



Fast Adaptable Insight Replacement



Surgical Technique

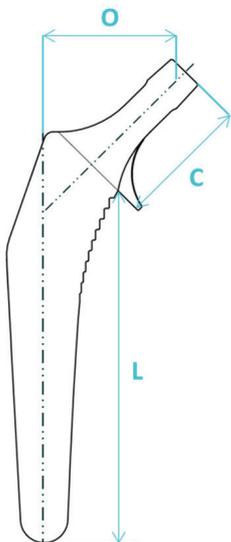
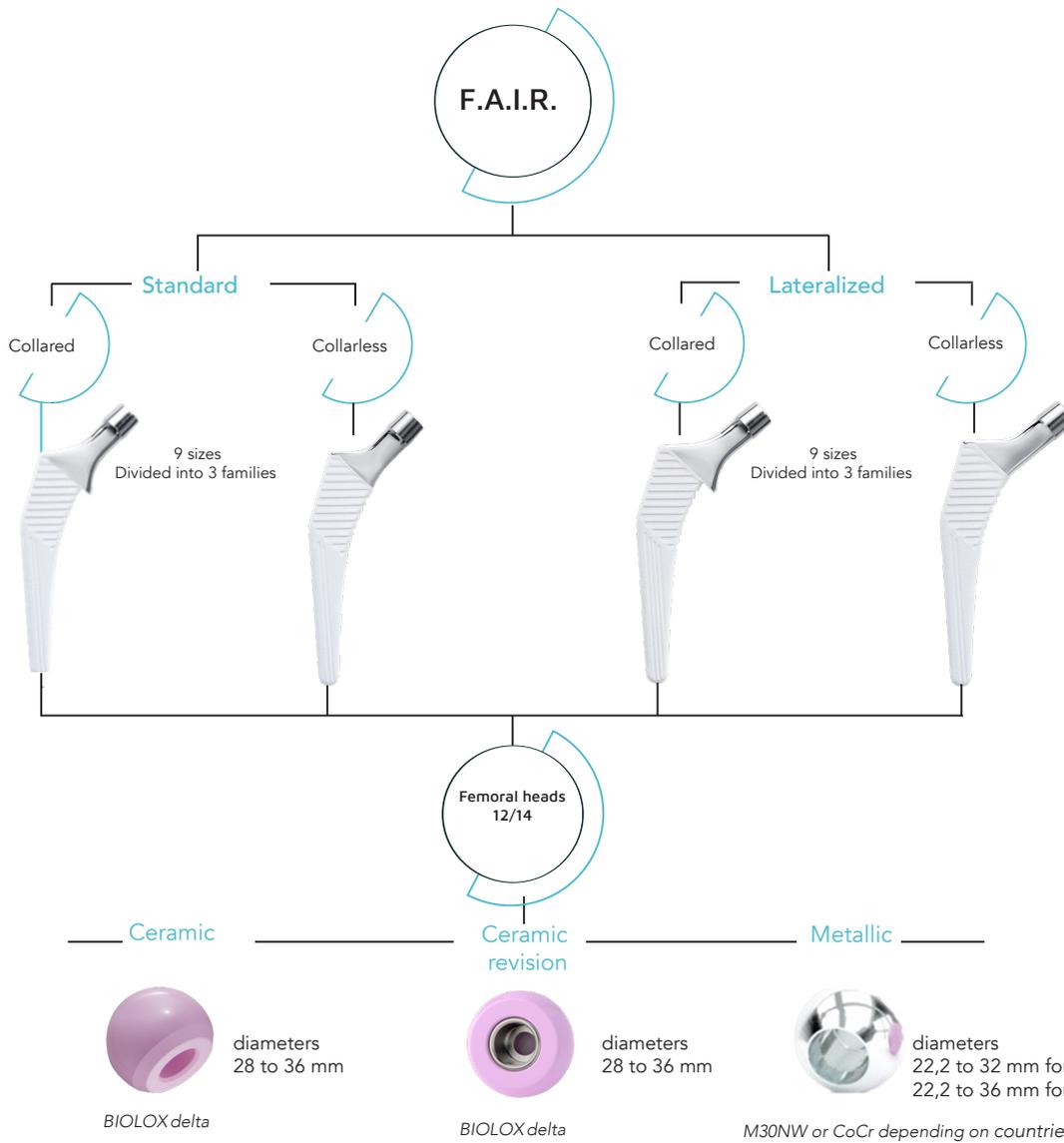


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Concept and Range



Size	L (mm)	O (mm)		C (mm)		Neck-Shaft Angle	
		Standard	Lateralized	Standard	Lateralized	Standard	Lateralized
Family A	1	38,4	44,3	32	34	135°	129°
	2						
	3						
Family B	4	41,2	47,8	36	39	135°	129°
	5						
	6						
Family C	7	44,1	51,3	40	43	135°	129°
	8						
	9						

Concept and Range

Shortened Straight Femoral Stem

Restoration of Hip Biomechanics

Two offsets - Standard and Lateralized.

Bone Stock Preservation

Low Profile Lateral Shoulder

High Surface Contact Area

Horizontal proximal stepped macrostructures on 3 faces
Vertical distal macrostructures open-ended

Tapered Distally

Flat Surface

Under taper - Range of motion

Adaptability

Stems available with or without collar. Collar has the same antero-posterior width as the stem, and its length evolves with implant size.

