperation for Hip Dislocation”
  CORR 2004 Vol 429 pp 94-101.
- Saffatato -Toni “ Large Diameter Bearings Reduce Wear in Metal-on-Metal Hip Implants“
  CORR 2006 Vol 456 pp 153-158.
- Sanches-Sorelo - Boberg “ Hospital Cost of Dislocation after Primary Total Hip Arthroplasty“
  JBJS 2006 VOL 88A pp 290-295.
- Scifert - Callaghan - Finite Element Analsysis of Factors Influencing Total Hip Dislocation“
  CORR 1998 Vol 355 pp 152-162.
- Sieber Rieker Köttig “Analysis of 118 Second Generation Metal-on-Metal Retrieved Hip Implants”
  JBJS 1998 Vol 80B pp 46-50.
- Sierra “ Dislocation of PrimaryTHA Done through a Posterolateral Approach in the Elderly”
  CORR 2005 Vol 441 pp 262-267.
- Thomas- Smith “ Metal on Metal Total Hip Arthroplasty with Large Head May Prevent Early Dislocation”
  CORR 2005 Vol 441 pp 137-142.

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