

MUTARS®



implantcast

Proximal Ulna
Surgical Technique

MUTARS®

Proximal Ulna Surgical Technique

MUTARS® was developed in co-operation with Univ.-Prof. Dr. W. Winkelmann (ex-director) and Univ.-Prof. Dr. G. Gosheger (director) Department of General Orthopaedics and Orthopaedic Oncology at the University Hospital of Münster, Germany. MUTARS® is in successful clinical use since 1992.

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Nota Bene: The herein described surgical technique shows the treatment suggested by the author in uncomplicated surgical procedures. However, it is ultimately the operating surgeon's decision, which approach is the most reasonable and effective for the respective patient.

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The Silver Coating

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 [1]. 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.

Silver, in particular free silver ions, is well known for its broad-spectrum antimicrobial activity. The silver coating has been shown to reduce bacterial colonization on the device surface.

Until now only non-articulating surfaces and surfaces without direct bony contact are coated with silver.

In the catalogue information of this surgical technique 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).

Important Intra-Operative Instructions for the Use of Silver-Coated Implants

It is not permitted to flush the wound with antiseptics that contain H₂O₂, Iodine or heavy metals (such as Betaisodona®) and acetic acid during surgery since this can lead to a subsequent loss of effectiveness of the silver coating due to their oxidative properties. Alternatively, solutions such as NaCl or Lavasept® and Prontosan® can be used. The additional use of antibiotic-containing bone cement can be an advantage particular in case of a septic revision.

The TiN Coating for Allergy Prophylaxis

All metallic implant components release ions to their environment over time. In some patients such ions can elicit allergic reactions. Nickel, cobalt and chromium, which are elements of the base material CoCrMo of the articulating implant components, are considered the most frequently allergy eliciting metals [2] The TiN-coating is biocompatible and acts like a barrier; the potential release of allergy eliciting ions of the base material is reduced to a minimum [3]. Also in clinical practice there have never been any evidence of allergic reactions with implants that have been TiN-coated showing an intact surface [5]. Therefore the TiN-coating on implant components is especially suitable for patients with sensitivity to nickel, chromium or cobalt [4][5].

Since almost all components of the MUTARS® tumour system consist of titanium alloy, this only concerns those components, which are made of a cast CoCrMo alloy. The REF-numbers of the TiN-coated implants have the suffix N after the last digit (e.g. 5720-0005N). Items which are available with Silver and TiN coating have the suffix SN after the last digit (e.g. 5720-0005SN).

***S:** Implants are available with Silver coating!

***N:** Implants are available with TiN coating!

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

[1] Gosheger et al. (2004). Silver-coated megaendoprostheses in a rabbit model – an analysis of the infection rate and toxicological side effects. *Biomaterials* 25, 5547-5556.

[2] Eben R et al. (2009) Implantatallergieregister - ein erster Erfahrungsbericht. *Orthopäde* 38: 557-562

[3] Wisbey et al. (1987) Application of PVD TiN coating to Co-Cr-Mo based surgical implants. *Biomaterials*, 11

[4] Prof. Thomas LMU München Final Report Effect of a TiNbN or TiN surface coating on cobaltchromium- molybdenum and stainless steel test specimens regarding the release of nickel, chromium and cobalt: evaluation via eluate analysis and in-vitro cytokine release from peripheral human blood cells, Data on file

[5] Baumann A. (2001) Keramische Beschichtungen in der KTEP Standardlösung für Allergiker. *JATROS Orthopädie & Rheumatologie* 6: 16-17

MUTARS® Proximal Ulna

Pre-Operative Planning

Pre-operative planning and precise surgical techniques are mandatory for optimal results. The instructions and the procedure given in the surgical technique to the system must be adhered to. Familiarity with the recommended surgical technique and its careful application is essential to achieve the best possible outcome.

Before surgery a surgical planning with regard to the dimensions of the prosthetic model and the positioning of the implant components in the bone has to be carried out by the surgeon.

For this purpose, x-ray templates are available:

Digital templates: Digital templates are included in the data base of the common planning systems. For missing templates, please contact the provider of the planning software and request for these templates.

Radiographic templates: Alternatively radiographic templates are available in various scale factors, which can be obtained from your local representative.



