HERMES

UNICOMPARTMENTAL KNEE SYSTEM

SURGICAL TECHNIQUE

MINIMALLY INVASIVE INSTRUMENT SYSTEM

CERAVER

EXPERIENCE - INNOVATION

RATIONALE

The HERMES minimally invasive instrument system allows the surgeon to perform unicompartmental knee arthroplasty (UKA) through a small incision, without everting the patella. The technique is based on a tibia first approach. Flexion and extension gaps are assessed prior to performing the femoral cuts so that the femoral component can be optimally positioned relative to the tibial component.

Accurate component positioning

- Proximal tibial cut : varus/valgus, posterior slope, and thickness of the resection can be set independently. Accurate tibial resection can be achieved using the tibial cutting block and the external tibial alignment guide.

- Performing soft-tissue balance prior to femoral cuts : it allows to determine and set the desired leg alignment and, therefore, the angle of the femoral cuts.

- Distal femoral cut using the intramedullary (IM) or extramedullary (EM) technique :
  - EM technique allows alignment of the components in extension.
  - IM technique allows reproducible positioning of the femoral component.

- Femoral sizing and finishing cuts : one finishing guide per component size (5 sizes) to ensure that the tibial and femoral components are perfectly aligned in flexion, and that the amount of bone removed from the posterior condyle is replaced by an equal amount of metal.

Option : the relative position of the femoral and tibial components can be checked in flexion and extension before setting the axial rotation of the femoral component.

Indications

Unicompartmental knee replacement (UKR) is indicated for patients with medial or lateral compartment osteoarthritis, with normal joint space on the contralateral side as confirmed by stress views.

DISTAL AND POSTERIOR FEMORAL CUTS

EM technique

IM technique

Femoral sizer/Finishing guide (posterior & chamfer cuts)

PROXIMAL TIBIAL CUT

Asymmetric tibial cutting block

Contraindications

UKR is contraindicated in the following situations : absent anterior cruciate ligament (ACL), inflammatory arthritis (chondrocalcinosis), severe deformity that requires overcorrection or ligament release.

ABBREVIATED SURGICAL TECHNIQUE

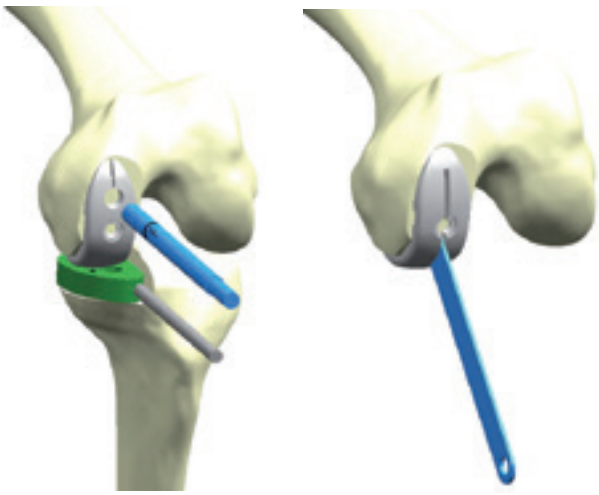
1 PROXIMAL TIBIAL CUT P.8

2 ESTABLISH THE FLEXION GAP P.10

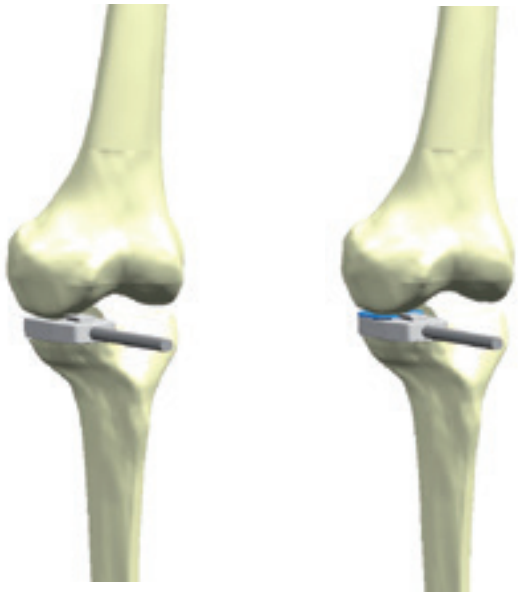
Determine thickness of the tibial insert (7, 9 or 11 mm) with the knee flexed 90°

4 POSTERIOR & CHAMFER CUTS P.14

5 TRIALING & FEMORAL FIN SLOT P.16

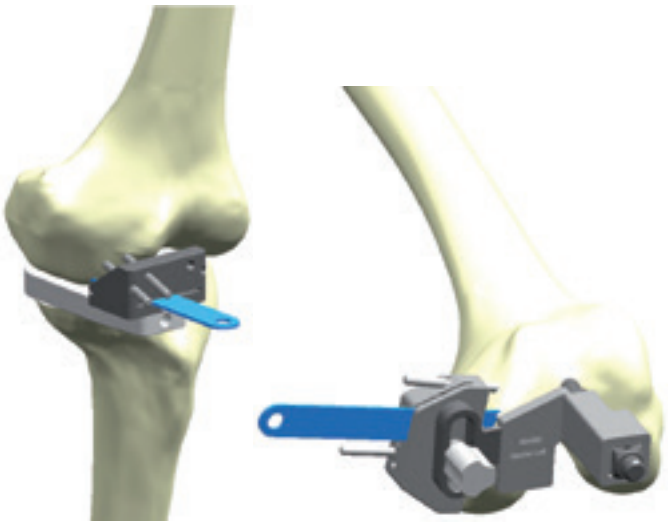


2 ESTABLISH THE EXTENSION GAP P.10



Validate thickness of the tibial insert in extension and determine distal cut level : «0» or «-2»

