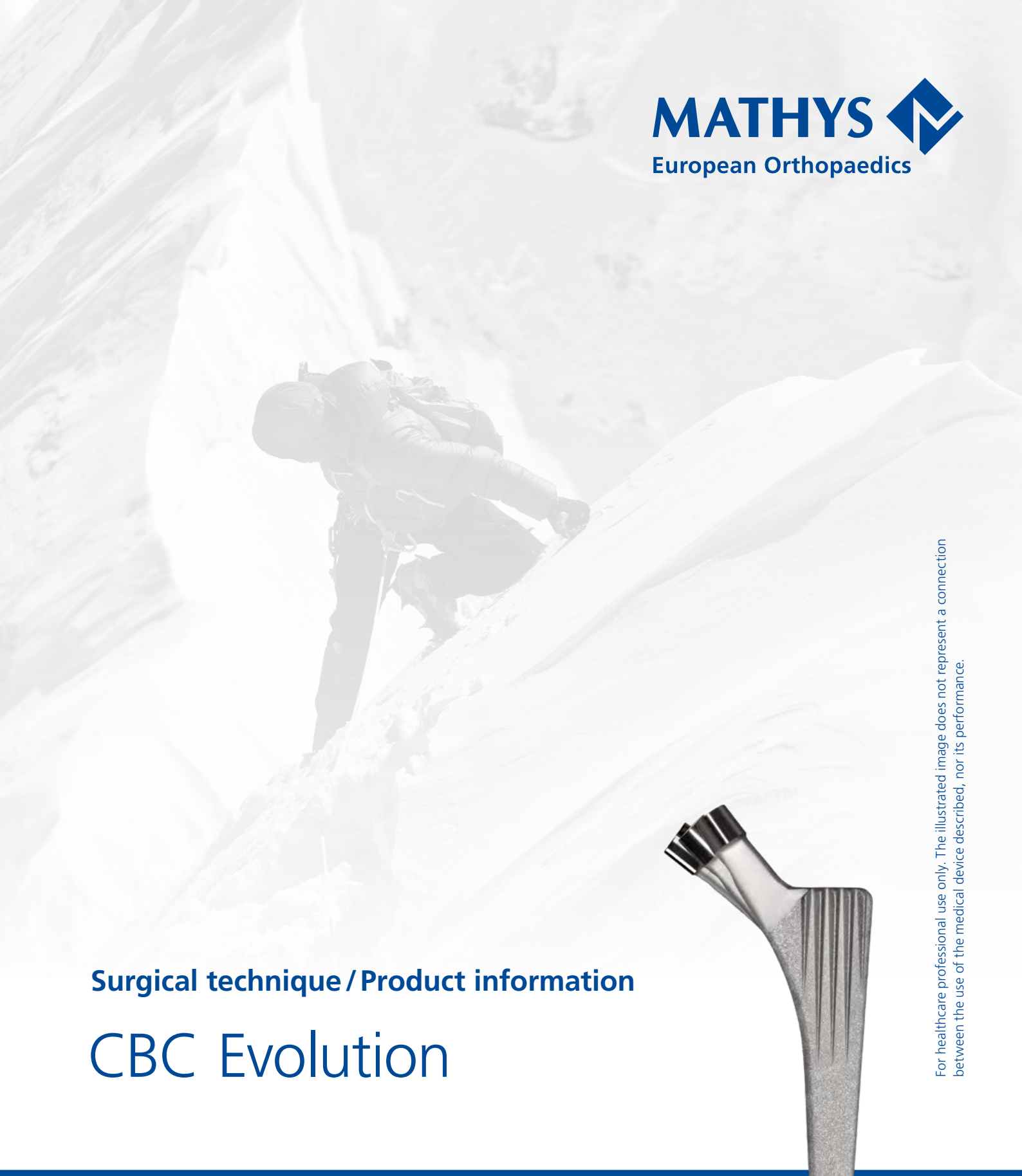
MATHYS
European Orthopaedics



Surgical technique / Product information

CBC Evolution

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*

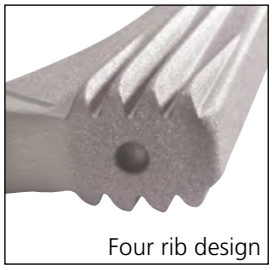
As a Swiss company, Mathys is committed to this guiding principle and pursues a product portfolio with the goal of further developing traditional philosophies with respect to materials or design in order to address existing clinical challenges. This is reflected in our imagery: traditional Swiss activities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

Table of contents

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


Three rib design


Four rib design


Five rib design

Fig. 1 Rib design

Today, many hopsitals perform artificial hip replacement as a routine procedure with the aim to reduce pain, to reconstruct a previously healthy joint and to improve mobility. An implant is basically indicated for hip joints that have undergone pathological changes, degeneration or trauma. Proper surgical technique and implant design are essential to ensure a positive outcome of artificial hip replacement for a patient population of increasingly younger age and greater life expectancy.

Philosophy

Design and anchoring philosophy of the CBC Evolution stem system by Mathys Ltd Bettlach (clinical use since 2011) are based on the principles of the Spotorno philosophy developed by Prof. Spotorno in 1982. This involves a straight stem with uncemented proximal anchorage.

In accordance with the original philosophy, the anchoring principle of the CBC Evolution stem is based on the idea of proximal and metaphyseal load introduction to the bone. Typical of this stem concept are multiple ribs on the stem's proximal third which are tapered toward the distal portion.

Principles of the biomechanical concept

The biconical design converts the acting shearing forces into compression forces, with the aim to obtain a reliable primary stability. [1] The corundum-blasted surface and the prism-shaped rib geometry promote the osteointegration and allow a stable anchoring of the stem. [2]

The rib geometry

The aim was to achieve a rib geometry and rib disposition, with the goal of a proximal introduction of force and minimised risk of intraoperative fractures. [2]
The disposition and height of the individual ribs adapt to the expansion of the cancellous bone volume in the proximal femur, especially in the area of the trochanter.
Additionally, the number of ribs to the stem size respective to the medullary space is adapted (Fig 1).

The stem versions

CBC Evolution stems are available in 13 sizes each with 3 different CCD angles (145°/135°/125°).
The smaller sizes are available in increments of 1 mm and the larger sizes in increments of 1.25 mm or 2.5 mm. (For more Information about the sizes, please see chapter Implants).

Offset

The femoral offset of a hip is defined as the distance between the centre of rotation and the central longitudinal axis of the femur (Fig 2). The offset usually is between 20 mm and 65 mm (Fig. 3). [3]

The CBC Evolution stem is offering three different CCD angle (125°/135°/145°), trying to reconstruct the anatomical offset required for the individual patient. This considers the change of the CCD angle and the resulting centre of rotation. The CBC Evolution stem system offer an offset range from 31.8 mm to 58.4 mm. (For more Information about the sizes, please see chapter Implants).