Picture shown: MUTARS® proximal ulna implant in A/P view

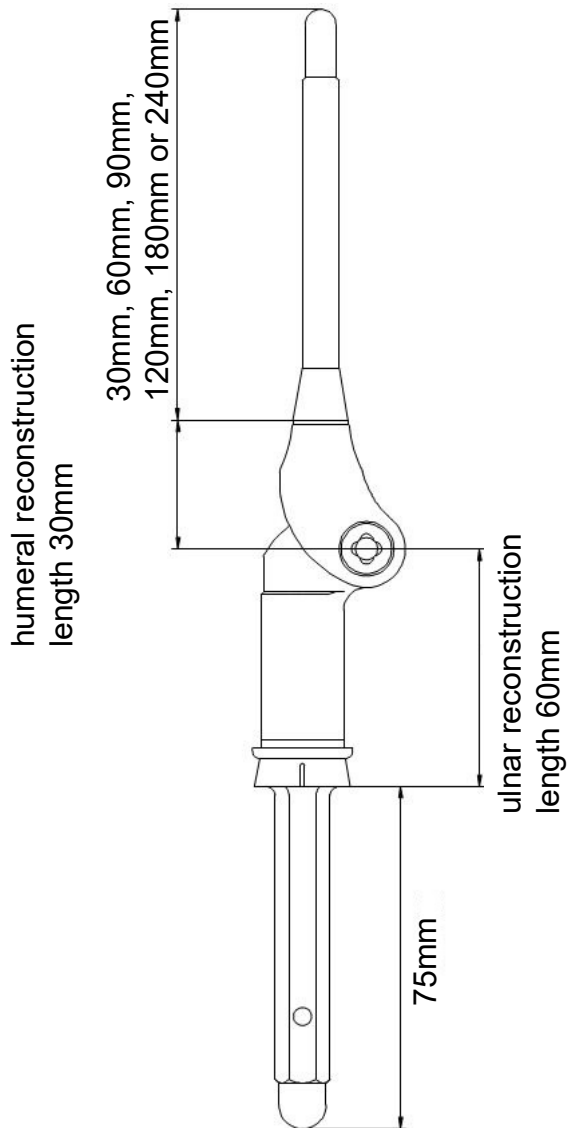


Picture shown: MUTARS® proximal ulna implant in M/L view



MUTARS® Proximal Ulna

System Overview



AGILON® stem

AGILON® stem Cemented	
Length	Diameter
60mm	ø 6, 8, 10, 12 mm
90mm	ø 6, 8, 10, 12 mm
120 mm	ø 6, 8, 10, 12 mm

AGILON® stem Cementless	
Length	Diameter
30mm ¹	ø 9 - 18 mm
60mm ²	ø 10 - 18 mm
120mm ²	ø 10 - 18 mm
180mm ¹	ø 10 - 16 mm
240mm ¹	ø 10 - 16 mm

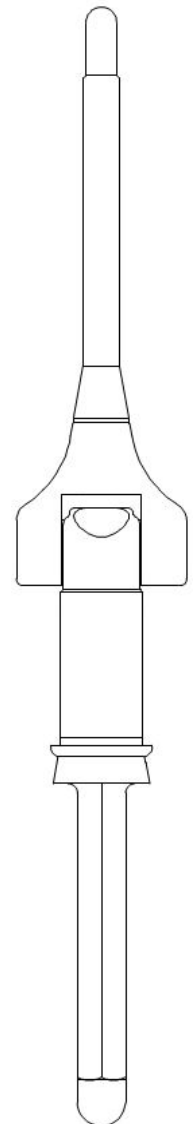
¹ Available on demand

² Stems with diameters bigger than ø13mm available on demand

distal humerus
30mm

proximal ulna

humerus stem
ø 7-13mm cementless
ø 14-16mm cementless*
ø 8-12mm cemented
* available on demand



MUTARS® Proximal Ulna

Assembling Options

Humeral Components			
Reconstruction (mm)	Distal Humerus 30mm (mm)	Distance sleeve (mm)	Screw for dist. Humerus 30mm (mm)
30	30	-	12,5
37.5	30	7,5	20
40	30	10	22,5
42.5	30	12,5	25
45	30	15	27,5
47.5	30	17,5	30

Ulnar Components					
Reconstruction (mm)	Proximal Ulna (mm)	Extension piece (mm)	Connection piece (mm)	Extension piece (mm)	Humerus screw
60	50	-	-	-	15
80	50	20	-	-	35
100	50	40	-	-	55
120	50	60	-	-	75
140	50	-	80	-	15 + 15
160	50	20	80	-	35 + 15
180	50	40	80	-	55 + 15
200	50	60	80	-	75 + 15
220	50	60	80	20	75 + 35
240	50	60	80	40	75 + 55
260	50	60	80	20 + 40	75 + 75

Note: Please notice that the amount of implants and instruments send 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.

Tumour Resection

Resect the tumour and determine the length of the explanted bone.

The minimal resection on the humeral bone is 30mm on the ulna bone is 60mm (Fig. 2).

Remark: In the case that the radius head is free of tumour it needn't be resected.



Fig. 1

Preparation of the Proximal Ulna

Cementless use

Drill the medullary cavity with a humerus drill 1mm smaller than the size of the preoperatively chosen humerus stem (Fig. 3).

Make sure that a minimum cortical bone contact of app. 4 cm is achieved.

Cemented Use

Drill the medullary cavity with a humerus drill 2mm larger than the size of the preoperatively chosen humerus stem (Fig. 3).

Make sure that a minimum cortical bone contact of app. 4 cm is achieved.

Remark: An even cortical contact must be obtained, since there is a danger of jamming.

Prepare the medullary cavity with the medullary cavity reamer (Fig. 4).

Remark: There is a danger of Via falsa with a corticalis perforation. An X-Ray control in two planes is advised!



