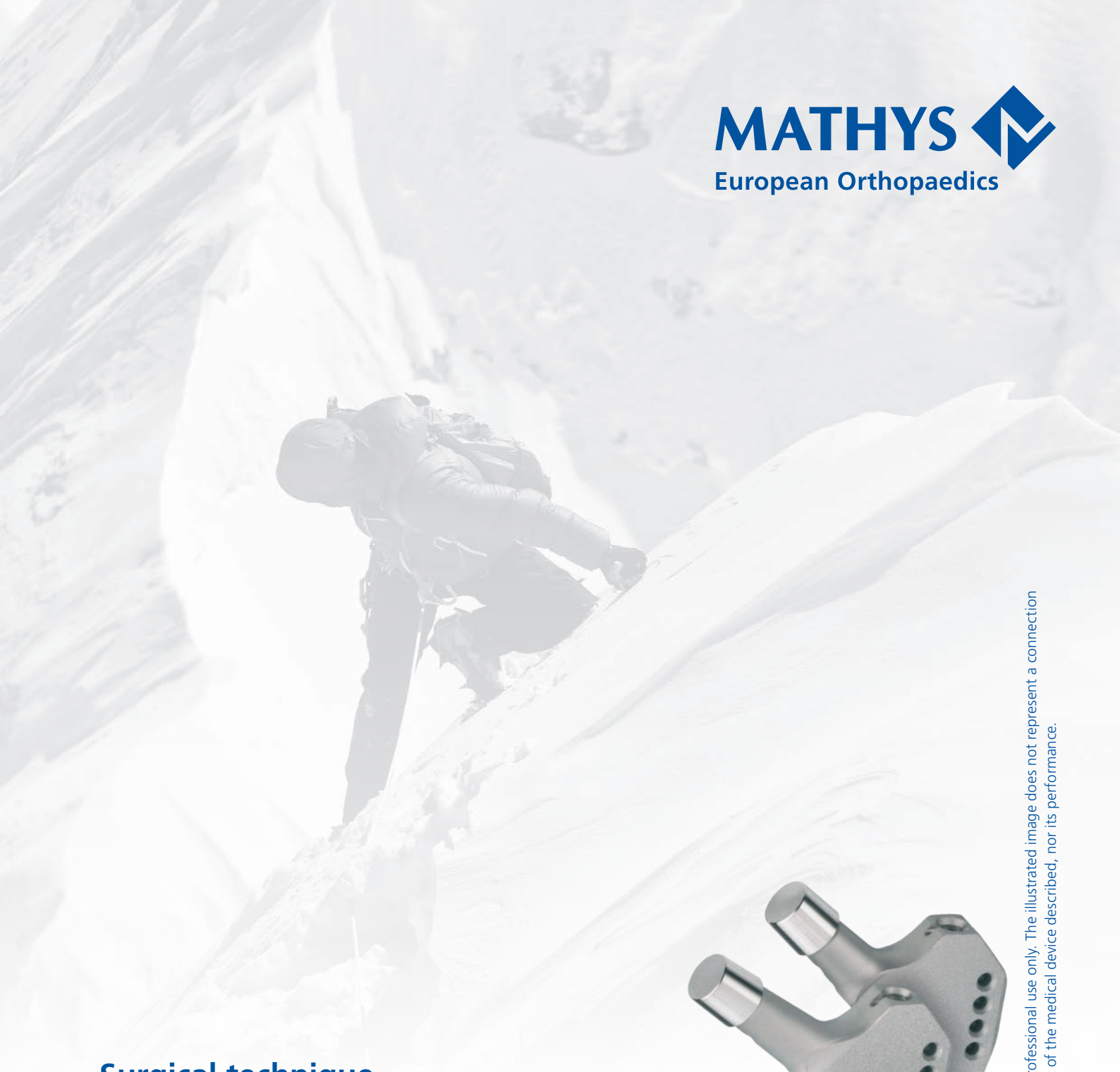
MATHYS
European Orthopaedics



Surgical technique

CBH

Preservation in motion

Building on our heritage
Moving technology forward
Step by step with our clinical partners
Towards a goal of preserving mobility

***Preservation** in motion*

As a Swiss company, Mathys is committed to this guiding principle and pursues a product portfolio with the goal of further developing traditional philosophies with respect to materials or design in order to address existing clinical challenges. This is reflected in our imagery: traditional Swiss activities in conjunction with continuously evolving sporting equipment.

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Remark
Please make yourself familiar with the handling of the instruments, the product-related surgical technique and the warnings, the safety notes as well as the recommendations of the instruction leaflet before using an implant manufactured by Mathys Ltd Bettlach. Make use of the Mathys user training and proceed according to the recommended surgical technique.

Introduction

The good clinical results of uncemented stems have been confirmed in past years. These stems enable numerous patients to lead daily lives free of complaints. [1] To move and live an active life – Mathys has been following this maxim for over 60 years. The CBH stem contributes its part to it. The uncemented CBH hip stem, implanted for the first time in 1999, follows the anchorage concept by Prof. K. Zweymüller. In Zweymüller type stems, the geometric design is based on the internal anatomy of the femur and results in reliable absorption of the rotational forces. The tapered design of the stem with its rectangular cross-sectional area supports the primary press-fit anchoring. [2, 3, 4] The rough-blasted surface of Zweymüller type stems promotes osseointegration and lasting stability of the implant. [4, 5, 6] The stems with a 12/14 cone are made of Ti6Al7Nb and are available in a standard (CCD angle 131°) and a lateral (CCD angle 124°) version, each in 13 sizes. The CBH stem is being offered with an offset range from 33 to 57 mm, covering the majority of offsets (Fig. 1).

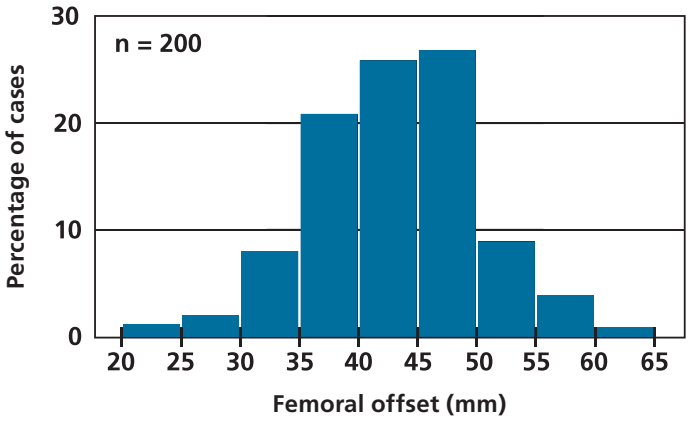


Fig. 1 Percentile distribution of the offset values in the range from 20 mm to 65 mm. Results of a study in 200 human femora. [7]

Primary stability of Zweymüller type stems [2, 3, 4]
- Distal anchoring in cortical bone
- Conically tapered design
- Rectangular cross-sectional area

Secondary stability of Zweymüller type stems [4, 5, 6]
- Rough-blasted surface

1. Indications and contraindications

Indications
- Primary or secondary osteoarthritis of the hip
- Femoral head and femoral neck fractures
- Necrosis of the femoral head

Contraindications
- Presence of factors jeopardising stable anchoring of the implant:
  – Bone loss and/or bone defects
  – Insufficient bone substance
  – Medullary canal not suitable for the implant
- Presence of factors preventing osseointegration:
  – Irradiated bone (exception: preoperative irradiation for ossification prophylaxis)
  – Devascularisation
- Local and general infection
- Hypersensitivity to any of the materials used
- Severe soft tissue, nerve or vessel insufficiency that jeopardise the function and long-term stability of the implant
- Patients for whom a different type of reconstruction surgery or treatment is likely to be successful

Restrictions
The CBH stem size 0 can be combined only with heads up to neck length L. The CBH stems size 1 – 12 can be combined only with heads up to neck length XL.

For further information, please refer to the instructions for use or ask your Mathys representative.

2. Preoperative planning

Preoperative templating can be performed using conventional radiographs or a digital planning system. The main goal is to plan the appropriate implant size and position to restore the individual biomechanics of the hip joint. Thus, potential problems can be anticipated even before surgery. In most cases, restoration of hip biomechanics can be achieved by reconstructing the original hip rotation centre, the leg length and the femoral and acetabular offset. [8]

Furthermore, the preoperative planning serves as a template in the context of intraoperative balancing by means of fluoroscopic monitoring. [9]

It is recommended to document the preoperative planning in the patient's file.