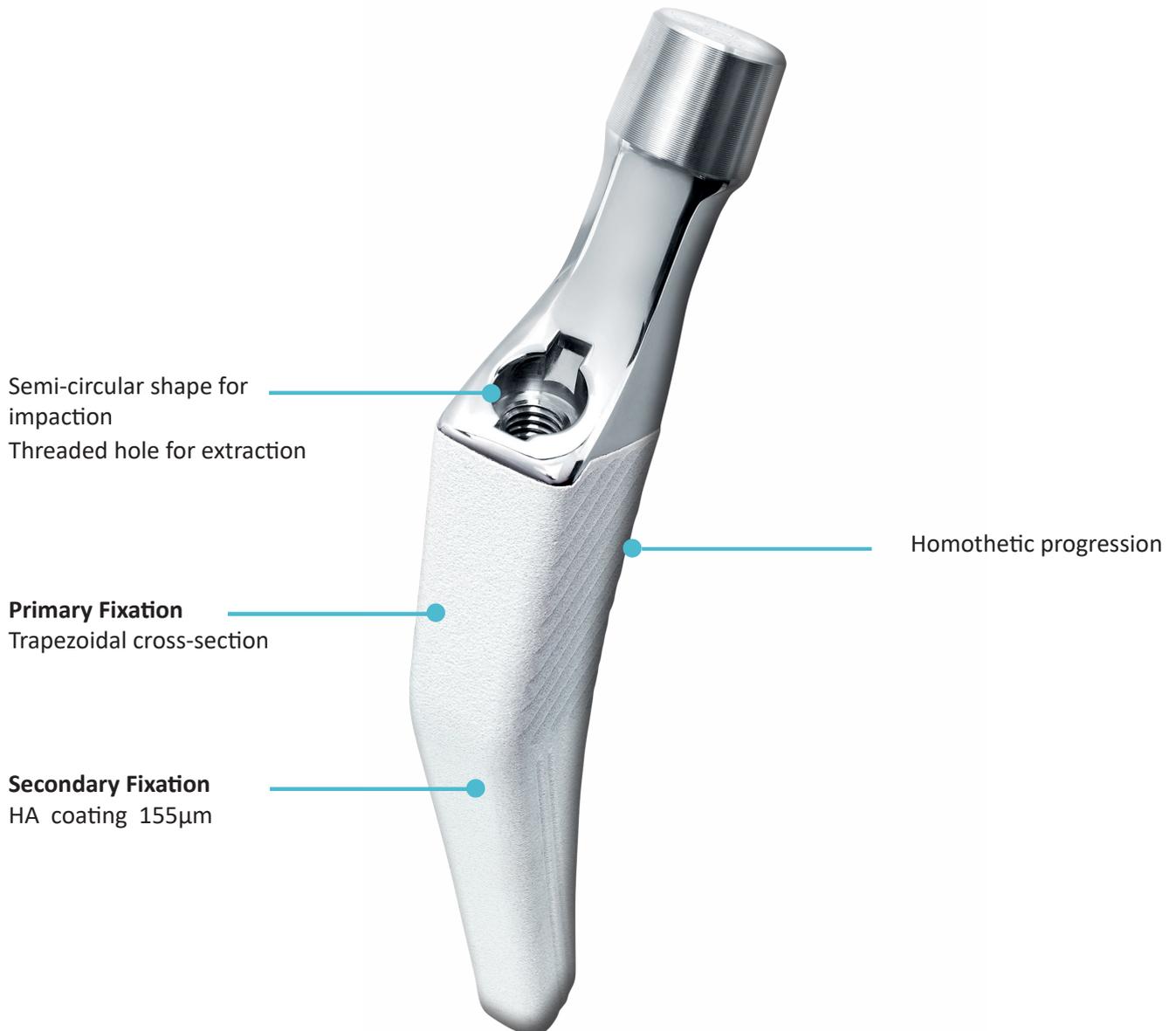


9 femoral sizes (size 1 to 9)
12/14 Taper 5°42'30"



Concept and Range

Stem shortened by 20% compared to a traditional stem⁽¹⁾.
 3 different extramedullary settings (same neck dimensions for 3 stem sizes), designed to independently set the extramedullary part from the intramedullary part.

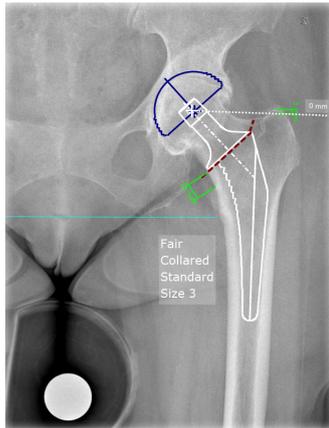


Material = Titanium alloy (Ti6Al4V)

⁽¹⁾ Compared to the AMPLITUDE stems EVOK, INTEGRALE

Surgical technique overview

1 Pre-operative Planning



2 Neck resection & Femoral Canal Preparation



3 Metaphyseal Preparation (Optional)



4 Broaching



Surgical technique overview

5 Calcar Reaming
(optional)



6 Trials on Broach



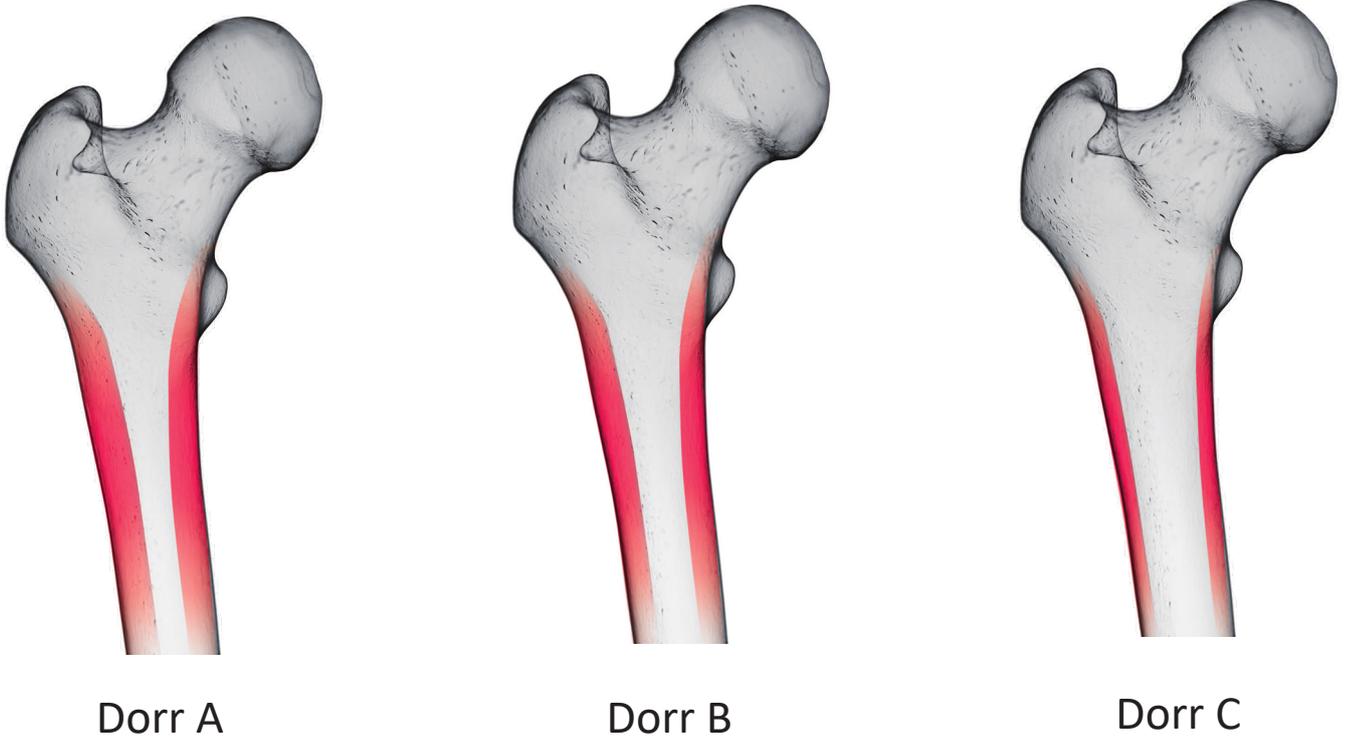
7 Final Stem Impaction



8 Head Impaction and
Final Reduction



1 Pre-operative planning



Pre-operative planning is an important step in total hip arthroplasty. It helps in the determination of optimum implant option, in order to restore patient's anatomy. The preoperative planning process should take quantitative and qualitative factors (such as bone quality, density, and morphology of the patient) into account. Implant size evaluation and the surgical technique are conditioned by the femoral anatomy of the patient:

Dorr A: Thick cortical wall, narrow medullary canal and trabecular bone generally dense. This type of femur is adapted to shortened stems, which avoid a diaphyseal wedging with undersized metaphyseal part. Distal reaming of the femoral canal can be exceptionally considered. Reaming diameter is measured on the template, at the level where the stem might wedge.

Dorr B: Standard femoral anatomy.

