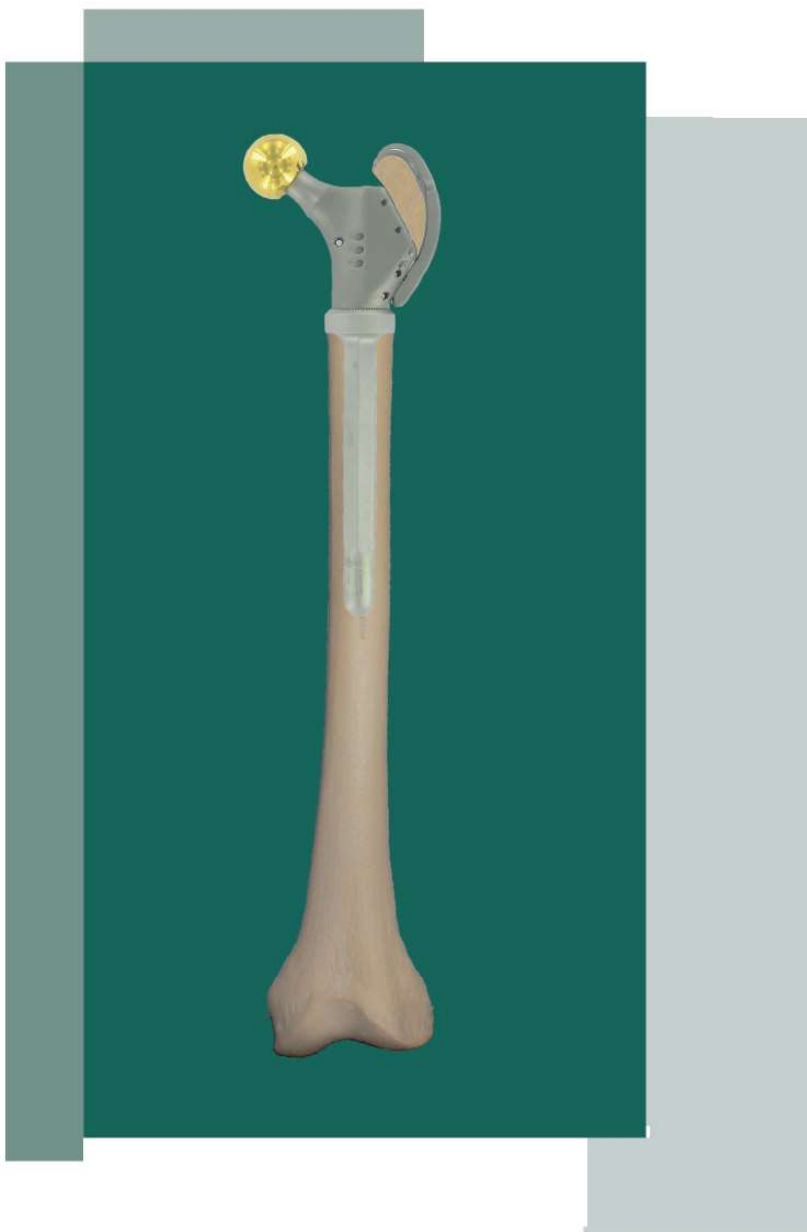


MUTARS[®] RS



implantcast



MUTARS[®]
Proximal Femur Revision
Surgical Technique

MUTARS® RS

MUTARS® Proximal Femur Revision Surgical Technique

The MUTARS® Proximal Femur RS was developed in co-operation with
Prof. Dr. Harges (Clinic and Polyclinic for General Orthopedics and Tumororthopedics
at the University Hospital of Münster),
Dr. Albrecht (Domenikus Clinic of Berlin) and
Prof. Dr. von Eisenhart-Rothe (Clinic for Orthopedic rechts der Isar, Technical University München).
MUTARS® has been in successful clinical use since 1992.

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Nota Bene: The described surgical technique is the suggested treatment for uncomplicated procedures. In the final analysis the preferred treatment is that which addresses the needs of the individual patient.

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MUTARS® Proximal Femur Revision

The Silver coating

Early and late infections represent the most severe complications of tumour arthroplastic treatments. Although local and systemic antibiotic treatments are considered, the scientific literature reports of infection rates from 5 to 35 percent. Reasons for these high rates are, for example, the long surgery time, the large incisions and the immunosuppression due to chemo therapy and radio therapy as well as the increasing resistance of the bacteria against antibiotic drugs.

The anti-infective effect of silver ions has been known for centuries i.e. the disinfection of potable water is based on this principle. This special property of silver is used for the silver coated components of MUTARS® to build an intelligent protection against bacteria.