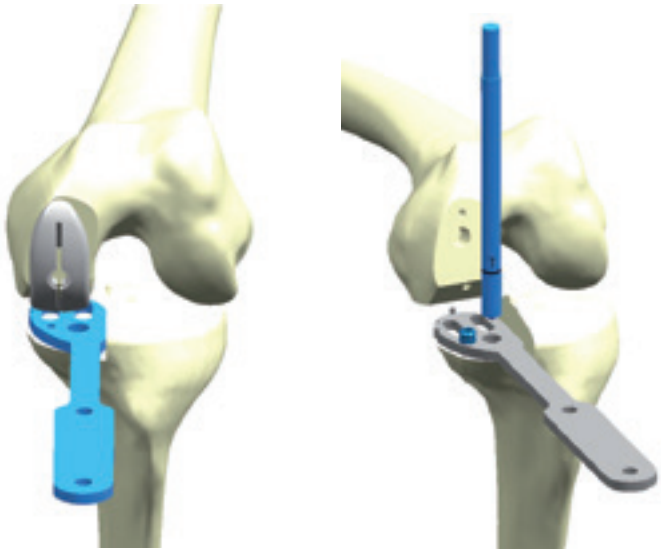
3 DISTAL FEMORAL CUT P.11



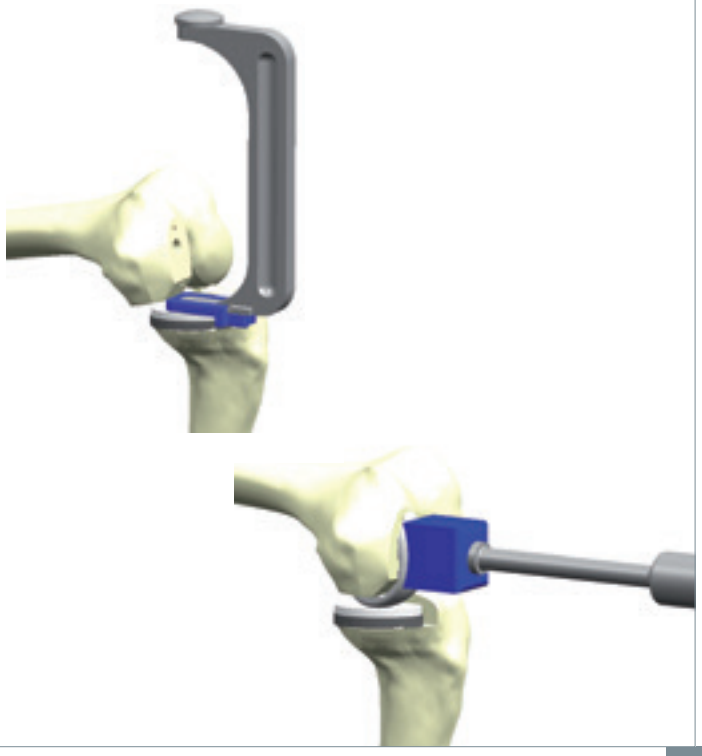
EM Technique

IM Technique

6 TRIALING & TIBIAL BASEPLATE P.17



7 IMPLANT FINAL COMPONENTS P.18



CONTENTS

PREOPERATIVE PLANNING & EXPOSURE

PREOPERATIVE PLANNING

An A/P view is used to determine the tibial resection level that will allow restoration of the joint line and correction of coronal deformity. A stress view may be helpful to determine the desired amount of correction.
One generally assumes that using a tibial component that is 1 mm thicker than the worn articular surface to be replaced results in one degree of correction of leg alignment.

A lateral view is used in conjunction with the x-ray templates to determine the size of the femoral component (which will have to be confirmed intraoperatively). The distal femoral cut should be performed perpendicular to the anatomic axis of the femur, and the component on the template should extend 1 to 2 mm distal to the inferior margin of the femur so as to restore the normal joint line.
The lateral view is also useful to evaluate the posterior tibial slope.

EXPOSURE

> Make an anteromedial or anterolateral skin incision (depending on the affected side), beginning 1 cm proximal to the superior pole of the patella, and extending 6-10 cm distally along the edge of the patella and patellar tendon to about 2 cm distal to the joint line. The incision may be extended further, if necessary (first implantation, obese patient ....).

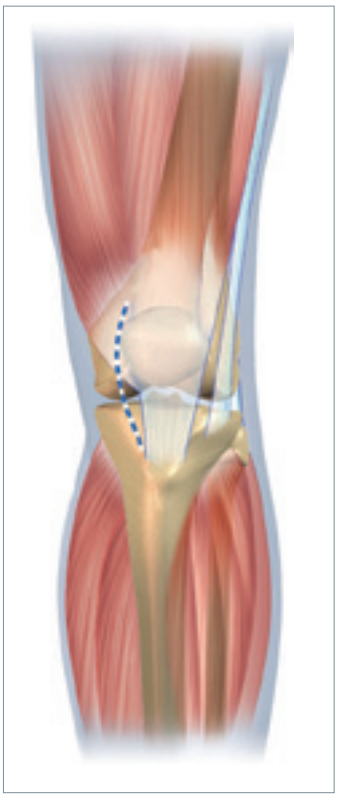
> Enter the joint using a parapatellar incision. Dislocation and eversion of the patella are not necessary. If the IM technique is used in the femur, the patella is simply subluxated and held in position by the IM rod.

> Incise the meniscus at the junction with the capsule, as far posteriorly as possible. Perform periosteal stripping of the tibia down to the anticipated tibial cut level.

> Remove all femoral and tibial osteophytes. Capsule and ligament release should be avoided.

> Carefully inspect the other knee compartments and ACL to confirm the indication for unicompartmental knee arthroplasty.

> First of all, place a mark at the limit between the condyles and the trochlear groove to avoid potential impingement of the femoral component upon the patella.



PROXIMAL TIBIAL CUT

STEP ONE > Extramedullary Technique

1/ Assembly and positioning of the extramedullary aligment system

- First assemble the extramedullary aligment system.
- Center the V-shaped ankle clamp over the ankle joint, check rotational alignment of the guide, and stabilize the lower assembly at the ankle joint with the elastic band.
- Raise the tibial cutting block to the level of the anticipated proximal tibial cut, and fix the cutting block in place by inserting a 3.2 mm pin through the slot in the proximal rod.

2/ Adjustment of the external tibial alignment guide in the coronal and sagittal planes

- In the frontal plane, align the vertical shaft of the instrument parallel to the tibial axis by adjusting the medial-lateral position of the ankle bar (thumbscrew 1).

Note : If a slight varus cut is wanted, just move the ankle bar 1 cm towards the lateral malleolus.

- In the sagittal plane, align the vertical shaft of the instrument relative to the tibial axis such that the posterior tibial slope is approximately 3°. This can be achieved by adjusting the anterior-posterior position of the ankle bar (thumbscrew 2).

Note : Too much posterior slope may result in excessive tension on the ACL.

