stryker

ABG™ II Modular
Anatomic Reconstruction

ABG™II Modular
Anatomic Reconstruction

The ABG™II Modular femoral component is based on the anatomical shape of the ABG™II Cementless femoral stem and follows the natural contours of the femur in all three dimensions.

This helps establish:

- Primary Stability – the anatomical shape of the femoral stem allows it to follow the contours of the femur. This results in excellent clinical performances over time[1,2].

- Loading – the close three-dimensional conformity with the femur ensures an even load transfer pattern imitating the natural distribution of stress. Bone stress levels are maintained keeping the bone in the proximal femur healthy and reducing resorption.

- The ABG™II Modular range of implants is constituted of 8 right stems, 8 left stems and 10 modular necks. All sizes of the ABG™II cementless stem, including the smallest (size 1) are available with a modular neck, making it especially useful in dysplasia cases.

- Proximal Load Transfer – The system's biomechanics are designed to be as close as possible to those of the normal femur. To achieve this, the distal part of the stem is made undersized, and load transfer is only allowed to occur proximally. Distal contact between stem and bone is avoided. The distal part of the stem is polished to prevent bone ongrowth in the event of any contact. This reduces stress shielding and prevents proximal bone resorption[3,4].

- The ABG™II and ABG™II modular have an identical shape below the resection line. The only difference is the modular neck.

- The re-establishment of normal anatomical loading of healthy bone encourages bone remodelling around the prosthesis. It also prevents bone resorption. As a consequence, healthy bone stock is maintained around the implant in the long-term and a stable firmly-fixed total hip replacement is achieved[1,2,3,4].

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Stem Features

- TMZF Alloy – Further improves stress transfer to the proximal femur over conventional TiAl6V4 alloy.
- Scales – these are incorporated into the stem's anterior, posterior and medial surfaces. They encourage the transmission of vertical loading from the implant to the bone and reduce the dependence on friction at the hydroxyapatite surface.
- Hydroxyapatite Coating – only applied proximally.

Neck Features

- The neck is made of GADS Vitallium®, a proprietary CoCr alloy that Stryker has developed. GADS stands for Gas Atomized Dispersion Strengthened. It is a CoCr alloy featuring high performances in term of corrosion resistance and improved fatigue strength (respect to regular CoCr alloy)[5].
- The range is composed of 10 reversible necks:
  - Short neck straight
  - Short neck Varus-Valgus (V-V)
  - Short neck Anteverted-Retroverted (A-R)
  - Short neck Anteverted-Retroverted-Varus-Valgus (A-R V-V)
  - Short neck Anteverted-Retroverted-Valgus-Varus (A-R V-V)
  - Long neck straight
  - Long neck Varus-Valgus (V-V)
  - Long neck Anteverted-Retroverted (A-R)
  - Long neck Anteverted-Retroverted-Varus-Valgus (A-R V-V)
  - Long neck Anteverted-Retroverted-Valgus-Varus (A-R V-V)
- The ABG™II Modular neck lengths differ by -4mm or +4mm with respect to the standard ABG™II stem from size 3 to 8. The ABG™II Modular sizes 1 and 2 can only receive the short neck which, in this case, corresponds exactly to the standard ABG™II cementless stem neck length.
- The ABG™II Modular necks have a femoral necks angle of 135° (valgus neck), 130° (straight neck) or 125° (varus neck). The standard ABG™II stem has a femoral necks angle of 130°.
- The ABG™II Modular necks anteversion differs by +7°, 0°, or -7° with respect to the standard ABG™II stem (i.e. 19° for the anteverted necks, 5° for the retroverted necks whereas the ABG™II standard stem features an anteversion of 12°). As a result, "retroverted" necks are not retroverted generally speaking but retroverted respect to the standard ABG™II.
- The 10 necks are reversible and offer 18 different head center positions.
- For each position it is to be noted that different head length options remain available.

ABG™II Modular

The following conversion tables show the implications for offset and leg length of each option (with a 0 head).

Leg length and offset changes from the ABG™II standard cementless stem to the ABG™II Modular.

	straight short		valgus short		varus short		straight long		valgus long		varus long	
ABG™II 1 and 2	leg length	offset	leg length	offset	leg length	offset						
	0	0	+2	-1.5	-2	+1.5						
ABG™II 3 to 8	leg length	offset	leg length	offset	leg length	offset	leg length	offset	leg length	offset	leg length	offset
	-2.5	-3	-1	-5	-4.5	-1.5	+2.5	+3	+5	+1	0	+5

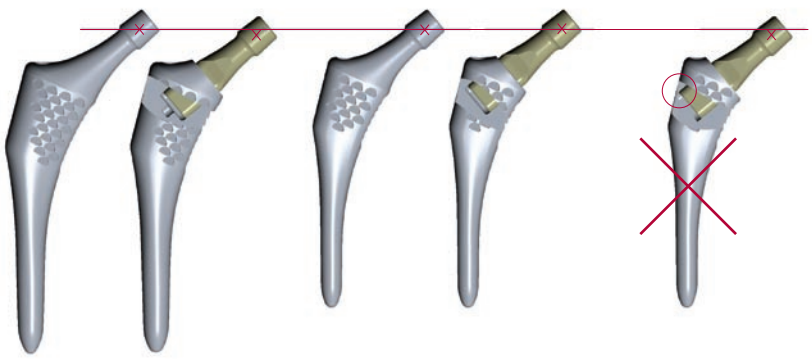
Leg length and offset changes from a modular neck to another.

	straight short		valgus short		varus short		straight long		valgus long		varus long	
straight short			leg length	offset	leg length	offset	leg length	offset	leg length	offset	leg length	offset
			+2	-1.5	-2	+1.5	+5	+6	+7.5	+4	+2.5	+8
valgus short	leg length	offset			leg length	offset	leg length	offset	leg length	offset	leg length	offset
	-2	+1.5			-4	+3	3.5	+8	+5.5	+5.5	+1	+10
varus short	leg length	offset	leg length	offset			leg length	offset	leg length	offset	leg length	offset
	+2	-1.5	+4	-3			+7	-4.5	+9.5	+2.5	+4.5	+6.5
straight long	leg length	offset	leg length	offset	leg length	offset			leg length	offset	leg length	offset
	-5	-6	-3.5	-8	-7	+4.5			+2.5	-2	-2.5	+2
valgus long	leg length	offset	leg length	offset	leg length	offset	leg length	offset			leg length	offset
	-7.5	-4	-5.5	-5.5	-9.5	-2.5	-2.5	+2			-5	+4
varus long	leg length	offset	leg length	offset	leg length	offset	leg length	offset	leg length	offset		
	-2.5	-8	-1	-10	-4.5	-6.5	+2.5	-2	+5	-4		

Values valid from size 1 to 8

Values valid only from size 3 to 8

As shown in the illustration below, for sizes 1 and 2, the modular neck had to be positionned at a higher level respect to its position in sizes 3 to 8. Indeed, if it had been positionned at the same level, the thickness of metal in the lateral part of the stem would have been too small. As a result, for sizes 3 to 8, the short neck is 4 mm shorter than the standard ABG™II; for sizes 1 and 2, the short neck is the same length as the standard ABG™II.



Short neck pattern
Sizes 3 to 8

Short neck pattern
Sizes 1 and 2

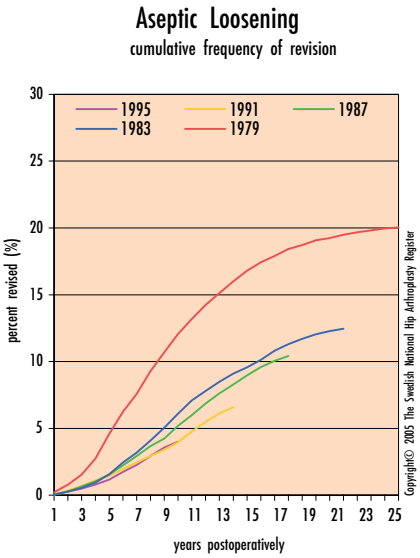
ABG™II Modular
Anatomic Reconstruction

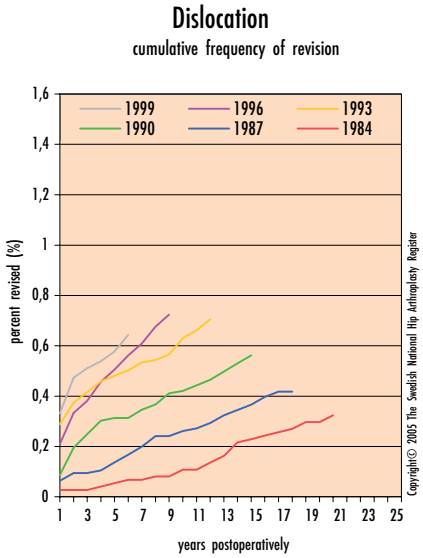
As technologies and techniques have evolved, patients and results have evolved. The Swedish Register shows clearly that, with time, fixation of Hip implants has greatly improved with the rate of aseptic loosening decreasing. The ABG™II cementless stem indeed shows great survivorship[1,2] in line with the fixation results of the ABG™I cementless stem[1,2].