Until now only non-articulating surfaces and surfaces without direct bony contact are coated with silver. In the catalogue information of this brochure you can find the supplement *S indicating which MUTARS® components are available in a silver coated version. The eight digit REF number receives an addition after the last digit (e.g. 5220-0020S).

It is not permitted to flush the wound with antiseptics that contain H₂O₂, Iodine or heavy metals (such as Betaisodona®) and acetic acid.

Iodine and Silver form insoluble salt complexes not only with the silver ions that are released post-operatively but also with the silver layer of the implant that will be covered with an insoluble silver-iodine (AgI) film. This will destroy the anti-adhesive protective layer irreversibly. Iodine or heavy metal based as well as H₂O₂ containing antiseptics and acetic acid may not be used at any time. Alternatively solutions like NaCl or Lavasept® and Prontosan® or similar can be used.

The silver coating can be destroyed in its function by two factors: large amounts of albumin from seroma or hematoma can bind larger amounts of silver (1 mol Albumin inactivates 3 moles Silver ions). This should be minimized by using an attachment tube.

In the instance that an infection is known pre-operatively, antibiotics like Vancomycin can be mixed with the bone cement. The intramedullary stems are not silver coated and cemented components are preferred in case of a septic revision.

The TiN coating for allergy prophylaxis

As the metallic components of total knee replacements, the articulating metallic parts of the MUTARS® system are made of casted CoCrMo alloy. In the late 70's and 80's of the last century, some of the Cobalt Chromium implants had a small Nickel content to add strength to the implant. Nickel is the primary cause for metal sensitivity, although some patients have shown to be hypersensitive to other metals such as Cobalt and Chromium. The use of titanium components can't solve this problem, because the wear of the articulating polyethylene inlays will increase and so the survival time of the prosthesis is reduced. Since the end of the 1990's TiN (Titanium Nitride coating) has been successfully applied to protect the body against metal ions that could cause allergic reactions.

The metal ion release of TiN coated or TiNbN coated implants is reduced down to 10%.

¹In order to prevent allergic reactions, certain parts of the prosthesis may be supplied with a ceramic coating (TiN). Since almost all components of the tumor system consist of titanium alloy, this only concerns those components, which are made of a cast CoCr alloy (CoCrMo). The REF-numbers of the TiN coated implants have the suffix N after the last digit (e.g. 5720-0005N).

*S: For anti-infective treatment, silver coated implants are available.

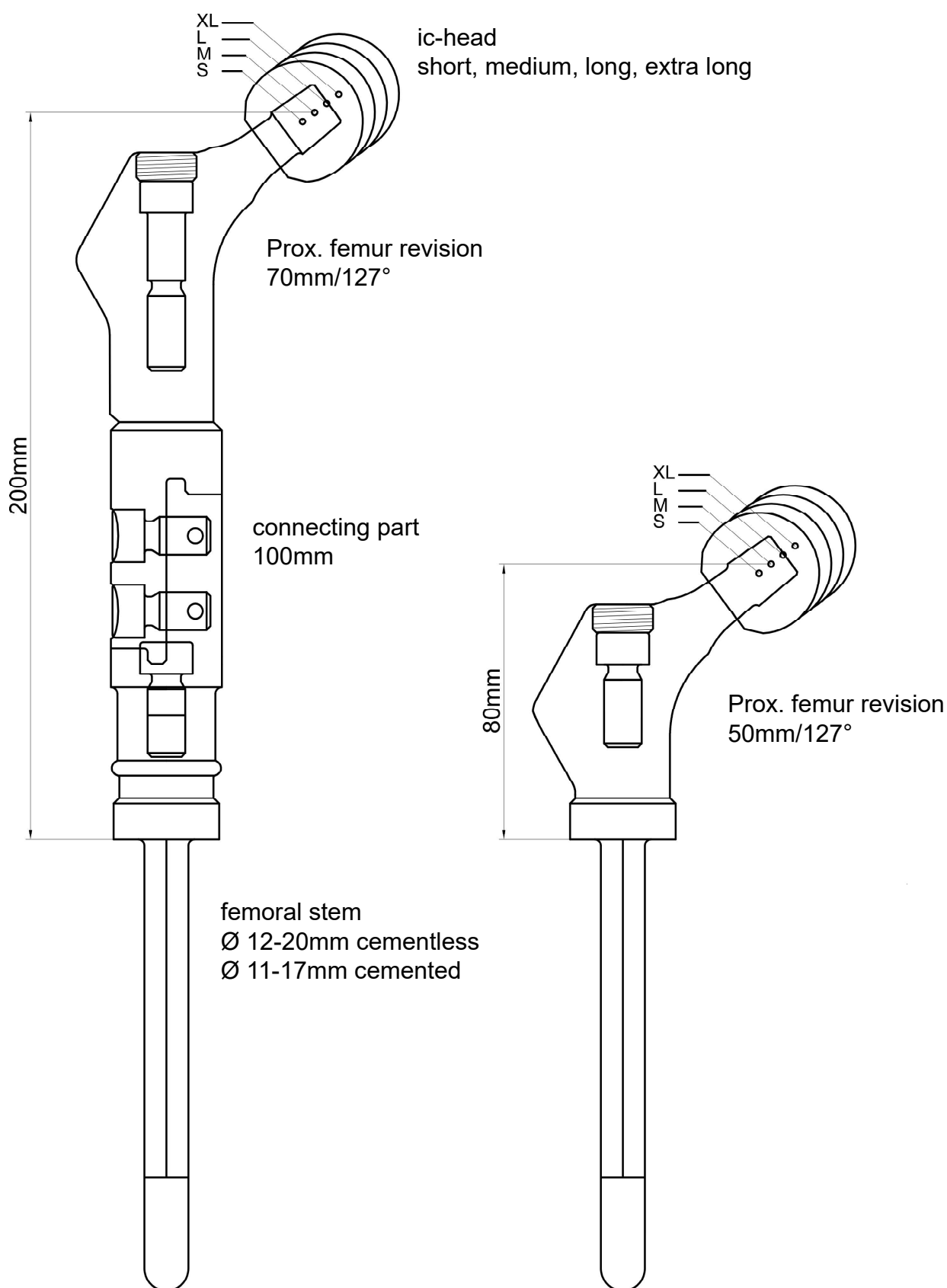
*N: For anti-allergic treatment, TiN coated implants are available.