3/ Determination of the tibial cut level

The tibial component should be at least 9 mm thick, which means that a 6 mm resection is usually performed, based on the lowest point of the tibial plateau. This allows for a slight amount of wear of the proximal tibia. In case of severe wear, lower the tibial cutting block to perform the cut 2 mm below the sulcus.

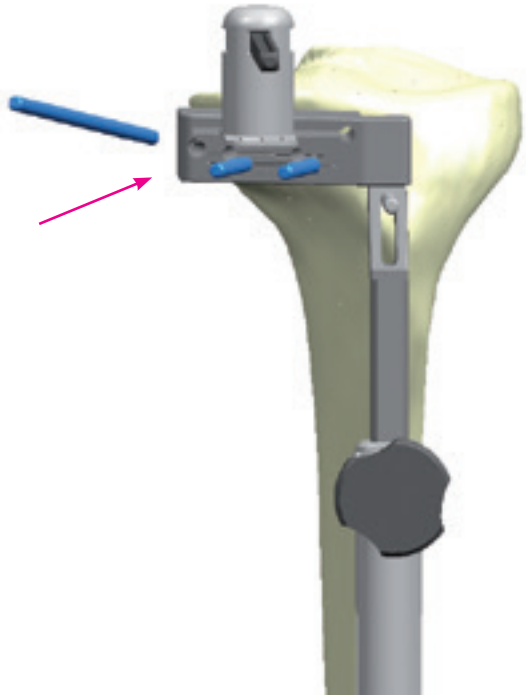
- Insert the appropriate tibial stylus (2 mm or 6 mm) into the slot of the cutting block, and position the tip of the stylus over the center of the sulcus.

Note : A 6 mm tibial cut allows for a slight wear of the proximal tibia and results in a correction of about 3 degrees (using the thinnest tibial component : 9 mm).

4/ Tibial cutting block

- Secure the tibial cutting block to the proximal tibia using two 3.2 mm pins inserted parallel to each other through the holes marked «0». This will allow for an additional 2 mm bone resection, if necessary.
- Insert a third 3.2 mm pin through the oblique hole to further secure the cutting block.
- Remove the tibial stylus.

Note : The external tibial alignment guide may be left in place during resection of the proximal tibia to ensure perfect stability of the cutting block.

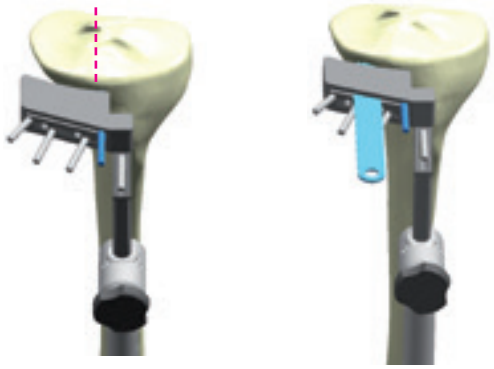


5/ Tibial resection

- The sagittal cut is made with a reciprocating saw : for a medial compartment, a strictly sagittal cut ; for a lateral compartment, a slightly oblique cut (with an anteromedial direction).
- Insert a 3.2 mm pin into the hole located at the medial end of the slot to mark the limit of the horizontal cut (and thus preserve tibial eminence integrity).
- Make the horizontal cut through the slot in the tibial cutting block.

Note : The horizontal cut should be performed using a narrow saw blade (1.27 x 12.5 mm) with a minimum length of 60 mm.

- Remove the external tibial alignment guide, leaving the two parallel pins in place.
- Insert the tibial spacer that corresponds to a 7 mm thick tibial insert. If the knee is tight both in extension and flexion, remove an additional 2 mm of bone from the proximal tibia.



OPTION / Recutting the proximal tibia

- To resect an additional 2 mm of bone, reposition the tibial cutting block over the pins in the «+2» holes.

SOFT-TISSUE BALANCING

STEP TWO

1/ Establish the flexion gap (with the knee flexed 90°)

The aim is to determine the appropriate thickness of the tibial insert : the PE insert should fit snugly in the space created by the tibial resection.

- With the knee flexed 90 degrees, insert the tibial spacers that correspond to the 7 mm, 9 mm and 11 mm tibial inserts.

Note : If the knee is tight in flexion with the thinnest tibial spacer (7 mm), check the tibial slope and/or remove an additional 2 mm of bone from the tibia in order to open the flexion gap.

- Select the tibial insert that provides optimal stability of the joint at 90 degrees of flexion.

Note : Thickness of the posterior femoral cut should be equal to the thickness of the prosthetic posterior condyle (6 to 9 mm according to the size of the femoral component).

2/ Establish the extension gap

This is the step of validation of the thickness of the tibial insert previously determined in flexion. In case of imbalanced flexion and extension gaps, adjustment will have to be made during distal femoral resection.

- With the knee fully extended, insert the spacer block used in flexion.

- Check stability of the joint and overall alignment of the lower limb :

Case A/ Alignment and stability are satisfactory : thickness of the PE insert can be validated. A standard distal femoral cut **«0»** will be performed, with thickness of bone resection corresponding to thickness of the component.

Case B/ Alignment and/or stability are not satisfactory : place a 2 mm augment on the spacer block and check again stability and alignment in extension. The augment is intended to compensate for wear of the distal femur. As a result, 2 mm less bone will be removed from the distal femur : **cut «-2»**.

Case A :
Distal cut «0»

Case B :
Distal cut «-2»

DISTAL FEMORAL CUT

STEP THREE > Extramedullary Technique

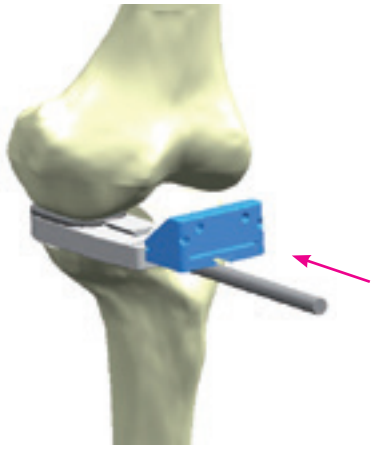
1/ Preparation for the distal femoral cut

- Following assessment of the extension gap, leave the selected spacer block with the attached 2 mm augment (if any) in place.
- Insert the extension distal femoral cutting block into the dovetail of the spacer block.

