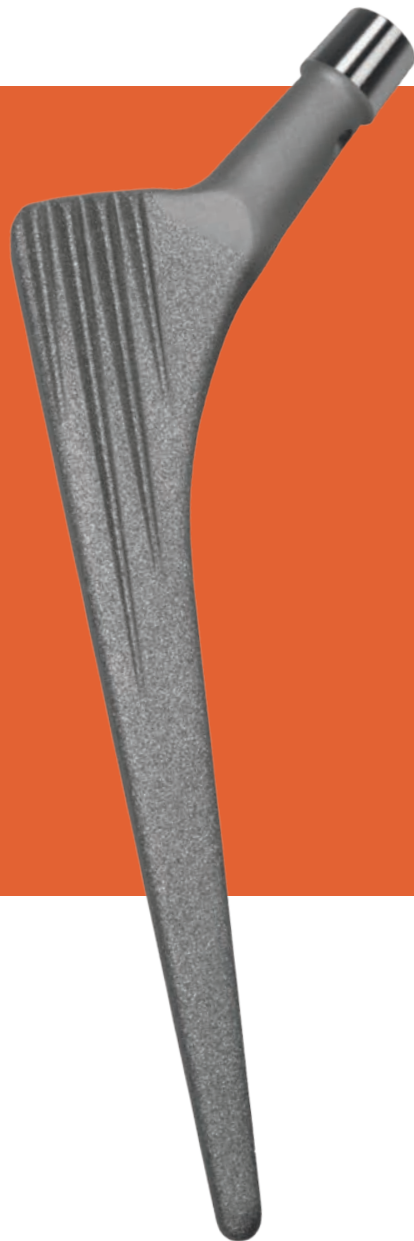


CBC  
**Surgical technique**





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## **Remarks**

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

Over the last few years, the good results of uncemented, femur-anchored stems have been confirmed. They allow numerous patients to lead a trouble-free life.

To be able to move and live an active life – Mathys has been living up to this maxim for more than 50 years. This point of view enables us to achieve our objective: to re-enable as many people as possible to lead a life of mobility; the CBC Stem is instrumental in this.

The benefits:

- Easy surgical technique
- Optimised 12/14 short cone and neck geometry to increase the range of motion
- Anatomical lateralisation option
- Ellipsoidal rib design to reduce the risk of fracturing the trochanter

# 1. Indications and contraindications

## **Indications**

- Degenerative disease of the joint, such as primary or secondary coxarthrosis
- Advanced loss of substance and/or functional loss of the hip joint caused by degenerative or post-traumatic arthritis or rheumatoid arthritis
- Avascular necrosis of the femoral head or fracture of the femoral neck
- After failed previous surgery, osteosynthesis, joint reconstruction, arthrodesis, hemiarthroplasty or total hip replacement
- Revisions with slight bone loss
- Dysplasia of the hip

## **Contraindications**

- Insufficient bone substance and/or poor bone quality that could jeopardise stable anchoring of the implant
- Acute or chronic infection, whether local or systemic (or a corresponding case history)
- Allergy to the material to be implanted, above all to metal (e.g. cobalt, chromium, nickel, etc.)
- Severe soft tissue, nervous or vascular insufficiency that could jeopardise the function of the implant
- Patients for whom a different type of reconstruction surgery or treatment is likely to be successful

## 2. Preoperative planning

Preoperative planning includes determination of the centre of rotation, the correct position of the acetabular component, optimal anchorage of the CBC Stem in the medullary cavity as well as the size and position of the CBC Stem in order to ensure identical limb length. Preoperative planning is accomplished with the use of x-ray templates or digital planning systems in AP and lateral projection.

### Example: X-ray templates

We recommend a pelvic survey radiograph with a film-to-focus distance of 120cm, which corresponds to a magnification of 1.15:1.

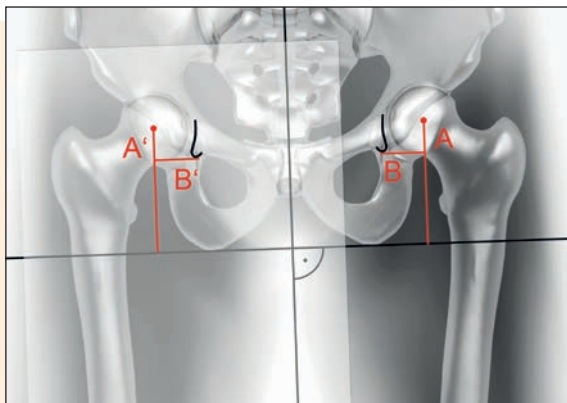


Fig. 1

### Planning steps for a case of unilateral coxarthrosis

#### Determination of the centre of rotation

To determine the centre of rotation of the operated side, the following steps are required:

- The vertical line is plotted through the centre of the symphysis.
- The horizontal tangent is aligned to the tips of both ischial tuberosities.
- This is followed by measuring the rotational centre of the head on the healthy side.
- Next, the vertical line A is plotted which corresponds to the distance between the horizontal interischial tuberosity line and the centre of rotation.
- Then line B is plotted which is delimited medially by Köhler's teardrop.
- Finally, the measured distances A and B are transmitted from the healthy to the operated half of the pelvis (corresponding to A' and B').