Fig. 2

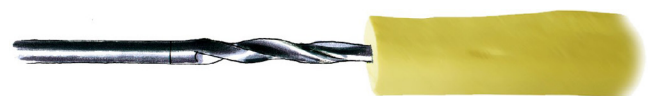


Fig. 3



Fig. 4

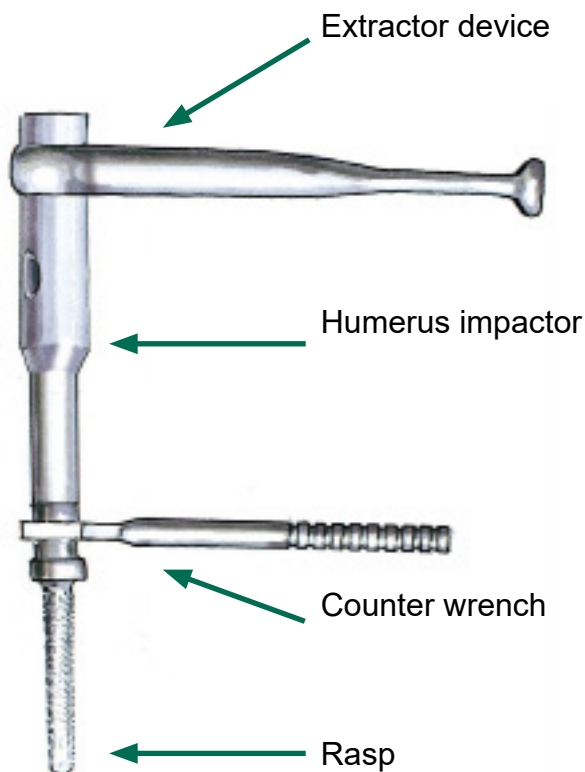


Fig. 5

Rasping of the Ulnar Cavity

Assemble the humeral rasp of the appropriated size (see tables below), the extractor device, the humerus impactor and the sleeve. Lock the rasp on the humerus impactor by using the counter wrench.

Remark: The use of a humeral rasp for a cemented stem is optional. Generally you can proceed with the trial assembly.

Use of Cementless Stems

Use the humeral rasp (Fig. 5), of the same size as the preoperatively chosen humerus stem (table 1).

Stem size	Rasp size
7mm	7mm
8mm	8mm
9mm	9mm
10mm	10mm
11mm	11mm
12mm	12mm
13mm	13mm

Optional Technique for the Use of Cemented Stems

If you want to prepare for a cemented stem with the humeral rasp, please use the rasp which is 2 mm larger than the preoperatively chosen cemented humerus stem (Fig. 5).

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

Stem size	Rasp size
8 mm	10 mm
9 mm	11 mm
10 mm	12 mm
11 mm	13 mm
12 mm	14 mm

Preparation of the Proximal Ulna

Use the rasp of the correct size to prepare the cavity (Fig. 6 and Fig. 7). A careful use of the mallet is recommended.



Fig. 6

Remark: It is recommended to clean the rasp from bone chips during the rasping. To prevent fractures of the cortical bone, it is helpful to fix a bone forceps around the ulnar bone during rasping.

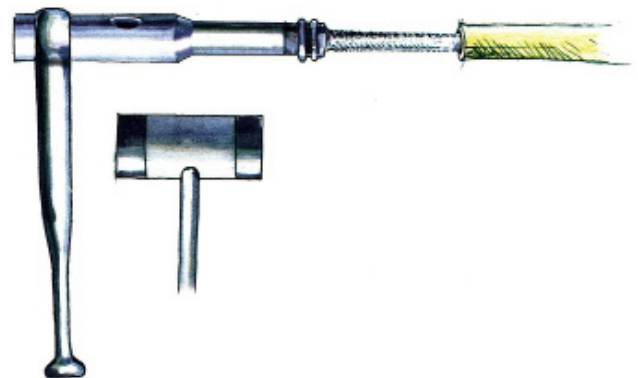


Fig. 7

Leave the humeral rasp in the bone for the trialing (Fig. 8).



Fig. 8



Fig. 9

Humeral Bone Preparation Cemented Use

Connect the AGILON® trauma shoulder drill to the ic T-handle with the help of the Zimmer adapter A/O. Ream the medullary cavity with the AGILON® trauma shoulder drill (Ø7-13mm, in 1mm steps) stepwise up to the planned diameter and the correct length (see the mark on the drill) (Fig. 9).

Note: There are no depth marks on the drills

Cemented Stem Use

For cemented fixation ream the canal 2mm bigger than the planned stem diameter (see Table 3).

Cementless Stem Use

For the cementless fixation ream up to the planned stem diameter (see Table 3).

Example:



Fig. 10

Table 3: AGILON® stem preparation		
Reamer Ø	cemented stem Ø	cementless stem Ø
Ø 8mm	Ø 6mm	-
Ø 9mm	-	Ø 9mm
Ø 10mm	Ø 8mm	Ø 10mm
Ø 11mm	-	Ø 11mm
Ø 12mm	Ø 10mm	Ø 12mm
Ø 13mm	-	Ø 13mm

* Cemented stems are also available with the diameter Ø12mm.

**Cementless stems are also available with diameters Ø14-Ø18mm.

Use additionally the AGILON® reamer tapered when a stem with a smaller diameter than 12mm is planned to complete the bone preparation (Fig.10). Therefore, connect the AGILON® reamer tapered to the ic T-handle Zimmer-Jakobs. The correct depth of reaming is achieved when the fins are fully inserted in the bone.

Fixation of the AGILON® trial Stem

Mount the AGILON® stem impactor and the AGILON® impaction sleeve M6 to the AGILON® trial stem of the correct size. Insert the AGILON® trial stem up to the correct depth (Fig. 11).

