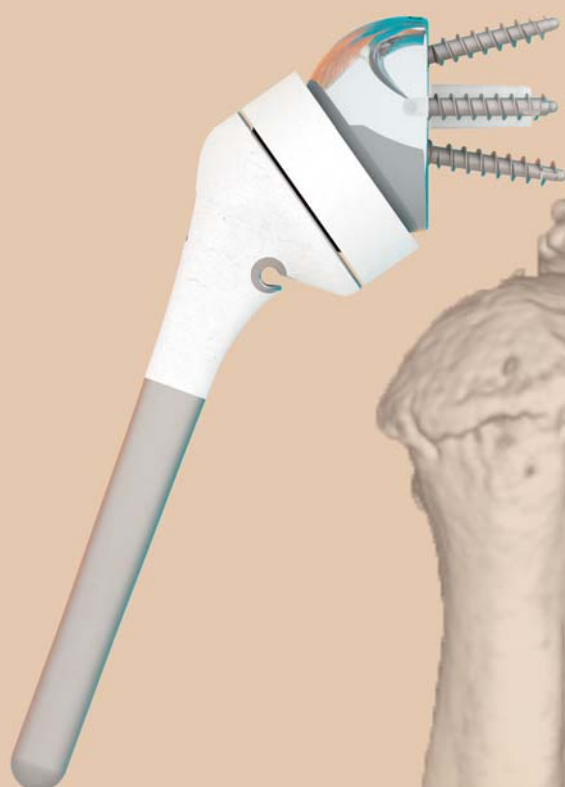




TM

HUMELockTM

REVERSED

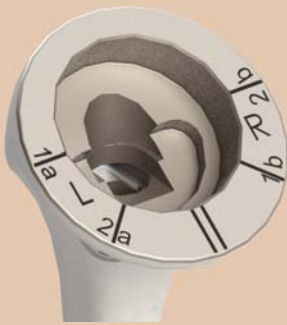


SUPERIOR GLENOID WEAR

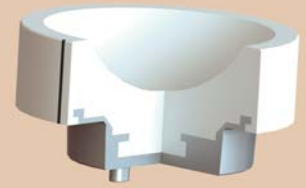


SURGICAL TECHNIQUE

CHARACTERISTICS, TIPS AND TRICKS



Index for offset of humeral cup = adaptation to posterior offset or in case of epiphyseal malunion (revision).



Humeral cup:

Thermocompressed poly UHMWPE in titanium shell
3 available heights (+3, 6, +9mm)
+ spacer (+9mm)



Stem designed with an anatomical shape giving intrinsic stability:
Fluted in diaphysis,
Belled in metaphysis,
Filling in epiphysis.

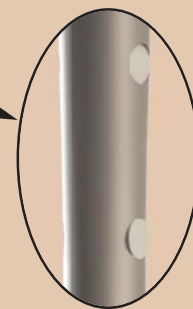


7 sizes of humeral stems:*

TA6V ELI / Ti + HA coated

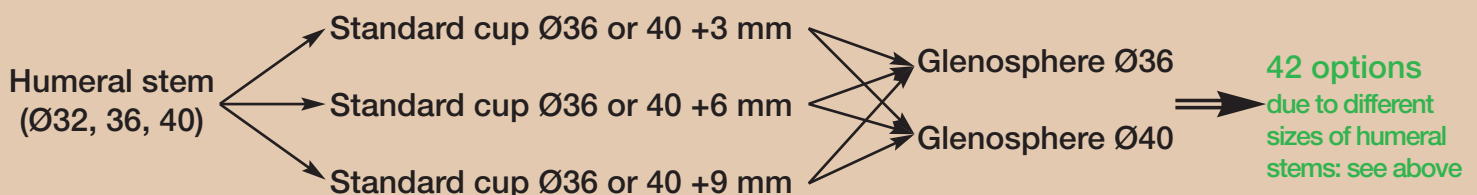
- Epiphysis Ø32 mm - diaphysis Ø08 mm
- Epiphysis Ø32 mm - diaphysis Ø10 mm
- Epiphysis Ø32 mm - diaphysis Ø12 mm
- Epiphysis Ø36 mm - diaphysis Ø10 mm
- Epiphysis Ø36 mm - diaphysis Ø12 mm
- Epiphysis Ø36 mm - diaphysis Ø14 mm
- Epiphysis Ø40 mm - diaphysis Ø12 mm

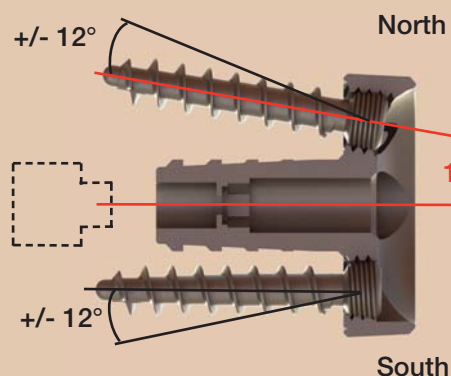
Resection at 145° = protection of scapula notching.