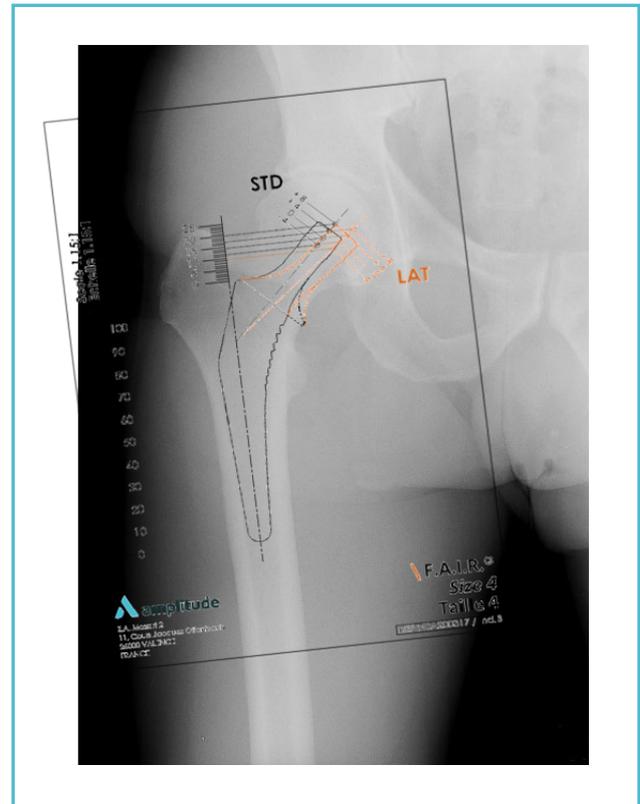
Dorr C: Thin cortical wall, wide metaphyseal and diaphyseal areas. Stem stability is usually achieved using a large size to avoid subsidence. A cemented stem design should be considered.

Pre-operative planning

F.A.I.R. femoral stem offers 2 extra-medullary options to adjust lower limb length and femoral offset:

- Standard option with a 135° neck-shaft angle
- Lateralized option with a 129° neck-shaft angle with larger offset.

- **Size evaluation:** It is advised to select a stem that provides an optimal canal filling while leaving 1 to 2 mm thickness of cancellous bone.
- The **implant option and position**, along with femoral neck cut, should allow a proper restoration of lower limb length and abductor's lever arm. Mark neck resection level, that will be used as a reference intra-operatively.



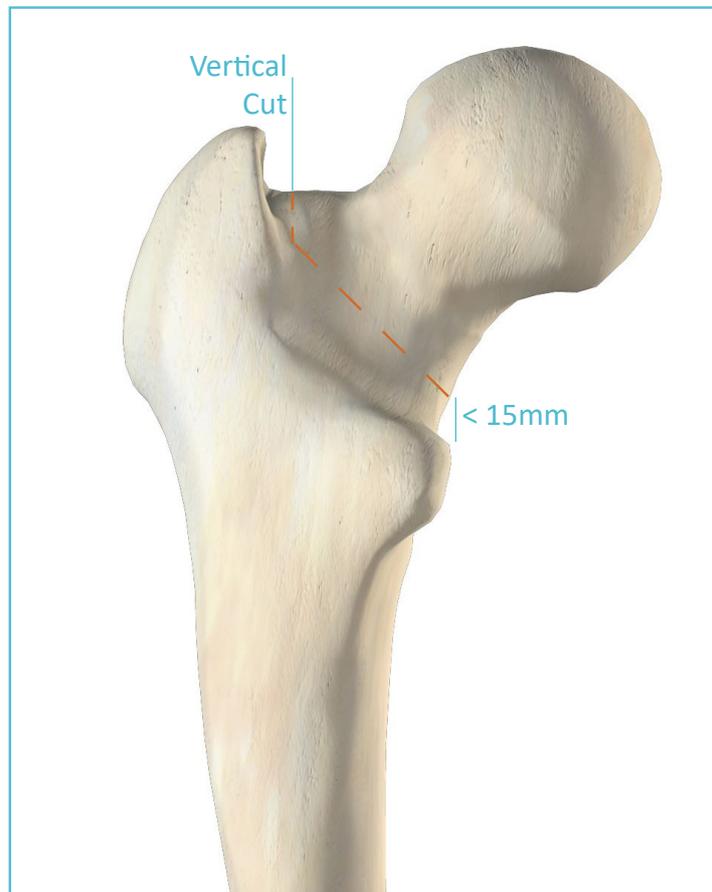
REMINDER

The purpose of this surgical technique description is to provide instructions on how to use the instrumentation properly. The surgeon is fully responsible for choosing and performing the approach and surgical technique.

NOTE

Templates are provided at 115% scale. Other magnifications and digital templates are available on request.

2 Femoral neck resection



The femoral neck resection level, as templated, is identified thanks to the anatomical landmarks (greater trochanter, lesser trochanter, piriformis fossa).

As the stem offers a collared option, femoral neck cut should be oriented in the sagittal plane so as to have the proper anteversion.

Femoral canal preparation can precede or follow the acetabulum preparation step.

The neck cut should be 45°, and can be done before or after femoral head dislocation. Its level can be slightly above what was planned. Final adjustments can be made later, broach in situ, with the calcar reamer.

NOTE

A broach aligned with the femoral diaphysis can enable to confirm the proper orientation of cut.

3 Femoral canal preparation



Canal Identification:

Insert the starter broach adapted to the surgical approach in the axis of the diaphyseal canal to ensure proper orientation of the stem.



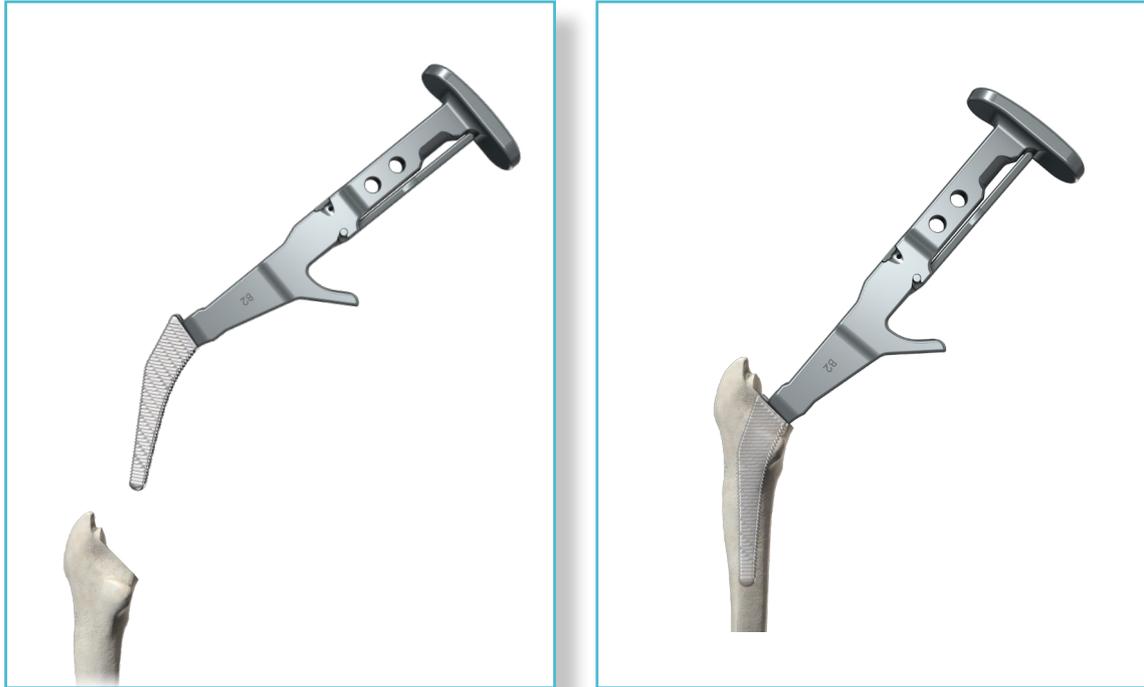
Metaphyseal preparation (optional):

Use the box chisel assembled onto the broach handle adapted to the surgical approach to start preparing the metaphyseal area according to the pre-operative planning.