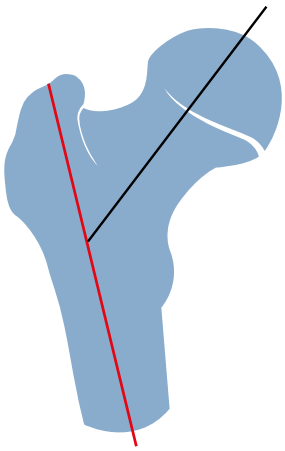


Fig. 2 Definition of femoral Offset and CCD angle

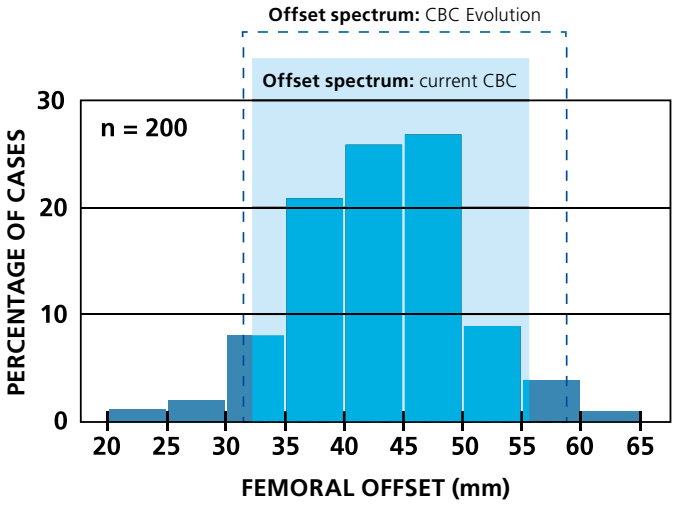


Fig. 3 Percentile distribution of the offset values in the range of 20 mm until 65 mm. Results of a study with 200 human femora. [3]

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

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

2. Preoperative planning

Preoperative templating can be performed on standard radiographs or with a digital planning system. The main goal is to plan the appropriate implant as well as its size and position, to restore the individual biomechanics of the hip joint. That way, potential problems can already be anticipated before surgery. In most cases, restoring hip biomechanics can be achieved by reconstructing the original hip rotation center, the leg length as well as the femoral and acetabular offset. [4]
Furthermore, the preoperative planning serves as a template in the context of intraoperative balancing by means of fluoroscopic monitoring. [5]

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

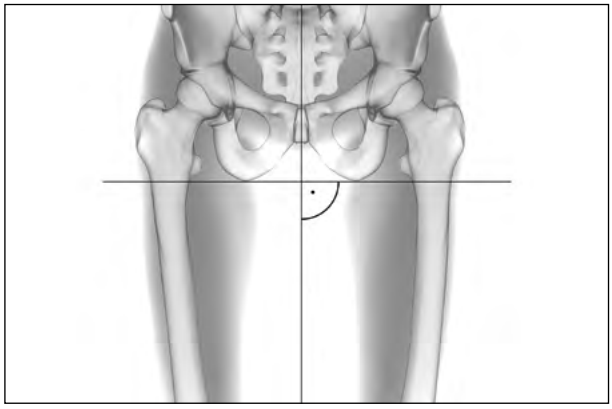


Fig. 4

Hip templating can best be performed on a pelvic radiograph taken in supine or standing position.
The radiograph needs to be symmetrical, centered on the symphysis of the pubis and with both femora in about 20° of internal rotation.
The magnification factor 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. 4).

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

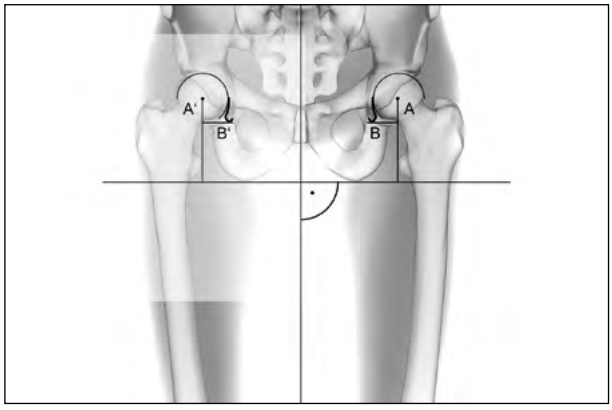


Fig. 5

Estimation of the acetabular offset
The rotation center of the healthy (A) and affected hip (A') are defined as the center of a circle that fits the 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 center of the symphysis of the pubis.

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

The acetabular offset can be defined as the distance between Köhler's teardrop (B or B') and a vertical line through the hip rotation center (A or A') (Fig. 5).

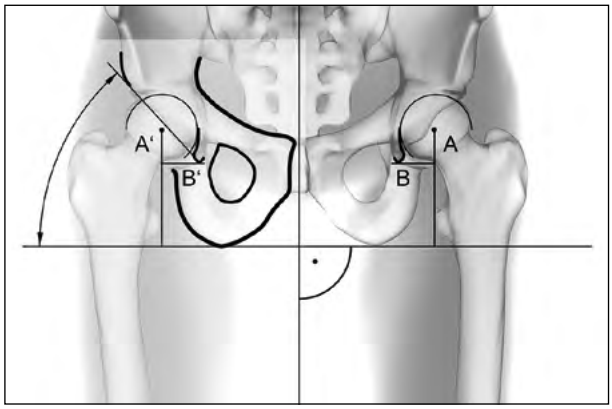


Fig. 6

Planning of the cup

The cup position in relation to the pelvis will take into account the acetabular contours, the hip rotation center, Köhler's teardrop and the required cup inclination angle (Fig. 6).

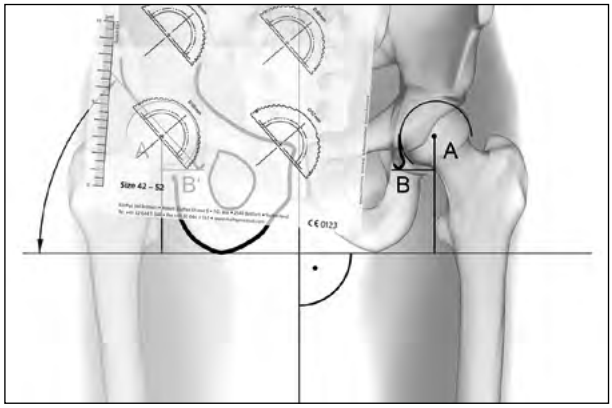


Fig. 7

To find an appropriate cup size, different cup templates are positioned at the level of the acetabular cavity aiming to restore the native hip rotation center while having sufficient bone contact, both at the level of the acetabular roof and Köhler's teardrop (Fig. 7).

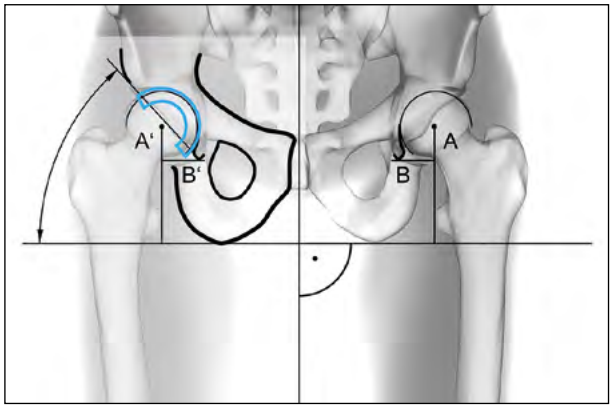


Fig. 8

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. 8).

