



A-Acuta



 **ADLER**[®]
ORTHO

A - ACUTA

The A - ACUTA stem made of titanium alloy (Ti6Al4V) conforming to ISO standard 5832 - 3: 1996, belongs to the family of stems with fins (ALATA family), marketed by ADLER ORTHO Srl.

Sand-blasting of the surface to ensure roughness level in the range Ra 2.5-6, together with the intrinsic structure of the stem, ensure optimum support for bone growth and anchoring.

The 5° taper, the shape, the perfectly circular cross-section and the presence of 8 longitudinal fins along the entire outer surface, indicate the A-ACUTA stem as particularly suitable for use in cases of dysplastic problems.

The depth of the longitudinal fins varies according to size from 1.2 mm to 2 mm and, for each size, it remains constant along the entire length of the stem. The fins penetrate into the bone by 0.1 mm to 0.7 mm, depending on the consistency of the bone and, in any case, ensure effective primary fixation, optimum contact throughout the length of the stem and excellent rotational stability.



A-ACUTA

The A-ACUTA stem is available in 12 sizes. A hollow in the upper proximal part makes it possible to fix the tool for impaction and extraction of the stem.

The proximal-medial part which is left out of the femoral osteotomy is mirror-polished. In the same area there is a seat to house the MODULA necks particularly useful for the possibility of optimizing the parameters such as height, off-set and ante-retro version, which are typically altered by dysplastic problems.



MODULAR NECKS

One of the few conceptual evolutions of great importance in orthopaedic hip surgery in the last 20 years, the modularity of the extramedullary component (femoral neck) has been of undoubted value. In particular, the MODULA SC necks system, unlike other modular neck systems, makes it possible to adapt a standard implant to the various anatomic-physiological features of the patient without having to provide for an excessive number of sizes and, what is more important, without affecting the correct positioning and thereby the stability of the stem and cup in the long run.

The complete series of MODULA SC necks, all patented, consists of 15 sizes and makes it possible to optimize the reciprocal position of the stem and cup on the basis of the articular needs of the patient, by restoring the physiological off-set and length.

So what are the reasons that have induced us to continue with the search for innovative and improved solutions of Modula necks?

The life expectancy of human beings is certainly increasing while the average age of patients with a higher level of physical activity is decreasing.

An accurate study of data collected in prosthesis registers has shown a distinct increase in the number of overweight patients, in the last few years.

The wide spatial coverage of MODULA SC necks can restore the operated patient the possibility of carrying out the same movements as those before the disease started.

Therefore, the patients are younger, live longer, are heavier and carry out more intense physical activity. All this requires new, high performance prosthetic systems capable of ensuring



greater freedom of movement and higher levels of mechanical resistance than in the past.

In the context of the program of ongoing improvement of our products, and in the light of what has been said above, it seemed indispensable for us to develop a new trial system which makes it possible to measure the stress in extreme conditions and indicate to us where and how to act to be able to design an instrument specific for this type of patients. We thus reached the idea of Modula “Super Charged” necks, designed for those who, because of their weight or the type of activity, or simply for greater freedom of movement, can bring the stress applied to the neck to levels much higher than the normally average levels known so far. The new Modula SC necks with their reinforcing fins, also useful as a system of removal of the neck from its seat in the stem, can amply pass the most demanding tests, more brilliantly than other solutions, as has been proved by laboratory tests.

GEOMETRIC SOLUTION TO CLINICAL PROBLEMS

The matrix distribution in space allows uniform coverage, adjusting the three main parameters:

LENGTH OFFSET - VERSION

These can be selected independently of one another and sequentially, so that it is possible to make the modifications necessary during the various phases of the operation, from pre-operative planning to surgery.

For this reason it was necessary to abandon the policy of angular necks in the long neck and short neck version, on the varus/valgus plane as well

as the ante/retroversion.

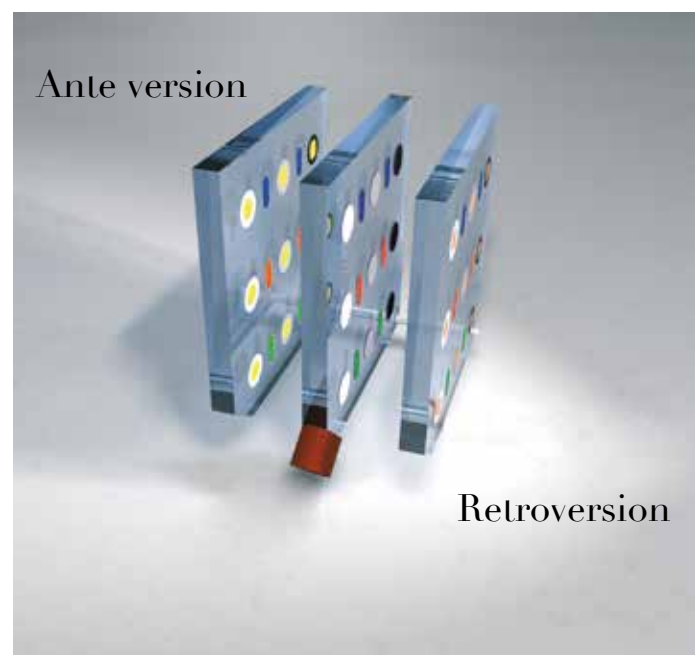
The MODULA SC necks are designed for such lengths and angles as to occupy a predefined position at a point on a three-dimensional matrix.