Remove the AGILON® stem impactor and AGILON® impaction sleeve M6. Prevent the AGILON® trial stem from rotating while loosening the screw connection. Therefore, fixate the AGILON® impaction sleeve M6 with the help of the AGILON® guide rod or the AGILON® trial stem adapter.

MUTARS® distal humerus 30mm trial reduction

Connect the inserted trial stem to the MUTARS® distal humerus 30mm trial and, if used, to the AGILON® trial extension piece. Therefore, use the MUTARS® trial screw for dist. humerus of the correct length (see table 4)

Use the torque wrench 15Nm 5mm to tighten the screw. Secure the humeral trial components from rotating while screwing. Therefore, insert the MUTARS® setting instrument for ulna, straight, into the holes for axle guidance of the MUTARS® distal humerus 30mm trial. Countering and screwing should be conducted by the same person (Fig. 12 and Fig. 13).



Fig. 11

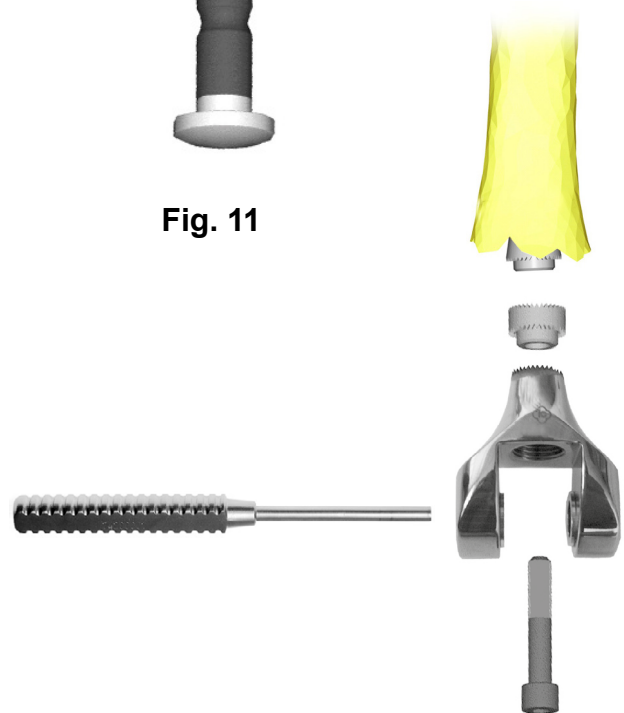


Fig. 12



Fig. 13

Table 4: Overview of extension pieces and screws		
Added length	Distance sleeve	Screw
0	-	12,5
7,5	7,5	20
10	10	22,5
12,5	12,5	25
15	15	27,5
17,5	17,5	30

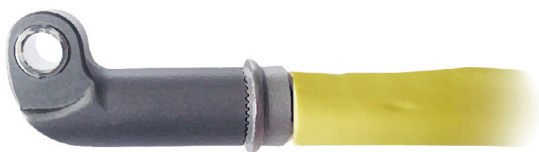


Fig. 14



Fig. 15

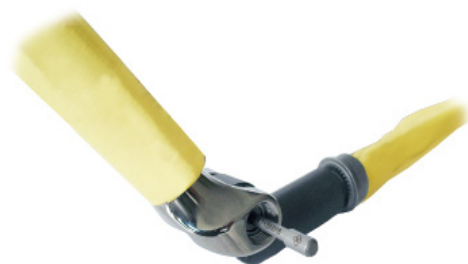


Fig. 16

Ulnar Trial Reduction

Mount the Proximale Ulna trial onto the rasp seated in the ulna cavity (Fig. 14). Secure this connection with the humerus trial screw of the correct size (see page 5).

Connecting the joint component

Assemble the articulating mechanism by inserting the trial axle (Fig 15 and Fig. 16).

Perform a trial reduction, control the muscle tension and check the rotational alignment of the components.

Removal of Trial Components

After successful trialing, remove the trial axis and all trial components.

For removing the MUTARS® distal humerus 30mm trial and the AGILON® trial extension piece, unscrew the MUTARS® trial screw for dist. humerus with the torque wrench 15Nm 5mm. Use the MUTARS® setting instrument for ulna, straight, to secure the trial components from rotating while unscrewing. Therefore, insert the MUTARS® setting instrument for ulna, straight, into the holes for axle guidance of the MUTARS® distal humerus 30mm trial.

Connect the AGILON® impaction sleeve M6 and the AGILON® stem impactor to the AGILON® trial stem. Fix the AGILON® trial stem adapter or the AGILON® guide rod to the Impaction Sleeve M6 to prevent rotation of the stem while screwing. In the following, remove the AGILON® trial stem.

Implantation of the AGILON® Stem cemented

Mount the AGILON® stem impactor and the AGILON® impaction sleeve M6 to the AGILON® stem cemented of the correct size. Prepare the intramedullary cavity with bone cement. Afterwards, insert the AGILON® stem cemented up to the marking into the previously prepared medullary cavity (Fig. 17).

Unscrew the AGILON® stem impactor, AGILON® impaction sleeve M6 and AGILON® stem assembly while cement hardening. Prevent the AGILON® stem from rotating in the humerus while loosening the screw connection. Therefore, fix the AGILON® impaction sleeve M6 with the help of the AGILON® guide rod or the AGILON® trial stem adapter.

cementless

Mount the AGILON® stem impactor and the AGILON® impaction sleeve M6 to the AGILON® stem cementless of the correct size. Insert the AGILON® stem cementless up to the marking into the medullary cavity (Fig. 17).