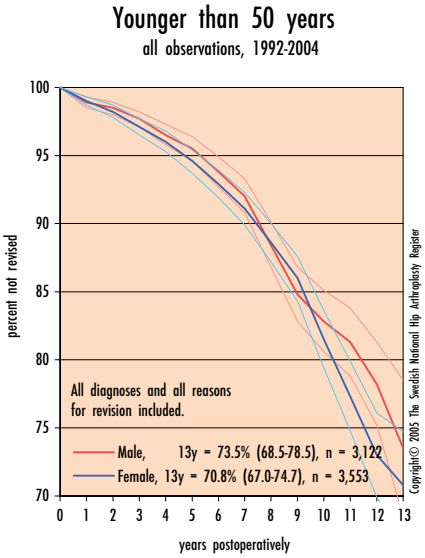
However, these results have led the patients to have higher expectations in term of pain, function and leg length discrepancies. A more active lifestyle raising the demands on the implants. Furthermore, the good results have made younger patients suitable for surgery. But with an even more active lifestyle the results on this population are not as good as for older patients.

The increasing dislocation rate over the years seen on the Swedish Register[6] can be explained by an aging population and increased activity demand.

This analysis has brought Stryker to orient its R&D efforts toward "Anatomic Reconstruction" solutions.
The ABG™II Modular is the natural evolution of the ABG™II cementless stem: it offers an "Anatomic Reconstruction" inside the femur with its proven anatomic shape, and outside of the femur with a fine tuning of length, offset and anteversion.







ABG™II Modular

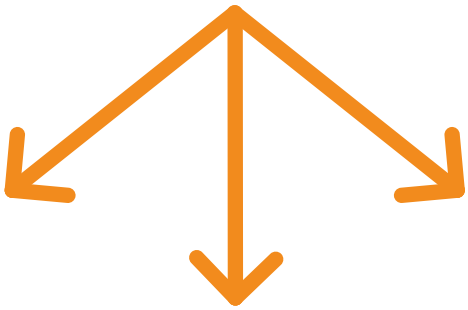
The ABG™II Modular provides the following benefits:

1. Advancing the concept of "Anatomic Reconstruction" it helps to
   • Adapt to different femoral geometries by adjusting anteversion / retroversion, femoral necks angle and neck length, resulting in improved ROM;
   • More easily achieve soft tissue balance.
2. It facilitates the insertion of the implant in small incision: rasps have become modular in order to be inserted without stretching the skin and the soft tissues but straight stemmed implants are still difficult to insert. The ABG™II with its curves in the A/P and M/L planes combined with its shortness is a natural fit for small incisions. The ABG™II Modular becomes a must.
3. It enables finally to use the full potential of the navigation. Indeed, it is now possible finally to dissociate the fixation of the stem from the extra medullar geometric reconstruction that can be fine tuned with the help of navigation.

This clearly will:

1. help to satisfy the most demanding patient lifestyle and

2. help to avoid edge loading that can increase wear on PE or lead to stripe wear on Ceramic, creating the conditions for the longest possible survivorship.

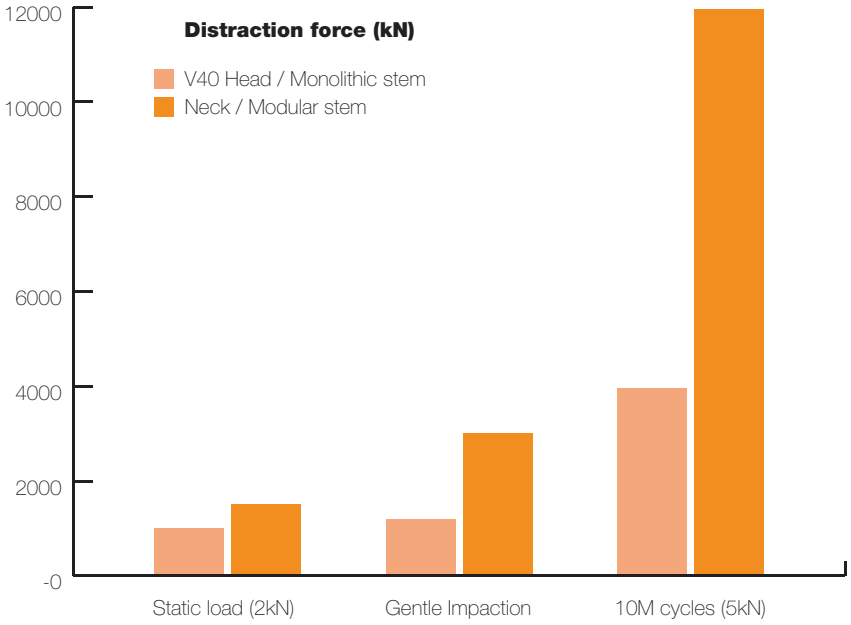


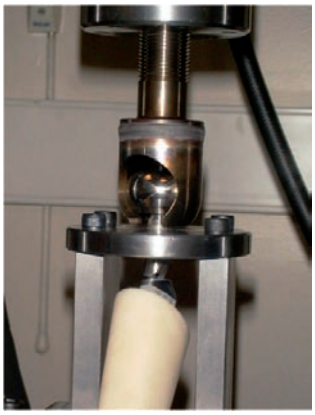
ABG™II Modular
Anatomic Reconstruction

1st R&D objective: Safety

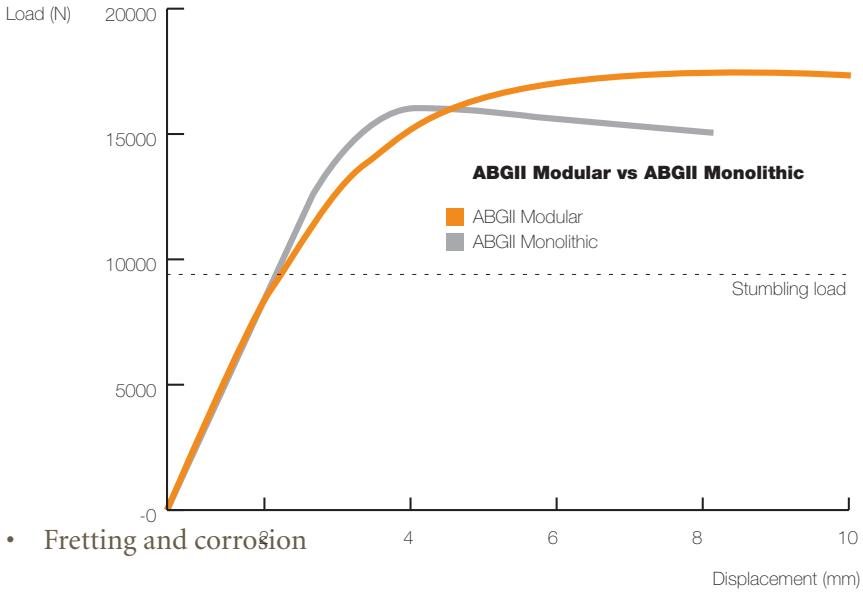
The additional benefits are valuable only if the modifications do not bring any additional issue. The R&D process has been first focused on limiting as much as possible the risks generated by the modularity.

- Neck loosening
  Tests have shown that locking strength of the stem / neck junction is higher than the V40 head / monolithic stem junction. To date, no issue has been reported regarding this matter. We have tested different loading conditions: static load, manual gentle impaction, several millions cycles of loading.
  In this last situation, the neck removal was virtually breaking all regular / traditional instruments designed for this purpose. The only way has been to combine the use of a specific instrument with repeated and violent hammering to distract the neck from the stem.





- Static mechanical strength
  The hip must endure daily life activities, including peak loads. During stumbling, up to 8.7 times the body weight[7]. The graph below shows that the maximum yield strength of the ABG™II Modular, which is much higher than this maximum load. This graph also offers a comparison with the standard ABG™II cementless stem (for which no such failure has ever been reported, after 10 years of implantations).