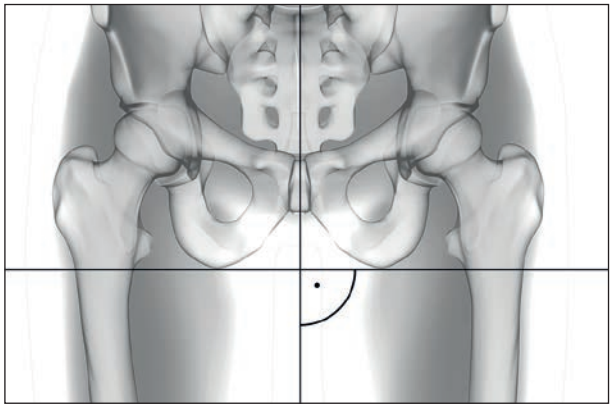


Fig. 2

Hip templating can best be performed on a pelvic radiograph taken with the patient in standing position. The radiograph needs to be symmetrical, centred on the symphysis of the pubis and with both femora in about 20° of internal rotation. The magnification scale of the radiograph can be controlled with a calibration object or by using a fixed film-to-focus distance and positioning the patient at a fixed distance between film and X-ray source (Fig. 2).

Remark
When the affected hip is severely damaged, templating on the unaffected side and transposing the planning to the affected side should be considered.

Estimation of the acetabular offset
The rotation centres of the healthy (A) and affected (A') hip are defined as the centre of a circle that fits the respective femoral head or the acetabular cavity.
A first, horizontal line is drawn tangent to both ischial tuberosities, and a second, perpendicular line is plotted through the centre of the symphysis of the pubis.

Remark
In case of leg length correction, the adjustment of the leg length can already be considered now, using the ischial tuberosities as a reference.

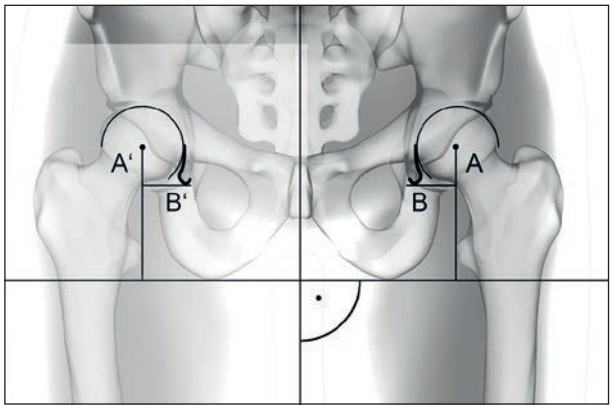


Fig. 3

The acetabular offset can be defined as the distance between Köhler's teardrop (B or B') and a vertical line through the hip rotation centre (A or A') and parallel to the symphysis line (Fig. 3).

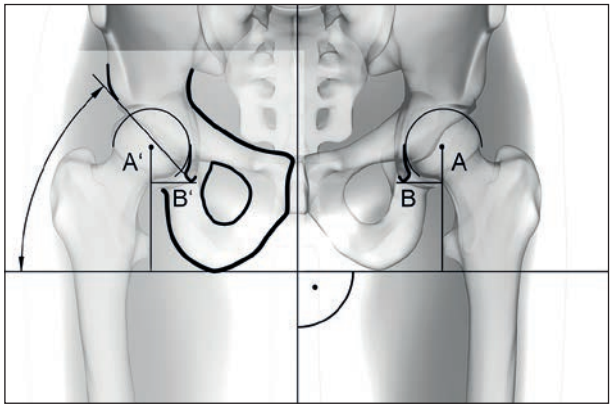


Fig. 4

Planning the cup

The cup position in relation to the pelvis must take into account the acetabular contours, the hip rotation centre, Köhler's teardrop and the required cup inclination angle (Fig. 4).

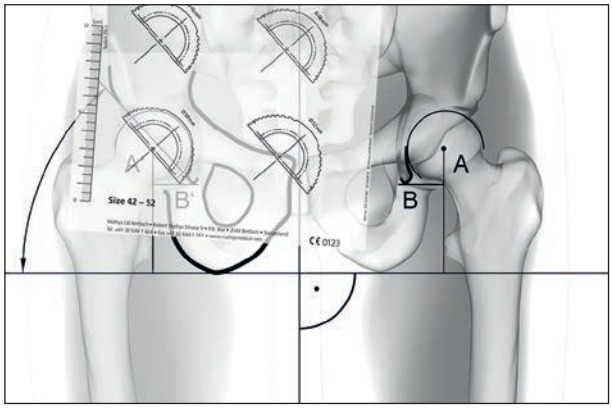


Fig. 5

To find an appropriate cup size, various cup templates are positioned at the level of the acetabular cavity aiming to restore the native hip rotation centre while establishing sufficient bone contact, both at the level of the acetabular roof and at the level of Köhler's teardrop (Fig. 5).

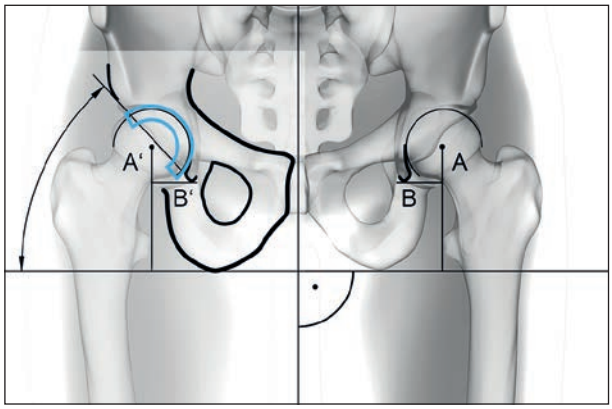


Fig. 6

The cup is positioned into the acetabulum. The implant position is established in relation to the anatomical landmarks (acetabular roof, Köhler's teardrop) and the implantation depth is marked down (Fig. 6).

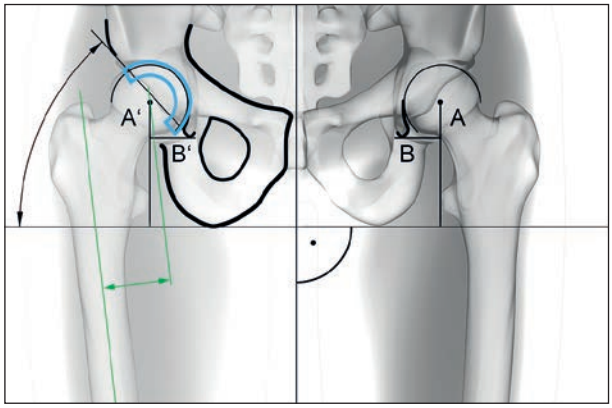


Fig. 7

Estimation of the femoral offset

The femoral offset is defined as the smallest distance between the central longitudinal axis of the femur and the hip rotation centre (Fig. 7).

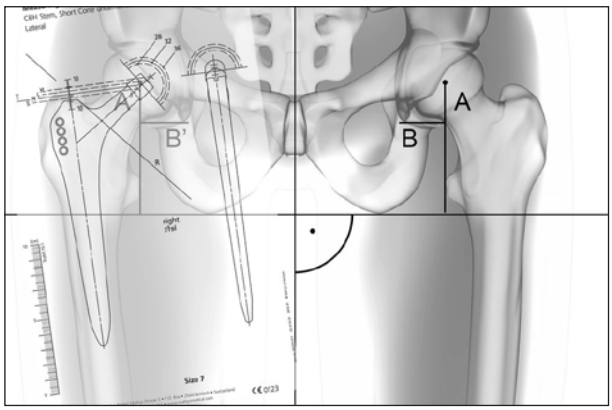


Fig. 8

Planning of the CBH stem

Determination of the stem size using the measuring templates on the femur to be operated on. The template is to be aligned to the centre of rotation and the central axis (Fig. 8).

Remark

The complete CBH system is available in 2 versions: A standard version with 13 sizes and a CCD angle of 131°, and a lateral version with 13 sizes and a CCD angle of 124°.

(A detailed information about the differences in offset and stem length can be found in chapter «Implants».)

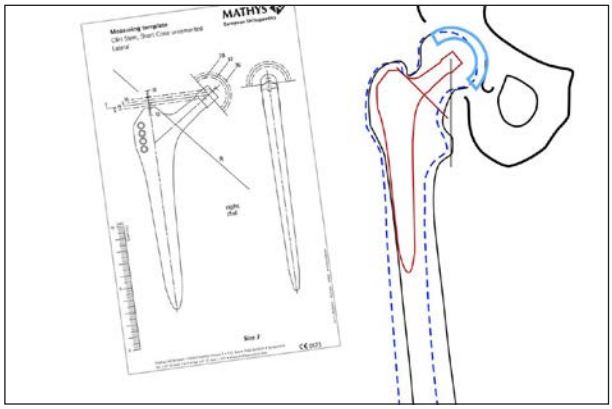


Fig. 9

On the planning sheet, the matching stem is delineated in the form of a straight red line with the measuring template in the same abduction/adduction position as the femur of the healthy side (Fig. 9).