The guarantee of removability (separation of the neck from the stem) is of fundamental importance to be able to exploit all the features of the MODULA SC necks.

The removal proposed by us is patented, and the separation force is always applied in the direction of the coupling axis also on angular necks.

The MODULA SC necks solve various problems.

For example: Left hip





HYDRA MECHANICAL SOLUTION TO RESISTANCE PROBLEMS

The hourglass shape with double elongated cone is designed to ensure contact between the surfaces of the cavity of the stem and that of the neck cone which are mainly subjected to mechanical stresses.

The coupling design has been developed and validated for the subsequent phases.

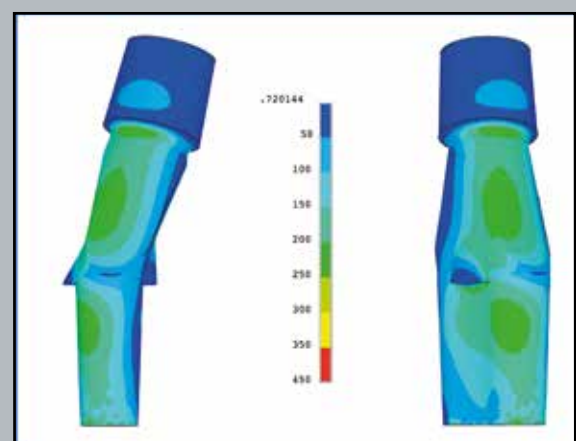
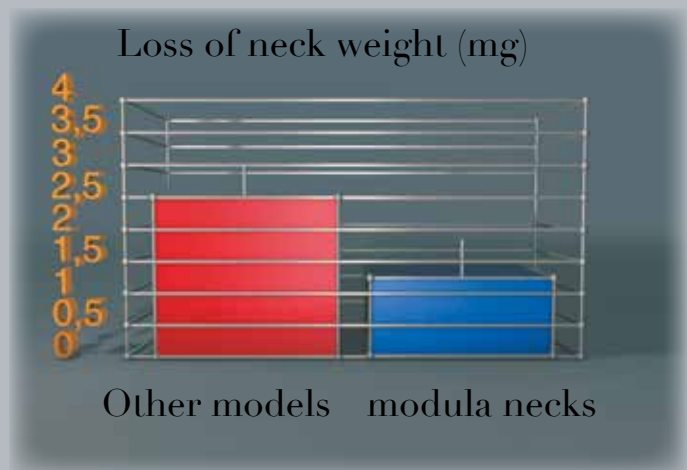
1) Numerous studies have made it possible to optimize the hourglass shape of the tapered fit. The shape and the positioning of the reinforcement fins and extraction of the neck are studied to avoid affecting the coupling solidity and to reduce the mechanical stresses when the implant is subjected to physiological loads.

2) Fatigue tests have shown that the most critical configuration can resist a cyclic load 200% greater than the limit value established by the international standard ISO 7206-8 applicable.

3) Fretting tests have shown that modular coupling generates a negligible amount of debris; the metal particles produced during a test which simulates 20 years of activity of an average

patient is less than 2.4 mg*, i.e. half of that reported in literature for the modular necks currently available on the market and, in any case, certainly less than the quantity of particulate equal to 10 mg/year a stable prosthesis may be expected to produce ("Fretting wear in a modular neck prosthesis" Viceconti M., Baleani M., Squarzoni S., Toni A.)

On the basis of these studies it is possible to state that MODULA SC necks do not represent a weak point of the implant but guarantee the necessary mechanical resistance to the stresses these products are subjected to.



* Estimate obtained assuming that the seat realized in the prosthesis stem is damaged to the same extent as the neck cone, equal to 1.2mg after a test conducted at 3300N for 20 million cycles.