- Fretting and corrosion

ABG™II Modular
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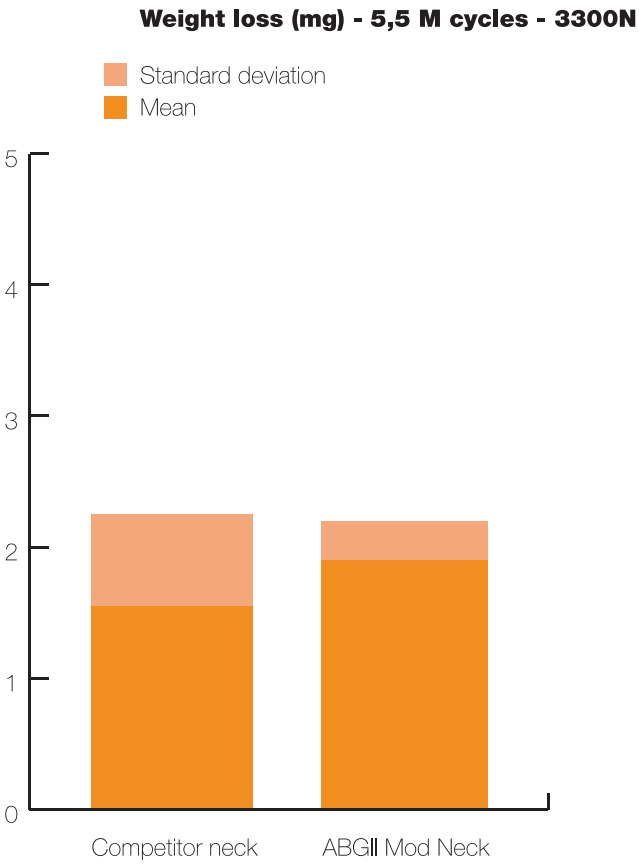
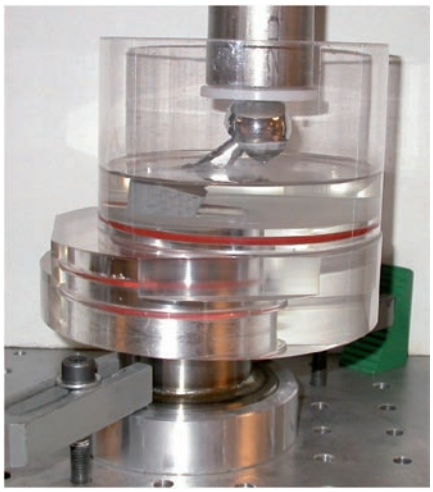
In order to accomodate a modural neck on the smallest ABG™II sizes, the junction dimensions have been reduced compared to some implants already available on the Market.
Viceconti et al[8] reported that reduced contact surfaces may produce higher fretting; despite these reduced dimensions, and thanks to the ABG™II Modular proprietary material properties and manufacturing processes, fretting level remains quite low and equivalent to what has been reported by Viceconti et al[8] as shown on the graph below.
Overall, neck + stem fretting wear remain under the 5 mg for 5 million cycle estimated by Viceconti et al[8] as the upper limit for modular implants.
Furthermore, our MEB and EDS analysis have demonstrated that all the components were undamaged, except at the surface contact area. Minimal corrosion was observed.
Being very low, fretting wear did not have any effect on the mechanical function of the test samples. No fatigue fractures were observed and the necks remained securely joined to the stems.



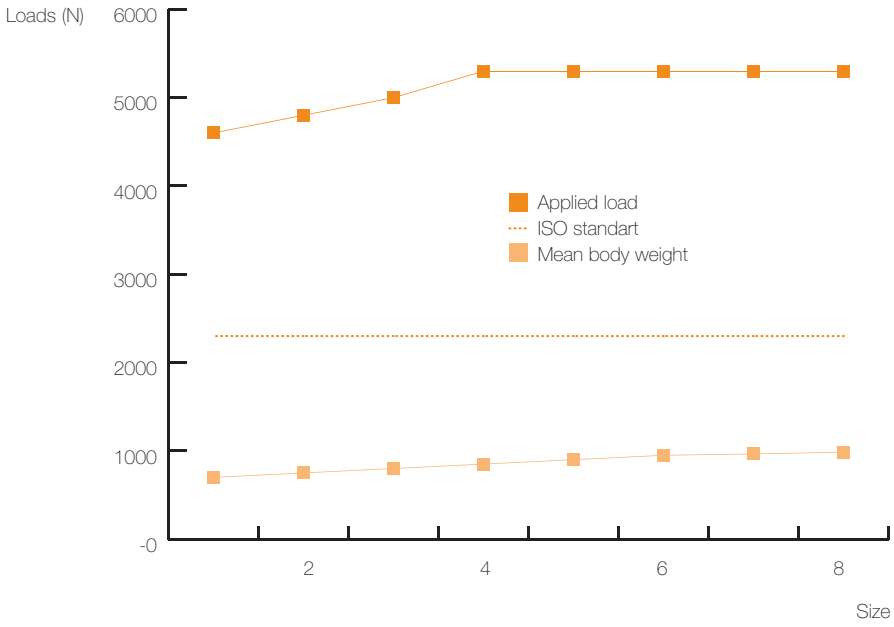


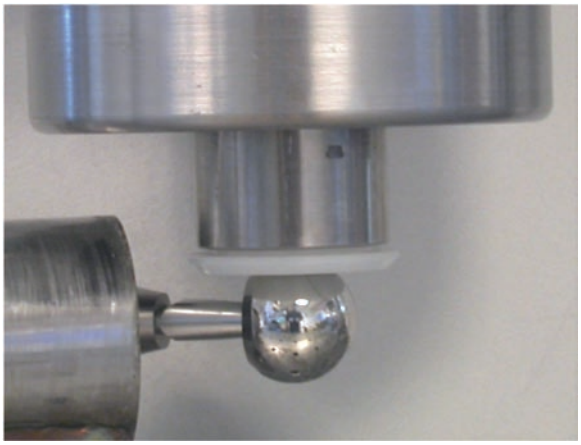
- Fatigue mechanical strength
  Being made of TMZF® for the stem and GADS Vitalium® for the neck, it has been possible to push the mechanical testing much further than most of the common tests reported on the market: both stem resistance and neck resistance have been tested (by potting the stem at a level such that it has to withstand a worst case scenario), futhermore the tests were run at loads much higher than the norm.

  Such a potting (just below the bottom of the connexion) creates the worst case conditions regarding stresses in the modular junction as it negates any shielding effects of the potting media to the stem components and connection.

  The worst stem/neck combinations in term of stress have been tested with a minimum load equivalent to 6 times the mean body weight (from 4500N to 5300N depending of stem size).
  All the stem and neck samples passed 10 millions cycles without any fracture or even an small crack in the components.

  Finally, despite the narrow width of the neck, and thanks to GADS Vitallium® material, samples tested to simulate "deep flexion" and loaded with 2300N, passed 1 million cycles without any failure.

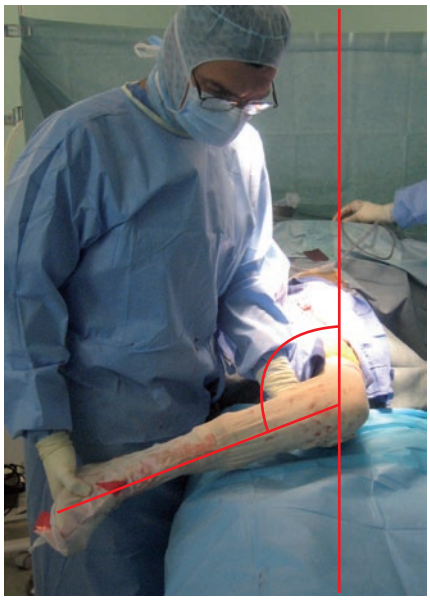




ABG™II Modular
Anatomic Reconstruction

2nd R&D objective:
Efficacy / Efficiency

Efficacy: Reach the Objective!
The 2 pictures on the right show very well the spectacular gain in ROM (in this case, external rotation) that a simple change of neck can bring (in this case rotating an anteverted neck to make it retroverted).
The X rays show how the various angles have helped to achieve an Anatomic Reconstruction.

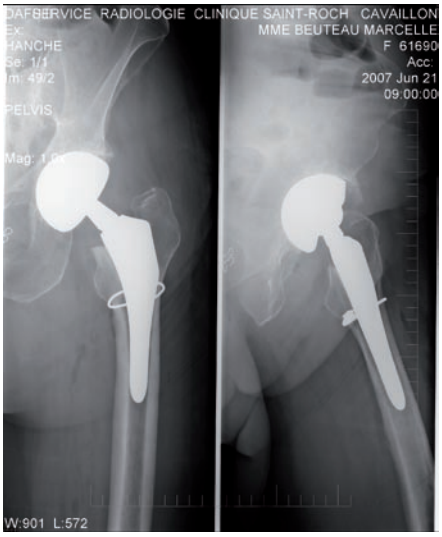


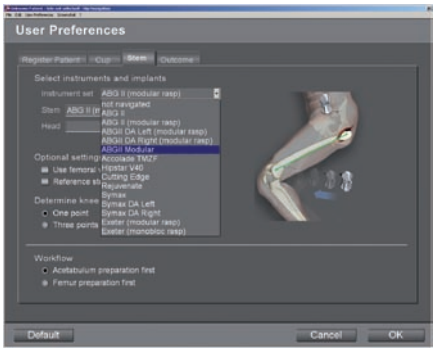
The result can be monitored and fine tuned with the Navigation system.

Efficiency: Keep it simple!

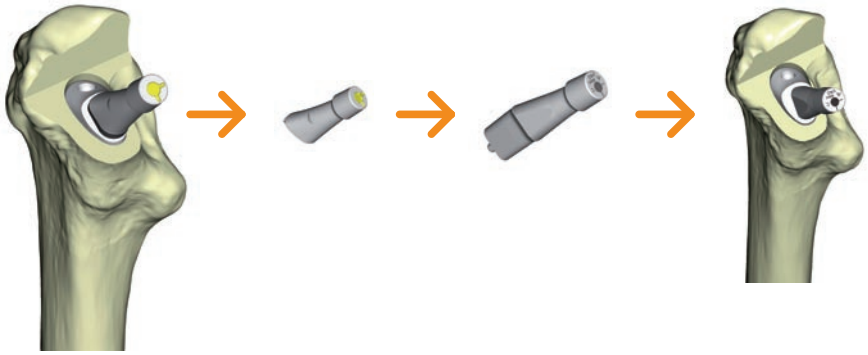
- Implant simplicity
  Does sophistication means automatically complication? The marketing and engineering temptation to "overkill" the number of head centers was countered only by the designer surgeons: a great solution is a simple solution. This is why an optimal number of neck options was relentlessly pursued, achieving the objective while remaining at a minimum necessary.