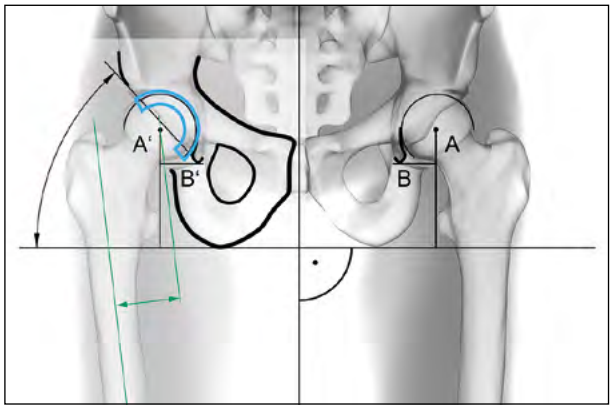


Fig. 9

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 center (Fig. 9).

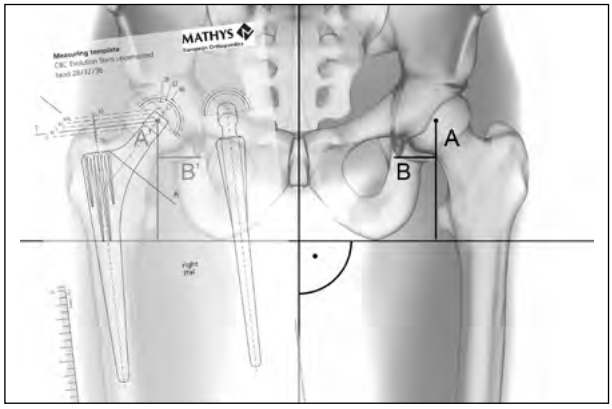


Fig. 10

Planning of the CBC Evolution 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. 10).

Remark

The Offset difference between 125°/135°/145° do differ between sizes starting from 4.1 mm for size 5.00 up to 6.5 mm for size 20.00. Furthermore, with the option of different CCD angles, the centre of rotation does change, which has to be taken into account, when changing between the different Offset options. (A detailed information about the differences can be found in chapter Implants.)

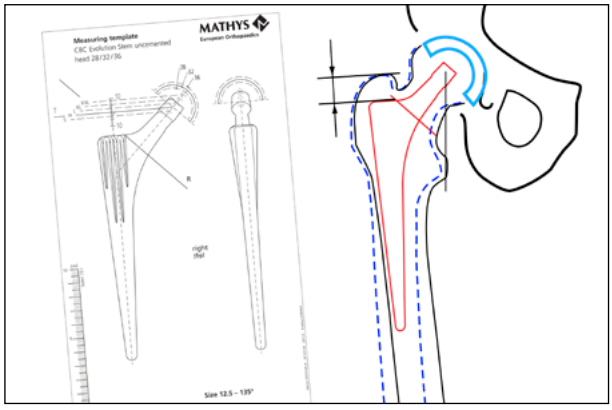


Fig. 11

On the planning sheet, the matching stem is delineated in the form of dotted lines with the measuring template in the same abduction/adduction position as the femur of the healthy side. (Fig. 11).

Remark

Due to its conical shape, the planned CBC Evolution stem should not touch the inner femoral corticalis at the height of the femoral diaphysis below the lesser trochanter. Ideally, medial and lateral distances of 1–2 mm between the CBC Evolution stem and the inner corticalis should be planned in this area of the medullary cavity.

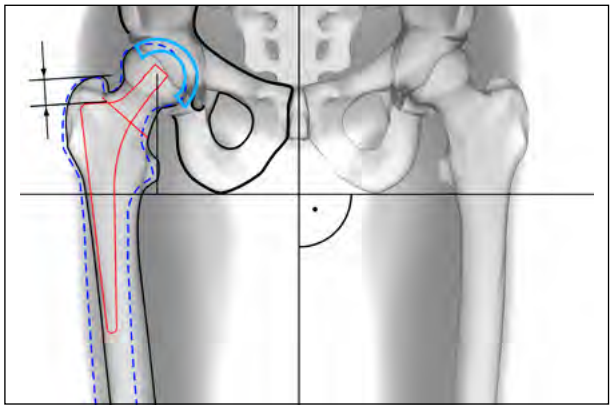


Fig. 12

The femur to be operated on is plotted over the selected stem.
The distance 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. 12).

3. Surgical technique

The CBC Evolution stem can be implanted through both, conventional and so called «minimal invasive» approaches. The choice of a specific approach should be based on patient anatomy, personal experience and preference of the operating surgeon.

Fig. 13

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. 13).

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

Fig. 14

Depending on the preference of the surgeon the preparation of the acetabulum and implantation of the cup will be performed (Fig. 14).

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.

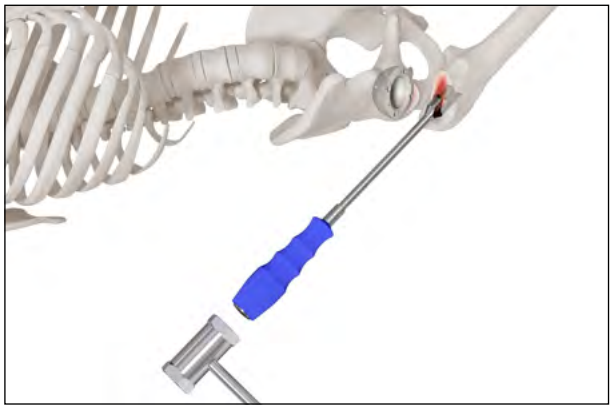


Fig. 15

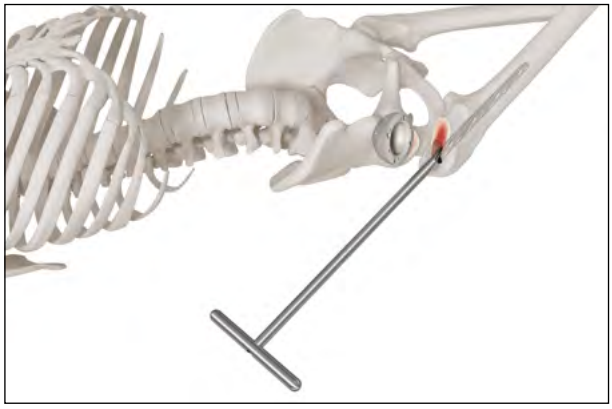


Fig. 16

Preparation of the implant bed for the CBC Evolution stem

Orthograde implantation is possible only after sufficient lateral opening of the femoral canal. Therefore, the box chisel (Fig. 15) must be applied slightly medially of the piriformis fossa and introduced in a parallel direction to the dorsolateral femoral cortex with careful hammer strokes.

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

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

If in doubt, a sharp spoon may be used to explore the inner lateral femoral cortex in anterior-posterior and medial-lateral before use of the box chisel. In this way, the risk of varus or valgus malposition of the implant is reduced.

Further opening with the reamer facilitates insertion and centring of the subsequent rasps (Fig. 16).
It must be ensured that the reamer retains its central position aligned to the femoral axis along the inner cortex of the femur as a guide element for preparation of the orthograde reaming.
The cancellous bone is removed only in the frontal plane.

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

Fig. 17

Locking and securing of the smallest rasp in the rasp handle (Figs. 17 and 18).