NOTE

Stem design does not require lateral metaphyseal preparation on the trochanteric side.

4 Broaching



Assemble the smallest femoral broach on the adapted broach handle and push it down into the femoral canal. In order to prevent any varus position, the broaches are introduced in line with the anatomical axis previously determined.

Sequentially increase the size of the broach pushed down the femur. Good preparation of compacted bone in the A/P plane is decisive. It is advised to do several back and forth with a broach of the same size to correctly compact the trabecular bone. Broach size is validated when good axial and rotational stability are achieved. The junction between broach and broach handle should remain visible.

The size of the last broach is usually the size that was templated. Leave the last broach in place in the femur, and remove the broach handle.

NOTE

The top of the broach (junction with broach handle) corresponds with the top of the HA coating on the stem.

NOTE

Broach handles are available for different surgical approaches. They can be provided on request

5 Calcar reaming (for collared stems)



Choose the calcar reamer that matches the broach size in place in the femur, and assemble it to the surgical hand-piece:

- **Broaches sizes 1 — 2**, use calcar reamer diameter 35 mm
- **Broaches sizes 3 to 9**, use calcar reamer diameter 40 mm

Position the calcar reamer's tip into the hole of the broach.

Ream slowly until reaching the broach, in order to achieve a flat surface, taking care to protect the soft tissues in this area.

This step is only necessary when using a collared stem. It ensures that the underside of the collar rests on a flat surface.

NOTE

The femoral neck can be recut directly on the broach

6 Trials on broach

Select a trial neck of the same size and option as templated (Standard or Lateralized).

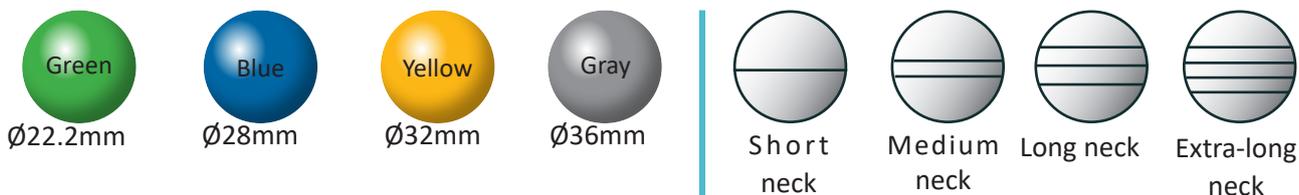
Place the appropriate trial neck on the broach:

- Trial neck for stems family A (sizes 1 – 2 – 3)
- Trial neck for stems family B (sizes 4 – 5 – 6)
- Trial neck for stems family C (sizes 7 – 8 – 9)

Refer to chart page 5 for offset values of all stems options.

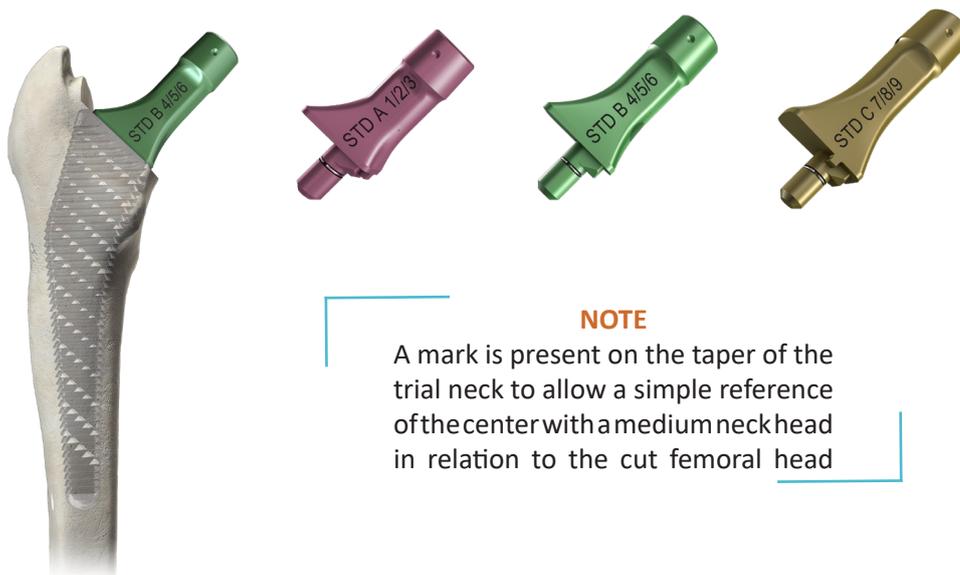
Check the head center position thanks to the pin diameter 2 mm: push the pin through the dedicated hole of the trial neck for the horizontal projection of the prosthetic centre of rotation with medium neck.

Select and place a trial head of the desired neck length and diameter on the trial neck taper:



Reduce the joint using the head impactor. Test the range of motion, joint stability and then check the limb length to confirm adjustments. If trials are unsatisfactory, repeat with a different trial neck and/or trial head until reaching the most satisfying functional result.

Remove the trial neck, and remove the broach from the femoral canal using the broach handle.



NOTE

A mark is present on the taper of the trial neck to allow a simple reference of the center with a medium neck head in relation to the cut femoral head

NOTE

Keep the final broach and trial neck on the table to serve as reference for the final implanted components

7 Final stem impaction



Select the F.A.I.R.stem that matches the size and model (Standard, Lateralized, Collared or Collarless) chosen during the trials.

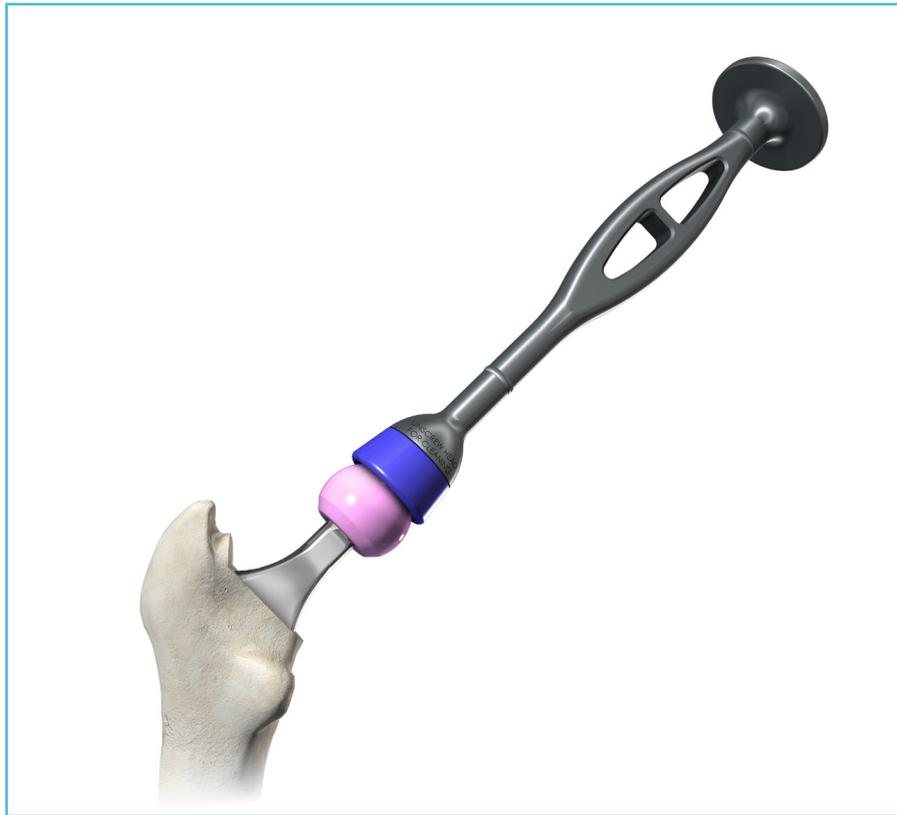
Manually position the stem into the femoral canal, leaving around 10 mm of exposed HA coating. This is approximately at this level that it wedges, due to its press-fit.