Self-stable stem (pressfit) but cementable or lockable in the event of instability.

Modularity of the prosthesis:





Locking screw Ø4.5 TA6V ELI :

Cortico-cancellous (conical core)

Conical head

Non traumatic tip

5 sizes (20 to 40 mm)



Standard screw Ø4.5 TA6V ELI :

Cylindrical core

Conical head

Non traumatic tip

5 sizes (20 to 40 mm)

Baseplate Ø24 mm :

Fits all anatomies

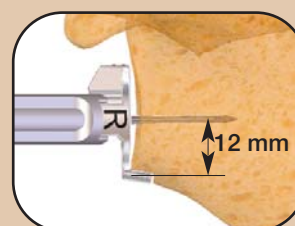
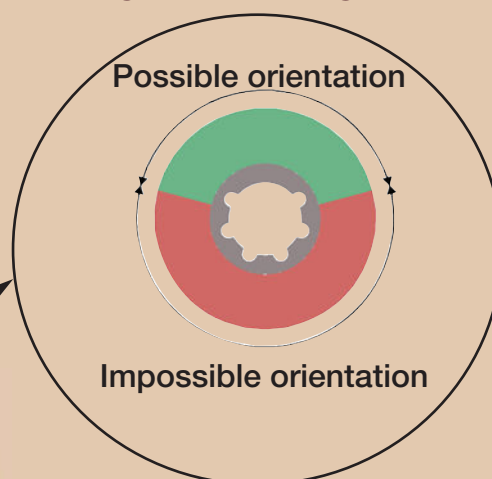
TA6V ELI / Ti + HA coated

Conical assembly

4 cylindrical threaded holes

2 extensions of +6 and +10 mm for lateralization and revisions.

Directive locking & variable angle screw system*



Implantation at 12 mm from inferior edge of the scapula

CoCr glenosphere:

2 sizes: Ø36, Ø40 mm

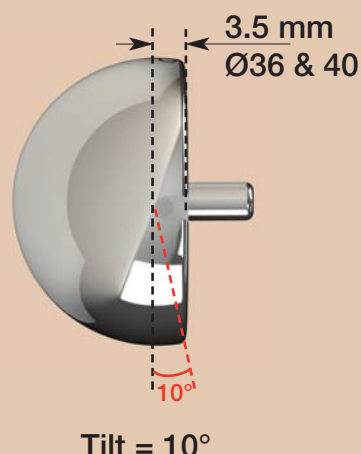
Centered or eccentric (3 mm)

Impacted with or without screw

Conical grooved impaction.

* Patented

		Ø36	Ø40
Impacted	Centered	X	X
	Eccentric	X	X
With screw	Centered	X	X
	Eccentric	X	X



CONTENTS

- Characteristics, tips and tricks	page 02
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- Surgical technique - humerus (1)	page 05
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- Surgical technique - humerus (2)	page 09
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INTRODUCTION

Humelock™ Reversed is a new generation of reversed prosthesis, designed for numerous shoulder pathologies: ranging from offset arthritis to a complex cephalotuberosity fracture in a subject over 70 years. The technical characteristics of this implant have been designed based on computer simulations, correlated to results previously published in medical journals, in order to avoid the disadvantages of traditional reverse prostheses.

A centric or eccentric glenosphere, tilted at 10°, centered on a variable length baseplate post (compatible with positioning techniques), the position of which is guided by an intuitive adaptive instrumentation.

A 145° prosthetic epiphysis allows the pillar of the scapula to be protected while maintaining optimum stability.

The humeral implant is positioned naturally in the center of the epiphysis, preserving the remaining bone as much as possible. However, the options of locking or cementing will allow the surgeon to position the prosthetic stem at the required height, according to the patient's indication and anatomy.

Humelock™ Reversed is a totally modern implant, designed to adapt to the new lifestyles of older, increasingly active, patients for a longer timeframe.