*SN: Implants are coated with silver and TiN.

¹ Metal Ion Release from Non-Coated and Ceramic Coated Femoral Knee Components: Boil test 240h in NaCl-solution nach FMZ PhysWerk VA 97350, University Würzburg (D) (On File)

MUTARS® Proximal Femur Revision

SYSTEMOVERVIEW





MUTARS® Proximal Femur Revision

MUTARS® Proximal Femur

proximal femur replacement
assembling options
by using a head with neck length medium
(length in mm)

Components				
reconstruction	Prox. Femur RS	connecting part 100mm	extension piece	bar screw
80 mm	50	-	-	25
100 mm	70	-	-	45
120 mm	50	-	40	65
140 mm	50	-	60	85
160 mm	50	-	80	105
180 mm	50	100	-	25 + 25
200 mm	70	100	-	25 + 45
220 mm	50	100	40	65 + 25
240 mm	50	100	60	85 + 25
260 mm	50	100	80	105 + 25
280 mm	50	100	40 + 60	125 + 25
300 mm	70	100	40 + 60	145 + 25
320 mm	50	100	60 + 80	165 + 25
340 mm	70	100	60 + 80	185 + 25

For resection length 180 mm and longer it is recommended to use the MUTARS® connecting part 100 mm.

Note: Please notice that the amount of implants and instruments sent with an individual shipment may differ from the information in the catalogue information of this brochure. Please make sure, during the preoperatively planning, that all necessary implants and instruments are available for the surgery.

MUTARS® Proximal Femur Revision



figure 1

Tumor resection

Resect the tumor and measure the length of the explant. The minimum bone resection is 80 mm.

Femoral bone preparation

Prepare the femoral medullary cavity with the MUTARS® medullary cavity reamer cross-hole (fig. 1).

Cementless fixation

Ream the femoral medullary cavity preferably up to a depth of 130 mm with a flexible reamer 1.5 mm smaller than the preoperatively chosen femoral stem (fig. 2).



figure 2

Cemented fixation

Ream the femoral medullary cavity preferably up to a depth of 130 mm with a flexible reamer 2 mm larger than the preoperatively chosen femoral stem (fig. 2).

Remark:

In case no flexible reamers are in the hospital's stock flexible reamers can be provided on special demand.



Rasping of the femoral cavity

Assemble the femur rasp of the appropriate size (see tables below), the sleeve and the slide hammer. Lock the rasp on the slide hammer by using the engineers' wrench.

Remark:

The use of a femoral rasp for a cemented stem is optional. Generally you can proceed with the trial reduction (see page 6).

Use of cementless stems

Use the femur rasp (fig. 3), of the same size as the preoperatively chosen femoral stem (table 1).