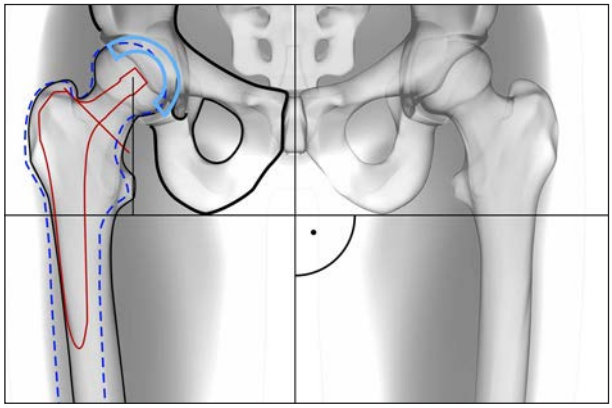


Fig. 10

The femur to be operated on is plotted over the selected stem.
The distances between the proximal end of the stem cone and the lesser trochanter as well as the one between the shoulder and the greater trochanter are measured.
Plotting of the resection plane and determination of the intersection between the trochanteric massive and the lateral demarcation of the prosthesis stem (Fig. 10).

3. Surgical technique

Depending on the positioning of the patient and the selection of the approach, conventional approaches are differentiated from minimally invasive approaches that strive to minimise bone and soft-tissue damage. The CBH stem can be implanted through conventional as well as through minimally invasive approaches. The choice of a specific approach should be based on patient anatomy and on personal experience and preference of the operating surgeon.

Fig. 11

Femoral osteotomy
The femoral neck resection level is related to the distance between the lesser and the greater trochanter and marked according to the preoperative planning (Fig. 11).

Remark
When anatomical conditions prevent head removal after a single neck cut, it is advisable to perform a double osteotomy and remove a fragment of the femoral neck first. Then the femoral head is removed with a Femoral head extractor.

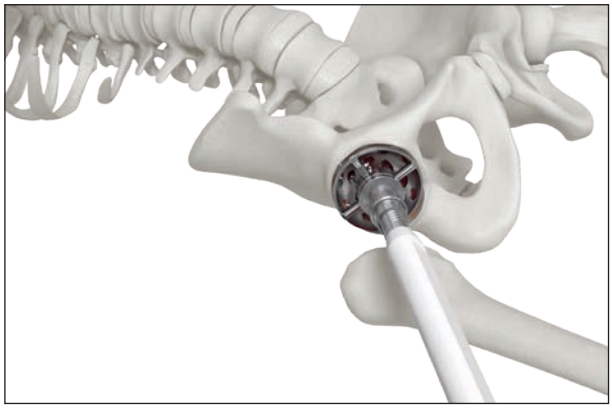


Fig. 12

Depending on the preference of the surgeon, the preparation of the acetabulum and implantation of the cup are to be performed according to the surgical technique (Fig. 12).

Remark
The implantation of the cup is described in a separate surgical technique, which can be downloaded from the Mathys Ltd Bettlach website or requested from your local Mathys representative.

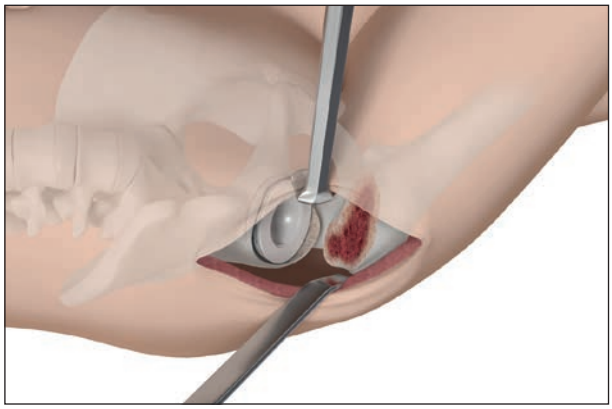


Fig. 13

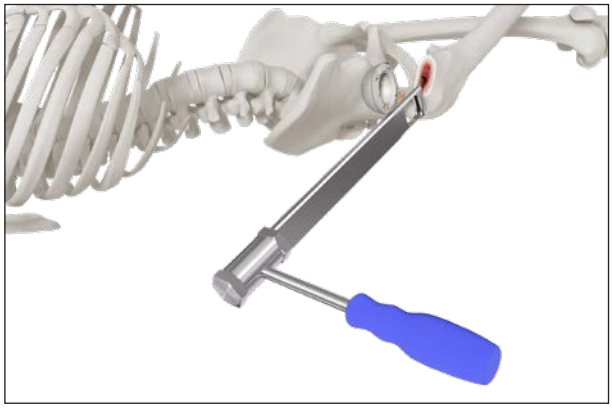


Fig. 14

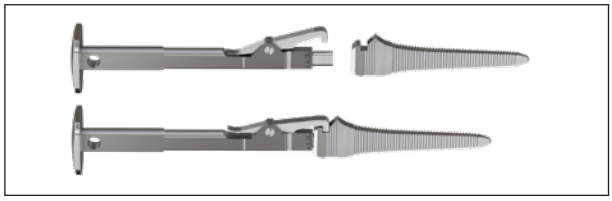


Fig. 15

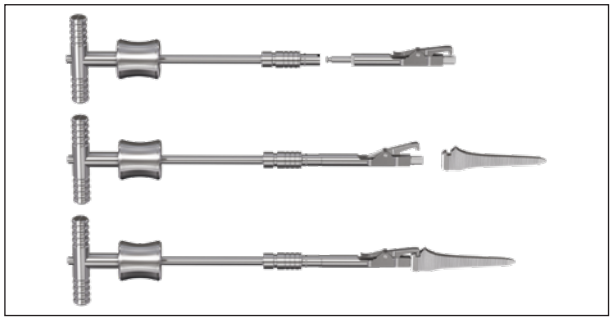


Fig. 16

Preparation of the femoral canal

Orthograde implantation is possible only after sufficient lateral opening of the femoral canal. Therefore, the CBH box chisel must be applied slightly medially of the piriformis fossa and introduced in a parallel direction to the dorsolateral femoral cortex with careful hammer strokes (Figs. 13 and 14).

The opening of the femoral canal should be done carefully, so that there is no fracture of the greater trochanter.

Remark

Pay attention to the desired anteversion of the stem of approximately 10°– 15° during this step.

The CBH box chisel should be introduced only 1 – 2 cm proximally into the medullary cavity, otherwise there is a risk of perforation.

Remark

Care should be taken not to remove an excessive amount of cancellous bone.

If in doubt, a sharp spoon may be used to explore the inner lateral femoral cortex before use of the CBH box chisel. Thus, the risk of varus or valgus malposition of the implant is reduced.

Locking and securing of the smallest rasp in the rasp handle (Fig. 15) or on the sliding hammer (Fig. 16).

Fig. 17

Stepwise rasping of the femur (Fig. 17).

Remark
It is recommended to start with the smallest rasp and then gradually open the femoral canal up to the pre-operatively planned size.

Fig. 18

The rasps are introduced along the lateral cortex with moderate hammer strokes into the femoral canal (Fig. 18).

Remark
The direction of advancement of the rasp needs to be in line with the femoral axis in order to reduce the risk of undersizing or malalignment of the final implant.

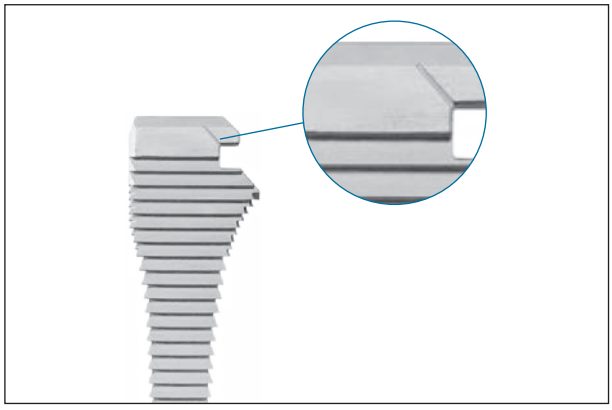


Fig. 19

Remark
The laser mark on the rasp corresponds to the resection line, and the end of the laser mark corresponds to the height of the implant shoulder (the implant shoulder does not match the centre of rotation and the tip of the greater trochanter) (Fig. 19).