The 15 final MODULA SC necks can, in fact, be rotated as required to occupy 27 positions in space. To facilitate use, the trial necks are realized in 27 types aligned on 3 matrices of 9 necks each. Thus, the following groups are formed:

GROUP 1

YELLOW support 9 necks with:

YELLOW group with VERSION correction
 LENGTH identification colour:
 3 GREEN necks, 3 RED necks, 3 BLUE necks
 OFFSET identification colour:
 WHITE: 1 GREEN neck, 1 RED neck, 1 BLUE neck
 GREY: 1 GREEN neck, 1 RED neck, 1 BLUE neck
 BLACK: 1 GREEN neck, 1 RED neck, 1 BLUE neck

GROUP 0

WHITE support 9 necks:

No group colour
 No VERSION correction
 LENGTH identification colour:
 3 GREEN necks, 3 RED necks, 3 BLUE necks
 OFFSET identification colour:
 WHITE: 1 GREEN neck, 1 RED neck, 1 BLUE neck
 GREY: 1 GREEN neck, 1 RED neck, 1 BLUE neck
 BLACK: 1 GREEN neck, 1 RED neck, 1 BLUE neck

GROUP 2

BROWN support 9 necks with:

BROWN group with VERSION correction
 LENGTH identification colour:
 3 GREEN necks, 3 RED necks, 3 BLUE necks
 OFFSET identification colour:
 WHITE: 1 GREEN neck, 1 RED neck, 1 BLUE neck
 GREY: 1 GREEN neck, 1 RED neck, 1 BLUE neck
 BLACK: 1 GREEN neck, 1 RED neck, 1 BLUE neck

NOTE: The three supports have cavities to house the trial necks on both fronts; the same 27 trial necks can be used to obtain the 27 spatial positions for both the femurs.



In the opposite part the supports are provided for the right hip where the left retroversion becomes right anteversion and the left anteversion becomes right retroversion.

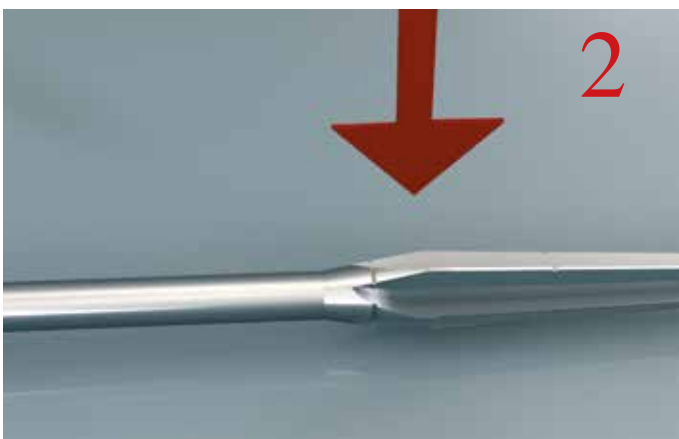
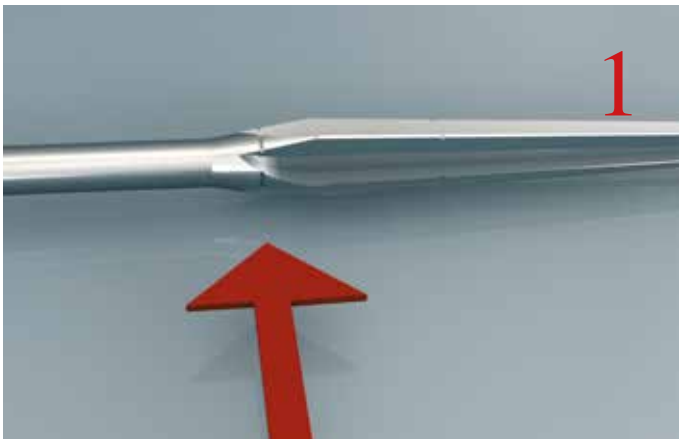
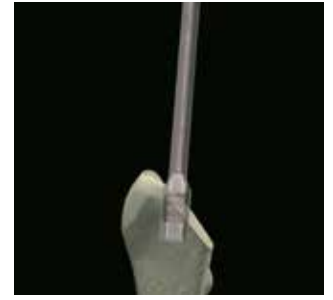
For example: Left hip



OPERATING TECHNIQUE

After dislocation of the femoral epiphysis, the length of osteotomy of the neck is determined by measuring the width of the epiphyseal surface, in relation to the system selected in the pre-operative plan.

Synovial tissue, if present, is removed from the lateral surfaces of the osteotomic section of the femoral neck, and Luer forceps are used to reset the cortical part by a few mm in such a manner as to insert the initial reamer, aligning it with the diaphyseal axis of successive rea-



mers to reach the size where landmark 1 of the reamer is aligned with the apex of the greater trochanter, which is usually the centre of rotation, with medium neck and head. Landmark 2 of the reamer indicates the level of the upper apex of the stem

Landmark 3 indicates the osteotomy level which corresponds to the end of the fins in the medial area of the stem.

Introduction in the medullary canal continues

Impactor - Extractor

Using the impactor extractor which exploits the forceps effect between the male neck, inserted in the hollow of the stem and the threaded handle which is blocked in the upper hollow, the trial stem, identical to the final stem but having only 4 longitudinal fins instead of 8, is inserted until the landmark is aligned with the apex of the greater trochanter.