Place the stem impactor in the impaction hole on top of the stem. Impactor design, with half-moon shaped tip, allows angular clearance of the instrument to adapt to surgical approach.

Impact the stem until adequate stability is achieved. HA coating border corresponds to the junction between broach and broach handle. Once the stem is stable, remove the stem impactor.

It is possible to perform new reduction trials with trial heads to confirm joint stability and leg length.

8 Final head impaction



Select the final head corresponding to the one validated previously.

Before placing the ceramic head on the femoral stem:

- Dry the stem taper
- Carefully inspect the stem taper and the head taper, and remove any foreign material.

Impaction of a metallic or ceramic head:

Manually place the head on the stem taper using a slight turning motion while pushing along the taper axis, until it firmly wedges. Secure the head on the stem taper using the head impactor: tap the impactor with a light hammer blow in the taper axis.

Reduce the joint.

Impaction of a ceramic head:

Manually assemble the sleeve into the head on the table, until resistance is felt. Manually place the head on the stem taper using a slight turning motion while pushing along the taper axis, until it firmly wedges. Secure it using the head impactor with a light hammer blow in the taper axis.

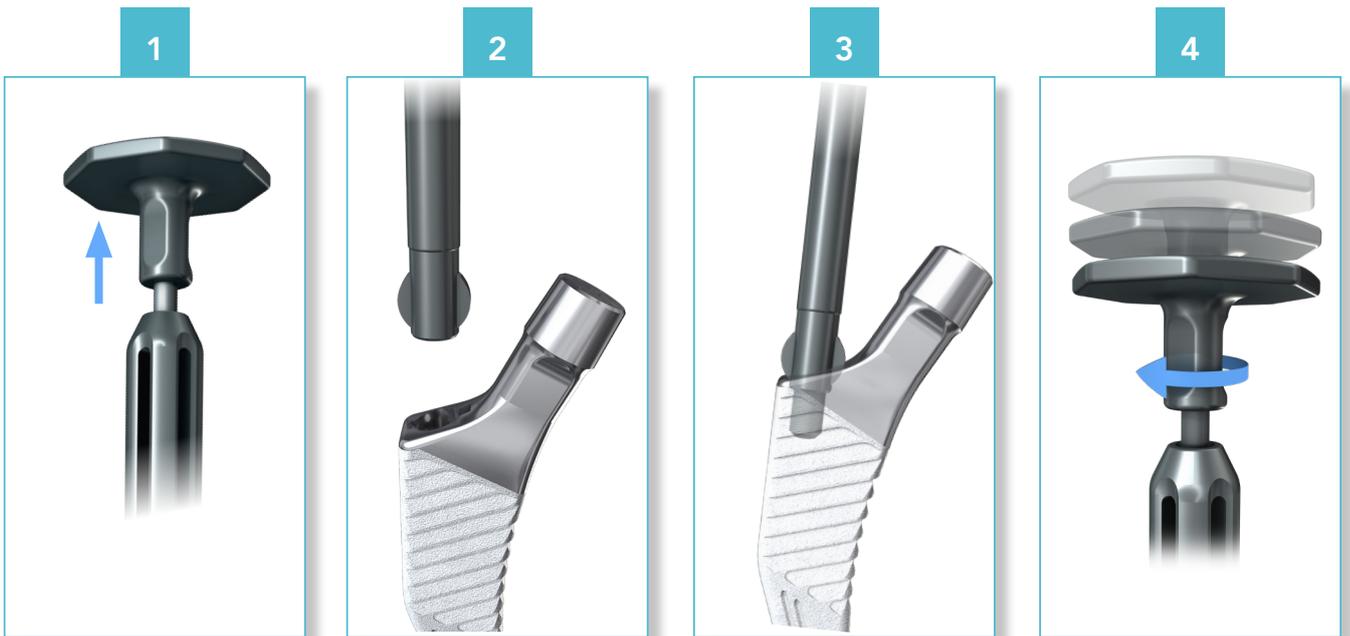
Reduce the joint.

9 Stem extraction (optional)

A per-operative extraction instrumentation is available.
Remove the femoral head by tapping around the base of the head.

Assemble the extractor according to Appendix A.

The threaded hole axis is 15° medially oriented compared to the diaphysis, in order to ease extractor insertion.



Keep the shaft with the strike plate in high position, so the thread end is retracted.

Position the half-moon shaped extremity of the extractor in the oblong hole and release the shaft with the strike plate

Orient the extractor toward the neck until the threaded hole axis is found.

Tightly screw the extractor tip into the upper portion of the stem.



Extract the stem from the femoral canal by tapping under the strike plate. Keep the extractor aligned with the stem axis during extraction.

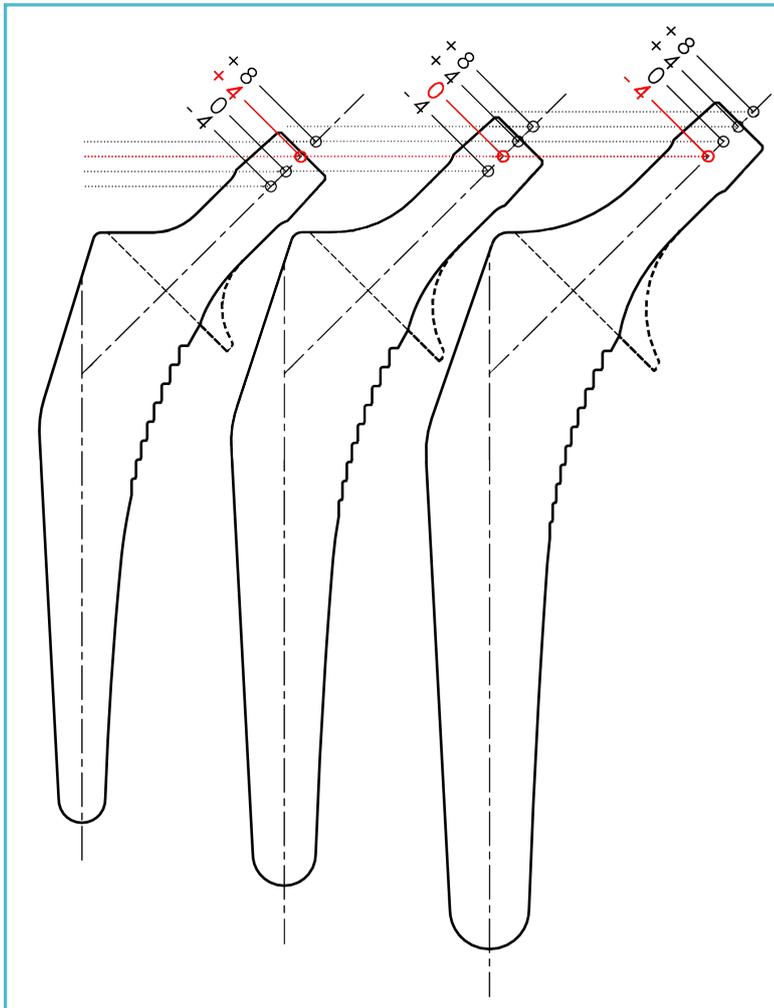
NOTE

If facing difficulties when extracting the stem, it is possible to screw an additional slap hammer to have a higher extraction force, see Appendix A of the document.