Unscrew the AGILON® stem impactor, AGILON® impaction sleeve M6 and AGILON® stem assembly. Prevent the AGILON® stem from rotating in the humerus while loosening the screw connection. Therefore, fixate the AGILON® impaction sleeve M6 with the help of the AGILON® guide rod or the AGILON® trial stem adapter.



Fig. 17

MUTARS® Proximal Ulna

Implantation of the Humeral Stem in the Ulna

Remove humeral rasp from the ulna using the humerus impactor and the extraction device (Fig. 18).

Mount the humerus stem of the proper size and the impaction sleeve on the impactor.

Fasten the connection using the counter instrument. Impact the humerus stem and impact the stem into the ulna. (Fig. 17).

When using the cementless stem, insert the stem of the same size as the previously used rasp.

Remark: To prevent fractures of the cortical bone, it is helpful to fix a bone forceps around the ulnar bone during impactation.

It is possible to protect the humerus stem against rotation using a 3.5mm cortical screw.

If a cemented implantation is planned, insert the cement and use the cemented stem which is 2 mm smaller than the previously used drill or rasp.

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

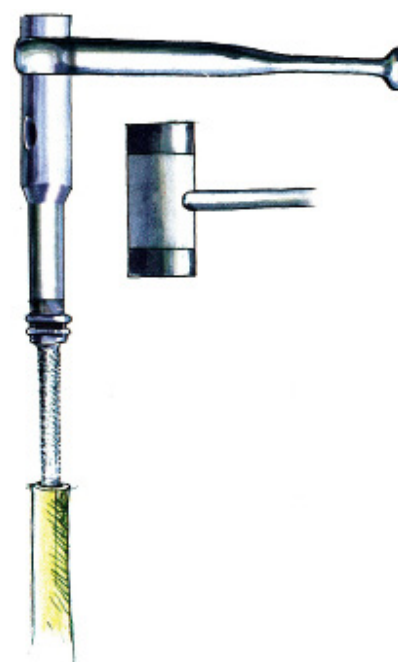


Fig. 18

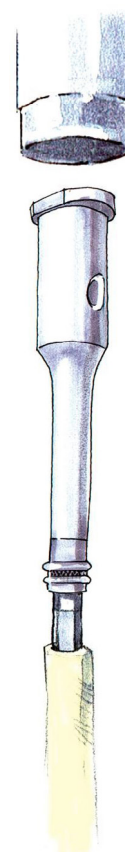


Fig. 19

Mounting of the Distal Humerus 30mm

Connect the implanted AGILON® stem to the MUTARS® distal humerus 30mm and, if used, to the AGILON® extension piece. Use the screw for distal humerus M6 of the correct length for connecting the components (see table 4, S.10).

Use the torque wrench 15Nm 5mm to tighten the screw. Prevent the humeral components from rotating while screwing. Therefore, insert the MUTARS® setting instrument for ulna, straight, into the holes for axle guidance of the MUTARS® distal humerus 30mm. Countering and screwing should be conducted by the same person (Fig. 20).

Screw the safety screw with the MUTARS® socket wrench small into the thread of the MUTARS® distal humerus 30mm to counter the screw for distal humerus. (Fig. 21)

Impact the ulna stop with the impaction instrument (fig. 22) or a punch.

The ulna Stop has to be fully seated to achieve a full range of motion of the joint.