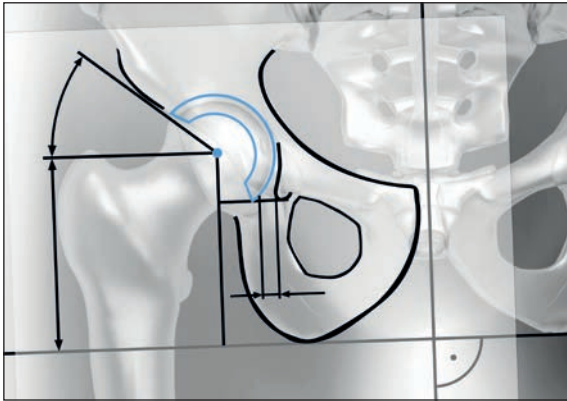


Fig. 2

### Cup determination

The position of the cup is determined on the basis of the acetabular contour, the calculated centre of rotation, the height of Köhler's teardrop and the required inclination angle.

- Selection of the appropriate cup size using the cup template.
- Plotting of the cup in the acetabulum with an inclination of  $40^\circ$  by transmitting A' and B' while taking into account the centre of rotation.
- Identification of the subsequent implant position relative to the osseous landmarks (Köhler's teardrop, craniolateral roof, osteophytes).

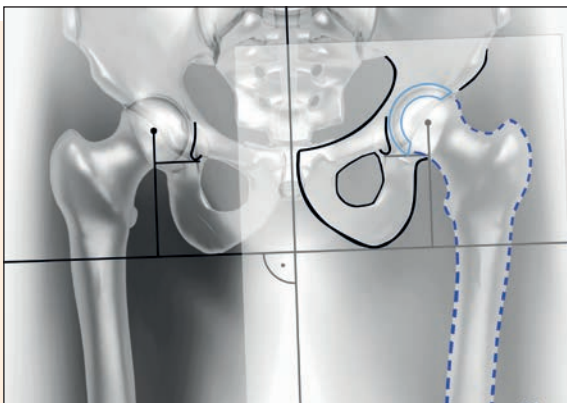


Fig. 3

Positioning of the planning sheet on the healthy side aiming at the closest possible congruence of the pelvic halves. Plotting of the healthy femur onto the sheet with dotted lines.

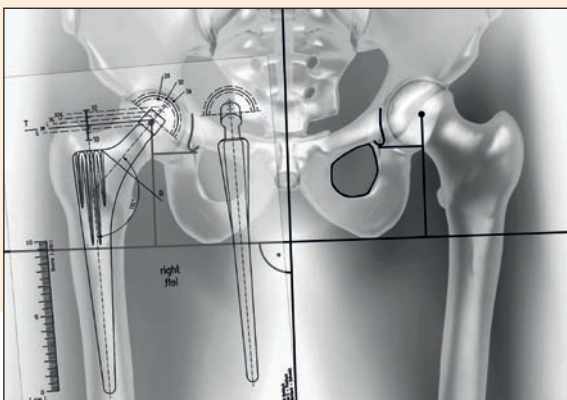
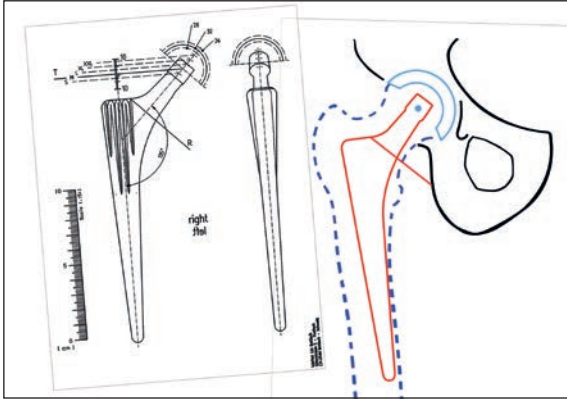


Fig. 4

### Planning of the stem

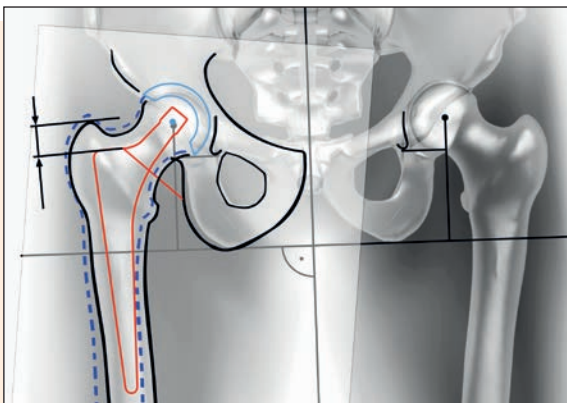
Determination of the stem size using the prosthesis templates on the operated femur. The x-ray template is brought into line with the centre of rotation and the central axis.

The stem of predetermined size can now be plotted onto our planning sheet.



**Fig. 5**

Plotting of the fitting stem with the template in the same abduction/adduction position as the femur plotted with dotted lines on the healthy side. Due to its conical shape, the planned CBC Stem should not abut the inner femoral corticalis at the height of the femoral diaphysis below the minor trochanter. Ideally, medial and lateral distances of 1–2 mm between the CBC Stem and the inner corticalis should be planned in this area of the medullary cavity.



**Fig. 6**

Plotting of the femur to be operated above the selected CBC Stem. The distance between the proximal end of the CBC Stem cone and the minor trochanter as well as the line between the stem shoulder and the major trochanter are measured. Plotting of the resection plane R and determination of the intersection L between the trochanteric mass and the lateral demarcation of the CBC Stem.