By also gripping the rod parallel to it by the handle, it is possible to check the stem also during anticlockwise movements.

On reaching this condition, it is necessary to check to make sure the apex of the stem is embedded by approx. 15cm with respect to the apex of the greater trochanter and that the proximal-medial area of the stem is outside the osteotomy line.

After obtaining these ideal conditions, it is possible to proceed with extraction of the trial stem and introduction of the final stem by means of the same technique, after finding the most suitable neck.

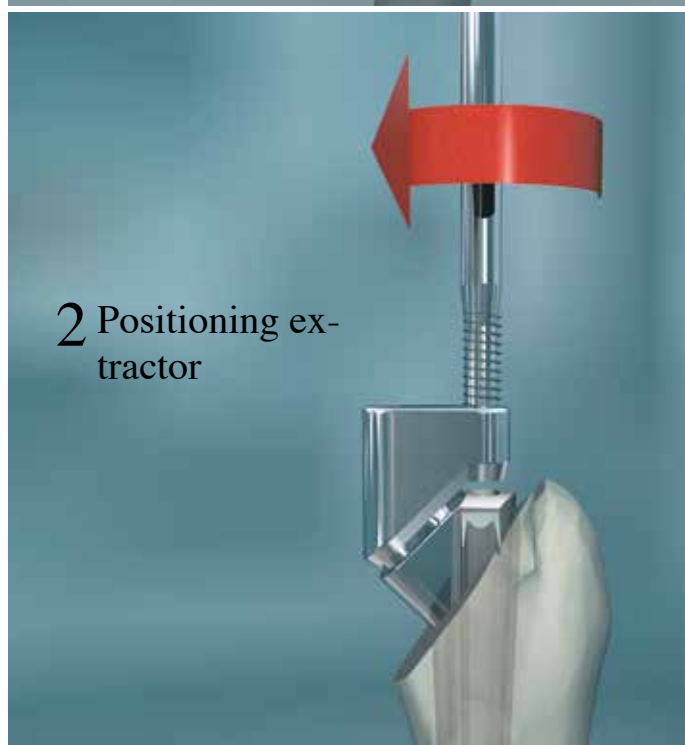


If the stem positioning is not optimal (because of incorrect penetration of the fin in the bone) it is advisable to select the most suitable neck using the trial stem.

The threaded rod can be screwed



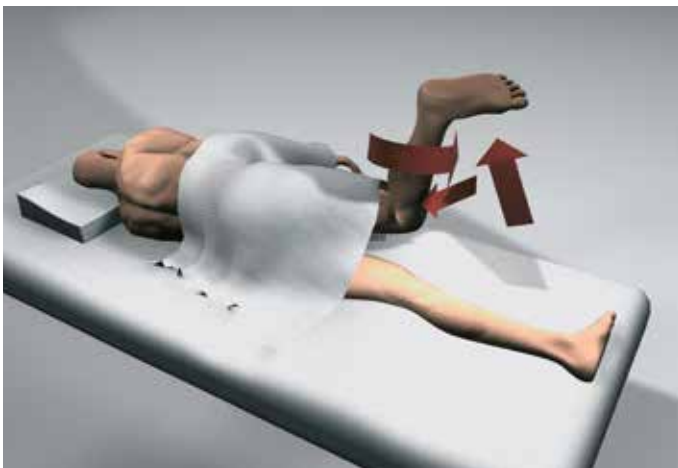
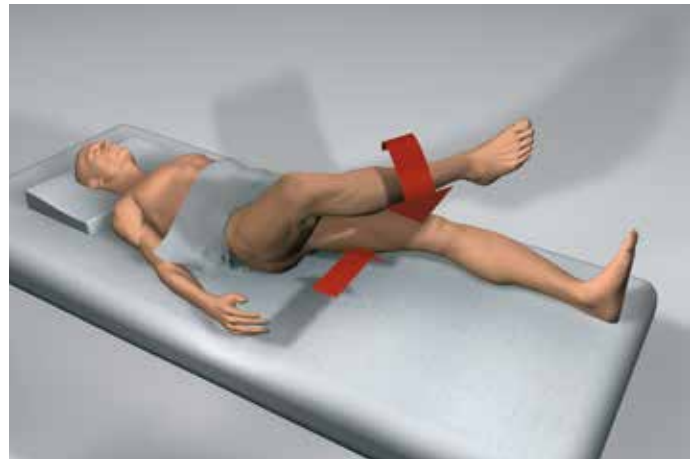
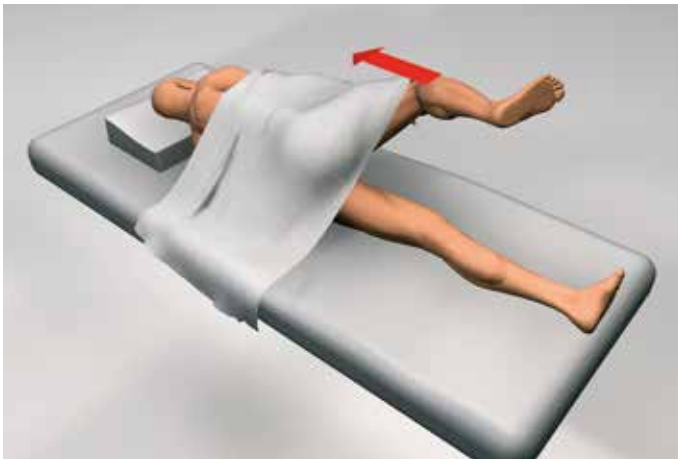
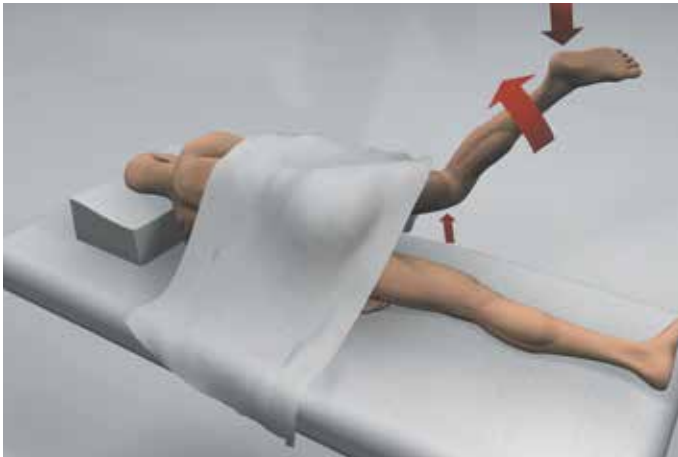
on the extractor using a diapason hammer. The trial stem as well as the final stem can be easily removed by applying the tool concerned inside the seat that is normally meant to receive the neck.