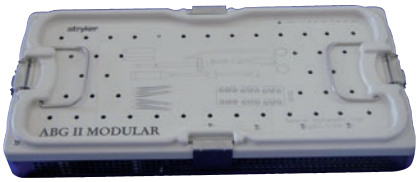
  The search of simplicity has led our R&D team to develop a unique system of tagging the necks linking color, shape and size of symbols. This system is a key element in the iterative process of the choice of the neck.

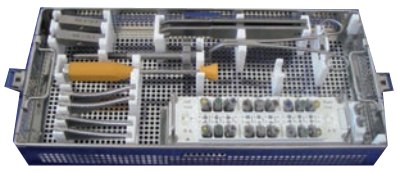




- Instrument simplicity
  The instruments design has been supervised by surgeons from various backgrounds with the obsession of simplicity: the result is 1 additional tray to the regular ABG™II stem instrumentation.







ABG™II Modular Operative Technique
Introduction

This surgical protocol is designed to provide the experienced surgeon with guidance for performing ABG™II Modular Total Hip Replacement. It should be read in conjunction with the operative technique for the ABG™II total hip system and/or any MIS operative technique related to the ABG™II total hip system.

ABG™II Modular Operative Technique
Pre-operative planning

Femoral Templating

Pre-operative planning is essential and should be conducted using templates which are placed on a frontal radiograph of the femur and then checked against the magnification noted on the template.
Templates are available with a magnification of 10% 15% and 20%.
The acetabular templating that determines the position of the center of the head. The following intructions deal only with the femoral templating which will allow defining stem sizes and CCD angle. It is therefore very important to template the cup as well. The modular neck will be fit intra-operatively to restore the hip stability with respect to the cup in place.
The enlargement of the femur depends on the focal distance, which is constant and the object-plate distance which is variable.
To calculate the level of magnification a small centimetre ruler is placed in the plane of the greater trochanter.

This ruler can then be used to determine the enlargement of the femur shown on the radiograph, as shown below.
The pre-operative planning of modular stem necessitates three steps:

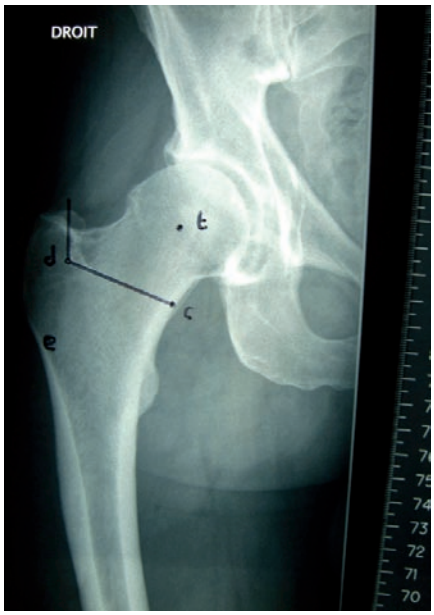
1 Determine the center of rotation of the acetabulum.
2 Determine the metaphyseal position and size of the femoral component.
3 Determine the proper modular neck in term of leg length and offset.

Metaphyseal fill should be optimized. When presented with the option of choosing 2 implants it is suggested that the smaller one be used since this will allow for greater preservation of cancellous bone. It may be possible to slightly undersize the femoral component in good quality cancellous bone thus preserving bone. The final choice of the femoral component size will be dependent of the intraoperative rotational stability of the broach.

The choice of the femoral component is made according to 3 reference points c, d and e, as shown below:

1 Implant sizing is determined during templating. The chosen implant should fill the metaphysis whilst preserving the femoral calcar.
2 Height is determined by the digital point **D** indicated on the template. The shoulder of the implant must be level with the lower part of the digital fossa **d**.
3 The inferior-lateral or trochanteric-diaphyseal point **E**. The lower, lateral part of the prosthesis must come to lean against the inferolateral part of the greater trochanter **e** marked on the radiograph, ensuring a thickness of cancellous bone that will be at least 3mm.
4 At the diaphyseal level, the implant drawn on the template must be centered in the shaft of the femoral diaphysis, to avoid either varus or valgus positioning.

Measuring radiograph of the femur with ruler.



Radiograph with markers.

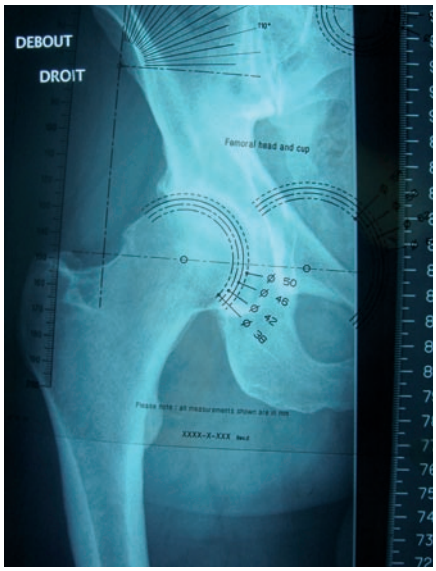
Precise pre-operative planning is performed using templates.

It is very important to obtain X-ray views in neutral rotation or even in slight internal rotation to visualize the neck from a true antero-posterior perspective (there is a risk of external rotation in case of stiff hip).

ABG™II Modular Operative Technique
Pre-operative planning

Adjustment of the femoral neck osteotomy

The cervical point **C** can be found on the template and the line of the femoral neck osteotomy (cervical osteotomy) drawn by linking the digital point **D** to the cervical point **C**. This makes an angle of approximatly 60° with the axis of the diaphysis.
The medial rulers on the templates helps to position point **C** with respect to the lesser trochanter and the medial edge of the calcar.



ABG™II Modular Stem template.

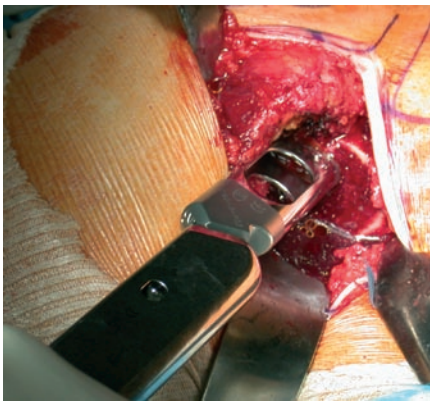
ABG™II Modular Operative Technique
Preparation of the femur

Metaphyseal housing

Using a box osteotome, the residual femoral neck is resected and the metaphyseal housing of the implant is prepared.

Chisels	8mm	12mm	16mm
Stems	1, 2, 3	4, 5, 6	7, 8

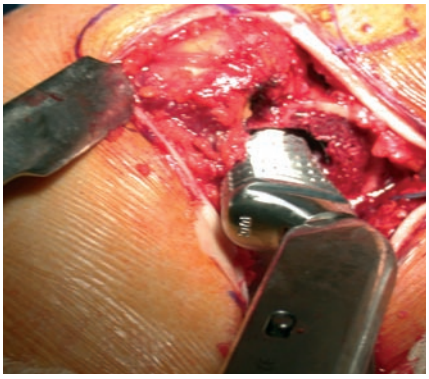
Correspondence
By using the hollow chisel adapted to the size of the implant and fixed to the broach handle, a cylinder of cancellous bone is removed from the metaphysis taking care not to damage the calcar or the greater trochanter.



Opening of the canal with the hollow chisel.

The smallest broach, left or right, is then introduced to find the medullary canal, as shown below.

If the pre-operative planning anticipates a possible contact between the prosthetic stem and the diaphyseal cortex, it is advisable to ream with flexible reamers up to the diameter corresponding to the chosen implant and shown on the template.



Use of broaches/trial prostheses
Broaching

After checking that they correspond to the side being operated, the broaches are fixed to the broach handle. They are introduced beginning with the smallest size up to the size chosen during pre-op planning. Apply a lateral force to the broach during impaction to avoid a varus position.

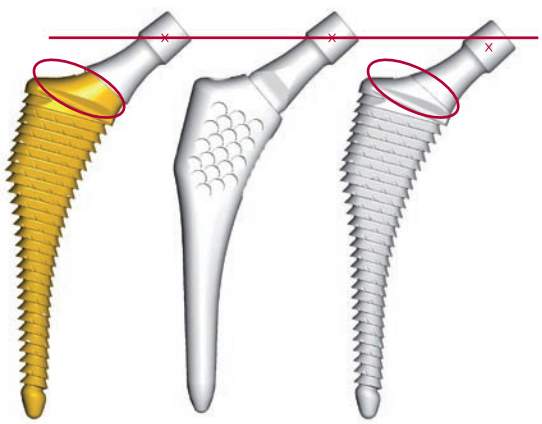
The broach / trial prosthesis will determine the size of the permanent implant if two conditions are fulfilled:

- The broach must be pushed down to the correct level: the shoulder of the broach must be at the level of the trochanteric fossa.
  The level of the last tooth of the rasp correspond to the upper limit of the scales of the stem.
- The broach must be perfectly stable in the coronal plane (varus-valgus) and particularly in rotation.