Stem size	Rasp size
12mm	12mm
13mm	13mm
14mm	14mm
15mm	15mm
16mm	16mm
17mm	17mm
18mm	18mm
19mm	19mm
20mm	20mm

table 1

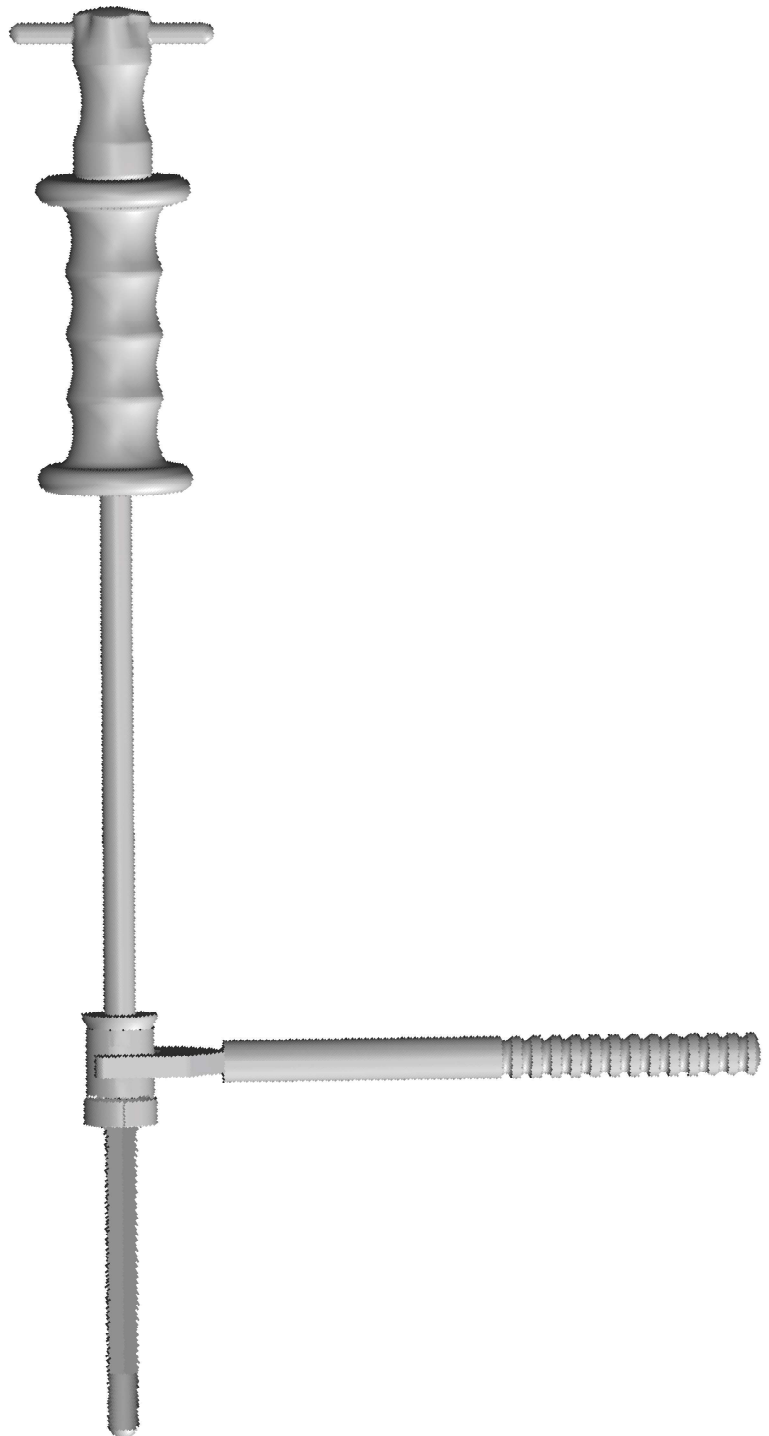


figure 3

MUTARS® Proximal Femur Revision



figure 4



figure 5

Mark the anterior aspect of the femoral bone to meet the correct antecurvation of the femur (fig. 4a).

Rasp the medullary cavity with the chosen femoral rasp (fig. 4b). A carefully use of the slide hammer is recommended.

Remark:

It is recommended to clean the rasp of bone chips during the rasping.

Leave the femoral rasp in the bone for the trialing.

Optional technique for the use of cemented stems

If you want to prepare for a cemented stem with the femoral rasp, please use the rasp which is 2 mm larger than the preoperatively chosen cemented femoral stem.

This will provide a cement mantle of 1 mm thickness (table 2).

Stem size	Rasp Size
11mm	13mm
13mm	15mm
15mm	17mm
17mm	19mm

table 2

Trial reduction

Mount the Proximal trial femur revision and the possibly needed trial extension pieces (possible enlargement from 20 to 260 mm; see table page 6) onto the top of the rasp (fig. 5a).