Then carry out reduction of the prosthesis and check of the length of the limb and stability of the prosthesis, by making sure that the prosthesis is not dislocated in the following three positions:

ACCESS WAY POSTERO - LATERAL

ACCESS WAY ANTERO - LATERAL



- 1 - Extension by 10° + extra-rotation
- 2 - Bending 90° neutral
- 3 - Bending + maximum intra-rotation

- 1 - Extension on the bed plane + maximum extra-rotation
- 2 - Maximum adduction + extra-rotation
- 3 - Maximum bending

CHOICE OF NECK

This is the crucial phase of the operation.

The neck is, in fact, the extramedullary component which allows articulation between the femur and the acetabulum, establishing ideal anatomic-physiological conditions.

The MODULA necks act on three spatial variables – length, offset and version – independently and sequentially to minimize the possibility of error, particularly if pre-operative planning has been carried out correctly.

With MODULA necks, more than the best choice of the neck, it is important to select the best point in a 3-D matrix which makes it possible to solve the difficult equation of identification of the articular centre.

THE TRIAL NECKS COLOUR CODES KEY

MODULA necks make it possible to reach 27 points in space and with heads available in 3 lengths, the real availability is 81 points over 3 dimensions for the right limb and an equal number for the left limb.

The final necks are 15 and help to achieve the objectives mentioned above.

To make the choice of the optimal neck much easier, 27 trial necks are used. The said 27 necks are made of Acetal in 3 different colours:

9 GREEN necks – which will occupy the SHORT length line in three spatial matrices.

9 RED necks – which will occupy the MEDIUM length line in three spatial matrices.

9 BLUE necks – which will occupy the LONG length line in three spatial matrices.

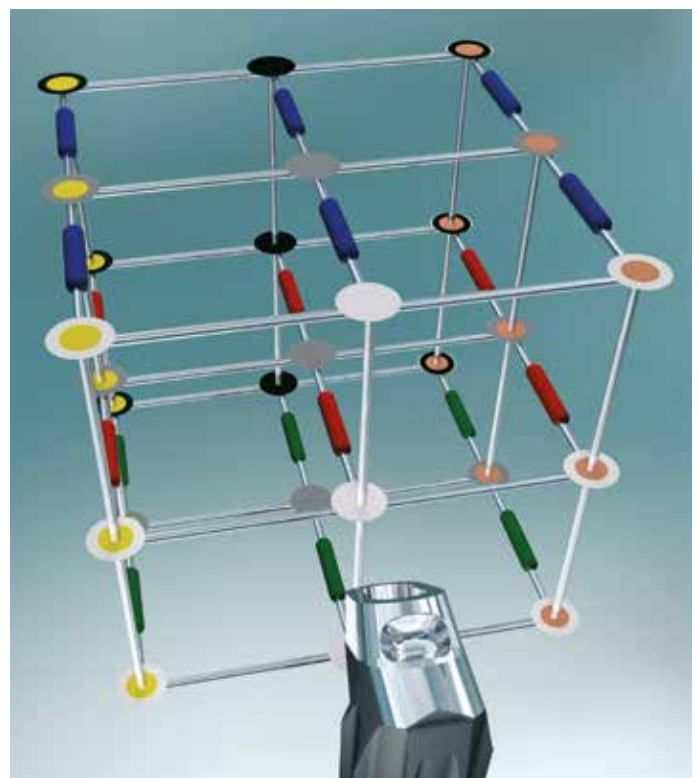
An identification colour is applied to each of the 27 necks, indicating that it belongs to one of the 3 OFFSET values, therefore, there will be:

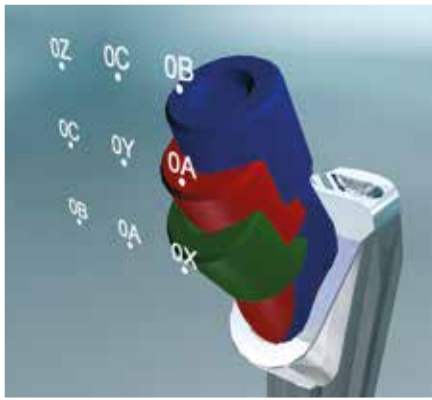
(3 GREEN necks; 3 RED necks and 3 BLUE necks) for a total of 9 necks with identification colour WHITE to indicate the MINUS offset value

(3 GREEN necks; 3 RED necks and 3 BLUE necks) for a total of 9 necks with identification colour GREY to indicate the STANDARD offset value

(3 GREEN necks; 3 RED necks and 3 BLUE necks) for a total of 9 necks with identification colour BLACK to indicate the PLUS offset value.

For example: Left hip





PHASE 1

The first parameters to be defined are **LENGTH** and **OFFSET**

The trial necks which determine this parameter are the 9 necks present on the **WHITE** support and defined as necks belonging to **GROUP 0** (zero anti-retroversion).

On the basis of the pre-operative plan, the neck considered as most suitable from among the 9 necks belonging to **GROUP 0** on **WHITE** support is used first.

In the absence of a plan or in case of doubt regarding the choice of the neck, the central **RED** trial neck with **GREY** offset referred to as **0Y** will be used first.

Obviously, apart from the possibilities offered by the necks available, it is possible to count on the various head lengths for further adjustments.

PHASE 2

Having identified the neck (from among the nine necks of **GROUP 0**) which offers the best combination of length and offset, it is possible to proceed, if necessary, for better stabilization of the joint, with the choice of the third spatial variable, the **VERSION** (ante and retro).

The latter is determined without modifying the parameters obtained earlier (length and offset) using the neck of the same colour (**GREEN**, **RED**,

BLUE) and the same definition (**WHITE**, **GREY**, **BLACK**) of **GROUP 1** present on **YELLOW** support, or **GROUP 2** present on **BROWN** support.

NOTE: In case of the **RH** hip, the **YELLOW** colour (insert and support) indicates retroverse necks, while the **BROWN** colour (insert and support) indicates anteverse necks. It is the other way around for the **LH** hip. The Table/poster and 3-D model present in the instruments set can be useful. Reference to correct positioning of the trial neck will facilitate insertion of the final neck. A special hourglass shaped bevelling of the trial neck, to be oriented always towards the medial part, will help the surgeon position the neck correctly.

Having identified the final neck, after washing it thoroughly, it is inserted in the stem by hammering with medium intensity.

Before inserting the final head identified by means of trial heads, the truncated-conical surface of the neck must be washed and dried.

If a ceramic head is used, it must be inserted with a 180° movement, avoiding hammering the head once it is in place. The dislocation is then reduced, which must be done without using the "reduction spoon".



LENGTH OFF-SET VERSION

The 18 necks with VERSION correction are divided into two groups of 9 necks by means of two group colours YELLOW (GROUP 1) and BROWN (GROUP 2); the remaining 9 necks with ZERO version correction form GROUP 0.