Extra-medullary design

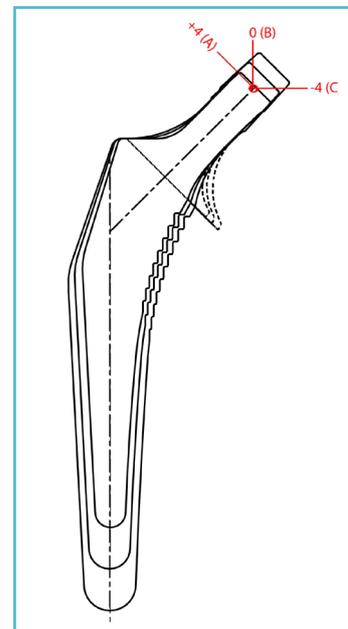
Link between families:



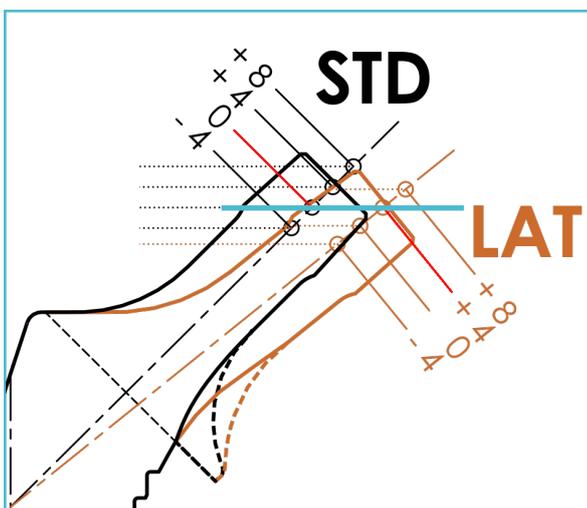
Head Centre with Medium Neck family N^*
 = Head Centre with Short Neck family N^*+1
 = Head Centre with Long Neck family N^*-1

Example:

COR^{**} Stem STD size 6 medium neck head
 = COR Stem STD size 7 with short neck head
 = COR Stem STD size 3 with long neck



Link between standard and lateralized options into the same family:



Height Head Centre Medium Neck STANDARD family N^*
 = Height Head Centre Long Neck LATERALIZED family N^*

Example:

Leg length with Stem STD size 3 medium neck head
 = Leg length with Stem LAT size 3 long neck head

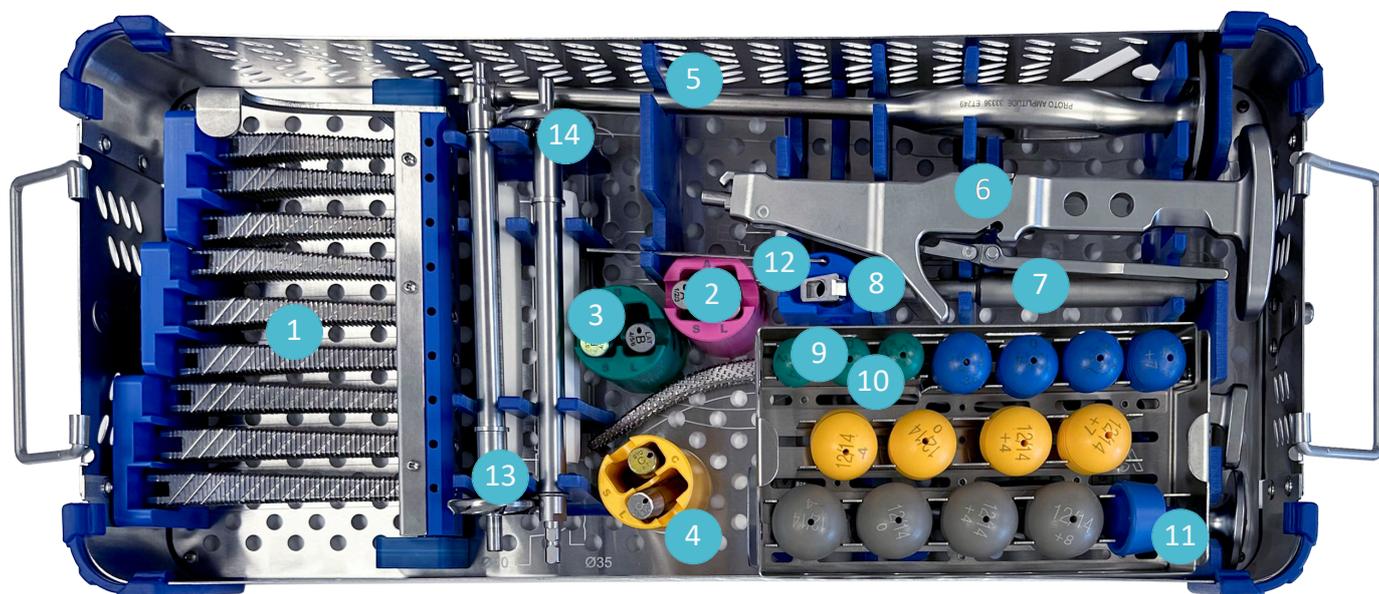
Note: For higher and lower neck length, the leg length difference is 0.3 mm between STD and LAT.

* $N = A, B$ or C

** $COR =$ Center Of Rotation

Instrumentation

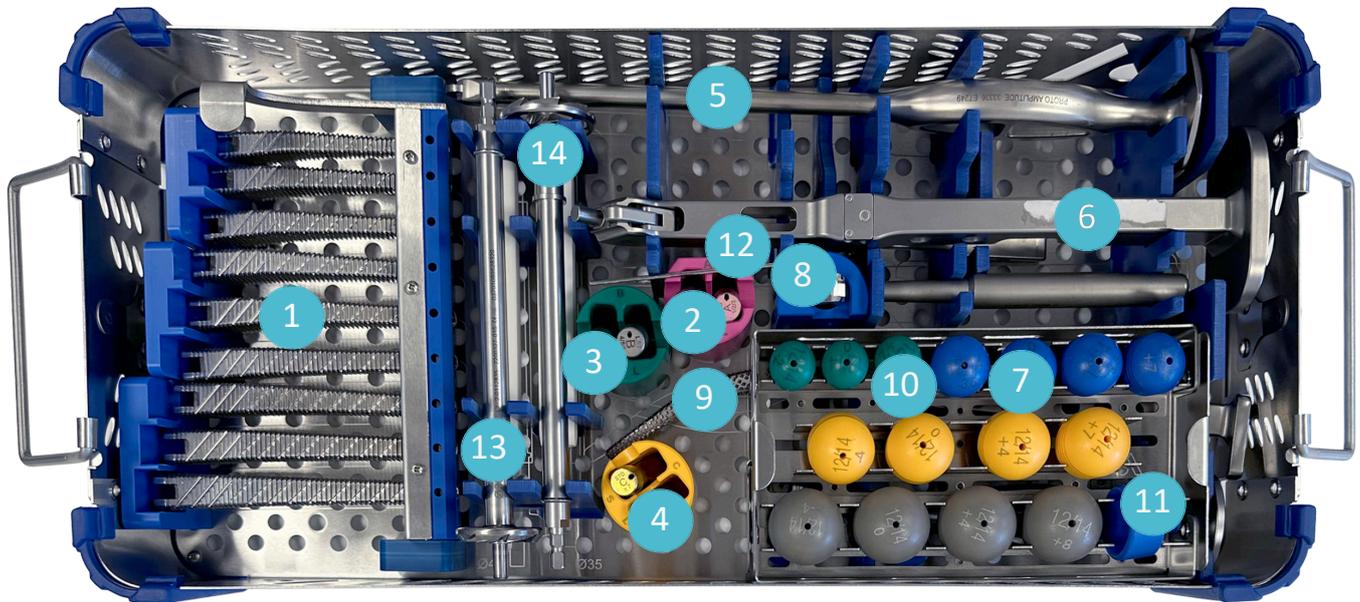
Femoral stem anterior approach preparation set C.LEVER Connexion