Remark:

For the cemented procedure bone rasps are usually not available. Please insert the cemented stem (without cement) for trialing purposes (fig. 5b).

Insert a trial screw of the correct length (see table on page 2) (fig. 5a and 5b).

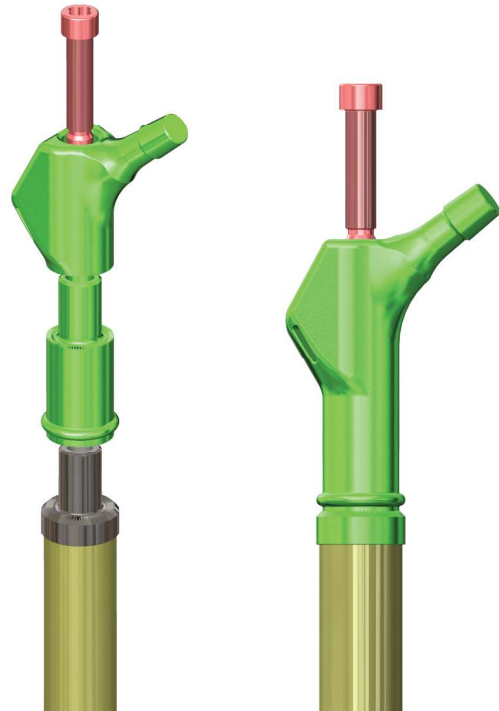


figure 5a and 5b

Place the medium trial head on the neck (fig. 6)

Do a trial reduction and check the muscle tension, the joint stability and the leg length.

Please check the rotational alignment. If necessary, adjust the rotation in steps of 5°.

Remove all trial components and the femoral rasp.



figure 6

MUTARS® Proximal Femur Revision

Implantation of the femoral stem

Impact the femoral stem (fig. 7).

Insert the stem of the same size as the rasp if a **cementless stem** is used.

To prevent fractures of the cortical bone it is helpful to fix a bone forceps around the femoral bone during impaction.

If a cemented implantation is planned, insert the intramedullary plug, the cement and insert a **cemented stem** which is 2 mm smaller than the previously used reamer or rasp.

Remove all instruments during the cement hardening to prevent bending moments.

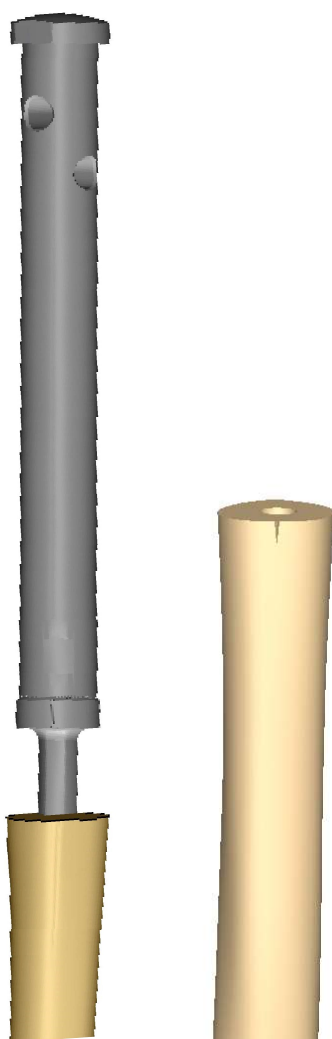


figure 7



MUTARS® Proximal Femur Revision

Implantation of the proximal components

Combine the proximal implant components on the femoral stem.
Insert the bar screw of the correct length (see table on page 2).

Tighten the bar screw with the socket wrench (fig. 8).

Final trialing

Once more, use the trial head to control the muscle tension (fig. 9).

Please check the rotational alignment. If necessary adjust the rotation in steps of 5°.

Remove the trial head when sufficient tension is achieved.



figure 8



figure 9

MUTARS® Proximal Femur Revision



figure 10

Final implant assembling

Lock the bar screw with the MUTARS® swing wrench (fig. 10).

Secure the assembly with the **ic-counter instrument** (fig. 11).

Lock the safety screw in the same way.

Connect the setting instrument for trochanter plate with the trochanter-plate. Attach it to the lateral shoulder and thighen the setup by turning the screw clockwise.

Combine the screw for trochanter plate with the 3.5mm screwdriver.

Hook the remaining trochanter bone chip to the trochanter plate and pull it across the lateral shoulder until the screwholes match with the threads of the proximal femur revision.