Note : Resection is automatically set to «0» or «-2» depending on whether a 2 mm augment has been used or not.

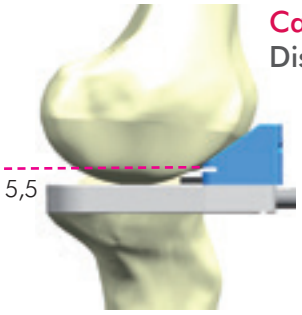
- Thus, in full extension, the distal femoral cutting block lies parallel to the resected tibial surface in both the frontal and sagittal planes.

Note : To ensure that the distal femoral cut will not be too anterior (i.e. the saw blade will not pass through the trochlear groove), it may be necessary to slightly flex the knee.

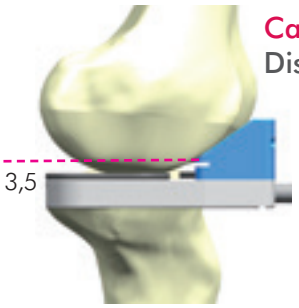


2/ Pinning the distal femoral cutting block

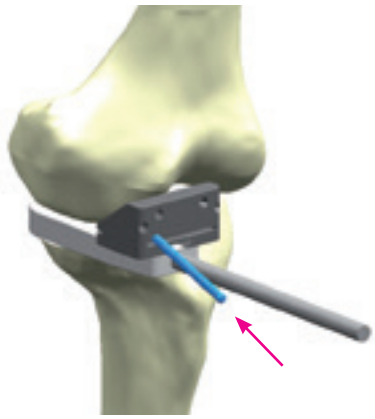
- Apply the distal femoral cutting block flush against the bone surface. The spacer block must be in contact with the distalmost aspect of the femoral condyle.
- Check again the overall alignment of the leg, and secure the distal femoral cutting block to the femur by inserting two 3.2 mm pins through the oblique holes of the cutting block.



Case A :
Distal cut «0»



Case B :
Distal cut «-2»



3/ Performing the distal femoral cut in extension

- Remove the spacer block handle, leaving the spacer block in place. Perform the distal femoral cut through the slot in the cutting block, with the knee fully extended.

Note : The distal femoral cut should be performed using a narrow saw blade (1.27 x 12.5 mm) with a minimum length of 60 mm.

DISTAL FEMORAL CUT

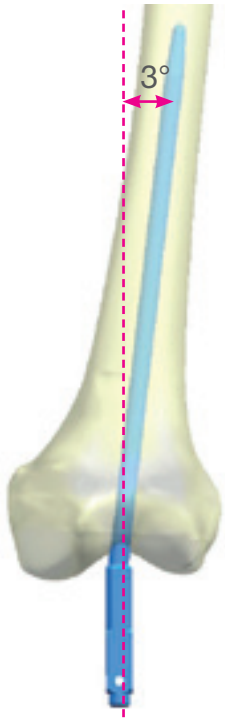
STEP THREE > Intramedullary Technique

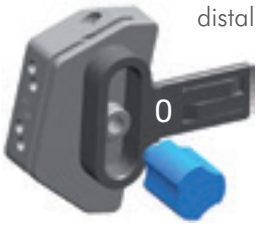
1/ Preparation for the distal femoral cut

- With the knee flexed 90 degrees, use the hand drill to create a pilot hole in the femoral canal for the IM rod.
- Introduce the 3° or 7° IM rod, depending on the desired amount of angular correction. Check for correct indication «Right» (for a right knee) or «Left» (for a left knee) on the top of the square section of the rod.

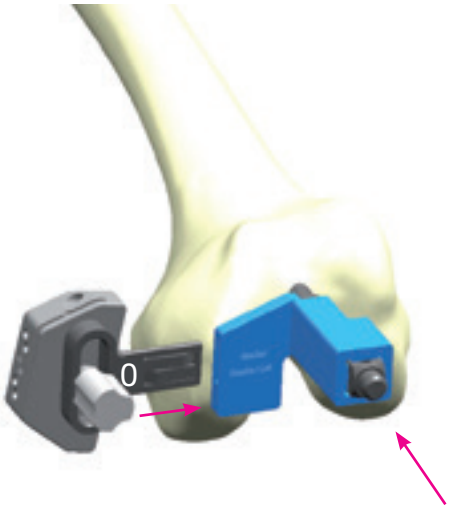
Note : To achieve undercorrection in a varus knee, the distal femur must be cut in slight varus. In this case, the 3° IM rod should be used.
In a valgus knee, the 7° IM rod will be used.

- Attach the reversible T-shaped support to the distal femoral cutting block using the big screw, with the side marked «0» or «-2» facing anteriorly. The appropriate resection level has previously been determined during the step «Establish the extension gap» (page 10).
- Slide the appropriate distal support (Right or Left) over the IM rod, and assemble the distal femoral cutting block to the distal support by inserting the arm of the reversible T-shaped support into the lateral slot of the distal support. This ensures that the distal femoral cut will be made perpendicular to the mechanical axis of the femur.





Reversible T-shaped support set to «0» for a standard distal femoral cut

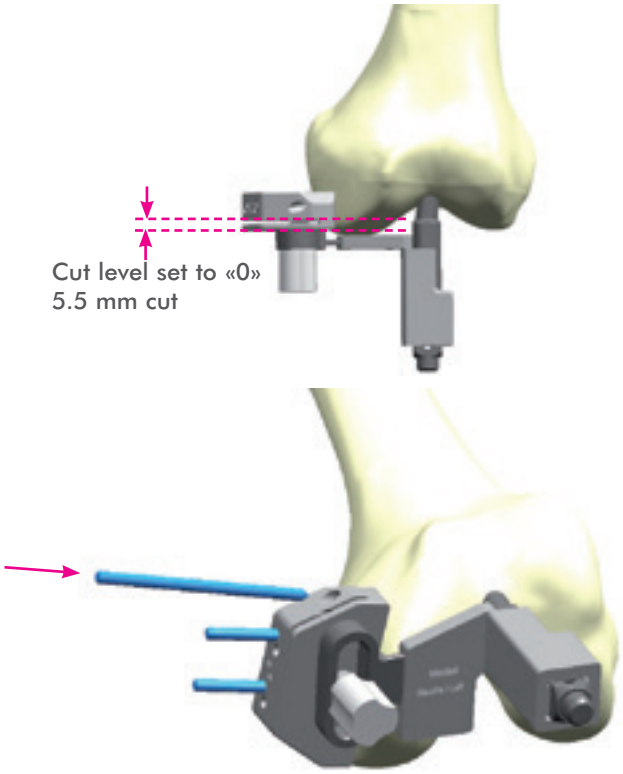


2/ Pinning the distal femoral cutting block

Note : A standard distal femoral cut «0» must be performed if the 2 mm augment has not been used during assessment of the extension gap.