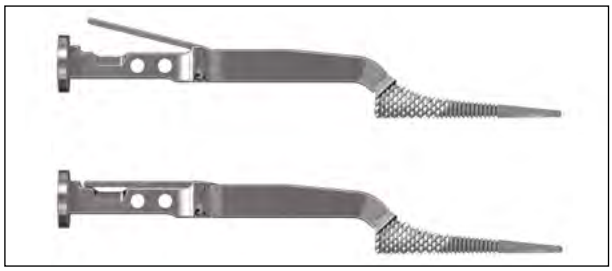


Fig. 18

Fig. 19

Stepwise rasping of the femur.

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. 19).

The rasps are introduced along the lateral cortex with moderate hammer blows into the femoral canal.

Remark
The drive direction of the rasp needs to be in line with the femur axis, to reduce a risk of an undersizing or malalignment of the final implant.

Fig. 20

In the gradual expansion of the medullary canal using rasps of ascending sizes, congruence of the direction of advancement with the axis of the femur must be ensured (Fig. 20).

Remark
Care should be taken to impact the rasp in the femoral axis and the given antetorsion without applying too much force.

Fig. 21 Incorrect

Fig. 22 Correct

Remark
Each rasp should be completely inserted up to the level of the resection plane in order to avoid possible length differences and potential protrusion of the final implant (Figs. 21 and 22).

Remark
If possible, the spongiosa should be compacted into the proximal anterior and posterior areas rather than rasped away completely.

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 recognize a cortical contact you have to stop 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 can be 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 the use of an incorrect radiographic magnification factor.

Remark
Insertion of a larger rasp 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.

Remark
In all 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.

Remark
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 CBC Evolution stem, corresponds to the basic implant.

Remark
The ribs of the proximal zone must cut into the cancellous bone. This requires an adequate distance to the cortical bone edge to allow inserting the CBC Evolution stem to the planned depth.

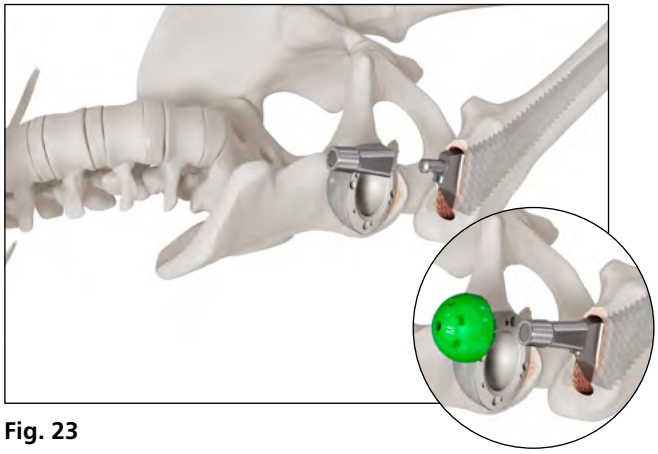


Fig. 23

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

Remark
A total of 3 trial necks are available with a CCD angle of 125°/135° and 145° Trial heads for trial reductions are available in the following diameter sizes: 28 mm, 32 mm and 36 mm, each with S, M, L, XL and XXL neck lengths.

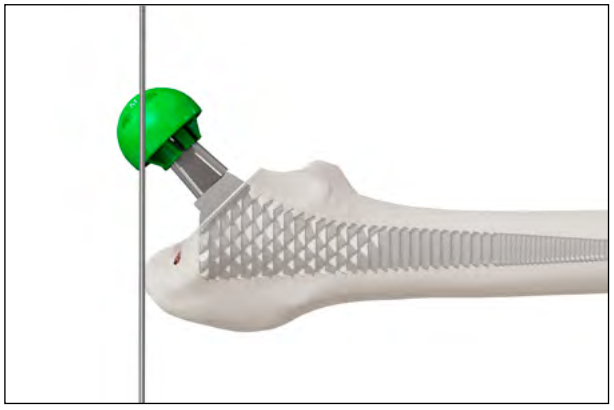


Fig. 24

For reconciliation with preoperative planning, one can now measure e. g. the distance between the Rasp shoulder and the tip of the greater trochanter or the trochanteric distance T (distance from the trochanter tip to the level of the head centre) using a Kirschner wire (Fig. 24) and compare it with the preoperative planning.

Remark
The final size of the head is defined with the inner diameter of the cup.

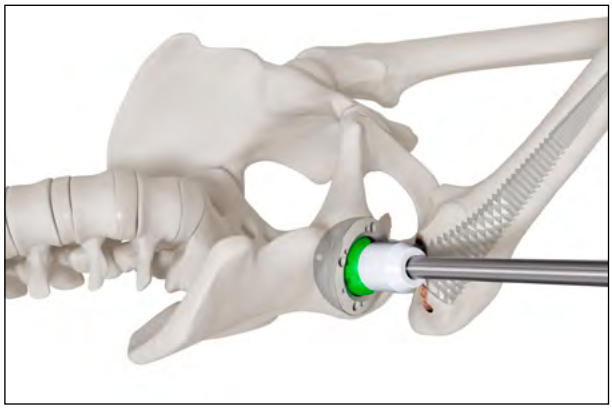


Fig. 25

Trial reduction (Fig. 25).

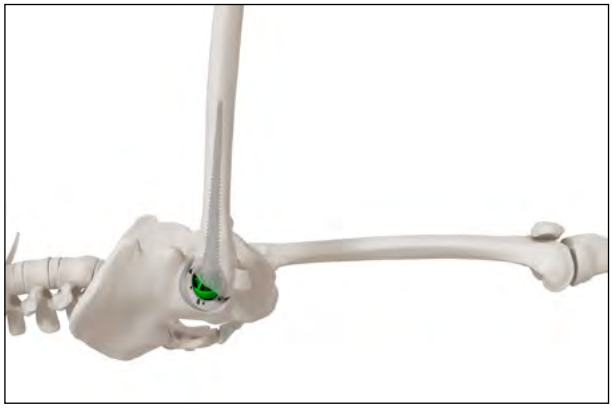


Fig. 26

After trial reduction, take the hip through a full range of motion. Look 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. Check also if the tension in the soft tissues is appropriate (Figs. 26 and 27).

Remark

At this stage, it is still possible to modify offset with additional necks (145°/135°/125°) and the neck length of the trail head if needed.

Remark

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

Fig. 27

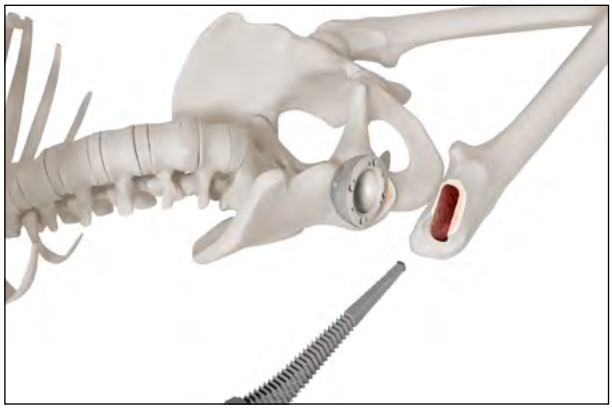


Fig. 28

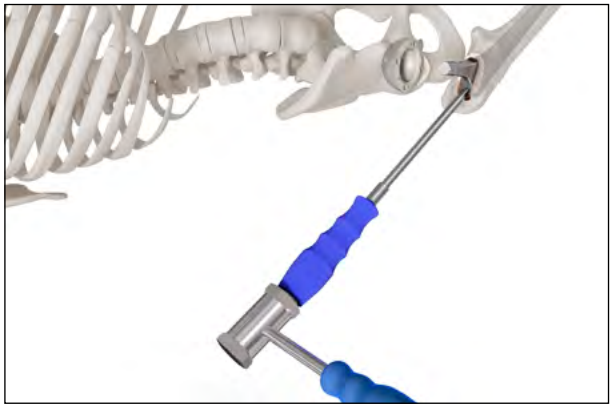


Fig. 29

Fig. 30

Fig. 31

Implantation of the CBC Evolution 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 (Fig. 28).