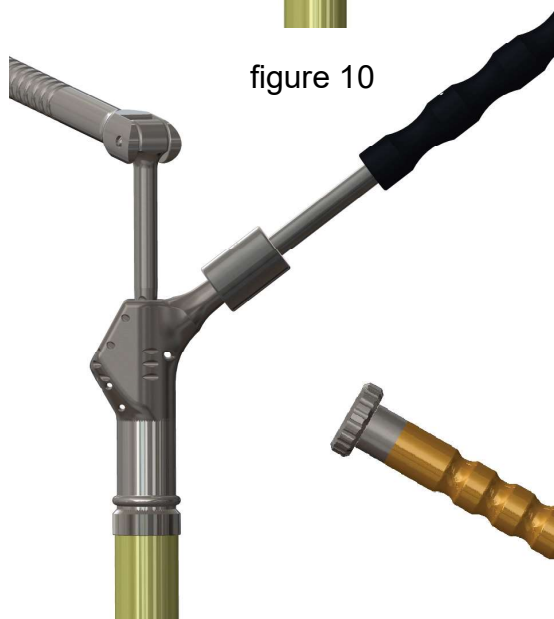


figure 11

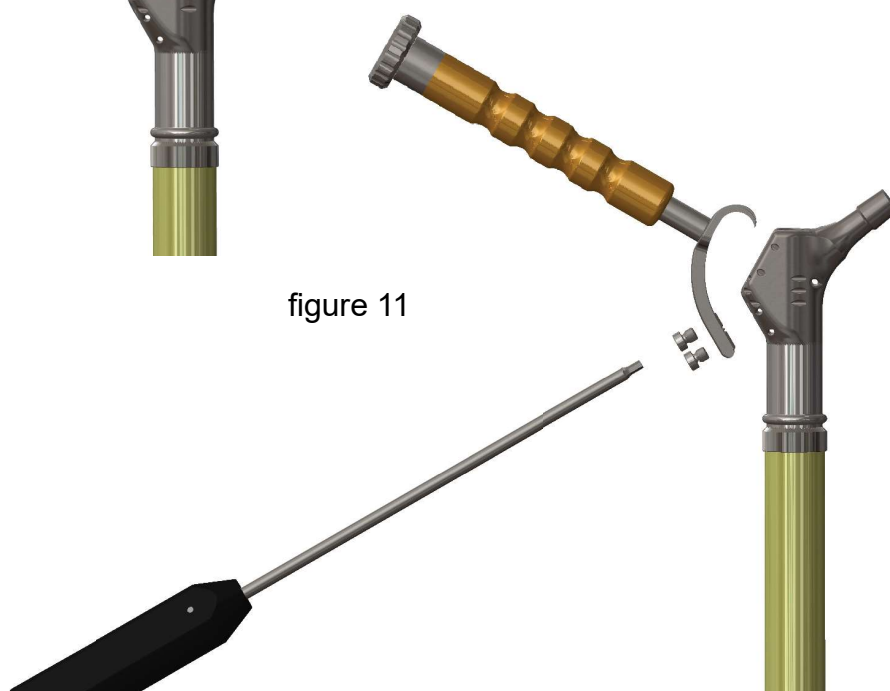


figure 12



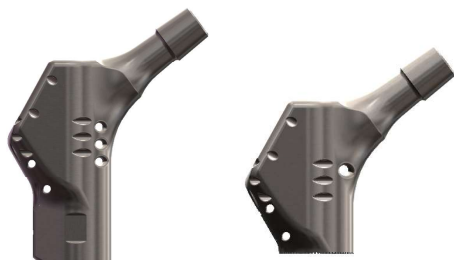
MUTARS® Proximal Femur Revision

IMPLANTS

***S:** For anti-infective treatment, silver coated implants are available.

***N:** For anti-allergic treatment, TiN coated implants are available.

***SN:** Implants with Silver and TiN coating!



MUTARS® proximal femur revision incl. safety screw *S

mat.: *implatan*®; $TiAl_6V_4$ acc. to ISO 5832-3

REF	size
5710-0305	50/127°
5710-0307	70/127°
5710-0405	50/135°
5710-0407	70/135°

MUTARS® extension piece *S

mat.: *implatan*®; $TiAl_6V_4$ acc. to ISO 5832-3



REF	size
5772-2504	40 mm
5772-2506	60 mm
5772-2508	80 mm
5772-2510	100 mm

MUTARS® connecting part *S

mat.: *implatan*®; $TiAl_6V_4$ acc. to ISO 5832-3



REF	size
5730-0100	100 mm

MUTARS® Proximal Femur Revision

IMPLANTS

MUTARS® screw

mat.: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3

REF	size
5792-1002	M10 x 25mm
5792-1004	M10 x 45mm
5792-1006	M10 x 65mm
5792-1008	M10 x 85mm
5792-1010	M10 x 105mm
5792-1012	M10 x 125mm
5792-1014	M10 x 145mm
5792-1016	M10 x 165mm
5792-1018	M10 x 185mm
5792-1020	M10 x 205mm
5792-1022	M10 x 225mm
5792-1024	M10 x 245mm