Rep	Description	Reference	Qty
1	Femoral broach for F.A.I.R.® stem-size 1 to 9	2-01986 01 to 09	1
2	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family A	2-0188101	1
3	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family B	2-0188102	1
4	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family C	2-0188103	1
2	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family A	2-0198701	1
3	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family B	2-0198702	1
4	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family C	2-0198703	1
5	Orientable impactor for femoral stem	2-0125600	1
6	C.LEVER Broach Handle - DAA 40° Straight - Model B2*	2-01300B2	1
7	Holding rod 10/15	2-0126100	1
8	Box chisel - Small size	2-0175000	1
9	Femoral starter for Anterior approach	2-0194800	1
10	Trial head 12/14 \varnothing 22,2 Short, Medium, Long Neck	2-01961 04 to 06	1
10	Trial head 12/14 \varnothing 28 Short, Medium, Long, Extra-long Neck	2-01961 01 to 103 and 2-0196113	1
10	Trial head 12/14 \varnothing 32 Short, Medium, Long, Extra-long Neck	2-01961 07 to 09 and 2-0196114	1
10	Trial head 12/14 \varnothing 36 Short, Medium, Long, Extra-long Neck	2-01961 10 to 112 and 2-0196115	1
11	Head impactor	112-042-045	1
12	Alignment Pin \varnothing 2 A/P	2-0114000	1
13	Calcar Reamer for C.LEVER Broaches - \varnothing 35 mm - Zimmer/Hall	2-01128 35	1
14	Calcar Reamer for C.LEVER Broaches - \varnothing 40 mm - Zimmer/Hall	2-01128 40	1

Instrumentation

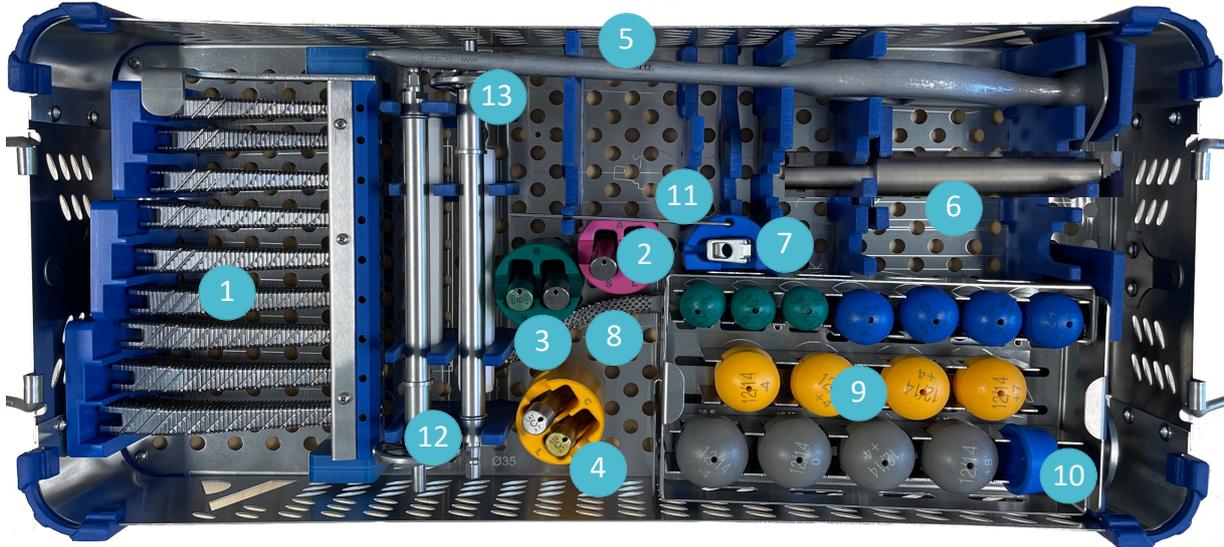
Femoral stem posterior approach preparation set C.LEVER Connexion



Rep	Description	Reference	Qty
1	Femoral broach for F.A.I.R.® stem-size 1 to 9	2-01986 01 to 09	1
2	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family A	2-0188101	1
3	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family B	2-0188102	1
4	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family C	2-0188103	1
2	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family A	2-0198701	1
3	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family B	2-0198702	1
4	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family C	2-0198703	1
5	Orientable impactor for femoral stem	2-0125600	1
6	C.LEVER Broach Handle - Straight posterior - Model A1*	2-01300A1	1
7	Holding Rod 10/15	2-0126100	1
8	Box chisel - Small size	2-0175000	1
9	Femoral Starter for Posterior Approach	2-0122500	1
10	Trial head 12/14 \varnothing 22,2 Short, Medium, Long Neck	2-01961 04 to 06	1
10	Trial head 12/14 \varnothing 28 Short, Medium, Long, Extra-long Neck	2-01961 01 to 103 and 2-0196113	1
10	Trial head 12/14 \varnothing 32 Short, Medium, Long, Extra-long Neck	2-01961 07 to 09 and 2-0196114	1
10	Trial head 12/14 \varnothing 36 Short, Medium, Long, Extra-long Neck	2-01961 10 to 112 and 2-0196115	1
11	Head impactor	112-042-045	1
12	Alignment Pin \varnothing 2 A/P	2-0114000	1
13	Calcar Reamer for C.LEVER Broaches - \varnothing 35 mm - Zimmer/Hall	2-01128 35	1
14	Calcar Reamer for C.LEVER Broaches - \varnothing 40 mm - Zimmer/Hall	2-01128 40	1

Instrumentation

Femoral stem preparation set C.LEVER Connexion Without broach handle - to be associated with a module*