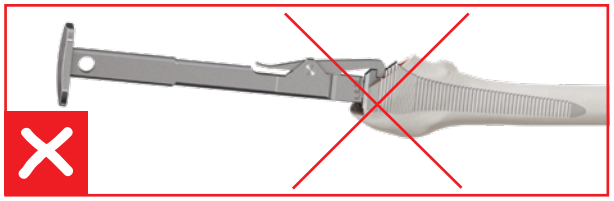


Fig. 20

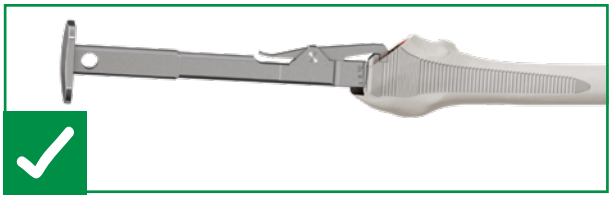


Fig. 21

While progressively widening the medullary canal using increasing rasp sizes, make sure to advance the rasps along the axis of the proximal femur and control the anteversion of the stem (Figs. 20 and 21).

Remark
Each rasp should be fully introduced down to the level of the resection plane in order to prevent protrusion of the final implant.

Once the largest possible rasp has been introduced up to the femoral resection level, the connection to the rasp handle is released.

Remark
As soon as you perceive cortical contact, you must stop reaming to prevent possible fissures.

Remark
If the largest possible rasp is smaller than the stem size that has been templated, early locking of the rasp may occur due to:
1) Incorrect insertion of the rasp, i. e. varus / valgus or rotational misalignment
2) High-density cancellous bone commonly found in young patients
3) Inaccurate templating or use of an incorrect radiographic magnification scale

Insertion of a rasp of larger size than the one that has been templated can be due to:
1) A fracture or fissure of the proximal femur
2) Inaccurate templating or the use of an incorrect radiographic magnification factor

In each of these cases, intraoperative findings should be compared with the preoperative planning to identify the cause of the mismatch. If needed, appropriate measures to correct the cause of the mismatch should be taken.

The size markings of the rasps match the implant sizes.

Remark
Correct fit of the rasp in the femur can additionally be checked under image intensification.

The design of the rasp, specifically optimised for anchoring the CBH stem, corresponds to the basic implant.

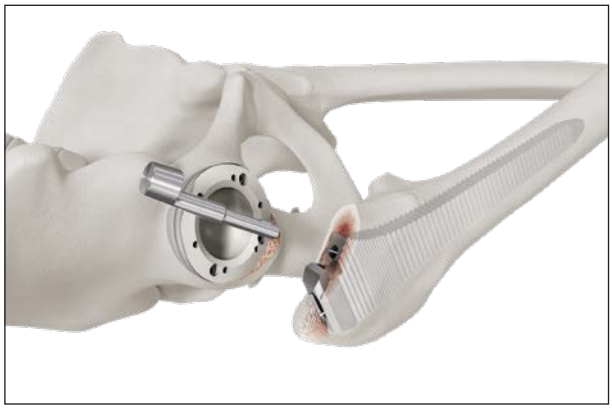


Fig. 22

As the inserted final rasp serves as a trial prosthesis, the planned and matching trial cone together with the trial head is placed on the rasp (Figs. 22 and 23).

The CBH stem size 0 can be combined only with heads up to neck length L. The CBH stems sizes 1 – 12 can be combined only with heads up to neck length XL.

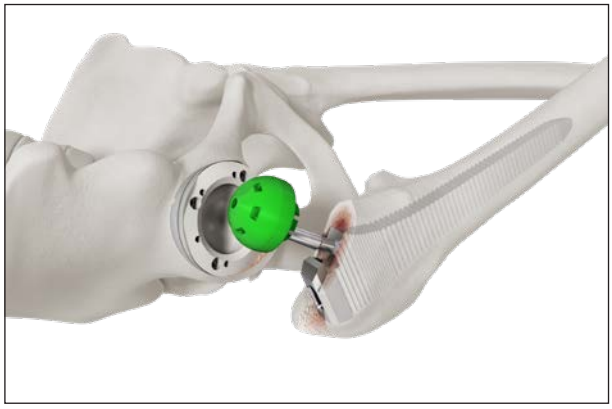


Fig. 23

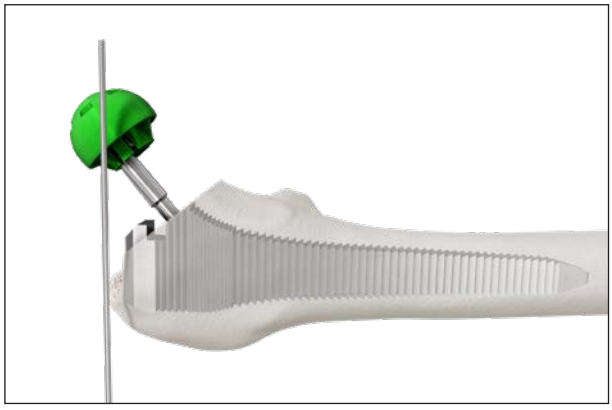


Fig. 24

Before trial reduction, it is recommended to compare the position of the rotational centre of the trial head with the preoperative templating measurements or using a Kirschner wire and compare the measurements with the preoperative planning (Fig. 24).
Alternatively, the distance between the proximal end of the stem cone and the lesser trochanter can be used as a reference for comparison with the preoperative planning.

Remark
Match the final head size to the inner diameter of the cup.

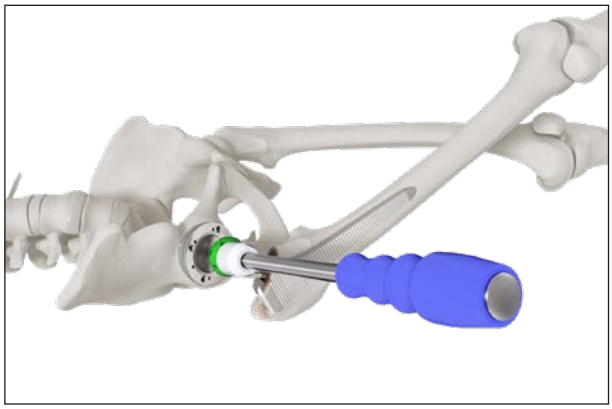


Fig. 25

Trial reduction with the final rasp (Figs. 25, 26 and 27).

Fig. 26

Fig. 27

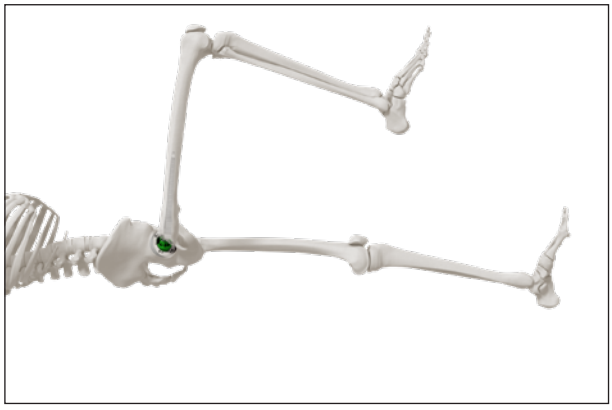


Fig. 28

After trial reduction, take the hip through a full range of motion. Watch out for soft-tissue and neck-cup impingement and evaluate the tendency of the implant to dislocate during internal and external rotation in flexion and extension. Make also sure that the tension is appropriate (Figs. 28 and 29).

Remark

At this stage, it is still possible to modify the offset with standard (131°) and lateral (124°) necks and the neck length of the trial head if needed.

Remark

Correct fit of the rasp in the femur can additionally be checked under image intensification.