MUTARS® femoral stem cemented *N

mat.: implavit®; CoCrMo acc. to ISO 5832-4

REF	size
5760-0011	11mm
5760-0013	13mm
5760-0015	15mm
5760-0017	17mm



MUTARS® femoral stem cementless

mat.: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3
with HA-coating acc. to ISO 13779-2

REF	size
5760-0012	12mm
5760-0113	13mm
5760-0014	14mm
5760-0115	15mm
5760-0016	16mm
5760-0117	17mm
5760-0018	18mm
5760-0019	19mm
5760-0020	20mm





MUTARS® Proximal Femur Revision

IMPLANTS



**trochanter plate for MUTARS®
proximal femur revision *S**
mat.: implatan®; TiAl₆V₄ acc. to ISO 5832-3

REF	size
5710-1305	50mm
5710-1307	70mm



**screw for trochanter plate for MUTARS®
proximal femur revision**
mat.: implatan®; TiAl₆V₄ acc. to ISO 5832-3

REF
5708-0001

MUTARS® Proximal Femur Revision

IMPLANTS

BILOX® forte

Al_2O_3 acc. to
ISO 6474-1

BILOX® delta

Al_2O_3 and ZrO_2
acc. to ISO 6474-2

REF	size	REF
2587-2800	28mm, S	2586-2800
2587-2805	28mm, M	2586-2805
2587-2810	28mm, L	2586-2810
2587-3200	32mm, S	2586-3200
2587-3205	32mm, M	2586-3205
2587-3210	32mm, L	2586-3210
-	32mm, XL	2586-3215
2587-3600	36mm, S	2586-3600
2587-3605	36mm, M	2586-3605
2587-3610	36mm, L	2586-3610
-	36mm, XL	2586-3615



CoCrMo

implavit® CoCrMo
acc. to ISO 5832-12

ic-head

Titanium

implatan® $TiAl_6V_4$
acc. to ISO
5832-3
with TiN-coating

REF	size	REF
2387-2800	28mm, S	2787-2800
2387-2805	28mm, M	2787-2805
2387-2810	28mm, L	2787-2810
2387-2815	28mm, XL	2787-2815
2387-3200	32mm, S	2787-3200
2387-3205	32mm, M	2787-3205
2387-3210	32mm, L	2787-3210
2387-3215	32mm, XL	2787-3215
2387-3600	36mm, S	2787-3600
2387-3605	36mm, M	2787-3605
2387-3610	36mm, L	2787-3610
2387-3615	36mm, XL	2787-3615