### 3. Surgical technique

Over the years, minimally invasive approaches to the hip joint have been established in orthopaedic surgery in addition to the conventional standard approaches. Several standard approaches to the hip joint are possible which, depending on the orientation of the incision, require supine or lateral positioning of the patient.

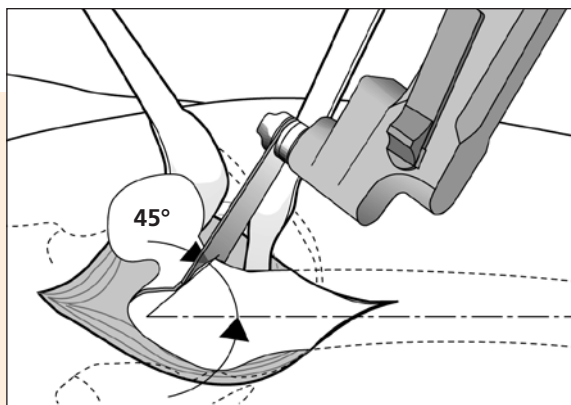


Fig. 7

#### Femoral osteotomy

Resection of the femoral neck is performed according to preoperative planning (Fig. 7). The femoral head is exposed with Blunt Hohmann Retractors. In case of narrow anatomical dimensions, it is recommended to perform a double osteotomy of the femoral head with removal of a disc-shaped bone segment from the femoral neck. This is followed by removal of the head with a Femoral Head Extractor.

#### Exposure of the acetabulum

Preparation of the acetabulum and implantation of the cup.

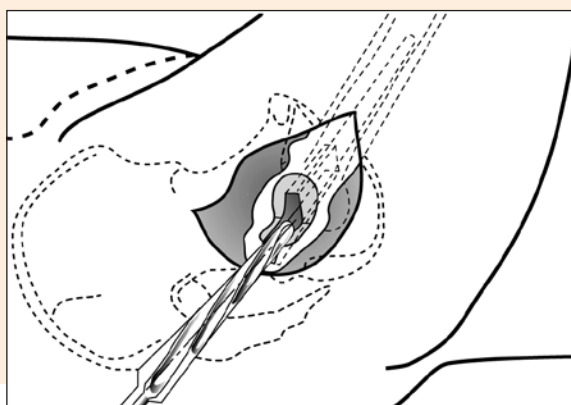


Fig. 8

The medullary cavity is opened with a Reamer.

The spongiosa must not be removed completely in the process. The osteotomy of the dorsal component should be performed following the prolongation of the femoral axis.

The alignment of the medullary cavity can be determined with a straight instrument.



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

To enable subsequent orthograde implantation of the CBC Stem, sufficient lateral opening of the femoral canal is required. The Box Chisel provided should therefore be positioned laterally on the trochanteric fossa and impacted cautiously in parallel to the dorsolateral femoral corticalis. The desired future antetorsion of the CBC Stem of approx. 10° should already be anticipated at this point.

**Remarks**

*By inserting a straight instrument (e. g. a sharp spoon), it is possible to define the alignment of the entry point for the Box Chisel in anterior-posterior and medial-lateral relation to the correct positioning.*

Since the spongiosa of the proximal femoral canal must be removed not completely but only laterally and proximally, it is advisable to insert the Box Chisel only 1–2 cm proximally into the medullary cavity.



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

Carefully impact the Rasps in ascending sizes up to the planned dimension. The last Rasp used must provide a tight, firm seat. The Rasp also acts as a trial prosthesis. Use the Trial Head to perform a trial reduction of the joint and check the free movement and stability of the joint.

**Remarks**

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

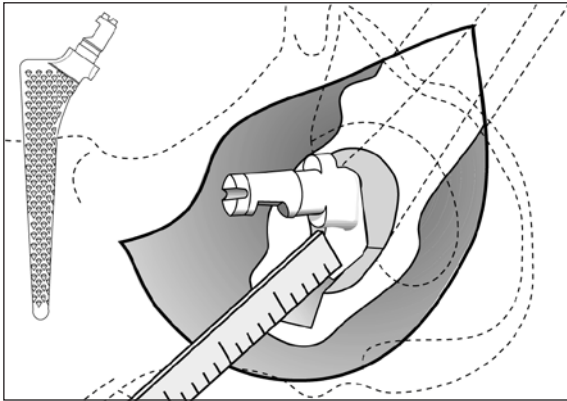


Fig. 9

**Remarks**

*If a clearly smaller rasp size is obtained than was planned (firm seat of the Rasp), it should be checked whether the Rasp is positioned far enough laterally, using the lateral corticalis as the guiding structure for the proximal portion of the Rasp.*

For reconciliation with preoperative planning, one can now measure e.g. the distance between the Rasp shoulder and the tip of the major trochanter and compare it with the preoperative planning.

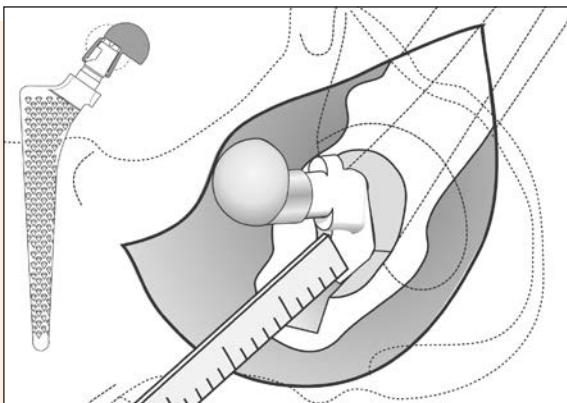


Fig. 10

Use the Trial Head lateral to simulate the lateral CBC Stem.