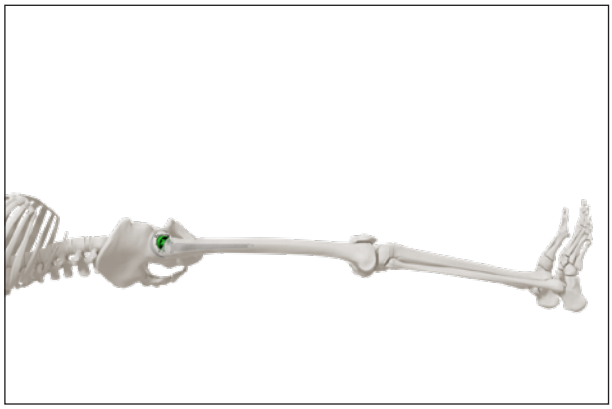


Fig. 29

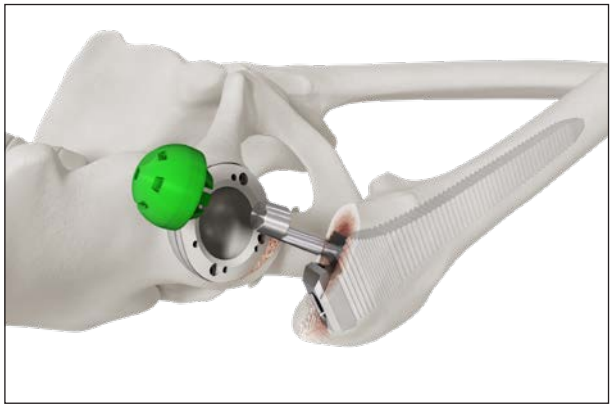


Fig. 30

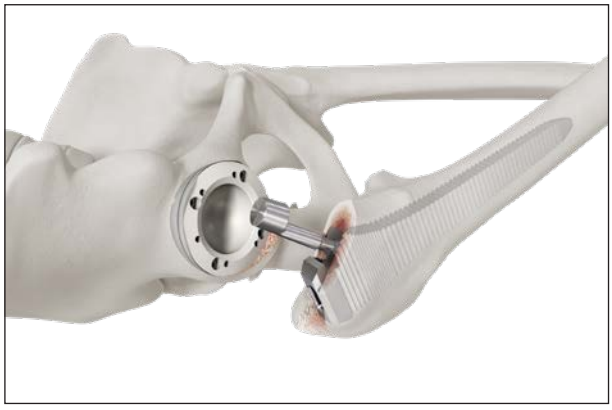


Fig. 31

Implantation of the CBH stem

Once the trial reduction has been completed, pull the trial head and the trial cone off the rasp and remove them. Then connect the rasp to the rasp handle again and remove the rasp from the femur (Figs. 30, 31, 32 and 33).

Fig. 32

Fig. 33

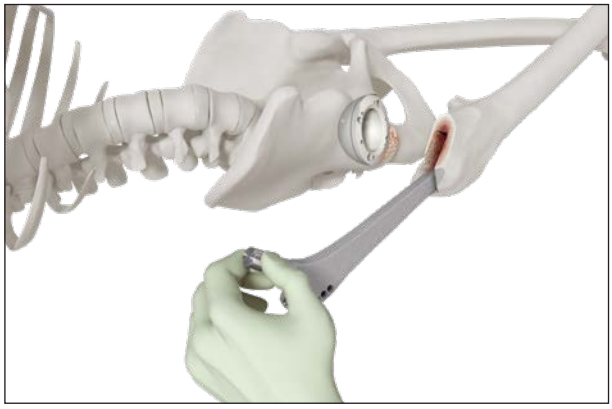


Fig. 34

After removal of the rasp implant the original CBH stem as soon as possible without rinsing or drying the medullary cavity.

The prosthesis stem is first inserted manually into the prosthesis bed (Figs. 34 and 35).

Remark
It should be possible to insert the CBH stem manually up to approx. 2 cm above the final position.

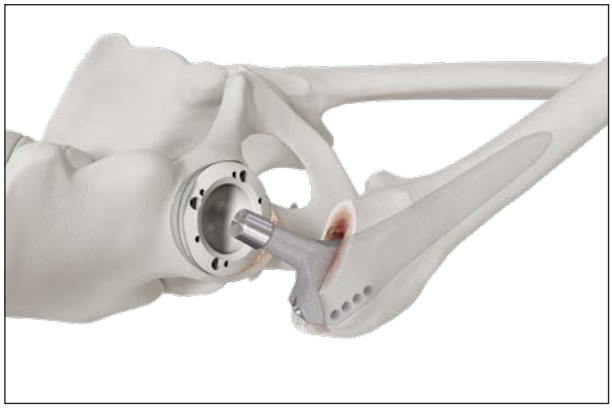


Fig. 35

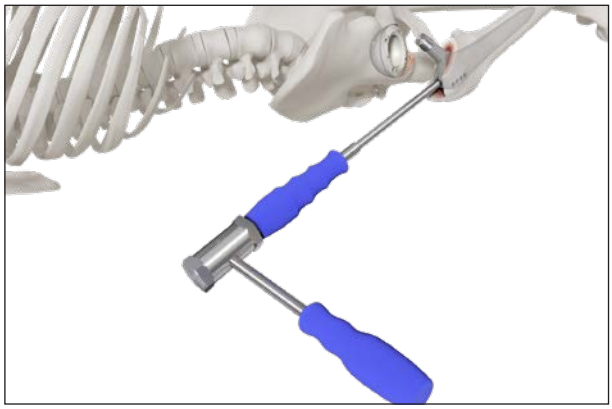


Fig. 36

Next, the stem is hammered into the predetermined end position with carefully measured strokes (Fig. 36).

Due to the rectangular cross-section design of the CBH stem (wedge effect) and the resulting force transmission to the diaphyseal region of the cortical bone, it is important to insert the CBH stem very carefully. In this process, the CBH stem should be placed against the lateral inner femoral cortical bone, and the correct anteversion should be observed.

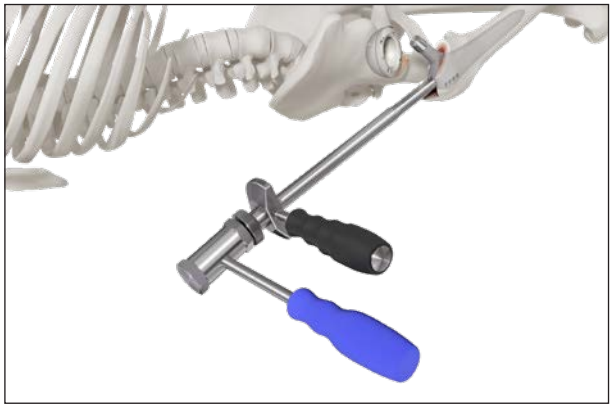


Fig. 37

Alternatively, the CBH positioner can be used for the insertion of the implant. The positioner needs to be threaded into the proximal thread of the implant before the placing of the implant (Fig. 37).

Remark
This instrument is also used for the extraction of the implant.

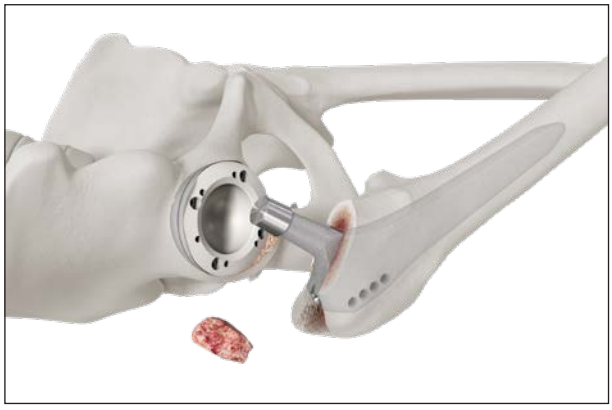


Fig. 38

Remark
If a substantial defect in the greater trochanter is present (e.g. in case of coxa vara) during preparation of the prosthesis bed or after implantation of the CBH stem, it is recommended to fill the defect with autologous bone material (Figs. 38 and 39). A stable fit of the slightly oversized (approx. 1 mm) inserted block must be assured.

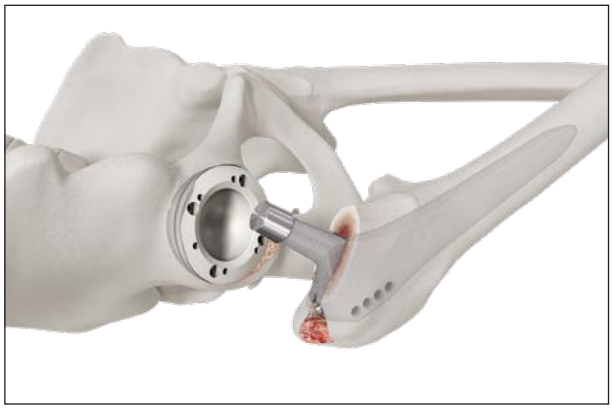


Fig. 39

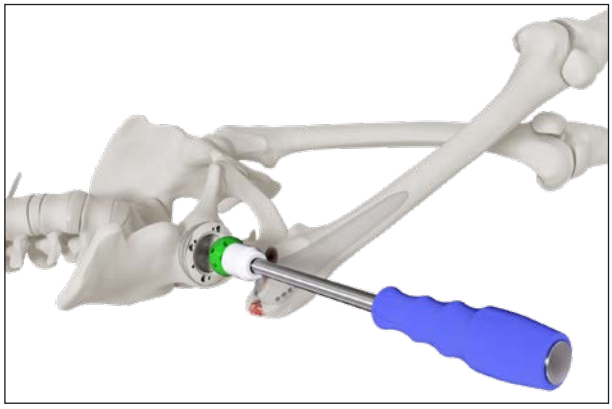


Fig. 40

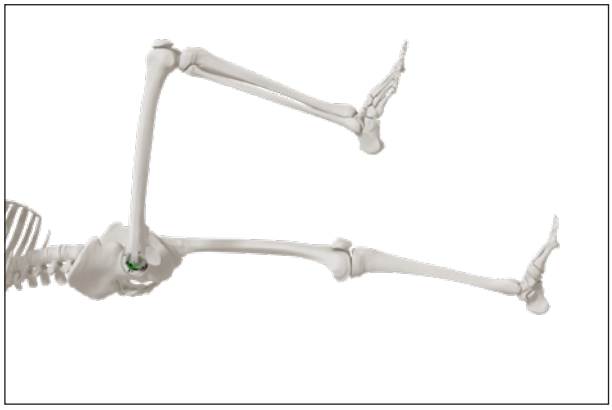


Fig. 41

Another trial reduction can be performed with the implant in place and the appropriate trial head in order to check the range of motion, impingement and ligament tension (Figs. 40, 41 and 42).