INDICATIONS

The Humelock™ Reversed prosthesis is indicated for patients presenting with:

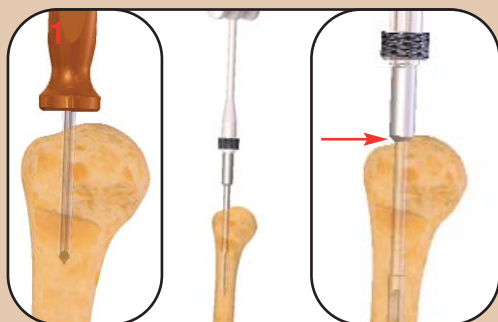
- eccentric omarthritis,
- a failed hemi-arthroplasty,
- a failed total arthroplasty,
- significant rupture of rotator cuff-tear : first surgery or revision surgery.

PATIENT POSITIONING

The recommended patient positioning is a beach chair with a member free in the operating area and the head fixed in position.

X-ray imaging must be available to confirm implants position intraoperatively.

SURG. TECH. - HUMERUS (1)



Preparation of the humeral shaft:

Locate and perforate the top of the humeral head in the medullary canal axis using a triangular awl.

Use the reamers in increasing size order on the T handle.

Go from one size to the next until the diameter of the reamer meets the diameter of the shaft.

The reamer should enter the humeral shaft up to the guard (→).

The stem choice is made depending on the last reamer size used:

Ø08 mm --> Stem with an epiphysis of Ø32 mm;

Ø10 mm --> Stem with an epiphysis of Ø32 or 36 mm;

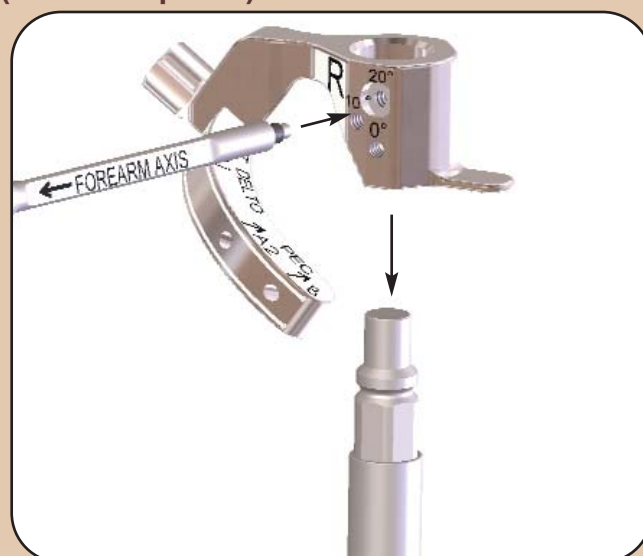
Ø12 mm --> Stem with an epiphysis of Ø32, 36 or 40 mm;

Ø14 mm --> Stem with an epiphysis of Ø36 mm.

Mounting the delto-pectoral cutting guide: (if in two parts)



Place the delto-pectoral cutting guide on the operating side on the guide holder.
Fasten the guide with the knurled screw (1).



Slide the assembly onto the remaining reamer.
Screw the retroversion stem into one of the three positions according to the required angle: 0°, 10°, 20°.



Placing the 145° cutting guide:

The probe stops at the top of the head and determines the incision height.

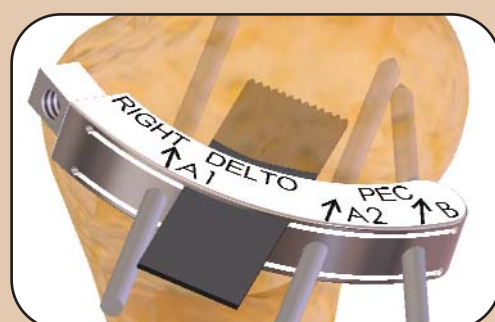
The retroversion is determined by screwing the stem into one of 3 positions (0, 10, 20°) and aligning it with the forearm axis. Fastening the retroversion stem sets the position for the cutting guide. Place two pins (A1+A2) by drilling if necessary, using the Ø3.2 mm bit.

Remove the retroversion stem and the guide holder as well as the reamer.