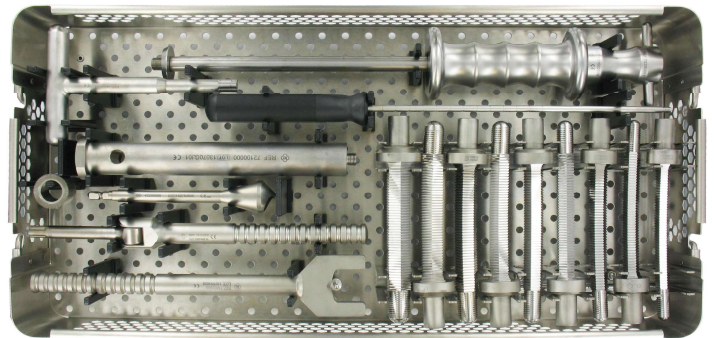




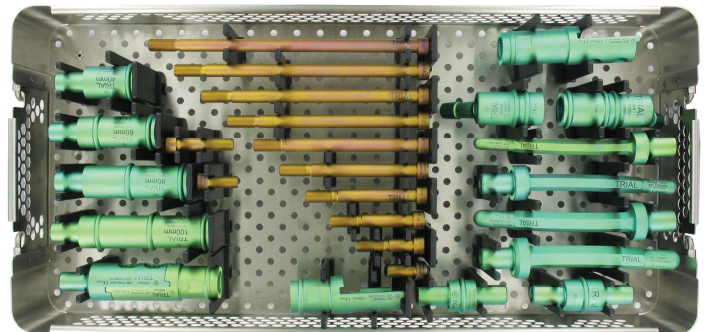
MUTARS® Proximal Femur Revision

INSTRUMENTS

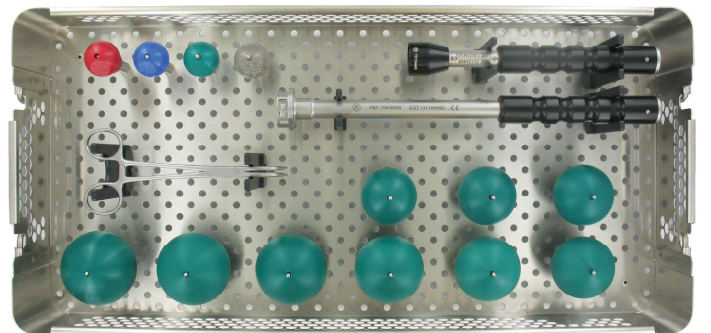
**MUTARS® basic
container
7999-5712**



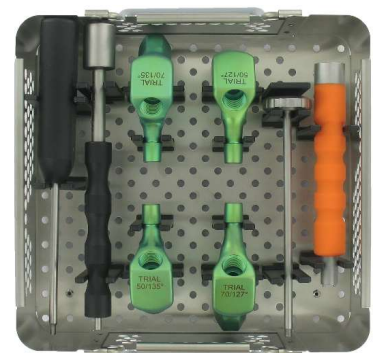
**MUTARS® trial
container
7999-7701**



**ic bipolar head
container
7960-9999**



**MUTARS® Prox. Femur RS trial
container
7999-7744**



MUTARS® Proximal Femur Revision

INSTRUMENTS



MUTARS® socket wrench
7420-0000



MUTARS® medullary cavity reamer cross-hole
4220-0000



MUTARS® engineers' wrench SW 24
7490-0000



MUTARS® universal impactor
7210-0000



MUTARS® impact and extract sleeve
7230-0000



MUTARS® swing wrench
7411-0000



MUTARS® slide hammer
7220-0001

MUTARS® rasp for femoral stem

7760-0112	12 mm
7760-0113	13 mm
7760-0114	14 mm
7760-0115	15 mm
7760-0116	16 mm
7760-0117	17 mm
7760-0118	18 mm
7760-0119	19 mm
7760-0120	20 mm



handle for intramedullary plug
7512-4001



MUTARS® Proximal Femur Revision

INSTRUMENTS

MUTARS® trial prox. femur revision

7710-0305 50/127°

7710-0405 50/135°

7710-0307 70/127°

7710-0407 70/135°



MUTARS® trial prox. femur

7710-0205 50mm

7710-0207 70mm



hexagon screw driver short 3,5 mm

0280-1007



impactor for trochanter plate

8400-0300



ic-counter instrument

8650-0003



MUTARS® trial reducer

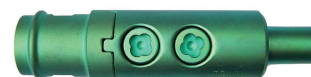
7730-0220 20mm

7730-0230 30mm



MUTARS® trial connecting part 100 mm

7730-0100



MUTARS® trial extension piece

7772-2504 40mm

7772-2506 60mm

7772-2508 80mm

7772-2510 100mm



MUTARS® trial extension piece for mod. prox. tibia

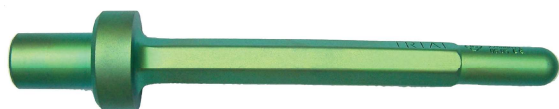
7750-0105 105mm

7750-0125 125mm



MUTARS® Proximal Femur Revision

INSTRUMENTS



MUTARS® trial femoral stem

7760-0011	11mm
7760-0013	13mm
7760-0015	15mm
7760-0017	17mm



MUTARS® trial bar screw

7792-1002	M 10x 25 mm
7792-1004	M 10x 45 mm
7792-1006	M 10x 65 mm
7792-1008	M 10x 85 mm
7792-1010	M 10x105 mm
7792-1012	M 10x125 mm
7792-1014	M 10x145 mm
7792-1016	M 10x165 mm
7792-1018	M 10x185 mm
7792-1020	M 10x205 mm



handle for bipolar sizing shell

7960-6000



head impactor

7512-4444



trial head snap taper 12/14mm

7962-2800	28 mm short
7962-2805	28 mm medium
7962-2810	28 mm long
7962-2815	28 mm extra long

alternative:

7965-2800	28 mm short
7965-2805	28 mm medium
7965-2810	28 mm long
7965-2815	28 mm extra long



ic-forceps for bipolar head

7960-6010

alternatively:

7960-6020



bipolar head sizing shell

7960-0044	28/44 mm
7960-0046	28/46 mm
7960-0048	28/48 mm
7960-0050	28/50 mm
7960-0052	28/52 mm
7960-0054	28/54 mm
7960-0056	28/56 mm
7960-0058	28/58 mm
7960-0060	28/60 mm



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