**Hint on how to fully seat the prosthesis**

The design of the Rasp, specifically optimised for anchoring the CBC Stem, corresponds to a great extent to the basic implant.

Remember, however, that the ribs of the proximal zone have to cut into the cancellous bone. This requires an adequate distance to the cortical bone edge to allow inserting the CBC Stem to the planned depth.

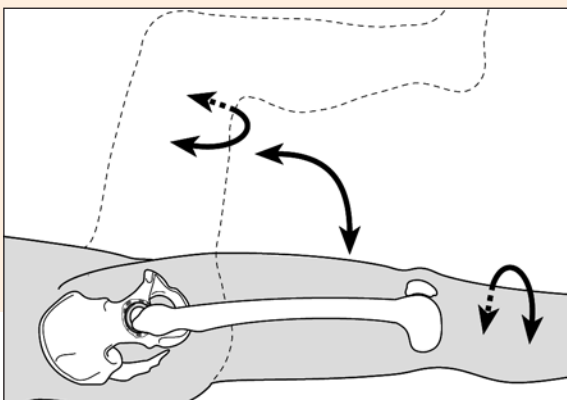
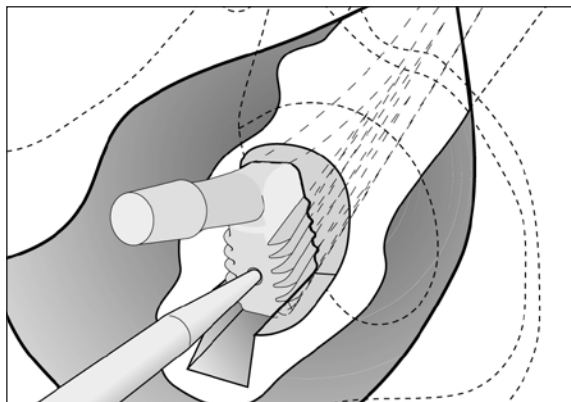


Fig. 11

After repositioning the femur, the full range of motion is examined. Particular attention should be paid to the susceptibility to dislocation caused by internal and external rotation in extension and flexion with balanced soft-tissue tension. The selected variant in conjunction with the determined head length must ensure reliable stability of the CBC Stem by optimal muscular pretension.

Finally, the desired leg length should be checked, taking into account the position of the pelvis. After removal of the Rasp, in order to promote further osseointegration, no rinsing of the medullary cavity with subsequent drying is performed. The original CBC Stem should be implanted as soon as possible after removal of the Rasp.



**Fig. 12**

The CBC Stem is first inserted manually into the prosthesis bed.

Next, the CBC Stem is hammered into the predetermined end position with carefully measured strokes of the Impactor/Extractor.

**Remarks**

*It should be possible to insert the CBC Stem manually until approx. 2 cm away from the final position and then advance it to the final position by controlled hammer strokes.*

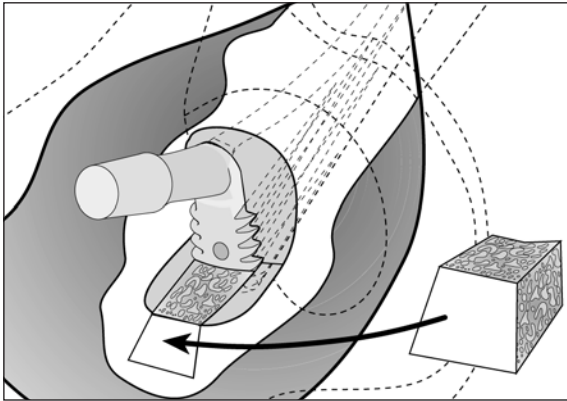
Due to the conical shape of the CBC Stem (wedge effect) and the resulting force transmission to the proximal femur, it is important to insert the CBC Stem very carefully. In this process, the CBC Stem should be placed against the lateral inner femoral corticalis, and the correct antetorsion should be observed. Tight and stable fit of the CBC Stem is more important than insertion depth.

**Remarks**

*The fins of the CBC Stem should be fixed in the spongiosa, not in the corticalis.*

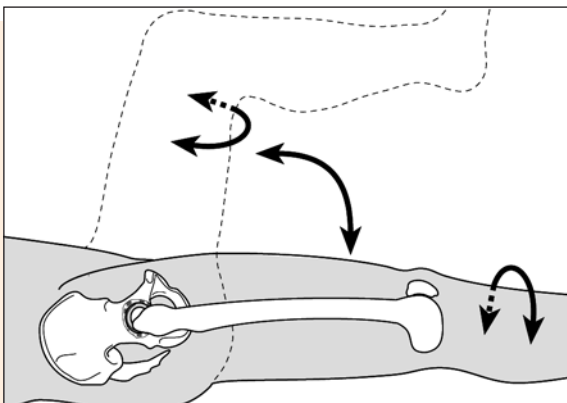


*In case of protruding corticalis at the dorsal portion of the anatomy (fossa piriformis), conflict between the fin and the corticalis may result in some anatomies. In such cases, care should therefore be taken to shorten the cortical portion.*