After removal of the rasp, in order to promote further osseointegration, no rinsing of the medullary cavity with subsequent drying is performed and the original CBC Evolution stem should be implanted as soon as possible.

The prosthesis stem is first inserted manually into the prosthesis bed. Next, the stem is hammered into the predetermined end position with carefully measured strokes (Fig. 29).

Remark

It should be possible to insert the CBC Evolution stem manually up to approx. 2 cm above the final position and then advance it to the final position by controlled hammer strokes.

Due to the conical shape of the CBC Evolution stem (wedge effect) and the resulting force transmission to the proximal femur, it is important to insert the CBC Evolution stem very carefully. In this process, the CBC Evolution stem should be placed against the lateral inner femoral corticalis, and the correct antetorsion should be observed.

The fins of the CBC Evolution stem should be fixed in the spongiosa, not in the corticalis.

Remark

In case of protruding corticalis at the dorsal portion of the anatomy (fossa piriformis), conflict between the fin and the corticalis may result in some anatomies. In such cases, care should be taken to shorten the cortical portion.

Remark

If a substantial defect in the greater trochanter, e. g. in case of coxa vara, occurs during preparation of the prosthesis bed or after impaction the CBC Evolution stem, it is recommended to backfill the defect with the optionally resected bone material (Figs. 30 and 31). A stable fit of the slightly oversized (approx. 1 mm) inserted block must be assured.

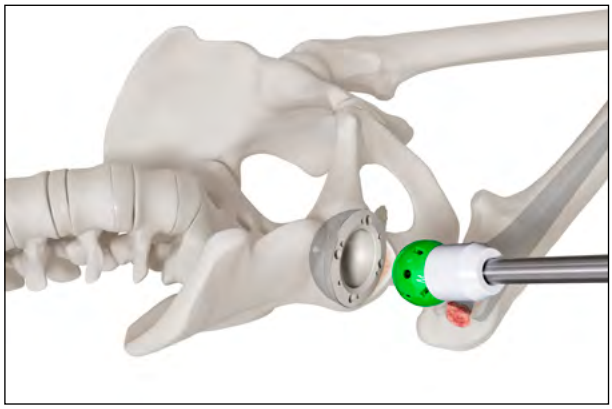


Fig. 32

Fig. 33

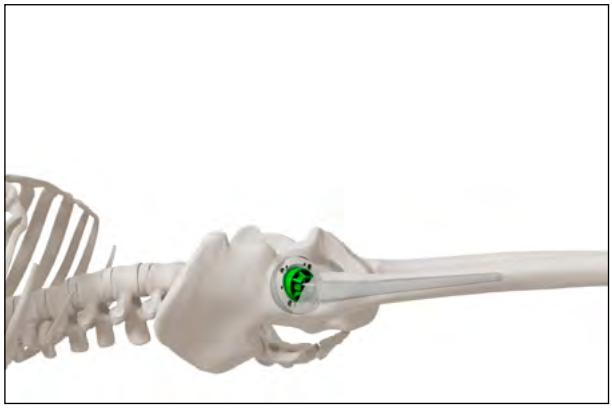


Fig. 34

Another trial reduction can be performed with the appropriate trial head in order to check the range of motion, impingement and soft tissue tension with the implant in place (Figs. 32, 33 and 34). At this stage, only the neck length of the prosthetic head can be modified if needed.

Fig. 35

Fig. 36

Fig. 37

Fig. 38

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

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

To avoid complications at the stem/head interface, the stem cone needs to be dry and free of any foreign matter (e. g. tissue parts, bone or cement particles) before assembling the final head (Figs. 35 and 36).

The CBC Evolution stem cannot be combined with the Dual Mobility cup of Mathys (DS Evolution).

Reduction of the joint (Figs. 37 and 38).

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

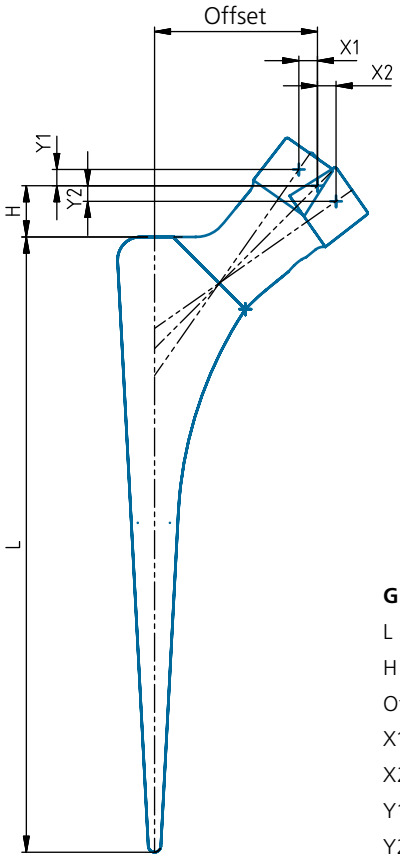
The joint space needs to be free of any bone particles present.
Depending on the approach, the muscle insertions are reattached, and the wound is closed layer by layer.

Removal of the CBC Evolution stem
In case of revision, the CBC Evolution stem can be removed with the curved extractor or a universal stem extraction instrument. For further information about stem revision and extraction instruments contact your local Mathys representative.

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

4. Implants

CBC Evolution Stem, Technical data
(all measurements in mm)