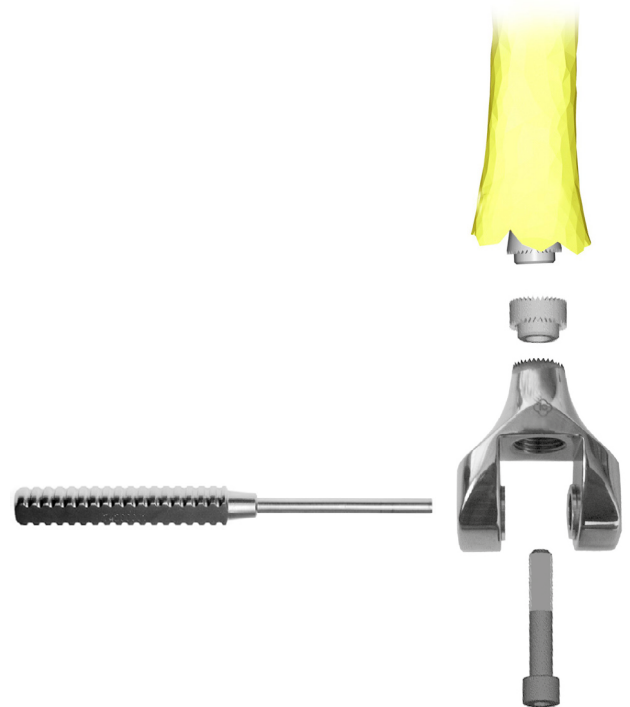


Fig. 20



Fig. 21



Fig. 22



Fig. 23



Fig. 24



Fig. 25



Fig. 26

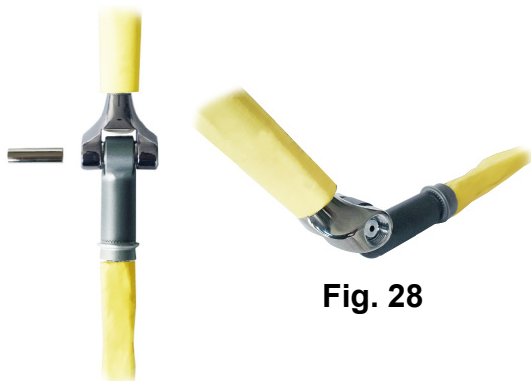


Fig. 27

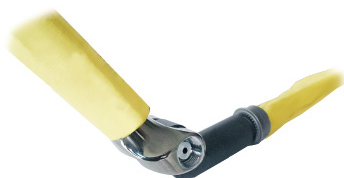


Fig. 28

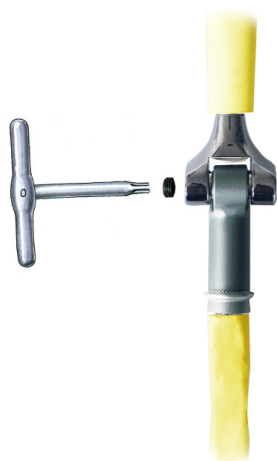


Fig. 29



Fig. 30

Mounting of the proximal ulna

Connect the Proximal Ulna with the stem (Fig. 23). If necessary use the extension pieces to reconstruct the previously resected amount of bone. Adjust the correct rotational alignment.

Lock the assembly by inserting the bar screw of the correct length (see table "Assembling Options - Ulnar Components" on page 5).

Use the small MUTARS® socket wrench to tighten the screw (Fig. 24). Use the counter wrench to secure the assembly (Fig 25).

Insert the safety screw and lock it in the same way (Fig. 26).

Final Reduction

Connect the distal humerus 30mm to the Proximal Ulna by inserting the articulating axle (Fig. 27).

Locking of the Hinge Mechanism

After coupling of the joint components (Fig. 28) please insert the locking screws on both sides in order to cover the articulating mechanism and to protect the axle Therefore the small socket wrench is used (Fig. 29 and Fig. 30).



Implants

*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.

AGILON® stem cemented *N

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

3840-6006	60mm Ø 6 mm
3840-6008	60mm Ø 8 mm
3840-6010	60mm Ø10 mm
3840-6012	60mm Ø12 mm
3840-9006	90mm Ø 6 mm
3840-9008	90mm Ø 8 mm
3840-9010	90mm Ø10 mm
3840-9012	90mm Ø12 mm
3841-2006	120mm Ø 6 mm
3841-2008	120mm Ø 8 mm
3841-2010	120mm Ø10 mm
3841-2012	120mm Ø12 mm



AGILON® stem cementless

mat.: *implatan®*; TiAl₆V₄ according to ISO 5832-3

3850-6009	60mm Ø 9mm
3850-6010	60mm Ø10mm
3850-6011	60mm Ø11mm
3850-6012	60mm Ø12mm
3850-6013	60mm Ø13mm
3851-2009	120mm Ø 9mm
3851-2010	120mm Ø10mm
3851-2011	120mm Ø11mm
3851-2012	120mm Ø12mm
3851-2013	120mm Ø13mm



Cementless Stems with length of 60mm with the diameters Ø14mm to Ø18mm and with the length of 120mm with the diameters Ø14mm to Ø16mm are available on demand.

Cementless Stems with length of 30mm (Ø10mm to Ø18mm), 180mm (Ø10mm to Ø16mm) and 240mm (Ø10mm to Ø16mm) are available on demand.

AGILON® Verlängerungshülse

Mat.: *implatan®*; TiAl₆V₄ nach ISO 5832-3

3821-0075	7,5mm
3821-0100	10mm
3821-0125	12,5mm
3821-0150	15mm
3821-0175	17,5mm





Implants

MUTARS® Distal Humerus 30 mm incl. axle, covers and safety screw

mat.: *implatan*®; TiAl₆V₄ according to ISO 5832-3
 axle CoCrMo according to DIN ISO 5832-12
 bushing CoCrMo according to ISO 5832-12
 5250-2300

Screw for Distal Humerus M6

mat.: *implatan*®; TiAl₆V₄ according to ISO 5832-3

5230-0125	12,5mm, SW5
5230-0200	20mm, SW5
5230-0225	22,5mm, SW5
5230-0250	25mm, SW5
5230-0275	27,5mm, SW5
5230-0300	30mm, SW5

MUTARS® ulna stop

mat.: UHMWPE according to ISO 5834-2
 REF 5250-1100

MUTARS® Proximale Ulna incl. safety screw *S

Mat.: *implatan*®; TiAl₆V₄ according to ISO 5832-3
 bushing CoCrMo according to ISO 5832-12
 REF 5250-0030

MUTARS® humerus screw

mat.: *implatan*®; TiAl₆V₄ according to ISO 5832-3

	size
REF 5230-0015	M8x15 mm
REF 5230-0035	M8x35 mm
REF 5230-0055	M8x55 mm
REF 5230-0075	M8x75 mm

MUTARS® humerus stem HA cementless

mat.: *implatan*®; TiAl₆V₄ according to ISO 5832-3
 with *implaFix*® HA; HA coating acc. to ISO 13779-2

	size
REF 5240-0807	7 mm
REF 5240-0808	8 mm
REF 5240-0809	9 mm
REF 5240-0810	10 mm
REF 5240-0811	11 mm
REF 5240-0812	12 mm
REF 5240-0813	13 mm

MUTARS® humerus stem cemented *N

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

	size
REF 5240-0408	8 mm
REF 5240-0409	9 mm
REF 5240-0410	10 mm
REF 5240-0411	11 mm
REF 5240-0412	12 mm

Special stem sizes are available on request.