A distal femoral cut «-2» must be performed if a 2 mm augment has been used during assessment of the extension gap.

- Apply the distal femoral cutting block flush against the bone surface. The distal support must be in contact with the distalmost aspect of the femoral condyle.
- Secure the distal femoral cutting block to the femur using two 3.2 mm pins inserted parallel to each other through the holes marked «0». This will allow for an additional 2 mm bone resection, if necessary.
- Insert a third 3.2 mm pin through the oblique hole to further secure the cutting block to the femur.

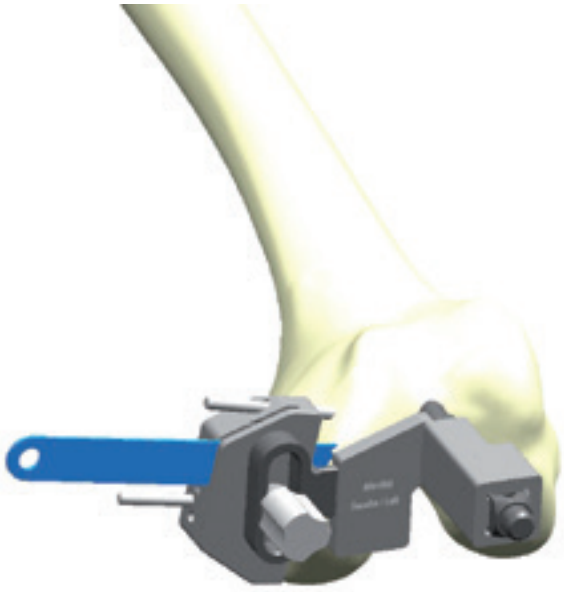


3/ Performing the distal femoral cut from the side

- The distal femoral cut is performed from the side, through the slotted cutting block.

Note 1 : The IM alignment system may be left in place during the distal resection to ensure perfect stability of the cutting block.

Note 2 : The distal femoral cut should be performed using a narrow saw blade (1.27 x 12.5 mm) with a minimum length of 60 mm.



POSTERIOR AND CHAMFER CUTS

STEP FOUR

1/ Femoral sizer/Finishing guide

• With the knee flexed 90 degrees, insert the selected spacer block (see Step Two : «Soft-tissue Balancing»).

Note : Do not use the 2 mm augment ! The augment should only be used in extension.

• Try successively larger femoral sizers/finishing guides (sizes 1 to 5), and select the largest size that provides good coverage of the resected distal condyle, without anterior overhang. If necessary, adjust knee flexion so that the femoral sizer/finishing guide sits flat on the resected condyle.

Note 1 : The posterior femoral cut will be parallel to the proximal tibial cut (for the selected tibial insert size).

Note 2 : The amount of bone removed from the posterior condyle is equal to the thickness of the metal component (i.e. 6, 7, 8, 8 and 9 mm for sizes 1 to 5).

OPTION / Assessment of femoral component rotation in extension

• Prior to performing the posterior and chamfer cuts :

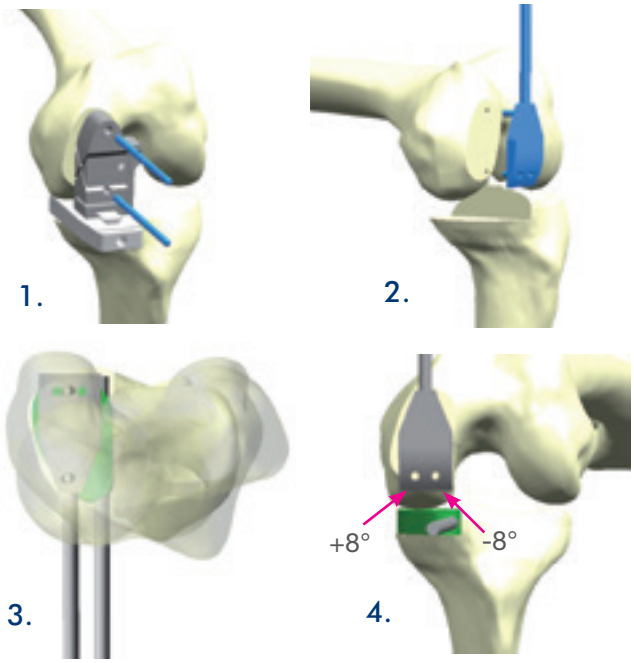
1. Drill through the two axially aligned holes of the selected femoral sizer/finishing guide using the 3.2 mm drill. Then, remove the spacer block and the femoral sizer/finishing guide.

2. Insert the appropriate size femoral trial into the two 3.2 mm holes.

• Place the tibial trial of the appropriate size and thickness (with its attached alignment handle) on the resected tibia.

3. With the knee fully extended, check alignment of the trial components.

4. In case of slight angular deviation in extension, it is possible to use one of the offset holes in the femoral trial to correct axial rotation by ±8°. Thus, the femoral sizer/finishing guide will be repositioned using this new hole.

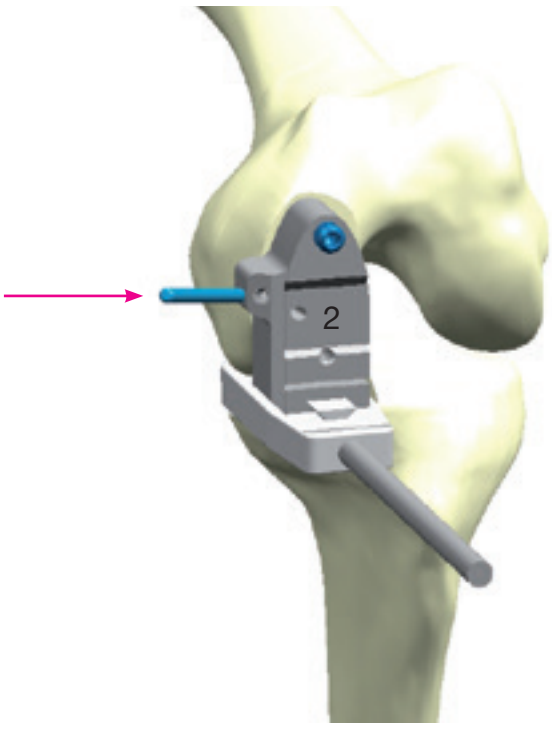


2/ Pinning the femoral sizer/finishing guide

- The femoral sizer/finishing guide must sit flat on the resected distal condyle.
- Secure the femoral sizer/finishing guide to the femur by inserting one headed pin into the superior axial hole and one 3.2 mm pin into the lateral oblique hole.