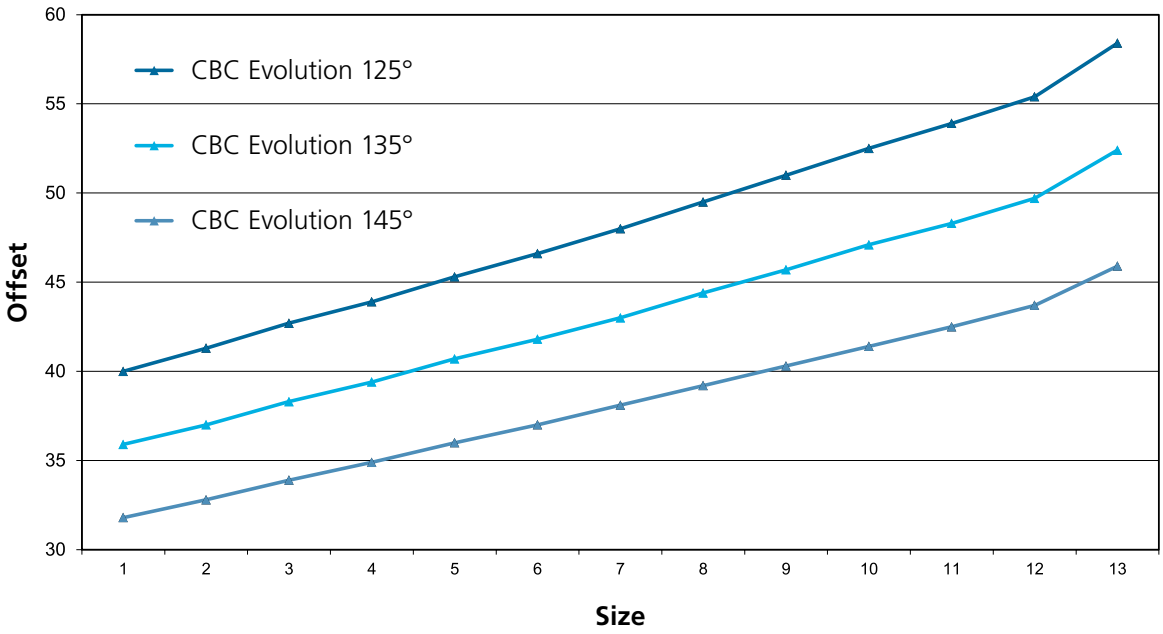
Glossary

L	Length
H	Height, distance between stem shoulder and centre of rotation for stems with 135° CCD angle
Offset	Distance between stem axis and centre of rotation for stems with 135° CCD angle
X1	Offset difference between stem with 135° CCD angle and stem with 145° CCD angle
X2	Offset difference between stem with 135° CCD angle and stem with 125° CCD angle
Y1	Height difference between stem with 135° CCD angle and stem with 145° CCD angle
Y2	Height difference between stem with 135° CCD angle and stem with 125° CCD angle

		135°		145°		125°	
Size	**L**	**H**	**Offset**	**Y1**	**X1**	**Y2**	**X2**
5	135.6	11.3	35.9	3.6	-4.1	-3.4	4.1
6	139.2	12	37	3.8	-4.2	-3.5	4.3
7	142.8	12.8	38.3	3.8	-4.4	-3.7	4.4
8	146.4	13.4	39.4	4	-4.5	-3.8	4.5
9	150	14.2	40.7	4.1	-4.7	-4	4.6
10	153.6	14.8	41.8	4.3	-4.8	-4	4.8
11.25	158.1	15.5	43	4.5	-4.9	-4.1	5
12.5	162.6	17	44.4	3.7	-5.2	-4.3	5.1
13.75	167.1	17.7	45.7	3.9	-5.4	-4.4	5.3
15	171.6	18.5	47.1	3.9	-5.7	-4.5	5.4
16.25	176.1	19.1	48.3	4.1	-5.8	-4.6	5.6
17.5	180.6	19.8	49.7	4.3	-6	-4.7	5.7
20	189.6	21.2	52.4	4.3	-6.5	-5	6

CBC Evolution Stem, Technical data
(all measurements in mm)

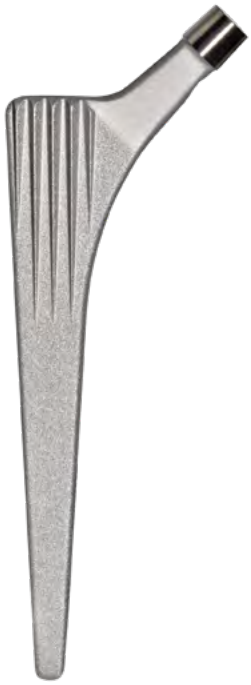
Dimension	5.00	6.00	7.00	8.00	9.00	10.00	11.25	12.50	13.75	15.00	16.25	17.50	20.00
CBC Evolution 145°	31.8	32.8	33.9	34.9	36	37	38.1	39.2	40.3	41.4	42.5	43.7	45.9
CBC Evolution 135°	35.9	37.0	38.3	39.4	40.7	41.8	43.0	44.4	45.7	47.1	48.3	49.7	52.4
Δ Offset (145°–135°)	*4.1*	*4.2*	*4.4*	*4.5*	*4.7*	*4.8*	*4.9*	*5.2*	*5.4*	*5.7*	*5.8*	*6.0*	*6.5*
CBC Evolution 125°	40	41.3	42.7	43.9	45.3	46.6	48.0	49.5	51.0	52.5	53.9	55.4	58.4
Δ Offset (135°–125°)	*4.1*	*4.3*	*4.4*	*4.5*	*4.6*	*4.8*	*5.0*	*5.1*	*5.3*	*5.4*	*5.6*	*5.7*	*6.0*



CBC Evolution 145°

Item no.	Size
52.34.0295	5.0 mm
52.34.0296	6.0 mm
52.34.0297	7.0 mm
52.34.0298	8.0 mm
52.34.0299	9.0 mm
52.34.0300	10.0 mm
52.34.0301	11.25 mm
52.34.0302	12.50 mm
52.34.0303	13.75 mm
52.34.0304	15.00 mm
52.34.0305	16.25 mm
52.34.0306	17.50 mm
52.34.0307	20.00 mm

Material: Ti6Al7Nb
Cone: 12/14 mm
CCD angle: 145°



CBC Evolution 135°

Item no.	Size
52.34.0312	5.0 mm
52.34.0313	6.0 mm
52.34.0314	7.0 mm
52.34.0315	8.0 mm
52.34.0316	9.0 mm
52.34.0317	10.0 mm
52.34.0318	11.25 mm
52.34.0319	12.50 mm
52.34.0320	13.75 mm
52.34.0321	15.00 mm
52.34.0322	16.25 mm
52.34.0323	17.50 mm
52.34.0324	20.00 mm

Material: Ti6Al7Nb
Cone: 12/14 mm
CCD angle: 135°

CBC Evolution 125°

Item no.	Size
52.34.0329	5.0 mm
52.34.0330	6.0 mm
52.34.0331	7.0 mm
52.34.0332	8.0 mm
52.34.0333	9.0 mm
52.34.0334	10.0 mm
52.34.0335	11.25 mm
52.34.0336	12.50 mm
52.34.0337	13.75 mm
52.34.0338	15.00 mm
52.34.0339	16.25 mm
52.34.0340	17.50 mm
52.34.0341	20.00 mm

Material: Ti6Al7Nb
Cone: 12/14 mm
CCD angle: 125°

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
2.30.414	28 mm	XXL + 12 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
2.30.404	32 mm	XXL + 12 mm

Material: FeCrNiMnMoNbN
Cone: 12 / 14 mm

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
2.30.014	28 mm	XXL + 12 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
2.30.024	32 mm	XXL + 12 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
52.34.0690	36 mm	XXL + 12 mm

Material: CoCrMo
Cone: 12 / 14 mm

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

For ceramic-ceramic pairings, use only ceramic heads with ceramic inlays by Mathys.

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

For ceramic-ceramic pairings, use only ceramic heads with ceramic inlays by Mathys.

Femoral Head, Bionit2

Item no.	Outside diameter	Neck length	
5.30.010L	28 mm	S	- 3.5 mm
5.30.011L	28 mm	M	0 mm
5.30.012L	28 mm	L	+ 3.5 mm
5.30.020L	32 mm	S	- 4 mm
5.30.021L	32 mm	M	0 mm
5.30.022L	32 mm	L	+ 4 mm
5.30.030	36 mm	S	- 4 mm
5.30.031	36 mm	M	0 mm
5.30.032	36 mm	L	+ 4 mm

Material: Al_2O_3
Cone: 12/14 mm

For ceramic-ceramic pairings, use only ceramic heads with ceramic inlays by Mathys.

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

ceramys Revision Heads can be used with all Mathys stem systems with a «12/14 cone».

