Surgical Technique
Intramedullary Application

smith&nephew

RT-PLUS◇

Modular Rotating Hinged

RT-PLUS◇ Modular

Table of Contents

Nota Bene

The technique description herein is made available to the health care professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient.

Introduction

With the rising number of implantations we are increasingly being confronted by cases which are difficult to treat and which require the use of special prosthetic systems using a higher degree of coupling. The RT-PLUS◇ Modular prosthesis has been designed to take this development into account.

It is a constrained rotating knee, the development of which drew upon knowledge and experience gained from state-of-the-art knee joint prosthesis.

The RT-PLUS Modular knee system is the modular version of RT-PLUS and it represents a valuable addition to bicondylar surface replacement.

The functional design allows extremely sparing resections. The joint components feature anatomical geometry, as it's also used today for bicondylar surface replacement cases.

The femoral and tibial components have the same stem coupling and are anchored in the bone by stems made of Ti_6Al_4V for noncemented application and in CoCrMo for cemented application. To compensate various femoral and/or tibial bone defects, there are CoCrMo augmentation blocks available.

Special attention was also paid to the development of a user-friendly instrument set. This ensures that the prosthesis is implanted securely and precisely.

Concept/Description

The RT-PLUS◇ Modular is a constrained rotating knee prosthesis for condylar cemented implantation.

The prosthesis allows an internal/external rotation of approx. 10° each. This is locked by the tibial insert when extended. Due to the peg design, the prosthesis has the capability of elongation, i.e., for distraction between the femoral and the tibial components. In an extreme flexed position, the femoral component can lift off the tibial insert, which reduces the sagittal leverage forces that have an effect on the prosthesis stem in this load situation.

The implant allows sparing resections. The cut compatibility with the tricompartmental prosthesis TC-PLUS◇ permits, if necessary, an intraoperative switchover from the resurfacing to the constrained rotating knee.

The femoral and tibial components of RT-PLUS Modular are identical to those of RT-PLUS, with the exception of the additional option to connect stems and augmentation blocks. The tibial inserts are the same. As a result, the femoral and tibial components in both these systems are entirely cross-compatible. All the stems of RT-PLUS Modular can be combined with the femoral and tibial components of RT-PLUS Modular to suit requirements.

The implants are available in five sizes (corresponding to TC-PLUS sizes 2, 4, 6, 8 and 10). Apart from size 2, the sizes can be combined with the next size up or down (see product overview on page 83).

In the RT-PLUS Modular knee system, the required stability and absorbtion of acting forces are assured by the joint mechanism between tibial and femoral components, the condylar articulating surfaces, the anchoring elements in the tibia and the femur and the still intact soft tissue structures.

Femoral Component

The femoral component is manufactured from CoCrMo alloy and is asymmetrical.

The patellar groove is deeply hollowed out and presents an anatomical oblique outline. This feature offers improved patellar tracking and leverage on the knee extensor apparatus.

The joint mechanism is contained in a narrow box, the width of which is comparable to that of a posterior stabilized implant. This allows sparing bone resection, which reduces the risk of femoral condyle fracture.

The rotation peg of 40mm of length provides adequate security against dislocation, but the components can nevertheless be easily coupled. Because of the design of the condyles, physiological rollback of 9mm is possible, which improves the flexion capability of the joint.

The joint mechanism has been designed in such a way, that all metal components (peg and joint axis) interface with UHMWPE to absorb the stress forces, therefore preventing premature wear.

A modular stem connection allows the use of different stems to stabilize the femoral component.

To compensate femoral bone defects, distal and/or posterior femoral augmentation blocks can be fixed to the femoral component.

The femoral component is available in sizes 2, 4, 6, 8 and 10.

Please see the available sizes in the implant table (on page 62 ff).

Patellar Component

The all-poly (UHMW polyethylene) patellar component has a symmetrical biconcave surface for better tracking.

Tibial Insert

The simple and securely anchored tibial insert is manufactured from UHMW polyethylene and is available in three different heights of 8mm, 11mm and 14mm, in order to restore the joint height independent of the degree of tibial bone substance loss.

Important

Be aware, that the tibial components of 3mm need to be added to the tibial insert of 8mm; means a total tibial height of 11mm (respectively 17mm for a 14mm tibial insert).

The special design of the polyethylene insert enables an easy coupling of the prosthesis, for which only minimal distraction is required.

The minimum effective PE thickness in the load zone is 8mm. The selected manufacturing method, the design (condyles) and the high-quality material combine to form the proven wear resistance of the insert.

The tibial inserts are identical to those in the RT-PLUS® portfolio.

Tibial Component

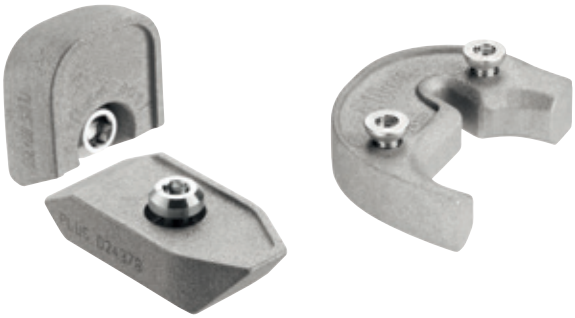
The symmetrical tibial component is manufactured from CoCrMo alloy.