It is often useful to check the correct positioning of the broach by measuring the distance between the medial edge of the broach and the medial surface of the cortex of the calcar femorale.

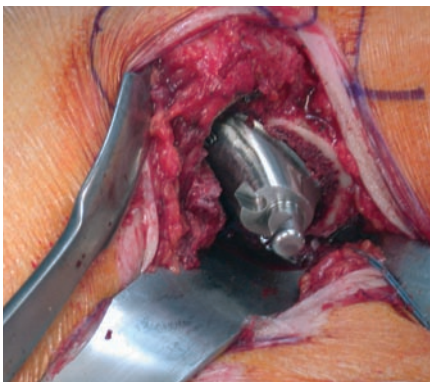
The ABG™II Modular instrument tray includes 4 golden rasps (size 1 & 2 left & right). These rasps have the same geometry below the resection line as the regular rasps. The stem sizes 1 & 2 feature a particular extra-medullar geometry for which the short neck is equivalent to the regular ABG™II neck instead of being shorter by 4mm (for sizes 3 to 8). As a result, if a trial reduction is to be performed with a stem size 1 or 2, these golden rasps need to be used with the corresponding trial neck. The final trial on the stem will be done with the golden connector (instead of the grey connector as for sizes 3 to 8). If no size 1 or 2 rasp is to be trialed, the rasping can be performed with either the regular rasps or these golden rasps indifferently.

On the left, golden rasp size 1 or 2.
On the right, a standard modular rasp



ABG™II Modular Operative Technique
Use of broaches / trial prostheses

If, despite correct reaming, a broach/ trial prosthesis smaller than the size anticipated in planning is perfectly stable in rotation (perhaps due to an anteroposterior narrowing of the neck), the use of a larger size must not be attempted because of the risk of a metaphyseal fissure or fracture.



Conversely, if the broach / trial prosthesis is unstable, the following solutions may be considered:

- Use of a larger broach (note: reaming may be required).
- Stabilise the planned implant with a cortico-cancellous bone graft taken from the remains of the resected bone (Please note however that stability of the implant should rarely be entrusted to bone graft).
- Cement an ABG®II femoral stem in Vitallium® with cement (if available in your area).

Reduction

Trial from the broach:

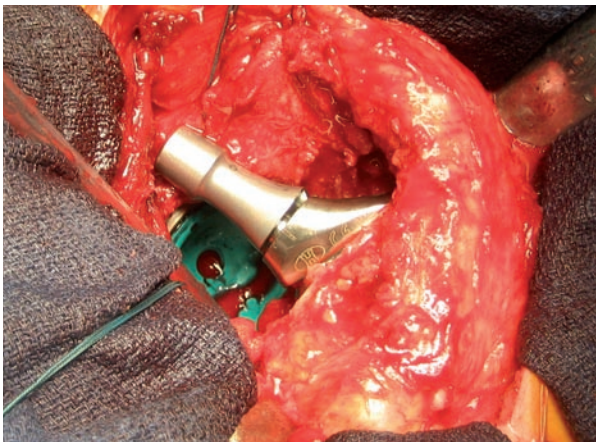
1 The metal trial neck from the broach featuring the femoral necks angle and neck length chosen during preop-templating combined with a "standard" (or Neutral) anteversion will be used 1st.

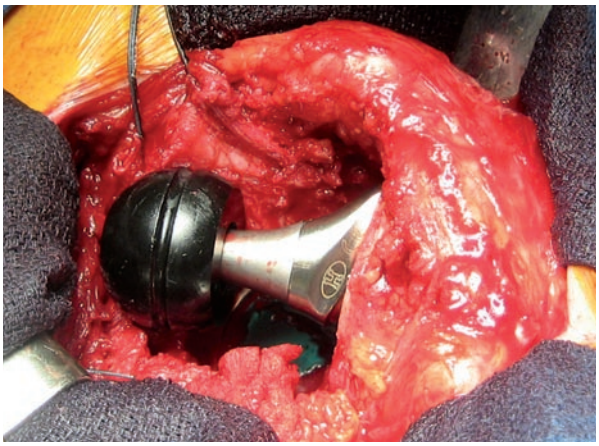
2 Then check the femoral necks angle and neck length that has been selected by checking leg length, and soft tissue tension. Various head lengths enable some fine tuning.

3 Once the most suitable femoral necks angle and neck/head length have been determined, the choice of the neck will be finally determined by adjusting the anteversion to get:

- a good internal / external rotational mobility in extension.
- a good stability of the hip in flexion / internal rotation / adduction and in extension / external rotation.

Note:
For sizes 3 to 8, the standard ABG™II (monolithic) corresponds to a short straight neck (version, femoral necks angle) with a +4 head, or a long straight neck with a -4 head. The short neck option is preferred because it gives greater clearance.





ABG™II Modular Operative Technique
Necks Selection

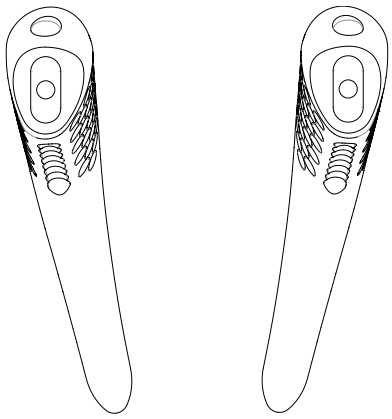
Trial Necks

18 trial necks are available as they are not reversible.
The color coding helps to facilitate the transition between trial neck and real neck box label.

Long Necks

Short Necks

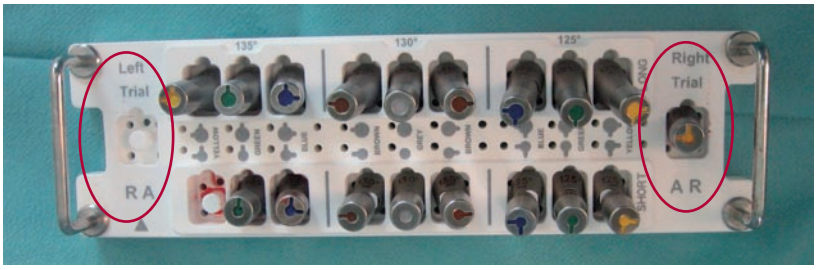
The trial necks provide information through the colored symbols and markings engraved on top and on the side of each neck:
A large central dot such as ● indicates a long neck, whereas a smaller dot such as ● indicates a short neck.
No line associated to the dot indicates that the neck is neither varus nor valgus and neither anteverted nor retroverted.
A vertical line such as ● indicates a valgus neck whereas ● indicates a varus neck.
An horizontal line such as ●— or —● indicates either an anteverted or retroverted neck depending on the side (right or left) as shown on the diagram.



Left **Right**

A horizontal and vertical line (●—) indicates valgus/varus and retro/anteverted.

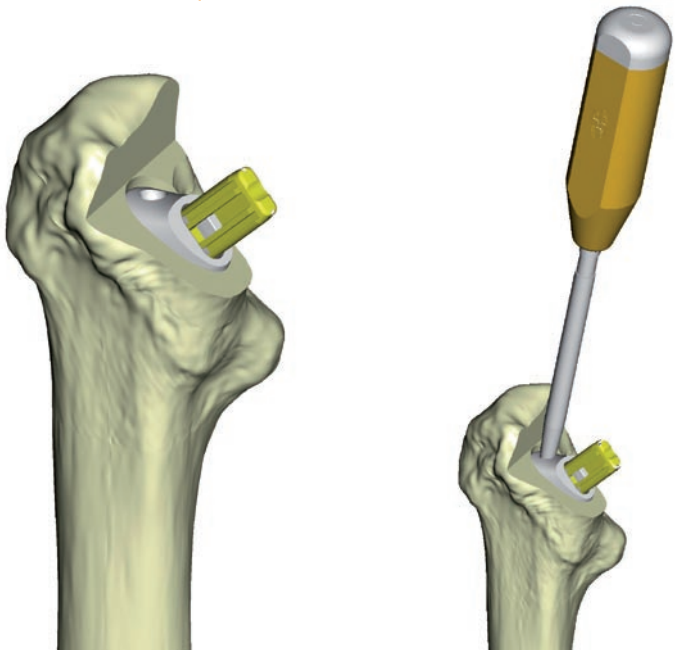
The removable tray, with all the trial necks, features 2 slots (one for a left stem, one for a right stem) which enable isolating the selected neck. The symbols then make an intuitive pattern of the chosen neck (varus/valgus, short/long, anteverted/retroverted). In this example, it is valgus anteverted neck (as it is on the right side).