The ceramys Revision Heads can be combined with inlays made of either ceramic (only from Mathys), Polyethylene or cross linked Polyethylene.

Bipolar Head, CoCrMo and Stainless Steel

CoCrMo	Stainless Steel	OD	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
Material stainless steel: FeCrNiMnMoNbN; UHMWPE

Hemiprosthesis Head, Stainless Steel

OD	Item no. / S –4 mm	Item no. / M 0 mm
38 mm	2.30.420 *	67092 *
40 mm	2.30.421 *	67093 *
42 mm	2.30.422	67094 *
44 mm	2.30.423	67095 *
46 mm	2.30.424	67096 *
48 mm	2.30.425	67097 *
50 mm	2.30.426	67098 *
52 mm	2.30.427	67099 *
54 mm	2.30.428	67100 *
56 mm	2.30.429	67101 *
58 mm	2.30.430	67102 *

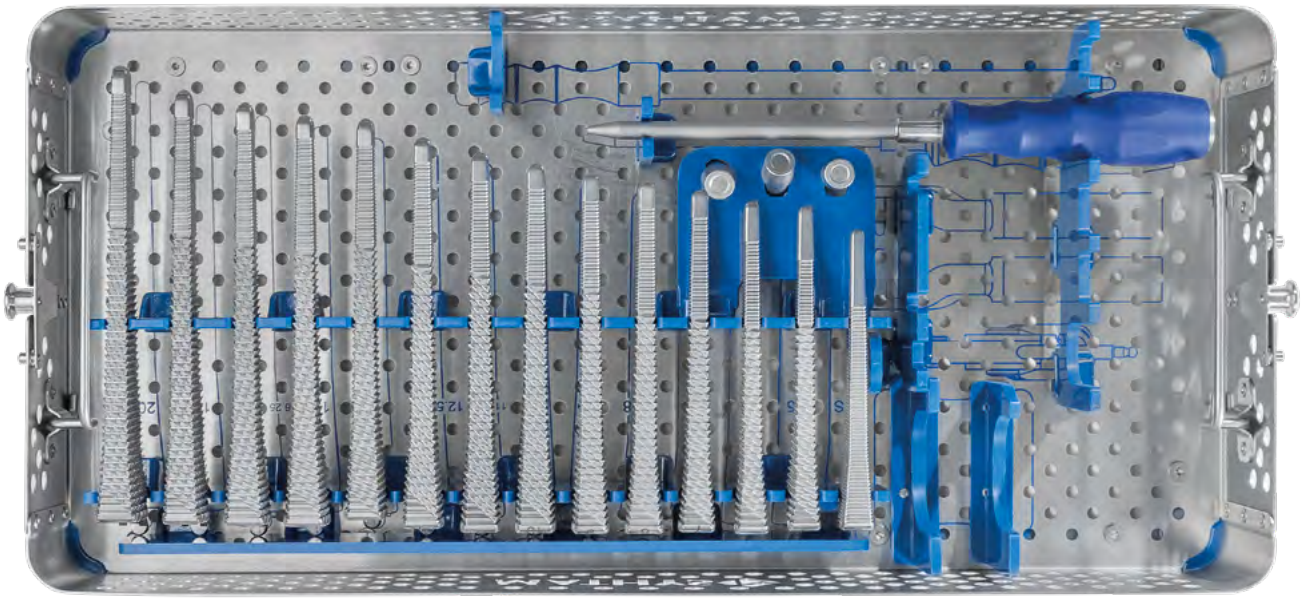
Material: FeCrNiMnMoNbN
Cone: 12 / 14 mm

** optional*

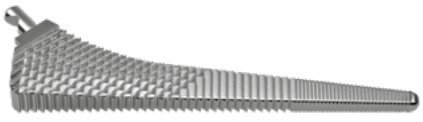
The implantation of Bipolar- and Hemi heads is described in an separate surgical technique. Please contact your local Mathys representative for further details.

5. Instruments

CBC Evolution Instrumentation 51.34.1082A



Item no. 51.34.0264 **CBC Evolution tray**
No picture / Item no. 51.34.0266 **CBC Evolution lid**