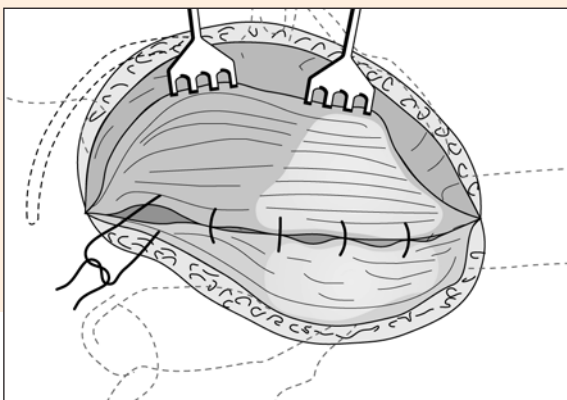
**Fig. 13**

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



**Fig. 14**

A further trial reduction can be carried out with the appropriate Trial Head in order to check the range of movement, the tendency to luxate and the ligament tension of the implanted prosthesis.



**Fig. 15**

The cone is then carefully cleaned and dried, and the definitive prosthesis head is carefully inserted, to avoid complications at the stem/head interface.

Reduction of the joint.

Rinsing of the joint space.

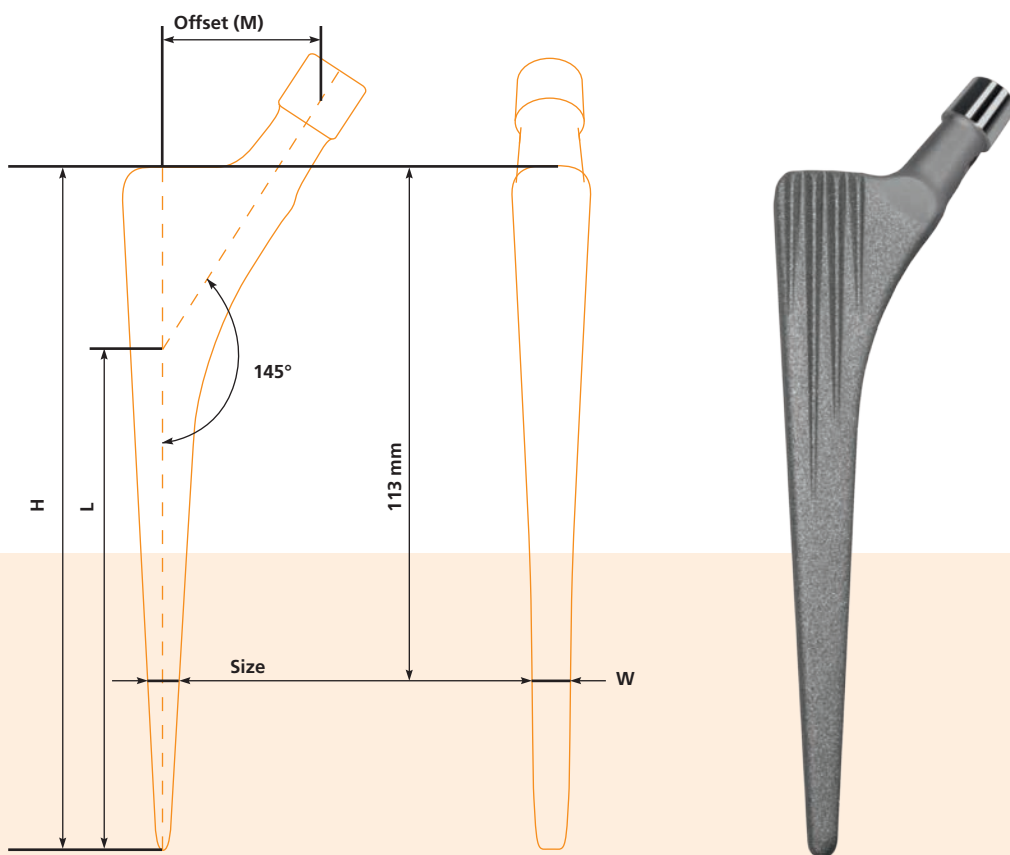
Insertion of a Redon Drain.

Reinsertion of the small gluteal muscles through the bone into the trochanter major using a strong suture.

Closure of the wound layer by layer.