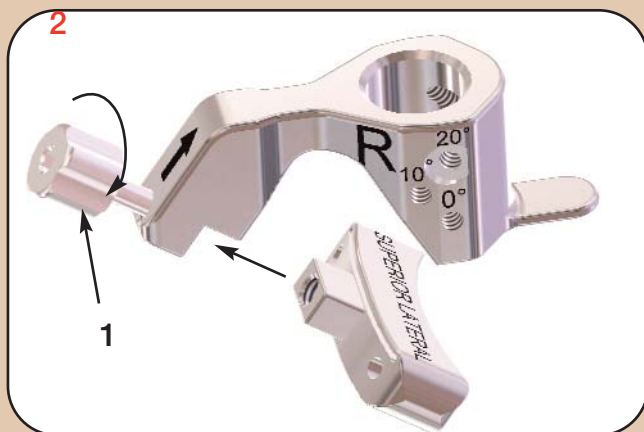
Slide the cutting guide along the pins.

Stabilize the mounting using a 3rd oblique pin (B).

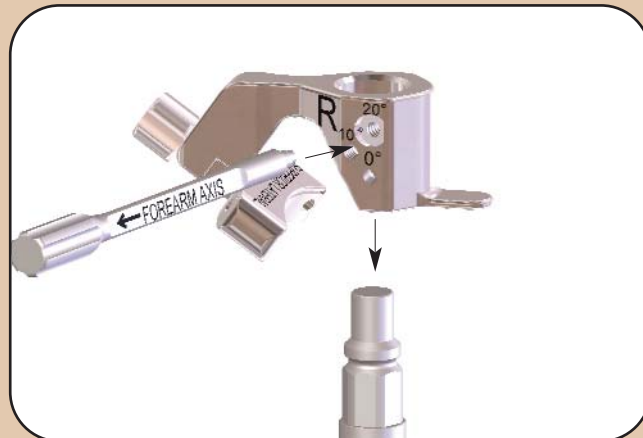
Make the incision across the slot with a saw blade of a maximum 0.9 mm thickness.



Mounting the superior-lateral cutting guide: (if in two parts)



Place the superior-lateral cutting guide on the operating side on the guide holder.
Fasten the guide with the knurled screw (1).



Slide the assembly onto the remaining reamer.
Screw the retroversion stem into one of the three positions according to the required angle: 0°, 10, 20°.



Placing the 145° cutting guides:

The probe stops at the top of the head and determines the incision height.

The retroversion is determined by screwing the stem into one of 3 positions (0, 10, 20°) and aligning it with the forearm axis. Fastening the retroversion stem sets the position for the cutting guide.

Remove the retroversion stem and the guide holder as well as the reamer.

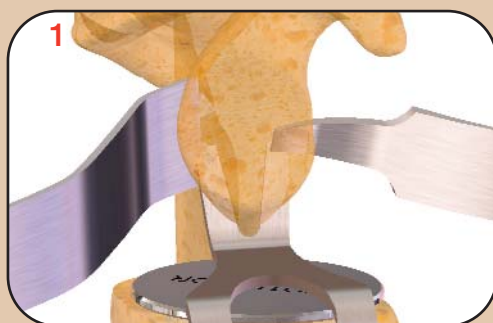
Slide the cutting guide on the pins.

Make the incision across the slot with a saw blade of a maximum 0.9 mm thickness.



Humerus protection:

Insert the protector into the prepared humerus during the glenoid preparation.



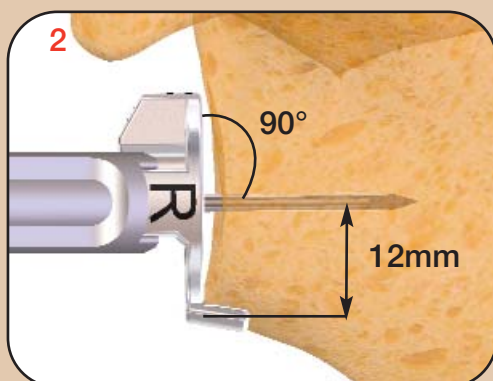
Glenoid exposure :

Expose the glenoid fully using the three types of retractors.

- Anterior retractor,
- Superior retractor,
- Inferior retractor.

Remove the glenoid labrum.

Remove any potential osteophytes to expose the full bone anatomy.



Placing the K-wire:

Three different positions for the guide: Left (L), Right (R) for a deltopectoral approach and Superior lateral (S).

Position the K-wire guide on the inferior part of the glenoid to determine the correct height.

The K-wire is 12 mm above the lower edge, according to Kelly² and must be centered in the antero-posterior plane.