MUTARS® Proximal Ulna

MUTARS® humerus extension piece *S

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

size

REF 5220-0020 20 mm

REF 5220-0040 40 mm

REF 5220-0060 60 mm



MUTARS® humerus connection piece *S

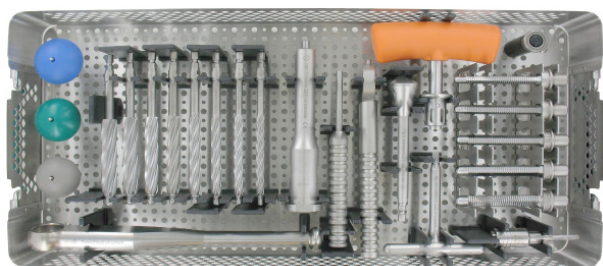
mat.: *implatan*®; $TiAl_6V_4$ according to ISO 5832-3

REF 5221-0080 80 mm

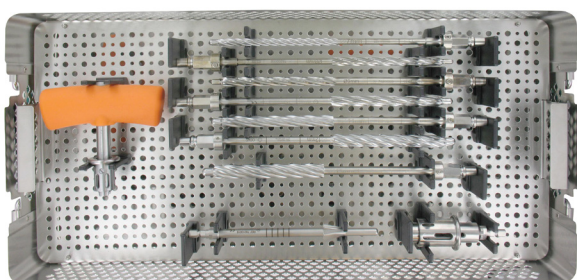


MUTARS® Proximal Ulna

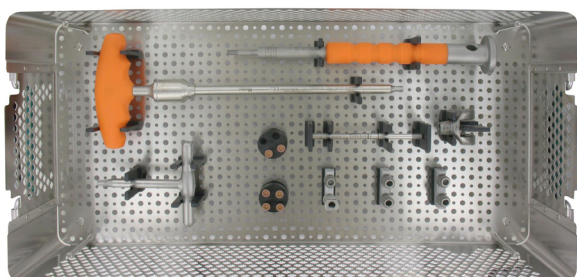
Instruments



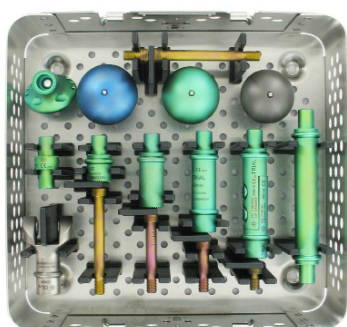
MUTARS® humerus container
7999-5200



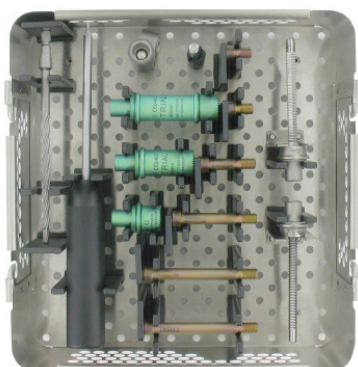
MUTARS® distal humerus 30mm M6 long fit container - upper tray
7999-5203



MUTARS® distal humerus 30mm M6 long fit container - bottom tray
7999-5203



MUTARS® humerus trial container
7999-5202



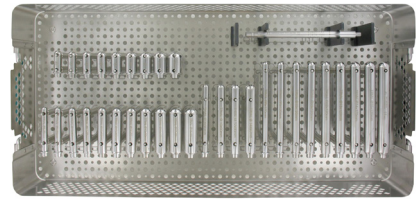
MUTARS® proximal ulna container
7999-5205



MUTARS® Proximal Ulna

AGILON® trial stem container

7999-3833





MUTARS® Proximal Ulna

MUTARS® humerus container
7999-5200

MUTARS® extractor device
REF 7220-0000



MUTARS® socket wrench small
REF 7608-1010



MUTARS® humerus drill ic-connection

	size
REF 7630-0207	7 mm
REF 7630-0208	8 mm
REF 7630-0209	9 mm
REF 7630-0210	10 mm
REF 7630-0211	11 mm
REF 7630-0212	12 mm
REF 7630-0213	13 mm
REF 7630-0214	14 mm



MUTARS® medullary cavity reamer
REF 4220-0000



MUTARS® rasp for humerus stem

	size
REF 7770-0809	9 mm
REF 7770-0810	10 mm
REF 7770-0811	11 mm
REF 7770-0812	12 mm
REF 7770-0813	13 mm