Note 1 : To further stabilize the guide during the posterior resection, or to allow repositioning of the guide (see «Option», page 13), a 3.2 mm pin may be inserted into the inferior axial hole. However, be careful to remove this additional pin prior to performing the chamfer cut.

Note 2 : If the lateral flange impinges upon the patella, the femoral sizer/finishing guide may be reversed so that the flange is located on the medial side.
In this case, take care to protect the anterior cruciate ligament (ACL).

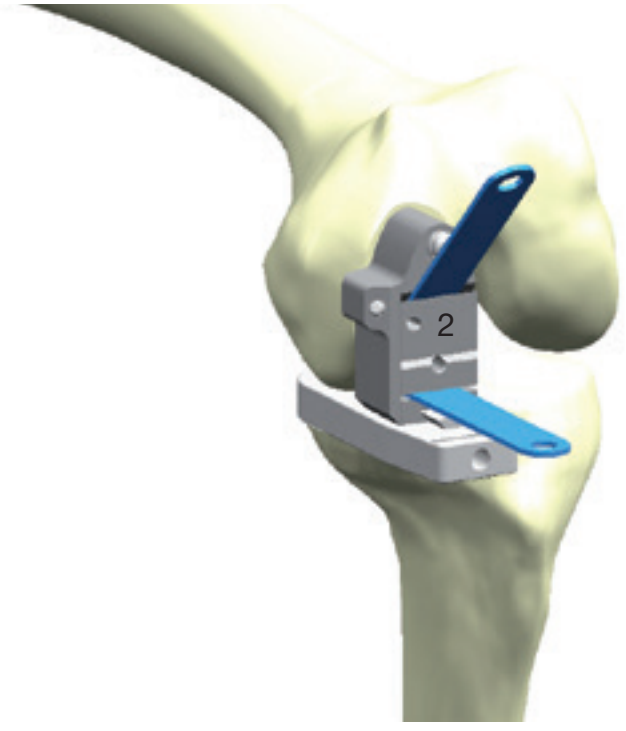


3/ Posterior & Chamfer cuts

- The posterior femoral cut is performed through the posterior slot of the guide.
- Make the chamfer cut through the slot that is angled 45 degrees posteriorly. If a 3.2 mm pin has been inserted into the inferior axial hole, it must be removed before completing the chamfer cut.

Note 1 : The spacer block may be left in place during these cuts to provide additional stability.

Note 2 : The femoral cuts should be performed using a narrow saw blade (1.27 x 12.5 mm) with a minimum length of 60 mm.

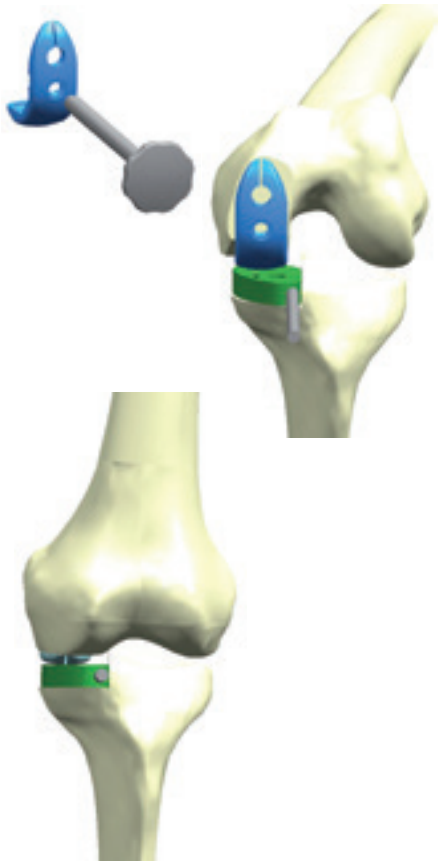


TRIALING & FEMORAL FIN SLOT

STEP FIVE

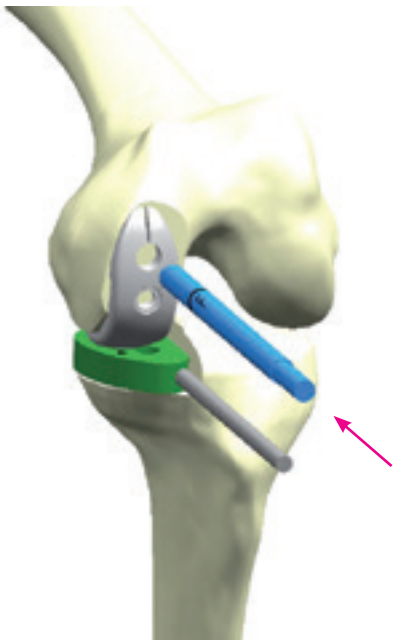
1/ Pegless femoral trial

- Thread the femoral trial holder into the selected pegless trial component.
- Place the tibial trial of the appropriate size and thickness on the resected tibia. It will assist in medial-lateral alignment of the femoral trial before impaction.
- The femoral trial holder is removed and the knee is ranged. The femoral trial should sit in the middle of the tibial trial in flexion and extension.



2/ Preparation for the femoral peg

- If necessary, secure the femoral trial to the femur using a 3.2 mm fixation pin.
- Drill the femoral peg hole with the 7.5 mm drill, up to the depth mark «F» (for «Femur») on the drill.



3/ Pegged femoral trial

- Thread the femoral trial holder into the selected pegged trial component.
- Impact the femoral trial into position.
- Cut the femoral fin slot in the distal femur through the slot of the femoral trial, using an oscillating saw.