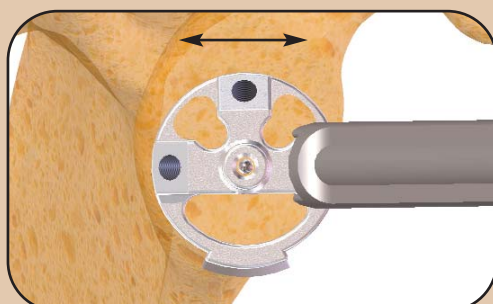
The K-wire guide orientation is important for the glenoid tilt and must be done at 90°. (see picture #2).

The glenospheres are tilted (lower lip) by 10°.

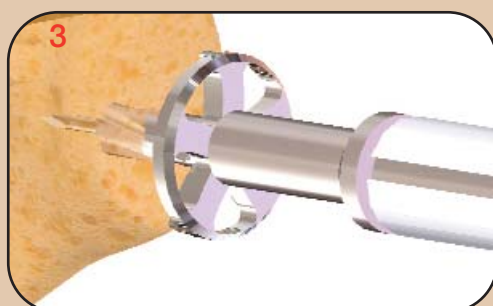
Positioning should be to fit the anatomy of the patient and planned according to the pre-operative X rays.

This element must be decided in pre-operative planning. By default, the base plate is perpendicular to the mid plane of the glenoid.

Insert the K-wire using a power tool.



(2) Kelly JD, Humphrey CS, Norris TR. Optimizing glenosphere position and fixation in reverse shoulder arthroplasty, Part One: the twelve-mm rule. J Shoulder Elbow Surg 2008;17:589-94



Glenoid reaming:

Drill and ream the glenoid using the K-wire guide.

Ream until the subchondral bone is reached.

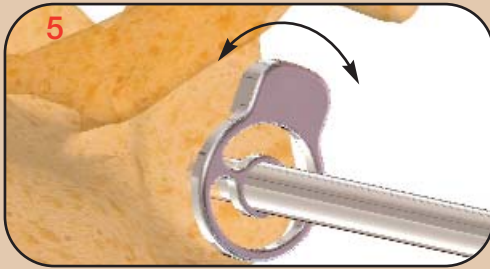
This step can be done by power or by hand if the glenoid is porotic.

Extension post:

In the case of revision or lateralisation of the center of rotation with a graft from the pillar of the scapula, it is possible to extend the post by 6 or 10 mm.

Tighten the block-stop in the correct position by screwing it onto the drill to either 6 mm or 10 mm, as required.

Drill the post again with block stop in position.

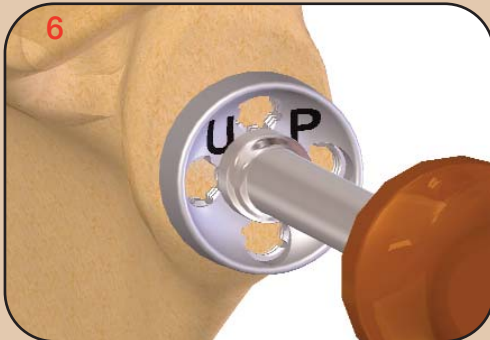


Glenoid clearance:

To avoid any interference between the glenosphere and the scapula, ream the glenoid using the Ø40 mm hand reamer.



Pay attention to avoid ovalizing the post hole.
360° clearance = successful impaction of the glenosphere.



Positioning the baseplate: (Ø24 mm)

Connect the holder/impactor to the baseplate.
Impact the baseplate so that there is pressure on the whole surface.
The impactor allows for the upper and lower holes to be placed so that a screw can be positioned in the base of the coracoid and in the pillar of the scapula.



The UP marking must be on top under the coracoid basis.

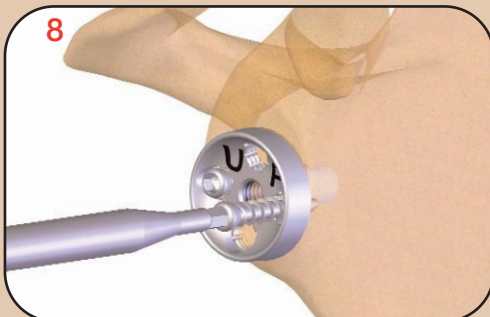
Remove the K-wire.



Length of screws (5 sizes from 20 to 40 mm) :

An adapted guide allows for the holes to be drilled and the length of the screws measured with the Ø 3.2 mm drill bit.
The length of the screws is measured directly.