# 4. Implants

## CBC standard



### Standard CBC version

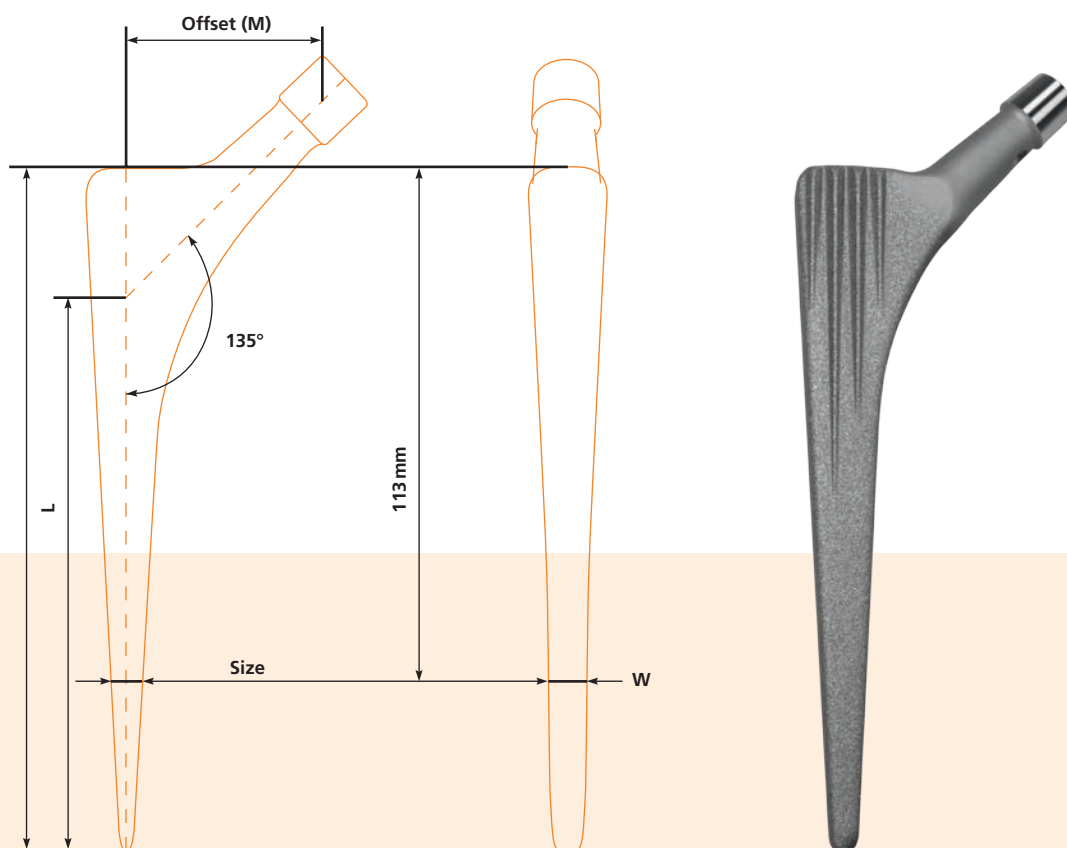
Item no.	Size	H	Offset (M)	L	W
4.30.370sc	Standard, 5.0 mm	135.5	32.8	103.9	6.8
4.30.371sc	Standard, 6.0 mm	139.2	33.9	106.8	6.8
4.30.372sc	Standard, 7.0 mm	142.8	35.0	109.7	8.0
4.30.373sc	Standard, 8.0 mm	146.4	36.1	112.6	8.0
4.30.374sc	Standard, 9.0 mm	150.0	37.2	115.5	8.0
4.30.375sc	Standard, 10.00 mm	153.6	38.2	118.4	8.8
4.30.376sc	Standard, 11.25 mm	158.1	39.4	122.1	8.8
4.30.377sc	Standard, 12.50 mm	162.6	40.6	125.6	8.8
4.30.378sc	Standard, 13.75 mm	167.1	41.8	128.2	8.8
4.30.379sc	Standard, 15.00 mm	171.6	43.0	132.8	8.8
4.30.380sc	Standard, 16.25 mm	176.1	44.2	136.4	8.8
4.30.381sc	Standard, 17.50 mm	180.6	45.4	140.0	8.8
4.30.382sc	Standard, 20.00 mm	189.6	47.8	147.2	8.8

**Material:** Ti6Al7Nb

**Cone:** 12/14 mm

**CCD angle:** 145°

## CBC lateral



### Lateral CBC version

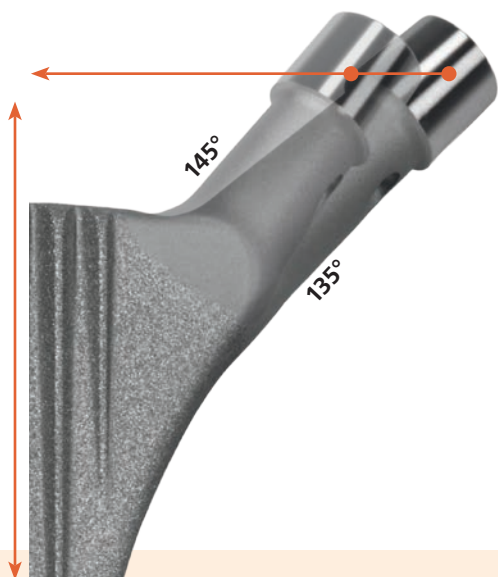
Item no.	Size	H	Offset (M)	L	W
4.30.390sc	Lateral, 5.0 mm	135.6	40.3	110.2	6.8
4.30.391sc	Lateral, 6.0 mm	139.2	41.6	113.4	6.8
4.30.392sc	Lateral, 7.0 mm	142.8	42.9	116.5	8.0
4.30.393sc	Lateral, 8.0 mm	146.4	44.3	119.69	8.0
4.30.394sc	Lateral, 9.0 mm	150.0	45.7	122.7	8.0
4.30.395sc	Lateral, 10.00 mm	153.6	46.9	125.8	8.8
4.30.396sc	Lateral, 11.25 mm	158.1	48.4	129.8	8.8
4.30.397sc	Lateral, 12.50 mm	162.6	49.8	133.6	8.8
4.30.398sc	Lateral, 13.75 mm	167.1	51.3	137.4	8.8
4.30.399sc	Lateral, 15.00 mm	171.6	52.7	141.3	8.8
4.30.400sc	Lateral, 16.25 mm	176.1	54.2	145.2	8.8
4.30.401sc	Lateral, 17.50 mm	180.6	56.1	148.5	8.8
4.30.402sc	Lateral, 20.00 mm	189.6	58.4	156.8	8.8