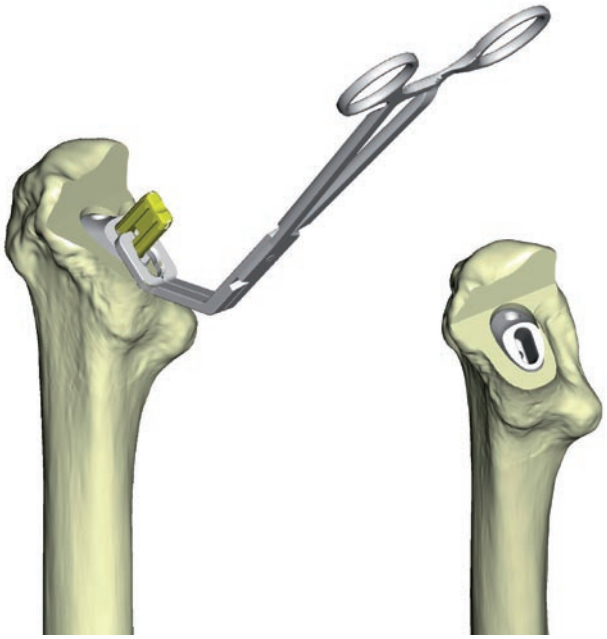
ABG™II Modular Operative Technique
Implantation of the femoral component

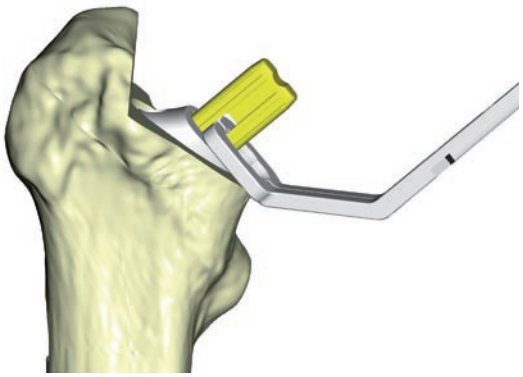
Implantation of the femoral component

Insertion of the Cementless ABG®II stem must be performed whilst taking care to avoid touching the hydroyxyapatite with gloves. The stem is introduced manually until it become wedged (generally at the last centimetre). Then, impaction is completed by gently hammering.
The ideal level of impaction is reached when the shoulder of the prothesis is at the level of the digital fossa.

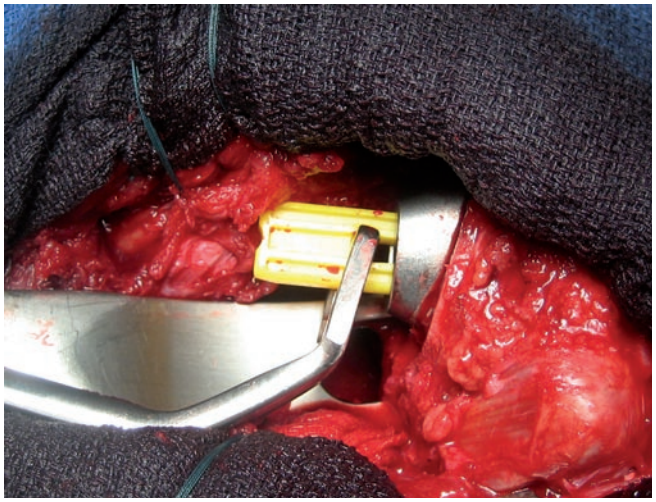


Once the stem seated, the plastic stem holder is removed as shown in the figure.





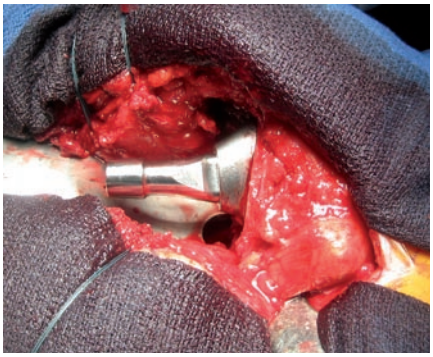
It is important to engage the teeth of the forceps in the hole of the plastic stem holder.

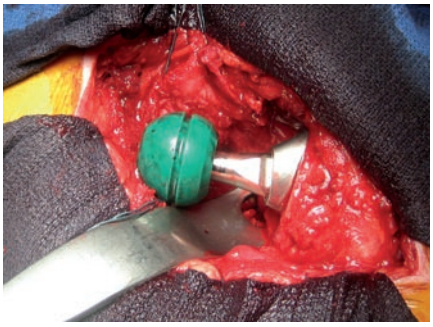


ABG™II Modular Operative Technique
Trials on stem

Neck Implants

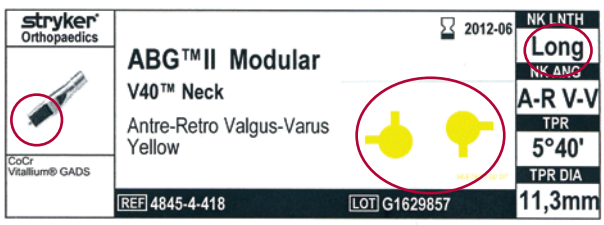
Trials on stem
Once the femoral stem implanted, it is possible to do another trial with the trial necks. To do so, the trial neck that had been selected needs to be attached to the connector (golden for size 1 & 2, grey for size 3 to 8), which will be seated on the stem as shown on the pictures. Then, the whole trial process will follow the same algorithm: 1. Check the CD angle and length and 2. Check the version.





Final Neck Selection

When the definitive implant needs to be picked up, just paying attention to the neck length and the color enables picking up he right box/implant.



In this particular example, the surgeon would simply ask for a long neck with yellow symbol. The nurse would simply check on the tag that she takes a long neck (clearly stated "long" and symbolised with the spigot), and that the symbol is yellow (clear yellow symbol with written "yellow").

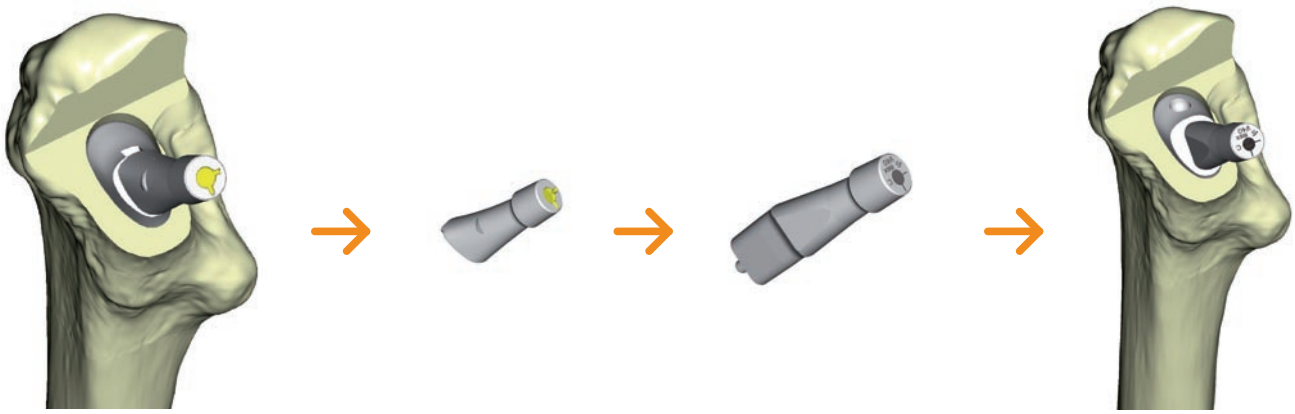
ABG™II Modular Operative Technique
Implantation of the final neck

Neck Implants

10 Modular Necks are available.

Warning:
- +5 heads are the maximum allowed
- For ceramic heads: Biolox® Delta ceramic head only can be used (no Biolox® Forte heads allowed)

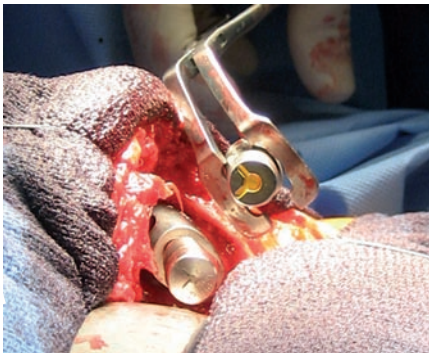
Once the implant is selected, the insertion in the proper orientation is enabled with reference to the orientation of the diagram. Please note that the actual necks do not feature the color coding, and the size of the diagram is not the same as the one on the trial necks due to the legal markings that need to figure on the actual neck. In order to check that no mistake is done on the length of the neck, it is enough to double-check the presence or not of the plug.