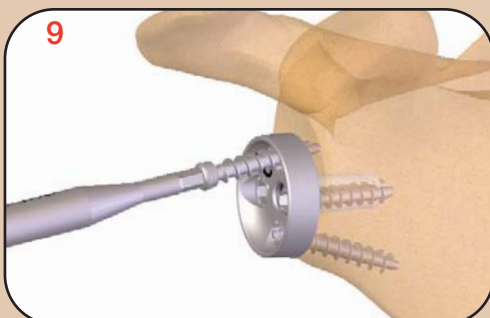
The screw length is measured from under the head.
Two types of screws are available, locking or standard (compression).



Fixation of the baseplate: (Ø24 mm)

Standard screws allow the baseplate to be lagged to the bone, and locking screws fix the mounting.

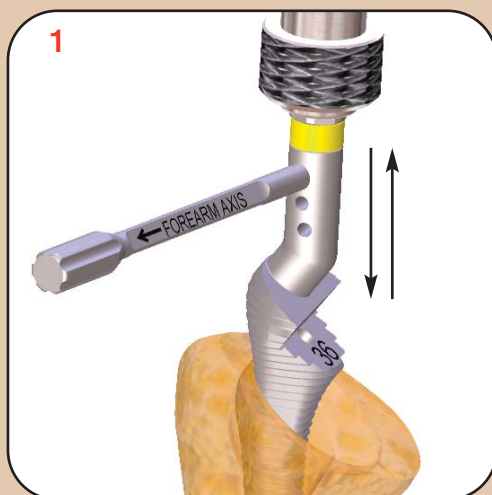
Each screw allows an angulation of +/-12° around the axial hole.
The upper hole for the first screw is pre-oriented by 10° to optimize its positioning in the base of the coracoid.



Recommendations:

2 compression screws (std) for anterior and posterior holes.
2 locking screws for superior and inferior holes.

SURG. TECH. - HUMERUS (2)



Metaphyseal preparation :

Use the metaphyseal rasps in order of increasing size while also checking the retroversion.

The size of the epiphysis is determined by the size of the last reamer used.

Ø08 mm --> Stem with an epiphysis of Ø32 mm;

Ø10 mm --> Stem with an epiphysis of Ø32 or 36 mm;

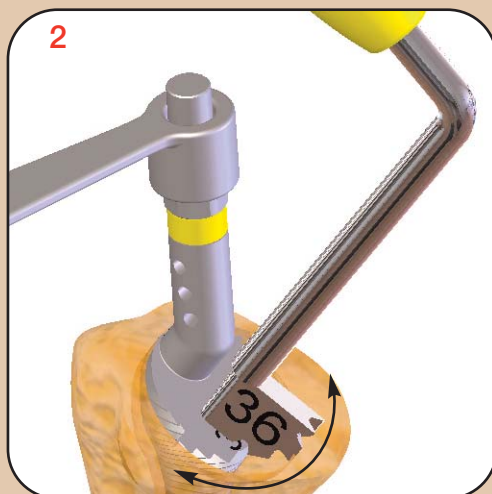
Ø12 mm --> Stem with an epiphysis of Ø32, 36 or 40 mm;

Ø14 mm --> Stem with an epiphysis of Ø36 mm;

Connect the rasp to the T handle.

Screw the retroversion stem onto the rasp.

Impact the rasp until it is flush with the height of the resected bone surface.



Epiphyseal preparation (OPTION):

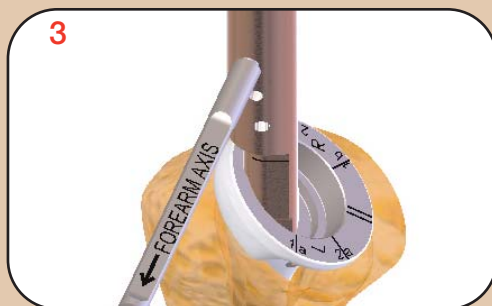
Use the same size epiphyseal rasp as the metaphyseal rasp, or not according to bone density.

The metaphyseal and epiphyseal rasps are color coded.

Unfasten the inside part of the rasp and fit the epiphyseal rasp in the designated hole.

Maintain the metaphyseal rasp using the special wrench.

Shape the epiphysis up to the height of the metaphyseal rasp.



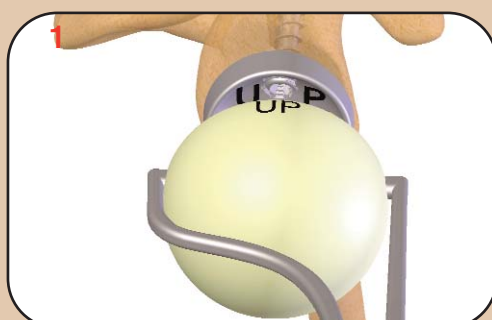
Stem impaction:

Fit the appropriate implant to the stem impactor.