LENGTH	
LONG	
MEDIUM	
SHORT	
OFFSET	
WHITE	MINUS 
GREY	STANDARD 
BLACK	PLUS 
VERSION	
BROWN INSERT 	YELLOW INSERT 
RIGHT ANTE VERSION- LEFT ANTE VERSION	LEFT ANTE VERSION RIGHT ANTE VERSION

IMPLANT – INSTRUMENT CODES

IMPLANT

0105113	A-ACUTA STEM	SIZE 13	
0105114	A-ACUTA STEM	SIZE 14	
0105115	A-ACUTA STEM	SIZE 15	
0105116	A-ACUTA STEM	SIZE 16	
0105117	A-ACUTA STEM	SIZE 17	
0105118	A-ACUTA STEM	SIZE 18	
0105119	A-ACUTA STEM	SIZE 19	
0105120	A-ACUTA STEM	SIZE 20	
0105121	A-ACUTA STEM	SIZE 21	
0105122	A-ACUTA STEM	SIZE 22	
0105124	A-ACUTA STEM	SIZE 24	
0105126	A-ACUTA STEM	SIZE 26	
0460110	COLLO MODULA® S.F	12/14	0X
0460210	COLLO MODULA® S.F	12/14	0A
0460220	COLLO MODULA® S.F	12/14	0Y
0460310	COLLO MODULA® S.F	12/14	0B
0460320	COLLO MODULA® S.F	12/14	0C
0460330	COLLO MODULA® S.F	12/14	0Z
0469110	COLLO MODULA® S.F	12/14	9X
0469120	COLLO MODULA® S.F	12/14	9AA
0469130	COLLO MODULA® S.F	12/14	9BB
0469210	COLLO MODULA® S.F	12/14	9A
0469220	COLLO MODULA® S.F	12/14	9Y
0469230	COLLO MODULA® S.F	12/14	9CC
0469310	COLLO MODULA® S.F	12/14	9B
0469320	COLLO MODULA® S.F	12/14	9C
0469330	COLLO MODULA® S.F	12/14	9Z

0514281	D. 28	DELTA SHORT CERAMIC HEAD
0514282	D. 28	DELTA MEDIUM CERAMIC HEAD
0514283	D. 28	DELTA LONG CERAMIC HEAD
0514321	D. 32	DELTA SHORT CERAMIC HEAD
0514322	D. 32	DELTA MEDIUM CERAMIC HEAD
0514323	D. 32	DELTA LONG CERAMIC HEAD
0514361	D. 36	DELTA SHORT CERAMIC HEAD
0514362	D. 36	DELTA MEDIUM CERAMIC HEAD
0514363	D. 36	DELTA LONG CERAMIC HEAD
0514401	D. 40	DELTA SHORT CERAMIC HEAD
0514402	D. 40	DELTA MEDIUM CERAMIC HEAD
0514403	D. 40	DELTA LONG CERAMIC HEAD
0540321	D. 32	METAL-METAL SHORT HEAD
0540322	D. 32	METAL-METAL MEDIUM HEAD
0540323	D. 32	METAL-METAL LONG HEAD
0540361	D. 36	METAL-METAL SHORT HEAD
0540362	D. 36	METAL-METAL MEDIUM HEAD
0540363	D. 36	METAL-METAL LONG HEAD
0540401	D. 40	METAL-METAL SHORT HEAD
0540402	D. 40	METAL-METAL MEDIUM HEAD
0540403	D. 40	METAL-METAL LONG HEAD

0522221	D. 28	SHORT	Co-Cr-Mo HEAD
0522222	D. 28	MEDIUM	Co-Cr-Mo HEAD
0522223	D. 28	LONG	Co-Cr-Mo HEAD
0520281	D. 28	SHORT	Co-Cr-Mo HEAD
0520282	D. 28	MEDIUM	Co-Cr-Mo HEAD
0520283	D. 28	LONG	Co-Cr-Mo HEAD