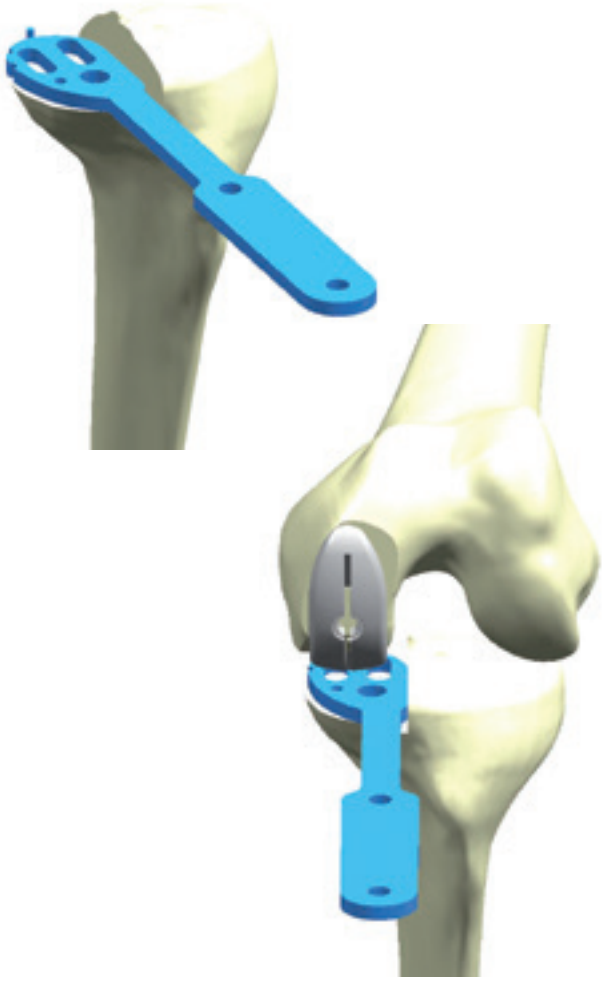
Note : With the help of a curved chisel, remove osteophytes on the posterior femur, and any projecting bone fagments along the posterior edge of the prosthetic condyle.

TRIALING & TIBIAL BASEPLATE

STEP SIX

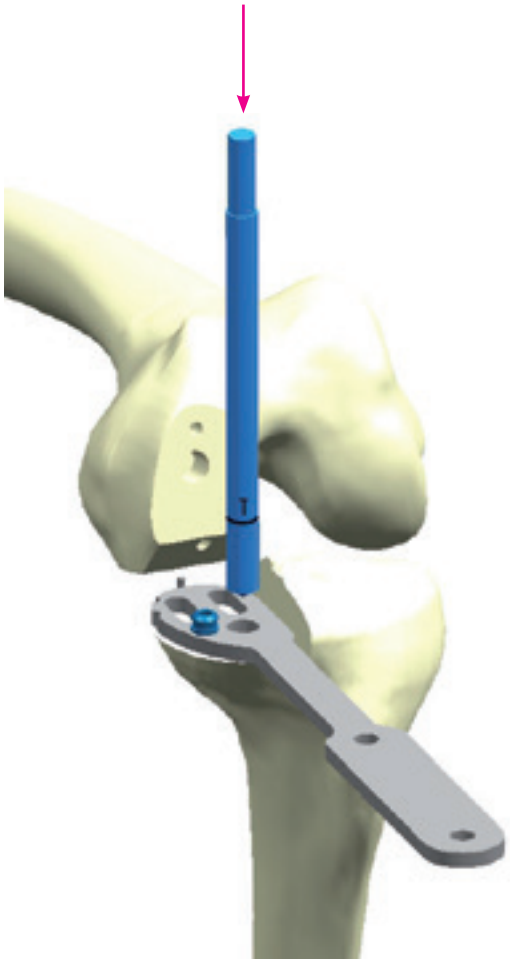
1/ Selection and placement of the tibial baseplate

- Use the tibial templates to determine the size of the tibial baseplate (sizes 1 to 5) that will provide optimal coverage of the resected tibial surface.
- Check for absence of posterior and posteromedial overhang of the tibial template by hooking the posterior aspect of the template over the edge of the posterior tibial cortex, and by palpating the posteromedial margin of the resected tibial surface.
- Check for proper M/L position and rotational alignment of the tibial template to ensure correct alignment of the final femoral and tibial components. Minor adjustments to the sagittal cut can be performed at this stage, if necessary.



2/ Drilling the tibial peg hole

- Secure the selected tibial template with a headed pin. Drill the tibial peg hole with the 7.5 mm drill up to the depth mark «T» (for «Tibia») on the drill.