Screw the retroversion rod onto the impactor to check the angulation while impacting the stem.

Protect the stem and the humerus, with a protector, by placing it in the stem during the glenoid time.

TRIAL IMPLANTS



Glenosphere trial (10° tilt):

There are two diameters of glenospheres: Ø36 and 40mm.

All glenospheres are centered or eccentric with or without a screw.

The choice of glenosphere does not depend on the size of the humeral stem.

All glenospheres are tilted downwards by 10°.

For slim patients (BMI (W/S2)≤21) (Body Mass Index (weight / size²)), use of the Ø 40 mm glenosphere is recommended, where possible, particularly if the subject is male.

Position the glenosphere with the special clamp allowing the humerus to be circumvented by the delto-pectoral approach.



Cup trial:

The cup diameter matches the glenosphere diameter. Three heights are available (+3, +6, +9 mm). If required a spacer (+9 mm) is available to add to the cup.

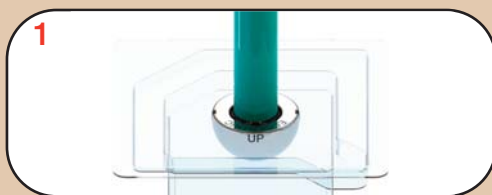


Take care to respect index marks on the stem and cup.

Test for stability and mobility.

Trials are identical to the final implants.

DEFINITIVE IMPLANTS



Handling of the definitive glenosphere:

Impacted glenosphere

Insert the glenosphere implant holder into the definitive implant. On the specially designed clamp, there are notches on the jaws which should be positioned to coincide with those on the middle of the glenosphere implant.



Handling of the definitive glenosphere w/screw:

Impacted glenosphere w/screw

Insert the 3.5mm hex screwdriver in the screw of the glenosphere.



Fitting of the definitive implants:

Impacted glenosphere

When positioning the glenosphere, pay attention to the "UP" marking, if an eccentric glenosphere is used.

First introduce the guiding post, then the female taper of the glenosphere into the male taper of the baseplate.

Be sure to check that the baseplate is clean and free of any bone or tissue particles that could hinder impaction of the Morse taper.



Impact the glenosphere and check it before closure.



Fitting of the definitive implants:

Impacted glenosphere w/screw

Insert the glenosphere paying attention to the «UP» marking, if an eccentric glenosphere is used.

Introduce the screw of the glenosphere in the post of the baseplate.

Be sure to check that the baseplate is clean and free of any bone or tissue particles that could hinder impaction of the Morse taper.

1- Begin to screw the glenosphere w/screw.

2- Impact the glenosphere with the impactor.

3- Finish screwing



Do not impact the glenosphere with the screwdriver.



Index of the definitive reversed cup:

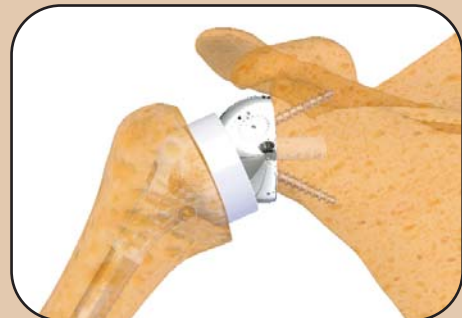
Find the index marks on both the definitive cup and the stem.
Position the cup so that the index matches the index on the stem.

Insert the cup into the taper of the stem so that indices of the cup and stem are correctly aligned.

Check there is nothing impeding impaction of the cup and impact it.



If the neck of the scapula is short, it is recommended to use an offset glenosphere to reduce the risk of notching.



If the neck of the scapula is long, depending on the deltoid tension and the stability of the mounting, a centered glenosphere can be implanted.

REHABILITATION

Short-term immobilization (according to the surgeon's assessment) with mobilization in neutral rotation to promote recovery of external rotation.