Trial in place | Trial neck | Actual neck | Actual neck in place

Long neck

Short neck

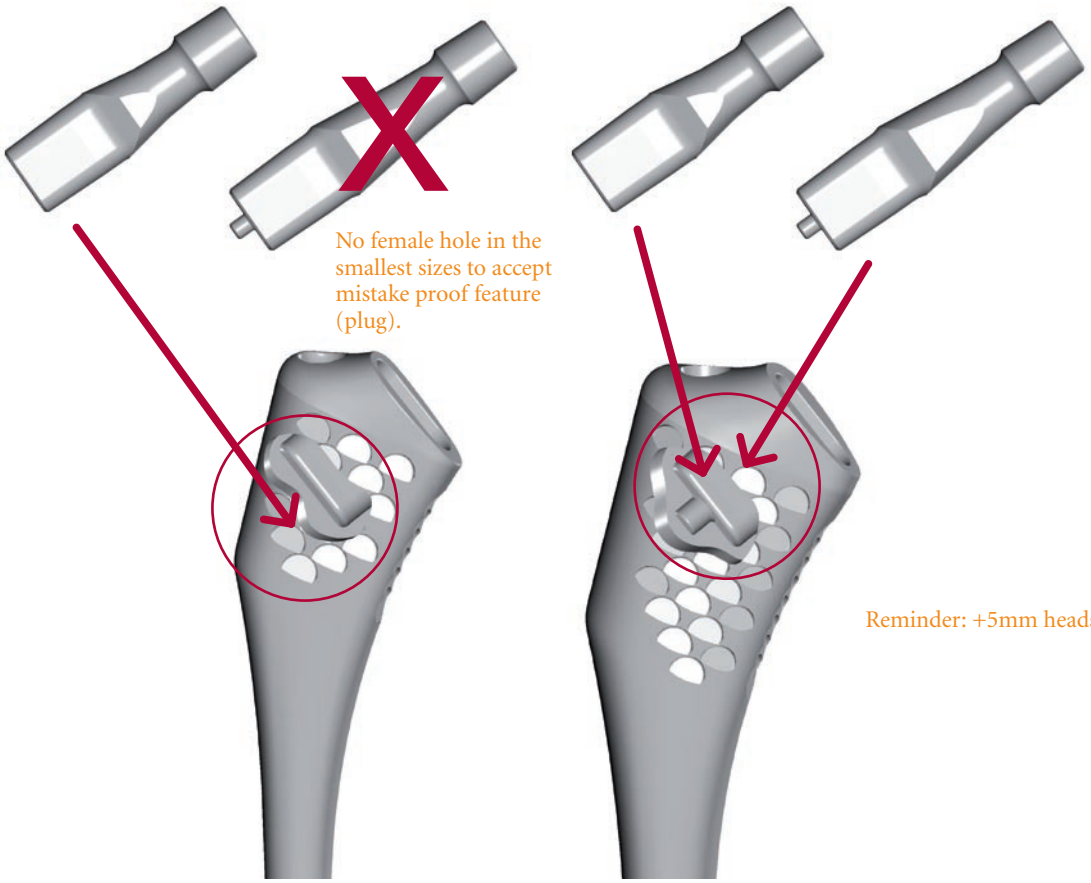


This case shows how looked a short neck (instead of a long neck), reversed respect to the example.

Wrong orientation

ABG™II Modular Operative Technique
Implantation of the final neck

Warning:
Long necks cannot be used with stems size 1 and 2.
The following illustration shows the feature on the necks that will prevent any mistakes.
The long necks have a plug that is compatible with the female junction of sizes 3 and over only.

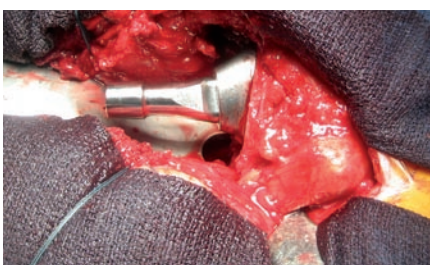


Sizes 1 and 2 **Size 3 and over**

Reminder: +5mm heads are the maximum allowed.

Implantation of the femoral neck

Before introducing the neck into the stem, make sure that:
- stem and neck are not damaged
- stem and neck junction are **carefully** cleaned and dried
- the neck is oriented according with the guidelines.
  Once the final neck determined, and the previous points have been carefully checked, it is placed onto the stem by hand and then impacted as shown, like a metal head on a traditional spigot. The neck is firmly impacted. Please, pay attention to not damage/scratch the implants or the impactor by using a sponge at the interface.



ABG™II Modular Operative Technique
Insertion of the permanent head

Head trial

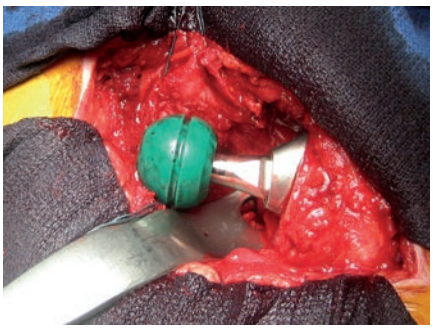
Once the final neck is implanted, it is still possible to use a trial head as with a standard stem.

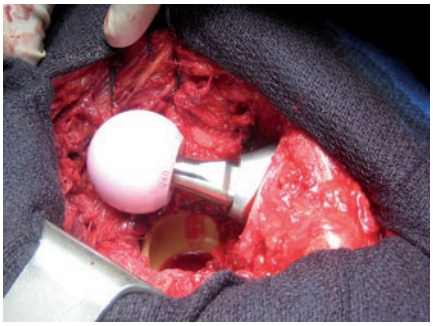
Insertion of the permanent head

It is essential to wash and then dry the Morse taper before the insertion of the permanent head.

V40™ Heads

The ABG™II Modular implant is only compatible with the range of Stryker® V40™ femoral heads. These heads have a taper of 5°40' with an entry diameter of 11.3mm and are available in LFIT™ (alloy of cobalt-chrome) and in Biolox ® Delta.
+5mm is the maximum offset allowed for the heads.
For ceramic heads: only Biolox® Delta ceramic heads allowed (no Biolox® Forte or any pure alumina head can be used).





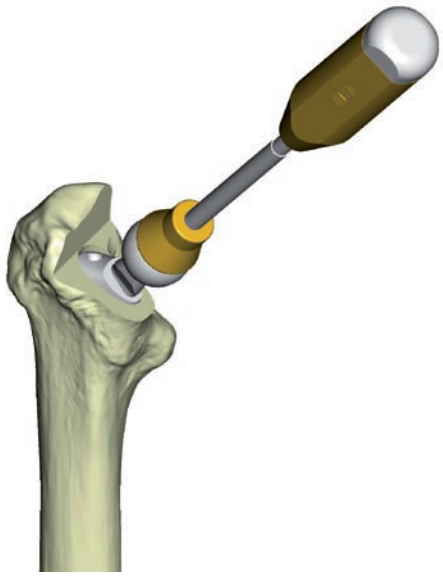


Table of heads (not exhaustive, please refer to full table in the reference section)

Heads in LFIT™ (CoCr) V40™						
Diameter	22.2mm	28mm	32mm	36mm	40mm	44mm
Short necks	-	-4	-4	-5	-4	-4
Standart necks	0	0	0	0	0	0
Long necks	+3	+4	+4	+5	+4	+4

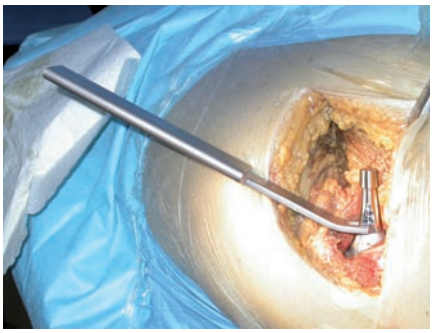
Heads in Biolox® Delta V40™			
Diameter	28mm	32mm	36mm
Short necks	-2.7	-4	-5
Standart necks	0	0	0
Long necks	+4	+4	+5

ABG™II Modular Operative Technique
Peroperative removal of neck and/or stem

Warning!
The procedures and instruments described on this page are for a peroperative use only!
In case of revision, specific instruments are available.
While a change of definitive neck is possible during primary surgery, a revision of the neck only is not recommended and both stem and neck should be removed.

Removal of the neck

If a wrong neck has been selected or if a neck has been implanted with the wrong orientation, it is possible to remove it. For this purpose, use the neck extractor as shown. The creation of mallet vibrations can help greatly to remove the neck. The teeth are engaged around the neck. This creates a splitting force that separates the neck from the stem. No lever movement should be needed, thus preserving the stem fixation and the bone integrity.



Please, note that they are 2 neck extractors:
One for sizes 1 and 2, and one for sizes 3 to 8.

Removal of the stem without neck

For whatever reason, the stem can be removed before neck insertion or after neck removal. The bare stem extractor has been designed to do this. The instrument is simply assembled to the stem as shown below. 2 options are available: 1. Use the stem impactor to push the stem back out of the femur, or 2. Hit the plate to extract the stem. Please note that 2 connectors are available (one for sizes 1 to 5, and one for sizes 6 to 8).

WARNING: it is strongly suggested to change the implants if any removal has been necessary during the intervention.