**Material:** Ti6Al7Nb

**Cone:** 12/14mm

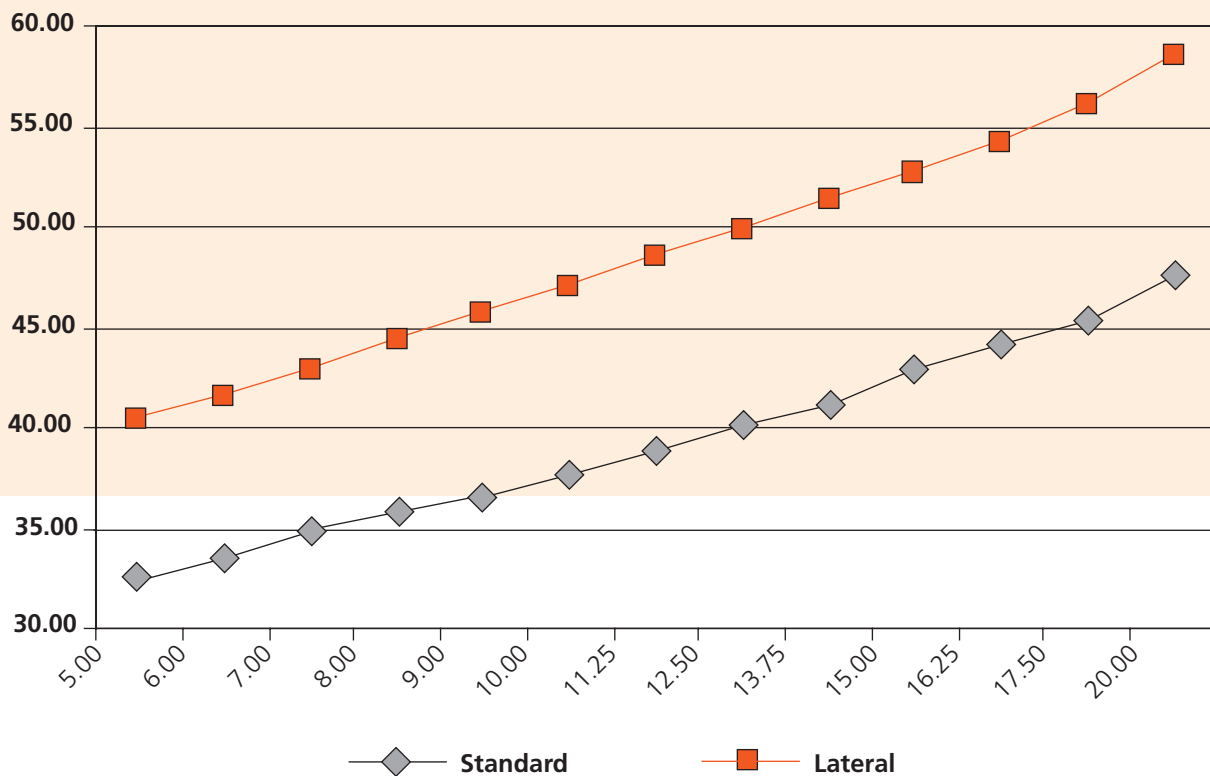
**CCD angle:** 135°

## Overview of offset dimensions



Stem size	Standard stem offset in mm	Lateral stem offset in mm	Difference S/L in mm
5.00	32.8	40.3	7.5
6.00	33.9	41.6	7.7
7.00	35.0	42.9	7.9
8.00	36.1	44.3	8.2
9.00	37.2	45.7	8.5
10.00	38.2	46.9	8.7
11.25	39.4	48.4	9.0
12.50	40.6	49.8	9.2
13.75	41.8	51.3	9.5
15.00	43.0	52.7	9.7
16.25	44.2	54.2	10.0
17.50	45.4	56.1	10.7
20.00	47.8	58.4	10.6