Remark
Perform trial reduction without damaging the cup and the stem already implanted.

Remark
At this time, only the neck length of the prosthetic head can be modified if needed.

Remark
An overview of the neck lengths of heads and trial heads can be found in chapters «Implants» and «Instruments».

Remark
The head diameter must always match the inner diameter of the cup.

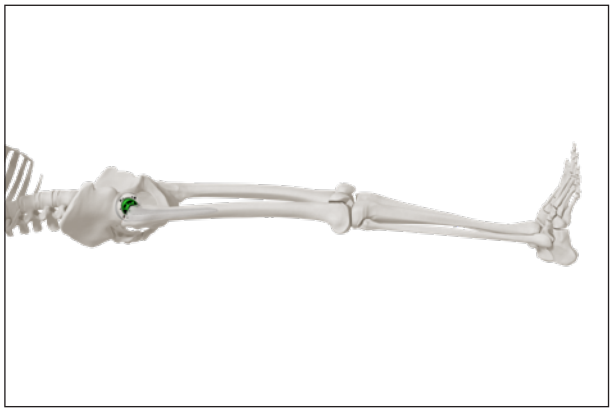


Fig. 42

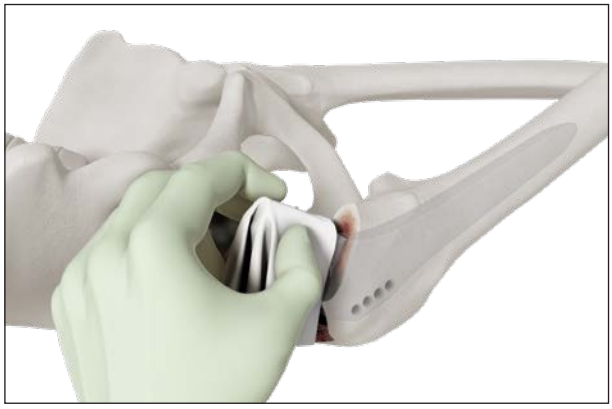


Fig. 43

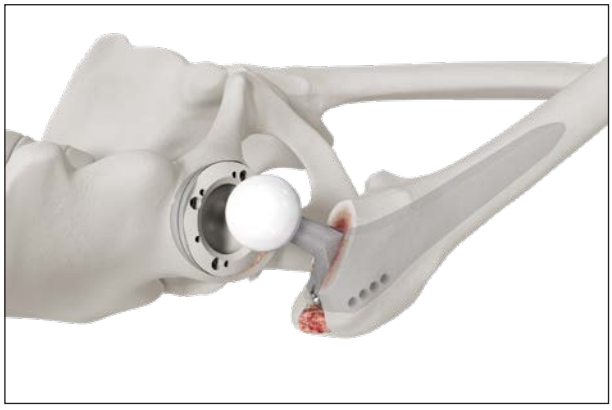


Fig. 44

To avoid complications at the stem / head interface, the stem cone needs to be dry and free of any foreign matter (e. g. tissue fragments, bone or cement particles) before assembling the final head (Figs. 43 and 44).

The CBH stem can not be combined with the dual mobility cup distributed by Mathys (DS Evolution).

The CBH stem size 0 can be combined only with heads up to neck length L. The CBH stems size 1 – 12 can be combined only with heads up to neck length XL.

Fig. 45

Fig. 46

Reduction of the joint (Figs. 45 and 46).

Remark
Correct fit of the implants can additionally be checked under image intensification.

The joint space needs to be free of any foreign matter (e. g. tissue fragments, bone or cement particles).

Depending on the approach, the muscle insertions are reattached, and the wound is closed layer by layer.

Fig. 47

Removal of the CBH stem
In case of revision, the CBH stem can be removed with the CBH positioner (Fig. 47) or a universal stem extraction instrument.

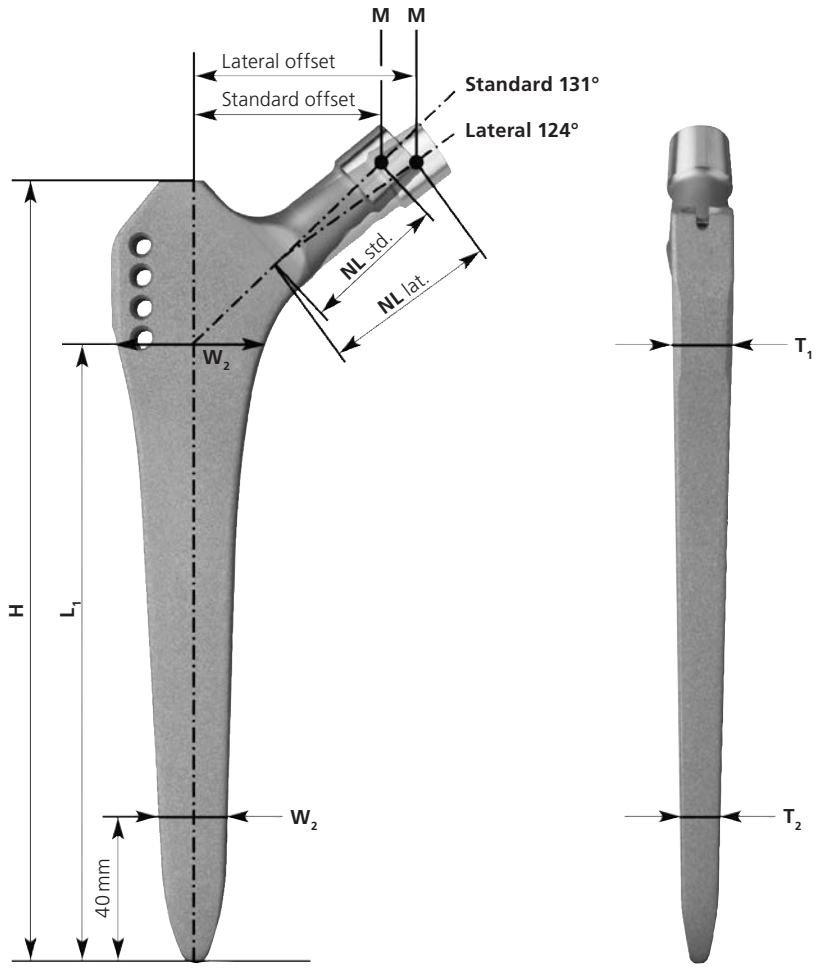
For further information about stem revision and extraction instruments contact your local Mathys representative.

In case of intra-operative removal of the final stem, re-implantation of the same stem is not allowed – a new stem must be used.

4. Implants

Uncemented Stems

Dimensions (all in mm)



Legend

H	= Height
L_1	= Length
NL	= Neck length
M	= Head centre M
T_1, T_2	= Thickness
W_1, W_2	= Width

Size	Offset std.	Offset lat.	NL std.	NL lat.	H	L1	W1	T1	W2	T2
0	33	39	24	29	132	105	24.4	9.0	10.0	6.9
1	34	40	25	30	136	109	25.1	9.3	10.6	7.1
2	36	41	26	31	141	113	25.9	9.6	11.2	7.4
3	37	43	27	32	145	116	26.8	10.0	11.9	7.6
4	38	44	28	33	149	119	27.8	10.4	12.7	7.9
5	39	46	29	34	154	123	29.1	10.9	13.6	8.2
6	41	47	30	35	159	127	30.3	11.4	14.6	8.6
7	42	49	31	36	164	131	31.6	11.8	15.6	8.9
8	43	50	32	37	169	136	33.1	12.4	16.6	9.3
9	45	52	33	38	175	140	34.6	13.0	17.8	9.8
10	46	53	34	40	180	145	36.1	13.5	19.1	10.2
11	48	55	35	41	186	150	37.8	14.2	20.5	10.8
12	49	57	36	42	192	154	39.5	14.9	22.0	11.3

CBH standard

Item no.	Description
56.20.0000SC	CBH std. stem TAN 0 uncem.
56.20.0101SC	CBH std. stem TAN 1 uncem.
56.20.0102SC	CBH std. stem TAN 2 uncem.
56.20.0103SC	CBH std. stem TAN 3 uncem.
56.20.0104SC	CBH std. stem TAN 4 uncem.
56.20.0105SC	CBH std. stem TAN 5 uncem.
56.20.0106SC	CBH std. stem TAN 6 uncem.
56.20.0107SC	CBH std. stem TAN 7 uncem.
56.20.0108SC	CBH std. stem TAN 8 uncem.
56.20.0109SC	CBH std. stem TAN 9 uncem.
56.20.0110SC	CBH std. stem TAN 10 uncem.
56.20.0111SC	CBH std. stem TAN 11 uncem.
56.20.0112SC	CBH std. stem TAN 12 uncem.