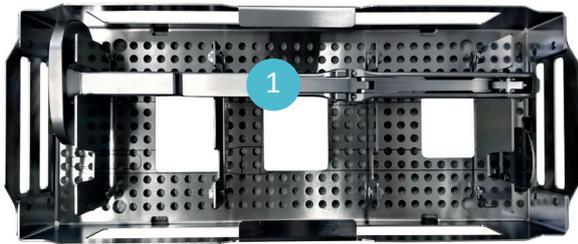


Rep	Description	Reference	Qty
1	Femoral broach for F.A.I.R.® stem-size 1 to 9	2-0198601 to 09	1
2	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family A	2-0188101	1
3	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family B	2-0188102	1
4	Trial neck on broach for F.A.I.R.® stem 12/14 Lateralized - family C	2-0188103	1
2	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family A	2-0198701	1
3	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family B	2-0198702	1
4	Trial neck on broach for F.A.I.R.® stem 12/14 Standard - family C	2-0198703	1
5	Orientable impactor for femoral stem	2-0125600	1
6	Holding rod 10/15	2-0126100	1
7	Box chisel - Small size	2-0175000	1
8	Femoral starter for Anterior approach	2-0194800	1
9	Trial head 12/14 Ø22,2 Short, Medium, Long Neck	2-0196104 to 06	1
9	Trial head 12/14 Ø28 Short, Medium, Long, Extra-long Neck	2-0196101 to 103 and 2-0196113	1
9	Trial head 12/14 Ø32 Short, Medium, Long, Extra-long Neck	2-0196107 to 09 and 2-0196114	1
9	Trial head 12/14 Ø36 Short, Medium, Long, Extra-long Neck	2-0196110 to 112 and 2-0196115	1
10	Head impactor	112-042-045	1
11	Alignment Pin Ø2 A/P	2-0114000	1
12	Calcar Reamer for C.LEVER Broaches - Ø35 mm - Zimmer/Hall	2-0112835	1
13	Calcar Reamer for C.LEVER Broaches - Ø40 mm - Zimmer/Hall	2-0112840	1

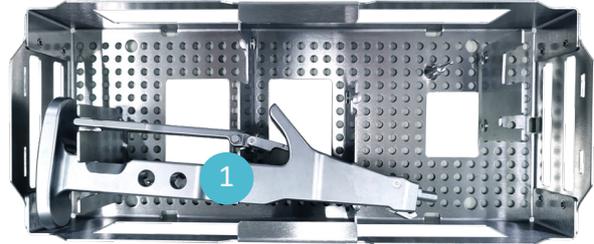
*Various broach handles can be supplied in modules depending on surgical approach

Instrumentation

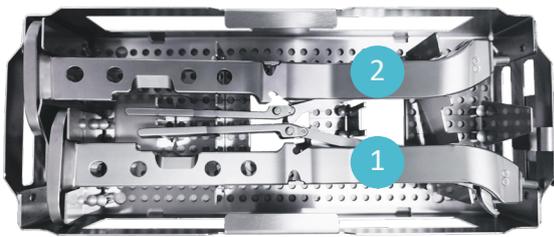
C.LEVER Broach Handles Modules



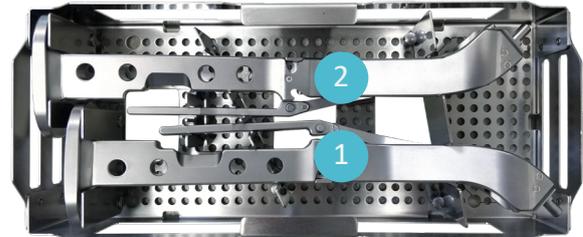
Rep	Designation	Ref.	Qty
1	C.LEVER Broach Handle - Straight posterior - Model A1	2-01300A1	1



Rep	Designation	Ref.	Qty
1	C.LEVER Broach Handle - DAA 40° Straight - Model B2	2-01300B2	1

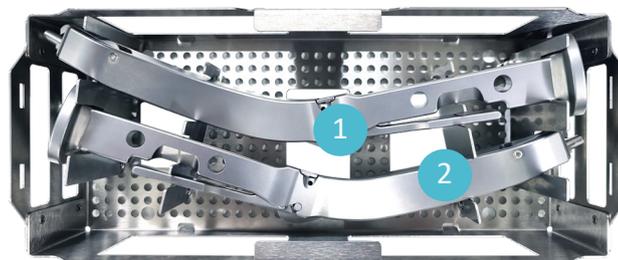


Rep	Designation	Ref.	Qty
1	C.LEVER Broach Handle - DAA 40° M/L Offset - Model C1 - Left	2-01300C1-L	1
2	C.LEVER Broach Handle - DAA 40° M/L Offset - Model C1 - Right	2-01300C1-R	1



Rep	Designation	Ref.	Qty
1	C.LEVER Broach Handle - M/L Offset - Model D1 - Left*	2-01300D1-L	1
2	C.LEVER Broach Handle - M/L Offset - Model D1 - Right*	2-01300D1-R	1

*this broach handle model can be used in posterior approach by inverting the sides used



Rep	Designation	Ref.	Qty
1	C.LEVER Broach Handle - Dual Offset - Model E1 - Left	2-01300E1-L	1
2	C.LEVER Broach Handle - Dual Offset - Model E1 - Right	2-01300E1-R	1

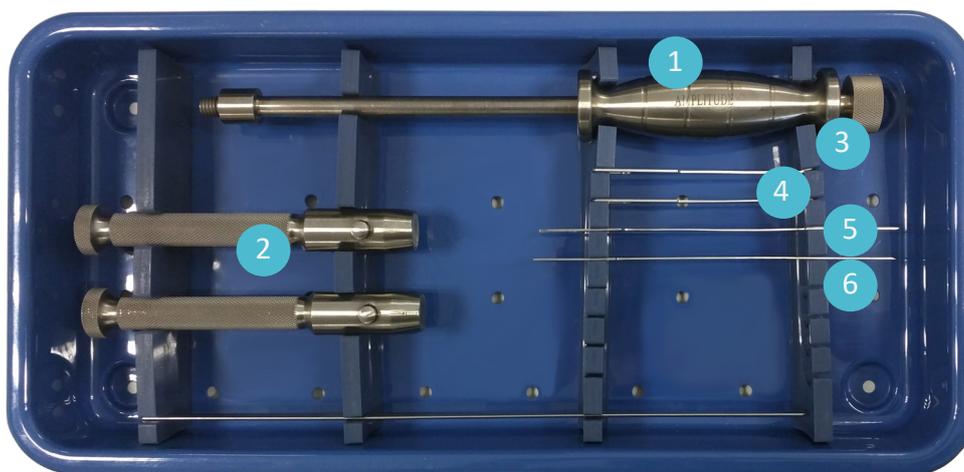
Instrumentation

Per-operative extraction set



Rep	Description	Reference	Qty
1	Slap Hammer Shaft	2-0102900	1
2	Femoral Stem Extractor Sleeve for Slap Hammer	2-0194900	1
3	Slap Hammer Cylinder	2-0103300	1
4	Extraction Shaft for Guided M6 Sleeve Femoral Stem Extractor	2-0188300	1

Cementless stem extraction instrumentation set



Rep	Description	Reference	Qty
1	Extraction Slap Hammer	12-007-000	1
2	Quick Release Handle	10-020-000	1
3	Flexible chisel Blade 8mm - Short	2-0198801	1
4	Flexible chisel Blade 10mm - Short	2-0198803	1
5	Flexible chisel Blade 8mm - Long	2-0198802	1
6	Flexible chisel Blade 10mm - Long	2-0198804	1



Appendix A

Extractor assembly

Per-operative extractor for F.A.I.R.® femoral stem is composed of:

- > Extraction shaft **4** that contains a handle, a strike plate and threaded extremity
- > Extractor sleeve **2** with a half-moon shaped extremity

To assemble the components, screw part **2** with **4**.



If facing difficulties during extraction, assemble the slap hammer **3** with the slap hammer shaft **1** and screw the assembly to the strike plate of part **4**.







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