ABG™II Modular
References

Implants

Femoral Components	Ref.
ABG™II Modular Cementless Hip Stem HA Coated SZE 1 SDE Right	4845-4-101
ABG™II Modular Cementless Hip Stem HA Coated SZE 2 SDE Right	4845-4-102
ABG™II Modular Cementless Hip Stem HA Coated SZE 3 SDE Right	4845-4-103
ABG™II Modular Cementless Hip Stem HA Coated SZE 4 SDE Right	4845-4-104
ABG™II Modular Cementless Hip Stem HA Coated SZE 5 SDE Right	4845-4-105
ABG™II Modular Cementless Hip Stem HA Coated SZE 6 SDE Right	4845-4-106
ABG™II Modular Cementless Hip Stem HA Coated SZE 7 SDE Right	4845-4-107
ABG™II Modular Cementless Hip Stem HA Coated SZE 8 SDE Right	4845-4-108
ABG™II Modular Cementless Hip Stem HA Coated SZE 1 SDE Left	4845-4-201
ABG™II Modular Cementless Hip Stem HA Coated SZE 2 SDE Left	4845-4-202
ABG™II Modular Cementless Hip Stem HA Coated SZE 3 SDE Left	4845-4-203
ABG™II Modular Cementless Hip Stem HA Coated SZE 4 SDE Left	4845-4-204
ABG™II Modular Cementless Hip Stem HA Coated SZE 5 SDE Left	4845-4-205
ABG™II Modular Cementless Hip Stem HA Coated SZE 6 SDE Left	4845-4-206
ABG™II Modular Cementless Hip Stem HA Coated SZE 7 SDE Left	4845-4-207
ABG™II Modular Cementless Hip Stem HA Coated SZE 8 SDE Left	4845-4-208

Implants

Modular Necks	Ref.
ABG™II Modular V40™ Neck Straight Grey NK LNTH Short	4845-4-410
ABG™II Modular V40™ Neck Varus-Valgus Green NK LNTH Short	4845-4-411
ABG™II Modular V40™ Neck Antre-Retro Brown NK LNTH Short	4845-4-412
ABG™II Modular V40™ Neck Antre-Retro Varus-Valgus Yellow NK LNTH Short	4845-4-413
ABG™II Modular V40™ Neck Antre-Retro Valgus-Varus Blue NK LNTH Short	4845-4-414
ABG™II Modular V40™ Neck Straight Grey NK LNTH Long	4845-4-415
ABG™II Modular V40™ Neck Varus-Valgus Green NK LNTH Long	4845-4-416
ABG™II Modular V40™ Neck Antre-Retro Brown NK LNTH Long	4845-4-417
ABG™II Modular V40™ Neck Antre-Retro Varus-Valgus Yellow NK LNTH Long	4845-4-418
ABG™II Modular V40™ Neck Antre-Retro Valgus-Varus Blue NK LNTH Long	4845-4-419

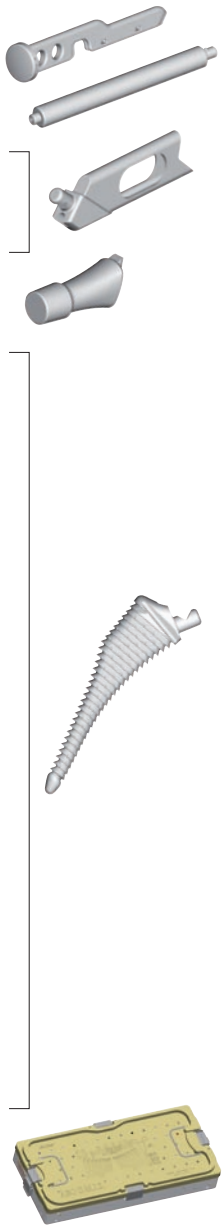
ABG™II Modular
References

ABG II Modular Specific Tray	Ref.
ABG™II Modular - 125° short trial neck green (for the rasps)	4845-5-110
ABG™II Modular - 125° short trial neck yellow (for the rasps)	4845-5-111
ABG™II Modular - 125° short trial neck blue (for the rasps)	4845-5-112
ABG™II Modular - 125° long trial neck green (for the rasps)	4845-5-113
ABG™II Modular - 125° long trial neck yellow (for the rasps)	4845-5-114
ABG™II Modular - 125° long trial neck blue (for the rasps)	4845-5-115
ABG™II Modular - 130° short trial neck grey (for the rasps)	4845-5-210
ABG™II Modular - 130° short trial neck brown (for the rasps) ante-retro 1	4845-5-211
ABG™II Modular - 130° short trial neck brown (for the rasps) ante-retro 2	4845-5-212
ABG™II Modular - 130° long trial neck grey (for the rasps)	4845-5-213
ABG™II Modular - 130° long trial neck brown (for the rasps) ante-retro 1	4845-5-214
ABG™II Modular - 130° long trial neck brown (for the rasps) ante-retro 2	4845-5-215
ABG™II Modular - 135° short trial neck green (for the rasps)	4845-5-310
ABG™II Modular - 135° short trial neck blue (for the rasps)	4845-5-311
ABG™II Modular - 135° short trial neck yellow (for the rasps)	4845-5-312
ABG™II Modular - 135° long trial neck green (for the rasps)	4845-5-313
ABG™II Modular - 135° long trial neck blue (for the rasps)	4845-5-314
ABG™II Modular - 135° long trial neck yellow (for the rasps)	4845-5-315
ABG™II Modular - Head/neck impactor	4845-5-520
ABGII Modular - Neck forceps	4845-5-510
ABGII Modular - Head/neck curved impactor	4845-5-525
ABGII Modular - Stem extractor	4845-5-530
ABGII Modular - Neck extractor (Sizes 3-8)	4845-5-540
ABGII Modular - Neck extractor (Sizes 1-2)	4845-5-541
ABGII Modular - Connector for trial with the stem (sizes 3-8)	4845-5-560
ABGII Modular - Connector for trial with the stem (sizes 1-2)	4845-5-561
ABGII Modular - Broach right size 1	4845-5-951
ABGII Modular - Broach right size 2	4845-5-952
ABGII Modular - Broach left size 1	4845-5-961
ABGII Modular - Broach left size 2	4845-5-962
ABGII Modular - Instrumentation tray	4845-5-550

ABG™II Modular

Templates	Ref.
ABGII Modular - Surgical templates - 5 pack - Scale 1	4845-5-600
ABGII Modular - Surgical templates - 5 pack - Scale 1.10	4845-5-610
ABGII Modular - Surgical templates - 5 pack - Scale 1.15	4845-5-615
ABGII Modular - Surgical templates - 5 pack - Scale 1.20	4845-5-620

ABG II MIS based Set 1	Ref.
Straight rasp handle (x2)	1440-1400
Quick-Connect Handle for Rasp Handle	1440-1040
ABGII MIS modular hollow chisel 8mm	4849-8-108
ABGII MIS modular hollow chisel 12mm	4849-8-112
ABGII MIS modular hollow chisel 16mm	4849-8-116
ABGII MIS trial neck	4845-2-970
ABGII MIS Broach N°1 Right	4845-2-951
ABGII MIS Broach N°2 Right	4845-2-952
ABGII MIS Broach N°3 Right	4845-2-953
ABGII MIS Broach N°4 Right	4845-2-954
ABGII MIS Broach N°5 Right	4845-2-955
ABGII MIS Broach N°6 Right	4845-2-956
ABGII MIS Broach N°7 Right	4845-2-957
ABGII MIS Broach N°8 Right	4845-2-958
ABGII MIS Broach N°1 Left	4845-2-961
ABGII MIS Broach N°2 Left	4845-2-962
ABGII MIS Broach N°3 Left	4845-2-963
ABGII MIS Broach N°4 Left	4845-2-964
ABGII MIS Broach N°5 Left	4845-2-965
ABGII MIS Broach N°6 Left	4845-2-966
ABGII MIS Broach N°7 Left	4845-2-967
ABGII MIS Broach N°8 Left	4845-2-968
Tray / Case	4849-6-350



ABG™II Modular

ABG II Set 2	Ref.
Tray / Case	4849-6-302
ABG Flexible Reamers	
9mm	MAL33000904002 (2224108)
10mm	MAL33001004002 (2224110)
11mm	MAL33001104002 (2224112)
12mm	MAL33001204002 (2224114)
13mm	MAL33001304002 (2224116)
14mm	MAL33001440002 (2224118)
15mm	MAL33001504002 (2224120)
16mm	MAL33001604002 (2224122)
17mm	MAL33001704002 (2224124)
18mm	MAL33001804002 (2224126)
Diameter Gauge for ABGII Broaches and Flexible Reamers	4842-4-002
Flexible Reamer Guide ø3.2mm, L 520mm	4900-1-530
Trinkle female/Jacobs male Adaptor	0252-0-010
Femoral Impactor	4842-1-000

ABG™ II Modular

V40™ Heads

Diameter (mm)	Neck length	Biolox Delta V40™	LFit COCr V40™	Vitallium COCr V40™	V40™ trial heads
22.2	0	-	62609122	62604122	62648122
22.2	+3	-	62609222	62604222	62648222
26	-3	-	62609026	62605026	62648026
26	0	-	62609126	62605126	62648126
26	+4	-	62609226	62605226	62648226
28	-4	65700028	62609028	62605028	62648028
28	-2.7	65700928	-	-	62648928
28	0	65700128	62609128	62605128	62648128
28	+4	65700228	62609228	62605228	62648228
32	-4	65700032	62609032	62605032	62648032
32	0	65700132	62609132	62605132	62648132
32	+4	65700232	62609232	62605232	62648232
36	-5	65700036	62609036	-	62648036
36	-2.5	65700436	-	-	62648436
36	0	65700136	62609136	-	62648136
36	+2.5	65700536	-	-	62648536
36	+5	65700236	62609236	-	62648236
40	-4	-	62609040	-	62648040
40	0	-	62609140	-	62648140
40	+4	-	62609240	-	62648240
44	-4	-	62609044	-	62648044
44	0	-	62609144	-	62648144
44	+4	-	62609244	-	62648244

Bibliography

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