Material: Ti6Al7Nb
Cone: 12/14 mm
CCD angle: 131°

CBH lateral

Item no.	Description
56.20.1000SC	CBH lat. stem TAN 0 uncem.
56.20.1101SC	CBH lat. stem TAN 1 uncem.
56.20.1102SC	CBH lat. stem TAN 2 uncem.
56.20.1103SC	CBH lat. stem TAN 3 uncem.
56.20.1104SC	CBH lat. stem TAN 4 uncem.
56.20.1105SC	CBH lat. stem TAN 5 uncem.
56.20.1106SC	CBH lat. stem TAN 6 uncem.
56.20.1107SC	CBH lat. stem TAN 7 uncem.
56.20.1108SC	CBH lat. stem TAN 8 uncem.
56.20.1109SC	CBH lat. stem TAN 9 uncem.
56.20.1110SC	CBH lat. stem TAN 10 uncem.
56.20.1111SC	CBH lat. stem TAN 11 uncem.
56.20.1112SC	CBH lat. stem TAN 12 uncem.

Material: Ti6Al7Nb
Cone: 12/14 mm
CCD angle: 124°

Stem-Head Combination

The CBH stem size 0 can be combined only with heads up to neck length L.
The CBH stems size 1 – 12 can be combined only with heads up to neck length XL.

Femoral Heads

Femoral Head, Stainless Steel

Item no.	Outside diameter	Neck length	
54.11.1031	22.2 mm	S	-3 mm
54.11.1032	22.2 mm	M	0 mm
54.11.1033	22.2 mm	L	+3 mm
2.30.410	28 mm	S	-4 mm
2.30.411	28 mm	M	0 mm
2.30.412	28 mm	L	+4 mm
2.30.413	28 mm	XL	+8 mm
2.30.400	32 mm	S	-4 mm
2.30.401	32 mm	M	0 mm
2.30.402	32 mm	L	+4 mm
2.30.403	32 mm	XL	+8 mm

Material: FeCrNiMnMoNbN
Cone: 12/14 mm

The stainless steel femoral heads can only be combined with Mathys polyethylene cups or inlays.

Femoral Head, CoCrMo

Item no.	Outside diameter	Neck length	
52.34.0125	22.2 mm	S	-3 mm
52.34.0126	22.2 mm	M	0 mm
52.34.0127	22.2 mm	L	+3 mm
2.30.010	28 mm	S	-4 mm
2.30.011	28 mm	M	0 mm
2.30.012	28 mm	L	+4 mm
2.30.013	28 mm	XL	+8 mm
2.30.020	32 mm	S	-4 mm
2.30.021	32 mm	M	0 mm
2.30.022	32 mm	L	+4 mm
2.30.023	32 mm	XL	+8 mm
52.34.0686	36 mm	S	-4 mm
52.34.0687	36 mm	M	0 mm
52.34.0688	36 mm	L	+4 mm
52.34.0689	36 mm	XL	+8 mm

Material: CoCrMo
Cone: 12/14 mm

The CoCrMo femoral heads can only be combined with Mathys polyethylene cups or inlays.

Stem-Head Combination

The CBH stem size 0 can be combined only with heads up to neck length L.
The CBH stems size 1–12 can be combined only with heads up to neck length XL.

Femoral Head, ceramys

Item no.	Outside diameter	Neck length	
54.47.0010	28 mm	S	-3.5 mm
54.47.0011	28 mm	M	0 mm
54.47.0012	28 mm	L	+3.5 mm
54.47.0110	32 mm	S	-4 mm
54.47.0111	32 mm	M	0 mm
54.47.0112	32 mm	L	+4 mm
54.47.0113	32 mm	XL	+8 mm
54.47.0210	36 mm	S	-4 mm
54.47.0211	36 mm	M	0 mm
54.47.0212	36 mm	L	+4 mm
54.47.0213	36 mm	XL	+8 mm

Material: ZrO_2-Al_2O_3
Cone: 12/14 mm

The ceramys femoral heads can only be combined with Mathys polyethylene, or with Mathys ceramic cups or inlays.

Femoral Head, symarec

Item no.	Outside diameter	Neck length	
54.48.0010	28 mm	S	-3.5 mm
54.48.0011	28 mm	M	0 mm
54.48.0012	28 mm	L	+3.5 mm
54.48.0110	32 mm	S	-4 mm
54.48.0111	32 mm	M	0 mm
54.48.0112	32 mm	L	+4 mm
54.48.0113	32 mm	XL	+8 mm
54.48.0210	36 mm	S	-4 mm
54.48.0211	36 mm	M	0 mm
54.48.0212	36 mm	L	+4 mm
54.48.0213	36 mm	XL	+8 mm

Material: Al_2O_3-ZrO_2
Cone: 12/14 mm

The symarec femoral heads can only be combined with Mathys polyethylene, or with Mathys ceramic cups or inlays.

Stem-Head Combination
The CBH stem size 0 can be combined only with heads up to neck length L.
The CBH stems size 1 – 12 can be combined only with heads up to neck length XL.

Revision Head, ceramys

Item no.	Outside diameter	Neck length	
54.47.2010	28 mm	S	-3.5 mm
54.47.2020	28 mm	M	0 mm
54.47.2030	28 mm	L	+3.5 mm
54.47.2040	28 mm	XL	+7 mm
54.47.2110	32 mm	S	-3.5 mm
54.47.2120	32 mm	M	0 mm
54.47.2130	32 mm	L	+3.5 mm
54.47.2140	32 mm	XL	+7 mm
54.47.2210	36 mm	S	-3.5 mm
54.47.2220	36 mm	M	0 mm
54.47.2230	36 mm	L	+3.5 mm
54.47.2240	36 mm	XL	+7 mm

Material: ZrO_2-Al_2O_3, TiAl6V4
Cone: 12/14 mm

The ceramys Revision Heads can only be combined with Mathys polyethylene, or with Mathys ceramic cups or inlays.

Stem-Head Combination
The CBH stem size 0 can be combined only with heads up to neck length L.
The CBH stems size 1 – 12 can be combined only with heads up to neck length XL.

Bipolar Head, CoCrMo and Stainless Steel

CoCrMo	Stainless Steel	Outside diameter	Head diameter
52.34.0090	–	39 mm	22.2 mm
52.34.0091	–	40 mm	22.2 mm
52.34.0092	–	41 mm	22.2 mm
52.34.0093	–	42 mm	22.2 mm
52.34.0094	–	43 mm	22.2 mm
52.34.0100	54.11.0042	42 mm	28 mm
52.34.0101	–	43 mm	28 mm
52.34.0102	54.11.0044	44 mm	28 mm
52.34.0103	–	45 mm	28 mm
52.34.0104	54.11.0046	46 mm	28 mm
52.34.0105	–	47 mm	28 mm
52.34.0106	54.11.0048	48 mm	28 mm
52.34.0107	–	49 mm	28 mm
52.34.0108	54.11.0050	50 mm	28 mm
52.34.0109	–	51 mm	28 mm
52.34.0110	54.11.0052	52 mm	28 mm
52.34.0111	–	53 mm	28 mm
52.34.0112	54.11.0054	54 mm	28 mm
52.34.0113	–	55 mm	28 mm
52.34.0114	54.11.0056	56 mm	28 mm
52.34.0115	–	57 mm	28 mm
52.34.0116	54.11.0058	58 mm	28 mm
52.34.0117	–	59 mm	28 mm

Material CoCrMo: CoCrMo; UHMWPE
Material stainless steel: FeCrNiMnMoNbN; UHMWPE

The implantation of the bipolar heads is described in a separate surgical technique, which can be downloaded from the Mathys Ltd Bettlach website or requested from your local Mathys representative.