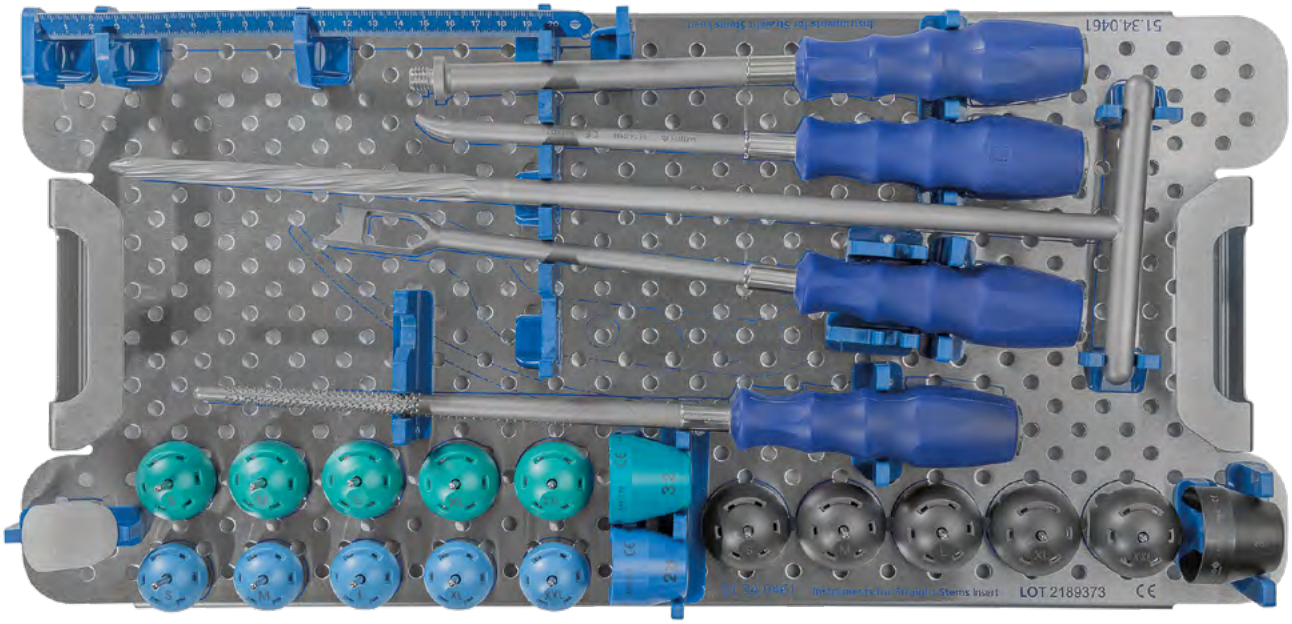


Item no.	Description
51.34.0373	CBC Evolution starter rasp

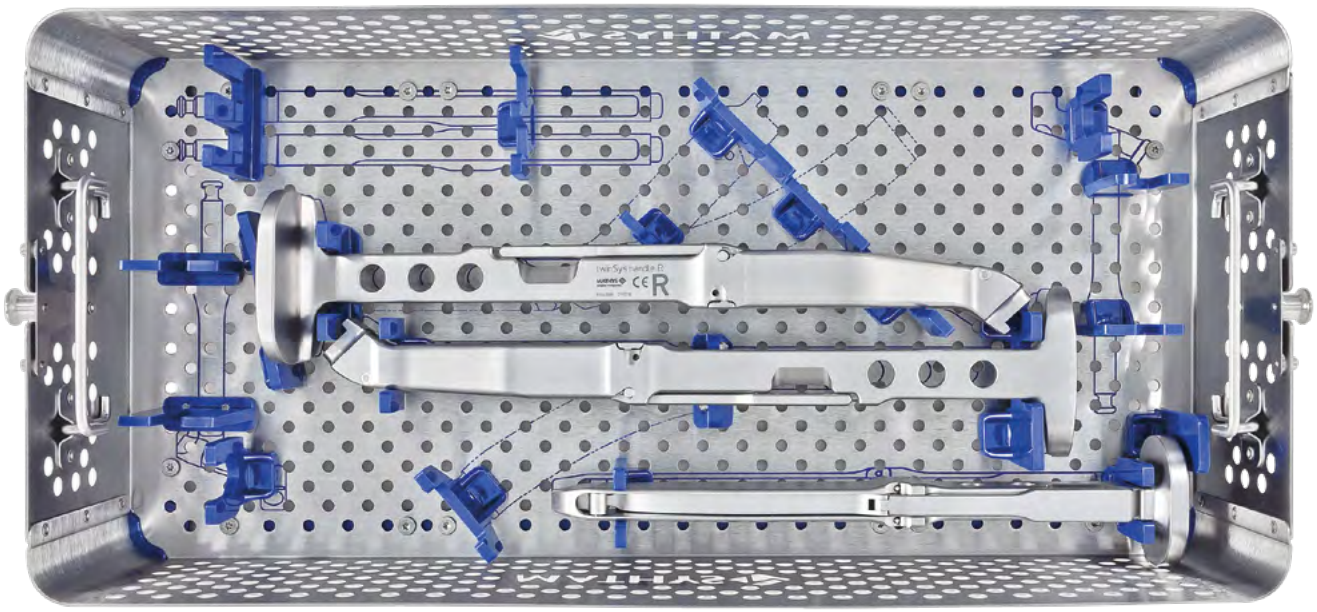
Item no.	Description
51.34.0761	CBC Evolution Rasp size 5.0 II
51.34.0762	CBC Evolution Rasp size 6.0 II
51.34.0763	CBC Evolution Rasp size 7.0 II
51.34.0764	CBC Evolution Rasp size 8.0 II
51.34.0765	CBC Evolution Rasp size 9.0 II
51.34.0766	CBC Evolution Rasp size 10.00 II
51.34.0767	CBC Evolution Rasp size 11.25 II
51.34.0768	CBC Evolution Rasp size 12.50 II
51.34.0769	CBC Evolution Rasp size 13.75 II
51.34.0770	CBC Evolution Rasp size 15.00 II
51.34.0771	CBC Evolution Rasp size 16.25 II
51.34.0772	CBC Evolution Rasp size 17.50 II
51.34.0773	CBC Evolution Rasp size 20.00 II

Item no.	Description
51.34.0260	CBC Evolution trial neck 145°
51.34.0261	CBC Evolution trial neck 135°
51.34.0262	CBC Evolution trial neck 125°

Item no.	Description
51.34.0263	Impactor/extractor silicone



Item no. 51.34.0461 **Univ. Instr. for Straight Stems insert**



Item no. 51.34.0460 **Univ. Instr. for Straight Stems tray**
No picture / Item no. 51.34.0462 **Univ. Instr. for Straight Stems lid**

Item no.	Description
3.30.130	Ruler length 20

Item no.	Description
51.34.0134	Box chisel silicone

Item no.	Description
58.02.4030	Box chisel MIS

Item no.	Description
51.34.0469	Opening reamer for straight stems

Item no.	Description
51.34.0858	optimys Opening Broach

Item no.	Description
51.34.0859	optimys Opening Broach bent

Item no.	Description
56.02.2016	Reamer, narrow

Item no.	Description
51.34.0076	twinSys rasp handle MIS II straight

Item no.	Description
51.34.0189	twinSys double offset adaptor right
51.34.0190	twinSys double offset adaptor left

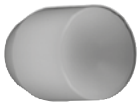
Item no.	Description
51.34.0075	twinSys rasp handle MIS II offset

Item no.	Description
51.34.0463	Rasp adapter for Specht straight

Item no.	Description
51.34.0758	Rasp handle DO Woodpecker right
51.34.0759	Rasp handle DO Woodpecker left

Item no.	Description
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 28 XL
51.34.1068	Trial head 28 XXL
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 32 XL
51.34.1073	Trial head 32 XXL
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
51.34.1078	Trial head 36 XXL

Item no.	Description
51.34.0135	Head impactor silicone

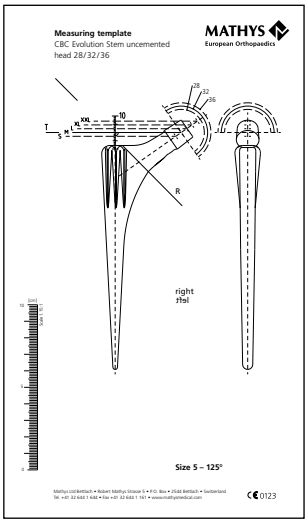


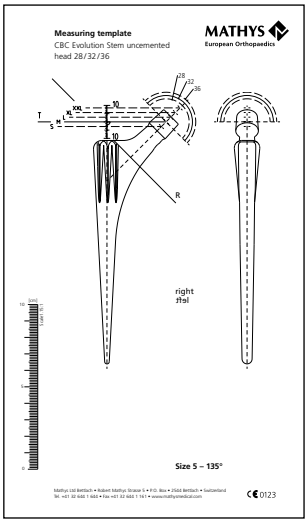
Item no.	Description
3.30.536	Top f/head impactor

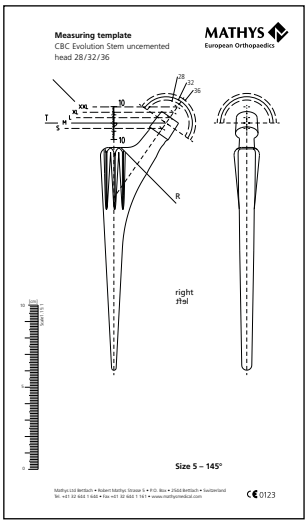
Item no.	Description
3.30.538	Impactor top 28
3.30.539	Impactor top 32
3.30.537	Impactor top 36

Item no.	Description
51.34.0136	Extractor curved silicone

6. Measuring templates







Item no.	Description
330.010.091	CBC Evolution Stem uncem. Template (Set)

7. Literature

1 Bieger R., Ignatius A., Reichel H., Durselen L. Biomechanics of a short stem: In vitro primary stability and stress shielding of a conservative cementless hip stem. J Orthop Res, 2013. 31(8): p. 1180-6.

2 Data on file by Mathys Ltd Bettlach

3 Noble_anatomic basis of femoral component design. Clin Orthop Relat Res. 1988 Oct;(235):148-65: s.n., 1988

4 Scheerlinck Th. (2010) Primary hip arthroplasty templating on standard radiographs A stepwise approach; Acta Orthop. Belg., 2010, 76, 432-442

5 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

8. Symbols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Correct


Incorrect


Caution

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