MUTARS® humerus impactor
REF 7710-0000



MUTARS® humerus impact + extract sleeve
REF 7721-0000



MUTARS® wrench for cap/ counter instrument
REF 7710-0001



MUTARS® counter instrument Ø6mm
REF 7420-0001



MUTARS® humerus trial cap

	size
REF 7710-1000	small
REF 7710-1005	medium
REF 7710-1010	large



ic T-handle Zimmer-Jakobs
REF 4223-0023



ic-adapter
REF 4223-0022





MUTARS® Proximal Ulna

MUTARS® distal humerus 30mm for M6 long fit container 7999-5203

AGILON® stem impactor

REF 7801-0009



AGILON® guide rod

REF 7801-0115



torque wrench 15Nm 5mm

REF 7512-0025



AGILON® reamer tapered

REF 7801-0019



MUTARS® socket wrench small

REF 7608-1010



ic T-handle Zimmer-Jakobs

REF 4223-0023



AGILON® trauma shoulder drill

REF 7820-0007 7 mm

REF 7820-0008 8 mm

REF 7820-0009 9 mm

REF 7820-0010 10 mm

REF 7820-0011 11 mm

REF 7820-0012 12 mm

REF 7820-0013 13 mm



AGILON® impaction sleeve M6

REF 7801-0125



MUTARS® distal humerus 30mm trial

REF 7250-2300



MUTARS® trial screw for dist. humerus

REF 7230-1125 M6 x 12,5mm, SW5

REF 7230-0200 M6 x 20mm, SW5

REF 7230-0225 M6 x 22,5mm, SW5

REF 7230-0250 M6 x 25mm, SW5

REF 7230-0275 M6 x 27,5mm, SW5

REF 7230-0300 M6 x 30mm, SW5



AGILON® trial extension piece

REF 7821-0075 7,5mm

REF 7821-0100 10mm

REF 7821-0125 12,5mm

REF 7821-0150 15mm

REF 7821-0175 17,5mm



Zimmer adapter A/O

REF 7701-0001



MUTARS® humerus trial container 7999-5202

MUTARS® humerus trial cap with thread

REF 7710-1200

REF 7710-1205

REF 7710-1210

size

small

medium

large



MUTARS® humerus trial head

REF 7710-1252



MUTARS® humerus trial extension piece

size

REF 7710-0020

REF 7710-0040

REF 7710-0060

20 mm

40 mm

60 mm



MUTARS® humerus trial reducer

size

REF 7710-2100

REF 7710-2101

10 mm

100 mm



MUTARS® humerus trial connecting part

REF 7710-2180

80 mm



MUTARS® humerus trial screw

size

REF 7710-2315

REF 7710-2335

REF 7710-2355

REF 7710-2375

M8x15 mm (x2)

M8x35 mm

M8x55 mm

M8x75 mm (x2)



MUTARS® distal humerus 50mm trial

REF 7710-1275



MUTARS® Proximal Ulna

MUTARS® proximal ulna container 7999-5205

MUTARS® trial axle for distal humerus
REF 7420-0015



hexagon screw driver 2.5 mm
REF 7608-1001



MUTARS® humerus drill ic-connection 6mm
REF 7630-0206



MUTARS® humerus trial extension piece

REF 7710-0020 20mm
REF 7710-0040 40mm
REF 7710-0060 60mm

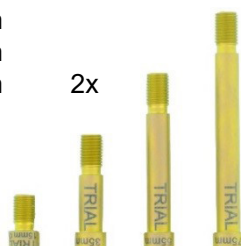


MUTARS® proximal trial ulna
REF 7710-1280



MUTARS® humerus trial screw

REF 7710-2315 M8x15mm 2x
REF 7710-2335 M8x35mm
REF 7710-2355 M8x55mm
REF 7710-2375 M8x75mm 2x



MUTARS® rasp for humerus stem

REF 7770-0807 7mm
REF 7770-0808 8mm



AGILON® trial stem container 7999-3833

AGILON® trial stem adapter
REF 7801-2430



AGILON® trial stem

REF 7850-3010	Ø10 x 30mm
REF 7850-3011	Ø11 x 30mm
REF 7850-3012	Ø12 x 30mm
REF 7850-3013	Ø13 x 30mm
REF 7850-3014	Ø14 x 30mm
REF 7850-3015	Ø15 x 30mm
REF 7850-3016	Ø16 x 30mm
REF 7850-3017	Ø17 x 30mm
REF 7850-3018	Ø18 x 30mm
REF 7850-6008	Ø8 x 60mm
REF 7850-6009	Ø9 x 60mm
REF 7850-6010	Ø10 x 60mm
REF 7850-6011	Ø11 x 60mm
REF 7850-6012	Ø12 x 60mm
REF 7850-6013	Ø13 x 60mm
REF 7850-6014	Ø14 x 60mm
REF 7850-6015	Ø15 x 60mm
REF 7850-6016	Ø16 x 60mm
REF 7850-6017	Ø17x 60mm
REF 7850-6018	Ø18x 60mm
REF 7850-9008	Ø8 x 90mm
REF 7850-9010	Ø10 x 90mm
REF 7850-9012	Ø12 x 90mm
REF 7850-9014	Ø14 x 90mm
REF 7851-2008	Ø8 x 120mm
REF 7851-2009	Ø9 x 120mm
REF 7851-2010	Ø10 x 120mm
REF 7851-2011	Ø11 x 120mm
REF 7851-2012	Ø12 x 120mm
REF 7851-2013	Ø13 x 120mm
REF 7851-2014	Ø14 x 120mm
REF 7851-2015	Ø15 x 120mm
REF 7851-2016	Ø16 x 120mm





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