Hemiprosthesis Head, Stainless Steel
Sizes 38 – 44 mm

Item no. / S -4 mm	Item no. / M 0 mm	Outside diameter
2.30.420	67092	38 mm
2.30.421	67093	40 mm
2.30.422	67094	42 mm
2.30.423	67095	44 mm

Material: FeCrNiMnMoNbN
Cone: 12 / 14 mm

Hemiprosthesis Head, Stainless Steel
Sizes 46 – 58 mm

Item no. / S -4 mm	Item no. / M 0 mm	Outside diameter
2.30.424	67096	46 mm
2.30.425	67097	48 mm
2.30.426	67098	50 mm
2.30.427	67099	52 mm
2.30.428	67100	54 mm
2.30.429	67101	56 mm
2.30.430	67102	58 mm

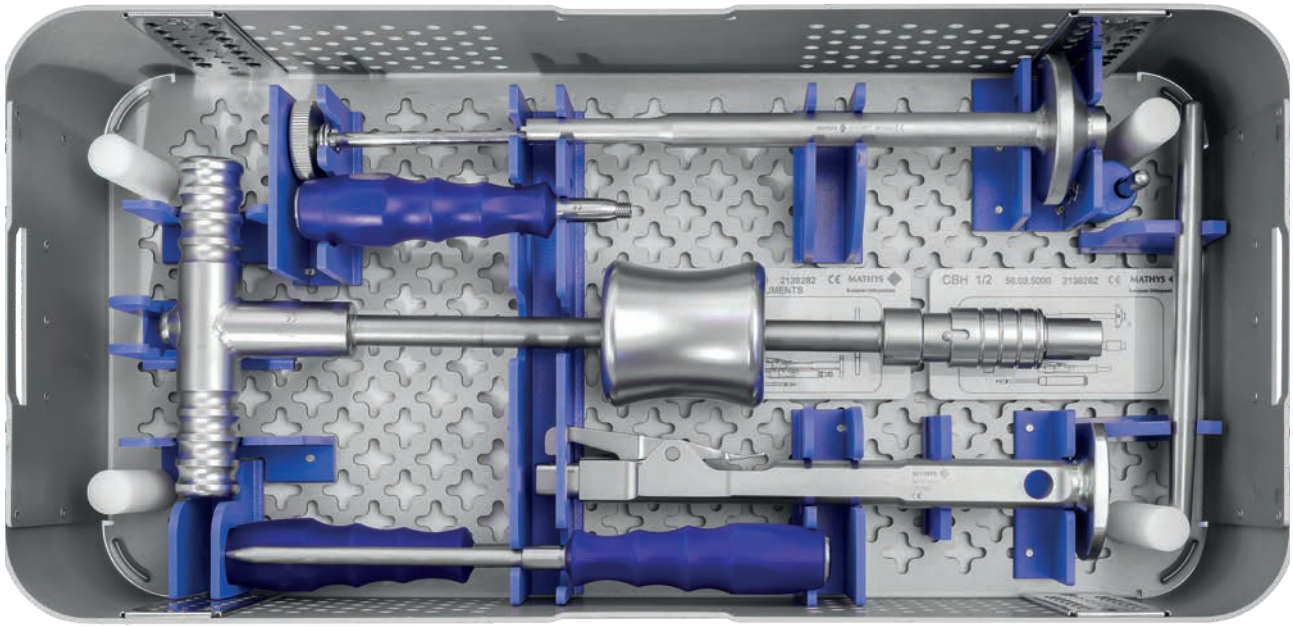
Material: FeCrNiMnMoNbN
Cone: 12 / 14 mm

The implantation of the hemiprosthesis heads is described in a separate surgical technique, which can be downloaded from the Mathys Ltd Bettlach website or requested from your local Mathys representative.

5. Instruments

CBH instrumentation 56.01.0017A

Item no. 56.03.5001 **Intermediate Tray for CBH Tray**



Item no. 56.03.5000 **Basic CBH Tray**
No image / Item no. 56.03.5002 **Lid for CBH Tray**

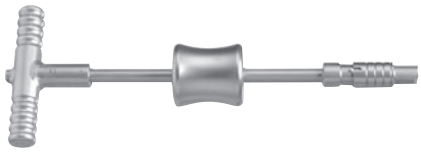
Item no.	Description
56.02.2001	Box Chisel

Item no.	Description
56.02.2101*	CBH Rasp/Trial Prosthesis size 01
56.02.2100	CBH Rasp/Trial Prosthesis size 0
56.02.2201	CBH Rasp/Trial Prosthesis size 1
56.02.2202	CBH Rasp/Trial Prosthesis size 2
56.02.2203	CBH Rasp/Trial Prosthesis size 3
56.02.2204	CBH Rasp/Trial Prosthesis size 4
56.02.2205	CBH Rasp/Trial Prosthesis size 5
56.02.2206	CBH Rasp/Trial Prosthesis size 6
56.02.2207	CBH Rasp/Trial Prosthesis size 7
56.02.2208	CBH Rasp/Trial Prosthesis size 8
56.02.2209	CBH Rasp/Trial Prosthesis size 9
56.02.2210	CBH Rasp/Trial Prosthesis size 10
56.02.2211	CBH Rasp/Trial Prosthesis size 11
56.02.2212	CBH Rasp/Trial Prosthesis size 12

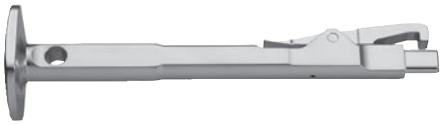
*** Can be used as starter rasp only**

Item no.	Description
56.02.4002	Adapter with Rocker

Item no.	Description
58.02.4128	CBH Rasp Handle MIS L
58.02.4129	CBH Rasp Handle MIS R



Item no.	Description
56.02.4001	Slide Hammer



Item no.	Description
56.02.4015	Impactor Handle with Rocker

Item no.	Description
3.30.552	Crossbar, long

Item no.	Description
5246.00	Hammer

Item no.	Description
56.02.2213	Trial Cone, standard

Item no.	Description
56.02.2214	Trial Cone, lateral

Item no.	Description
51.34.1061	Trial head 22 S
51.34.1062	Trial head 22 M
51.34.1063	Trial head 22 L
51.34.1064	Trial head 28 S
51.34.1065	Trial head 28 M
51.34.1066	Trial head 28 L
51.34.1067	Trial head 28XL
51.34.1069	Trial head 32 S
51.34.1070	Trial head 32 M
51.34.1071	Trial head 32 L
51.34.1072	Trial head 32XL
51.34.1074	Trial head 36 S
51.34.1075	Trial head 36 M
51.34.1076	Trial head 36 L
51.34.1077	Trial head 36 XL

Item no.	Description
56.02.4013	Handle for Positioner

Item no.	Description
56.02.4011	Threaded Rod for Positioner

Item no.	Description
56.02.4012	Guide Sleeve for Positioner

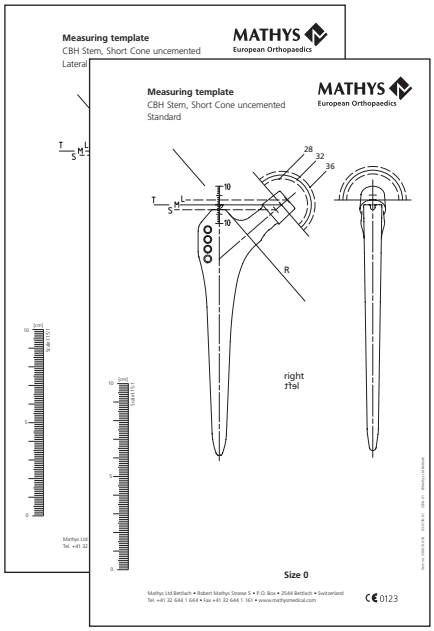
Item no.	Description
56.02.2017	Impactor for tapping

Item no.	Description
51.34.0446	twinSys Impactor with Offset

Item no.	Description
51.34.0295	MIS Stem impactor with ball

Item no.	Description
51.34.0136	Extractor curved silicone

6. Measuring templates



Item no.	Description
330.010.017	CBH Measuring template, lateral
330.010.018	CBH Measuring template, standard

Digital Measuring Templates are available for the common preoperative planning software.

7. Literature

1 Suckel, A.; Geiger, F.; Kinzl, L.; Wulker, N.; Garbrecht, M. Long-term results for the uncemented Zweymüller/Alloclassic hip endoprosthesis. A 15-year minimum follow-up of 320 hip operations. J Arthroplasty, 2009. 24, 6, 846-53.

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5 Wick, M.; Lester, D. K. Radiological changes in second- and third-generation Zweymüller stems. J Bone Joint Surg Br, 2004, 8, 1108-14.

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9 Loweg L.; Kutzner K.P.; Trost M., Hechtner M., et al. The learning curve in short-stem THA: influence of the surgeon's experience on intraoperative adjustments due to intraoperative radiography. European Journal of Orthopaedic Surgery & Traumatology, 2017, 28(2): 269-275

8. Symbols


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Correct


Incorrect


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