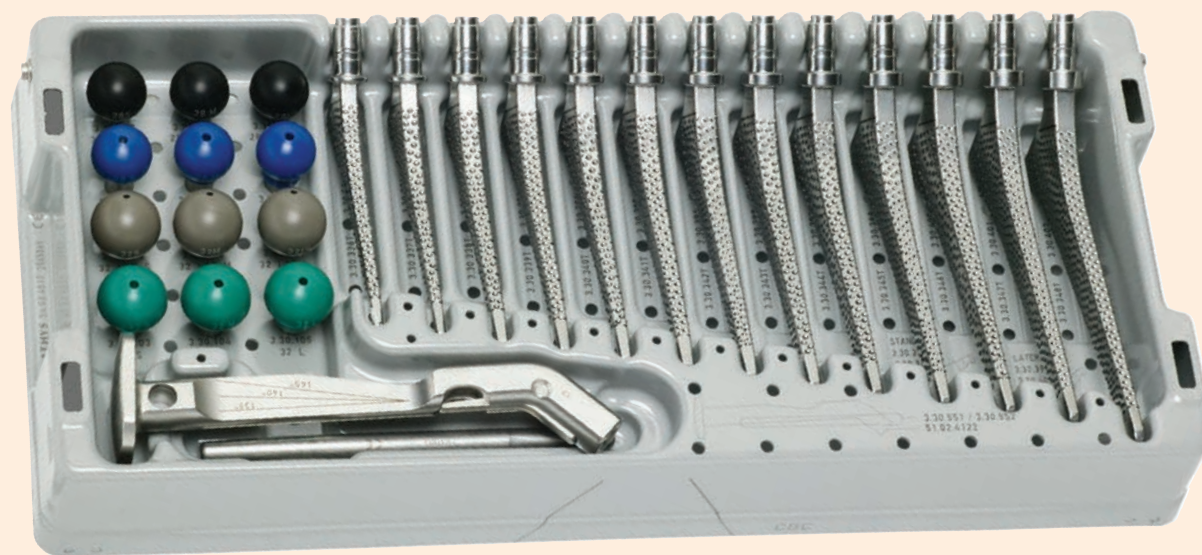
### Offset increase in mm





# 5. Instruments

## 5.1 CBC Instrumentation Set 56.01.0015A



56.03.4010 **CBC Insert 1/2**

56.03.4011 **CBC Insert 2/2**

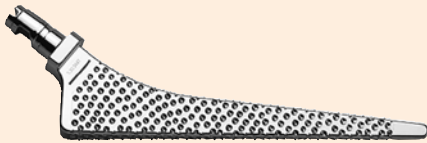
56.03.4012 **CBC Lid**



Item no.	Description
51.34.0150	Trial Head LC 28 S
51.34.0152	Trial Head LC 28 M
51.34.0154	Trial Head LC 28 L
51.34.0160	Trial Head LC 32 S
51.34.0162	Trial Head LC 32 M
51.34.0164	Trial Head LC 32 L



Item no.	Description
3.30.170	CBC Trial Head 28 S lat.
3.30.171	CBC Trial Head 28 M lat.
3.30.172	CBC Trial Head 28 L lat.
3.30.173	CBC Trial Head 32 S lat.
3.30.174	CBC Trial Head 32 M lat.
3.30.175	CBC Trial Head 32 L lat.



Item no.	Description
3.30.336T	CBC Rasp Modular 5
3.30.337T	CBC Rasp Modular 6
3.30.338T	CBC Rasp Modular 7
3.30.339T	CBC Rasp Modular 8
3.30.340T	CBC Rasp Modular 9
3.30.341T	CBC Rasp Modular 10
3.30.342T	CBC Rasp Modular 11.25
3.30.343T	CBC Rasp Modular 12.5
3.30.344T	CBC Rasp Modular 13.75
3.30.345T	CBC Rasp Modular 15
3.30.346T	CBC Rasp Modular 16.25
3.30.347T	CBC Rasp Modular 17.5
3.30.348T	CBC Rasp Modular 20



Item no.	Description
51.02.4122	Impact Handle f/Modular Rasp



Item no.	Description
3.30.552	Crossbar long

**Item no.**

3.30.349 Reamer broad

**Item no.**

51.34.0263 Impactor/Extractor silicone

**Item no.**

51.34.0136 Extractor curved silicone

**Item no.**

51.34.0134 Box Chisel silicone

**Item no.**

3.30.130 Ruler length 20

**Item no.**

51.34.0135 Head Impactor silicone

**Item no.**

3.30.536 Top f/Head Impactor

## Optional Instruments



Item no.	Description
3.30.106	Trial Head 28 XL blue
3.30.107	Trial Head 28 XXL blue
3.30.108	Trial Head 32 XL green
3.30.109	Trial Head 32 XXL green
54.02.1218	Trial Head 36 XL
54.02.1219	Trial Head 36 XXL



Item no.	Description
56.02.0100	CBC Trial Head 36 S lat.
56.02.0101	CBC Trial Head 36 M lat.
56.02.0102	CBC Trial Head 36 L lat.



Item no.	Description
51.34.0170	Trial Head LC 36 S
51.34.0172	Trial Head LC 36 M
51.34.0174	Trial Head LC 36 L



Item no.	Description
56.02.2000	MIS Positioner with Point



Item no.	Description
51.02.4121	Impact Handle mod. f/IMT Impactor
51.02.4125	Impact Handle modular f/Airpuls

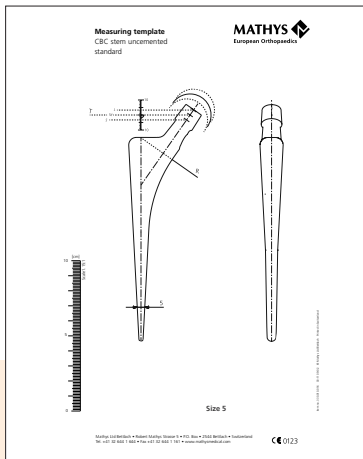


Item no.	Description
58.02.4130	CBC Rasp Handle MIS L
58.02.4131	CBC Rasp Handle MIS R

## 5.2 Measuring templates

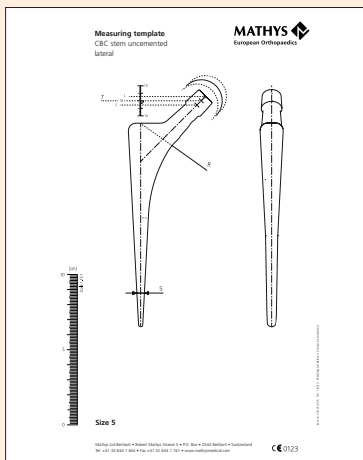
The item code for the CBC standard Measuring template is 330.010.016.

The item code for the CBC lateral Measuring template is 330.010.015.



### Item no.

330.010.016 CBC standard



### Item no.

330.010.015 CBC lateral

## 6. Symbols



Manufacturer



Caution



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