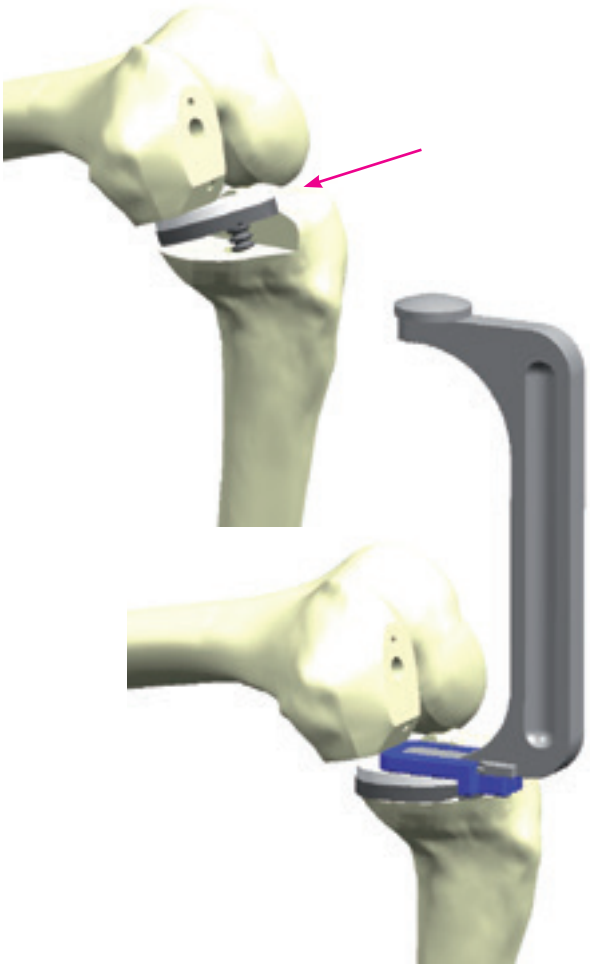


IMPLANT FINAL COMPONENTS

STEP SEVEN > Tibia Fémur

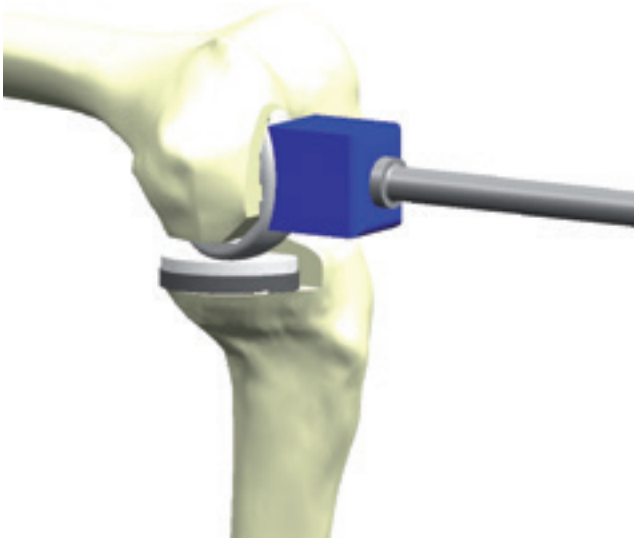
1/ Tibial component

- Flex the knee to 110 degrees with the tibia externally rotated for a medial UKR or internally rotated for a lateral UKR.
- Press down the selected tibial insert on the tibial baseplate to snap it into place. The PE tibial insert must match baseplate size 1:1.
- Cement the tibial baseplate first, using the tibial impactor.



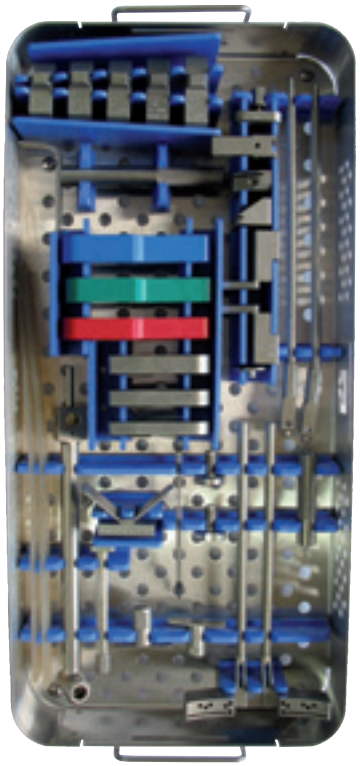
2/ Femoral component

- Place the knee in 90 degrees of flexion.
- Assemble the femoral component to the femoral inserter.
- Seat the femoral component using the femoral impactor.



INSTRUMENT TRAYS

TRAY #1 – 1912_1



TRAY #2 - 1912_2

	CATALOG #
PROXIMAL TIBIAL CUT	
DISTAL TIBIAL ALIGNMENT SHAFT	8011
V-SHAPED ANKLE CLAMP	8020
ANKLE BAR	8012
THUMBSCREW FOR TIBIAL ALIGNMENT SHAFT x2	8046
ELASTIC BAND x2	1165
TIBIAL CUTTING BLOCK Med. Right or Left	7336 & 7337
TIBIAL STYLUS BODY 2, 6 or 9 mm	7323 & 7347
TIBIAL STYLUS PROBE	7324
ESTABLISH GAPS	
TIBIAL SPACERS 7, 9 and 11 mm	7340 to 7342
2 mm AUGMENT	7320
CHECK SPACER PE 7, 9 and 11 mm	7310 to 7312
DISTAL FEMORAL CUT	
3° or 7° IM ROD	7313 & 7317
IM ROD HANDLE	2491
EM DISTAL SUPPORT	7345
IM DISTAL SUPPORT Med. Right or Left	7338 & 7339
REVERSIBLE T-SHAPED SUPPORT	7330
SCREW FOR DISTAL FEMORAL CUTTING BLOCK	7344
FLEXION DISTAL FEMORAL CUTTING BLOCK	7321
EXTENSION DISTAL FEMORAL CUTTING BLOCK	7346
POSTERIOR AND CHAMFER CUTS	
A/P FEMORAL SIZER	1757
FEMORAL SIZER/FINISHING GUIDES S1 to S5	7325 to 7329
TRIALING AND FEMORAL FIN SLOT	
DISTAL FEMORAL TRIALS S1 to S5	7331 to 7335
PEGLESS FEMORAL TRIAL COMPONENTS S1 to S5	1832 to 1836
7,5 mm DRILL	1726
PEGGED FEMORAL TRIAL COMPONENTS S1 to S5	1735 to 1739
FEMORAL TRIAL HOLDER	7349
TRIALING AND TIBIAL BASEPLATE	
TIBIAL TEMPLATES S1 to S5	2180 to 2184
TIBIAL TRIAL SIZE 1 TH 7, 9 and 11 mm	2020 to 2022
TIBIAL TRIAL SIZE 2 TH 7, 9 and 11 mm	2025 to 2027
TIBIAL TRIAL SIZE 3 TH 7, 9 and 11 mm	2030 to 2032
TIBIAL TRIAL SIZE 4 TH 7, 9 and 11 mm	2035 to 2037
TIBIAL TRIAL SIZE 5 TH 7, 9 and 11 mm	2040 to 2042
TIBIAL TRIAL HOLDER X2	1772
IMPACTORS	
TIBIAL IMPACTOR	7322
TIBIAL IMPACTOR INSERT	7348
FEMORAL IMPACTOR HANDLE	2048
FEMORAL IMPACTOR INSERT	1758
OTHERS	
LONG NAIL X2	6017
SHORT NAIL X2	6016
NAIL EXTRACTOR	1473
Ø3,2 mm DRILL Lg 130 mm WITH AO ADAPTATOR	2985
Ø3,2 mm DRILL Lg 130 mm	2086
Ø3,2 mm PIN Lg 100 mm X6	2039
PIN EXTRACTOR	8057
RASP	2056
MEASURING BLADE	1102

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EXPERIENCE - INNOVATION

HERMES **UNI**

THE LOW STRESS FIXED-BEARING KNEE

- Ligament balance in flexion-extension
- Minimal invasive approach
- Extra or intra medullary technique for distal femoral cut

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