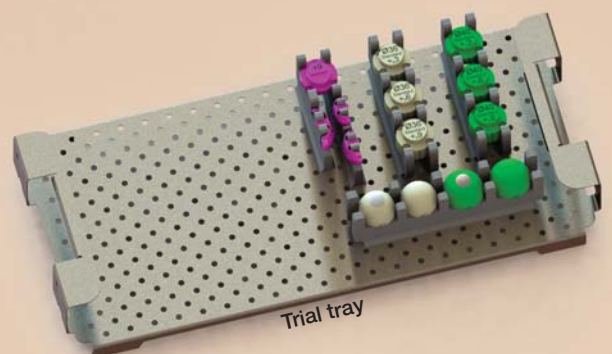
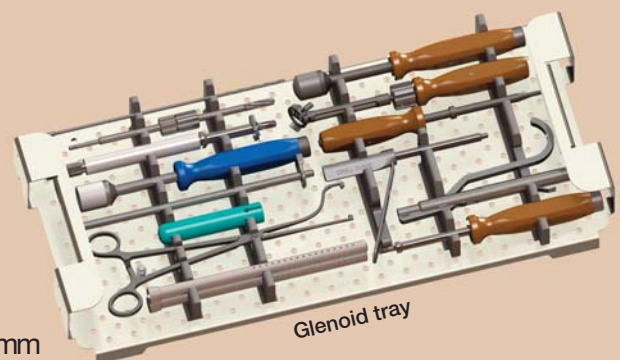
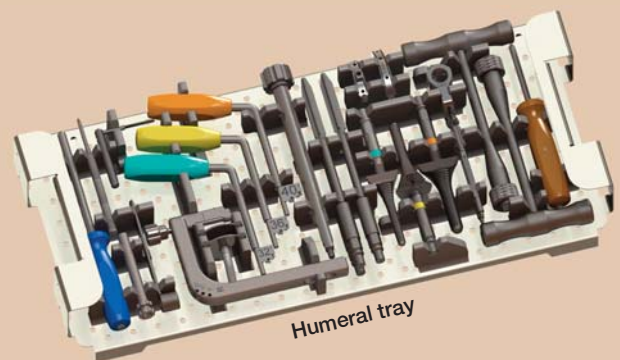
Promote pool therapy and specialist rehabilitation, without counter-resistance work for six weeks, depending on the age and objectives noted in the "patient contract".

IMPLANTS

INSTRUMENTS

101-0000	Hex. 3.5 screw for OMS / cage
103-0007	Humeral spacer TA6V +9 mm
103-0803	Humeral cup std PE/TA6V Ø36/+3
103-0806	Humeral cup std PE/TA6V Ø36/+6
103-0809	Humeral cup std PE/TA6V Ø36/+9
104-0803	Humeral cup std PE/TA6V Ø40/+3
104-0806	Humeral cup std PE/TA6V Ø40/+6
104-0809	Humeral cup std PE/TA6V Ø40/+9
105-0006	Post extension TA6V +6 mm
105-0010	Post extension TA6V +10 mm
105-0024	Glenoid baseplate TA6V Ti/HA Ø24 mm
105-3600 *	Centered glenosphere CoCr 10° tilt Ø36 mm
105-3603	Eccentric glenosphere CoCr 10° tilt Ø36 mm
105-4000	Centered glenosphere CoCr 10° tilt Ø40 mm
105-4001	Eccentric glenosphere CoCr 10° tilt Ø40 mm
105-3610	Centered glenosphere w/ screw CoCr/TA6V 10° tilt Ø36 mm
105-3613	Eccentric glenosphere w/ screw CoCr/TA6V 10° tilt Ø36 mm
105-4010	Centered glenosphere w/ screw CoCr/TA6V 10° tilt Ø40 mm
105-4011	Eccentric glenosphere w/ screw CoCr/TA6V 10° tilt Ø40 mm
107-4518/4536	Cortical screw TA6V Ø4.5 mm L.18 to 36 mm inc. 2 mm
108-4520/4540	Polyaxial locking screw TA6V Ø4.5 mm L. 20 to 40 mm inc. 5 mm
109-4520/4540	Polyaxial standard screw TA6V Ø4.5 mm L.20 to 40 mm inc. 5 mm
108-3632	Cage T40 R36/Ø32 mm
108-4036	Cage T40 R40/Ø36 mm
108-4440	Cage T40 R44/Ø40 mm
312-3208	Stem TA6V cementless Ø32/08 Ti/HA
312-3210	Stem TA6V cementless Ø32/10 Ti/HA
312-3212	Stem TA6V cementless Ø32/12 Ti/HA
312-3610	Stem TA6V cementless Ø36/10 Ti/HA
312-3612	Stem TA6V cementless Ø36/12 Ti/HA
312-3614	Stem TA6V cementless Ø36/14 Ti/HA
312-4012	Stem TA6V cementless Ø40/12 Ti/HA

* Glenospheres are also available in CoCr / TiN coated.



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