INSTRUMENT

IG12900	A-ACUTA COMPLETE INSTRUMENT SET		
IG01000	HANDLE FOR ALATA STEMS IMPACTOR		
IG03000	ALATA STEM IMPACTOR		
IG03100	“T” HANDLE FOR HELICOIDAL REAMERS		
IC05400	900GR DIAPASON HAMMER 15MM FORK		
IC00500	HEAD PUSHER		
IC02400	NECKS HAMMER		
IC00300	UNIVERSAL HANDLE		
IC06500	CHISEL		
IG11201	A-ACUTA HELYCOIDAL REAMER		
IG11301	A-ACUTA	SIZE 13	HELYCOIDAL REAMER
IG11401	A-ACUTA	SIZE 14	HELYCOIDAL REAMER
IG11501	A-ACUTA	SIZE 15	HELYCOIDAL REAMER
IG11601	A-ACUTA	SIZE 16	HELYCOIDAL REAMER
IG11701	A-ACUTA	SIZE 17	HELYCOIDAL REAMER
IG11801	A-ACUTA	SIZE 18	HELYCOIDAL REAMER
IG11901	A-ACUTA	SIZE 19	HELYCOIDAL REAMER
IG12001	A-ACUTA	SIZE 20	HELYCOIDAL REAMER
IG12101	A-ACUTA	SIZE 21	HELYCOIDAL REAMER
IG12201	A-ACUTA	SIZE 22	HELYCOIDAL REAMER
IG12301	A-ACUTA	SIZE 24	HELYCOIDAL REAMER
IG12401	A-ACUTA	SIZE 26	HELYCOIDAL REAMER
IG13100	A-ACUTA TRIAL STEM	SIZE 13	
IG13200	A-ACUTA TRIAL STEM	SIZE 14	
IG13300	A-ACUTA TRIAL STEM	SIZE 15	
IG13400	A-ACUTA TRIAL STEM	SIZE 16	
IG13500	A-ACUTA TRIAL STEM	SIZE 17	
IG13600	A-ACUTA TRIAL STEM	SIZE 18	
IG13700	A-ACUTA TRIAL STEM	SIZE 19	
IG13800	A-ACUTA TRIAL STEM	SIZE 20	
IG13900	A-ACUTA TRIAL STEM	SIZE 21	
IG14000	A-ACUTA TRIAL STEM	SIZE 22	
IG14100	A-ACUTA TRIAL STEM	SIZE 24	
IG14200	A-ACUTA TRIAL STEM	SIZE 26	
IM00100	BLUE TRIAL NECK WHITE CAP	0B	
IM00200	BLUE TRIAL NECK GREY CAP	0C	
IM00300	BLUE TRIAL NECK BLACK CAP	0Z	
IM00400	RED TRIAL NECK WHITE CAP	0A	
IM00500	RED TRIAL NECK GREY CAP	0Y	
IM00600	RED TRIAL NECK BLACK CAP	0C	
IM00700	GREEN TRIAL NECK WHITE CAP	0X	
IM00800	GREEN TRIAL NECK GREY CAP	0A	
IM00900	GREEN TRIAL NECK BLACK CAP	0B	
IM01100	BLUE TRIAL NECK WHITE CAP YELLOW TIP	9B	
IM01200	BLUE TRIAL NECK GREY CAP YELLOW TIP	9C	
IM01300	BLUE TRIAL NECK BLACK CAP YELLOW TIP	9Z	
IM01400	RED TRIAL NECK WHITE CAP YELLOW TIP	9A	
IM01500	RED TRIAL NECK GREY CAP YELLOW TIP	9Y	
IM01600	RED TRIAL NECK BLACK CAP YELLOW TIP	9CC	
IM01700	GREEN TRIAL NECK WHITE CAP YELLOW TIP	9X	
IM01800	GREEN TRIAL NECK GREY CAP YELLOW TIP	9AA	
IM01900	GREEN TRIAL NECK BLACK CAP YELLOW TIP	9BB	
IM02100	BLUE TRIAL NECK WHITE CAP RED TIP	9BB	
IM02200	BLUE TRIAL NECK GREY CAP RED TIP	9CC	
IM02300	BLUE TRIAL NECK BLACK CAP RED TIP	9Z	
IM02400	RED TRIAL NECK WHITE CAP RED TIP	9AA	
IM02500	RED TRIAL NECK GREY CAP RED TIP	9Y	
IM02600	RED TRIAL NECK BLACK CAP RED TIP	9C	
IM02700	GREEN TRIAL NECK WHITE CAP RED TIP	9X	
IM02800	GREEN TRIAL NECK GREY CAP RED TIP	9A	
IM02900	GREEN TRIAL NECK BLACK CAP RED TIP	9B	
IM03100	GREY PLATE FOR RH/LH TRIAL NECKS		
IM03200	RED PLATE FOR RH ANTE/LH RETRO TRIAL NECKS		
IM03300	YELLOW PLATE FOR RH RETRO/LH ANTE TRIAL NECKS		
IM07701	“FORK” COMPONENT FOR NECKS EXTRACTOR		
IM07702	NECKS EXTRACTOR BEATER		
IM07704	“FORK” COMPONENT FOR NECKS EXTRACTOR H 2mm		
IH28000	TRIAL HEAD	D. 28	SHORT
IH28100	TRIAL HEAD	D. 28	MEDIUM
IH28200	TRIAL HEAD	D. 28	LONG
IH32000	TRIAL HEAD	D. 32	SHORT
IH32100	TRIAL HEAD	D. 32	MEDIUM
IH32200	TRIAL HEAD	D. 32	LONG
IH36400	TRIAL HEAD	D. 36	SHORT
IH36500	TRIAL HEAD	D. 36	MEDIUM
IH36600	TRIAL HEAD	D. 36	LONG
IH40000	TRIAL HEAD	D. 40	SHORT
IH40100	TRIAL HEAD	D. 40	MEDIUM
IH40200	TRIAL HEAD	D. 40	LONG
IC00700	TOMMY BAR		
IC05500	BASIC A-ACUTA STEM INSTRUMENT CONTAINER		
IC05800	BASIC ALATA INSTRUMENTS CONTAINER		

Manufactured by Adler Ortho  0426



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A-ACUTA 07-2011



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