In order to prevent polyethylene wear inside the tibial component, the base plate is polished on the inside and the insert is completely enclosed along its entire circumference.

A modular stem connection allows the use of different stems, which serve to stabilize the tibial component.

To compensate tibial bone defects, proximal tibial blocks can be fixed on the tibial component. The tibial component is available in sizes 2, 4, 6, 8 and 10.

Femoral and Tibial Blocks



The femoral and tibial blocks are manufactured from CoCrMo alloy.

In order to compensate different femoral and/or tibial bone defects, there are distal femoral blocks available in heights of 5mm, 10mm and 15mm, posterior femoral blocks in heights of 5mm and 10mm and proximal tibial blocks in heights of 5mm, 10mm and 15mm.

The same femoral blocks are used for the medial as well as for the lateral condyle of the femoral component. The same tibial blocks, except height of 15mm, are used for the medial as well as for the lateral condyle of the tibial component.

The blocks have to be assembled to the femoral and tibial components with screws and can then be cemented on the tibia or on the femur, respectively.

Cemented Stems

The femoral and tibial components can be anchored in the bone intramedullary by cemented conical stems, made of forged CoCrMo alloy.

Available in lengths: 95mm, 120mm and 160mm.

Noncemented Stems

The femoral and tibial components can also be stabilized in the bone by using non-cemented cylindrical stems, made of extruded Ti_6Al_4V alloy. These stems are not suitable for primary anchorage; therefore they are not designed for osseointegration. This combination with CoCrMo components is already clinically approved since 1999 (RT-PLUS Modular).

A wide range of stems enables an optimal adaptation to different indications. They are available in various diameters (Ø 10, Ø 12, Ø 14, Ø 16, Ø 18 and Ø 20mm) and lengths (95mm, 120mm, 160mm and 200mm) in order to ensure optimum anchorage, even with a variety of femoral or tibial geometries.

For the tibial components, aside from the straight stems, offset stems with 3.75mm offset are available in various diameters (Ø 10, Ø 12, Ø 14, Ø 16, Ø 18 and Ø 20mm) and lengths (95mm, 120mm and 160mm).

Please see the available sizes in the implant table (on page 62 ff).

Indications

The principal preoperative planning factor is the correct diagnosis. It has to be determined whether the bone and stability situation require the implantation of a constrained prosthesis.

The main indications for implantation of RT-PLUS◇ Modular are:

- High-grade joint destruction with considerable loss of function and requirement for additional stabilization with longer stems and reconstruction of bone defects
- Severe joint instability that predictably cannot be corrected by suitable bone reconstruction (bone grafts) or soft-tissue intervention
- Marked contractures and axial displacements of more than 15°–20°
- Failure after surface replacement (e.g. infection, loosening)
  Revision of a primary prostheses
- Trauma-induced femoral or tibial fractures

Important

Due to the design, it is possible to switch with relatively little effort, even intraoperatively, from the TC-PLUS◇ knee system to the RT-PLUS Modular knee system, since the resections and prosthesis sizes match

Contraindications

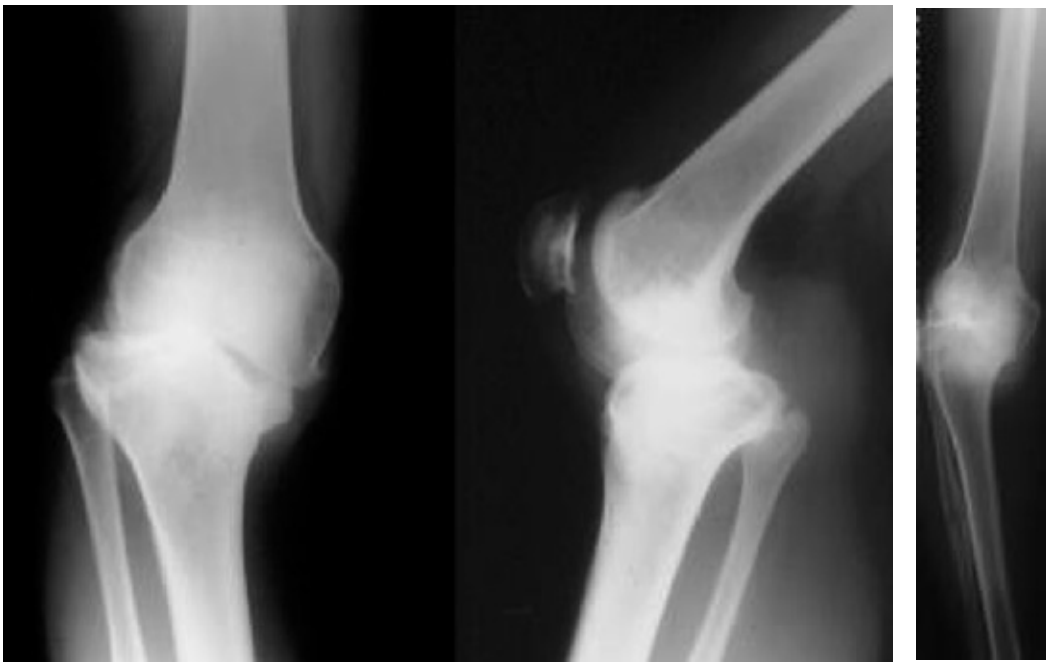
Contraindications are:

- Acute or chronic, local or systemic infections (or in the case of a corresponding anamnesis)
- Severe muscle, nerve or vascular diseases that endanger the affected extremity
- Lacking bone substance or inadequate bone quality that endangers a stable seating of the prosthesis
- Severe adiposity
- All concomitant diseases that may endanger the function of the implant. These include in particular extreme insufficiency of the knee extensor mechanism, which can lead to excessive joint distortion; or severe adiposity which can lead to a dorsal impingement, which may uncouple the components. In these cases it may be advisable to use a coupled hinge or a tumor prosthesis
- Patient hypersensitivities or allergies to the materials used
- Strenuous physical activity (e.g. competitive sport, hard physical work)

See also instructions on the package insert

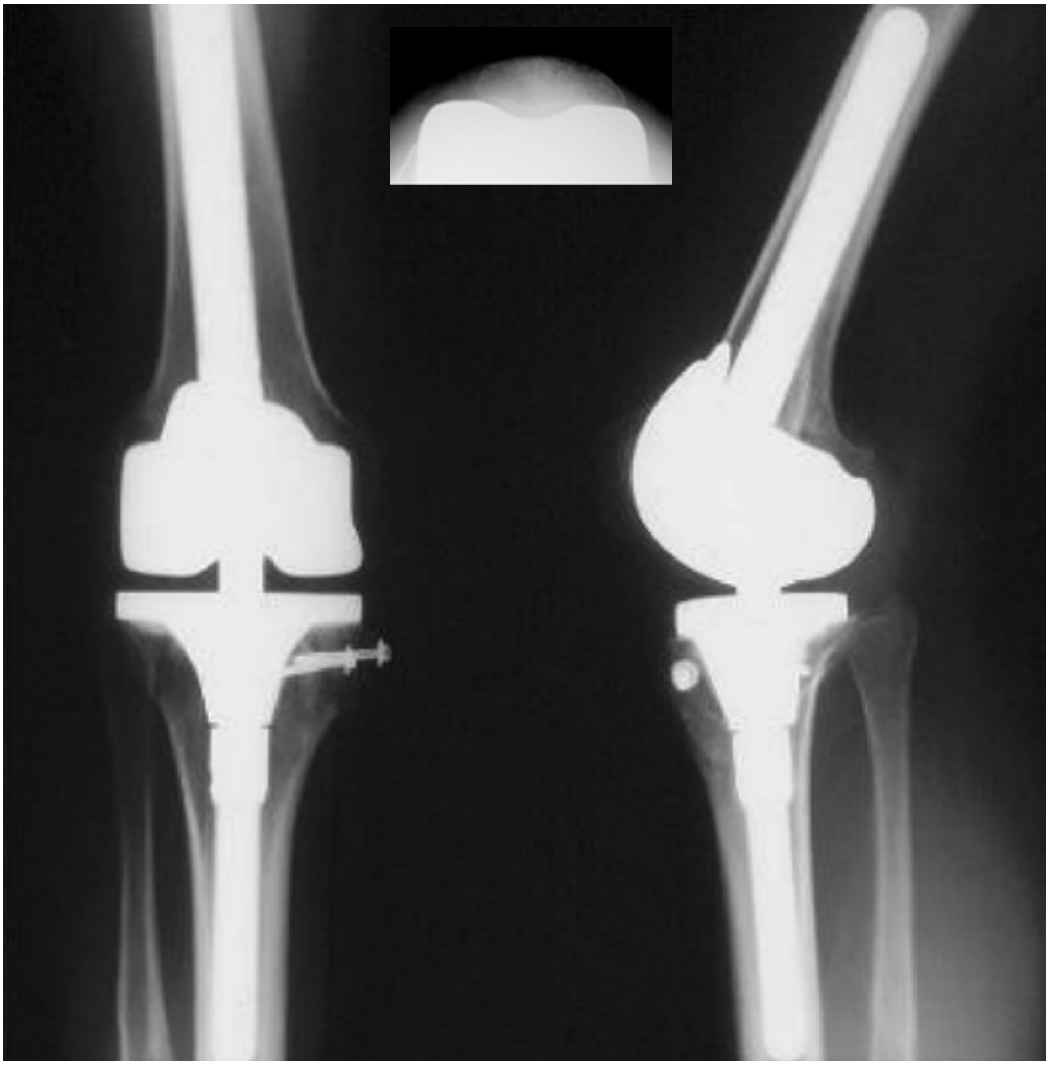
Case Study

Preoperative Situation



Patient with severe joint instability (varus gonarthrosis) as well as medial joint destruction.

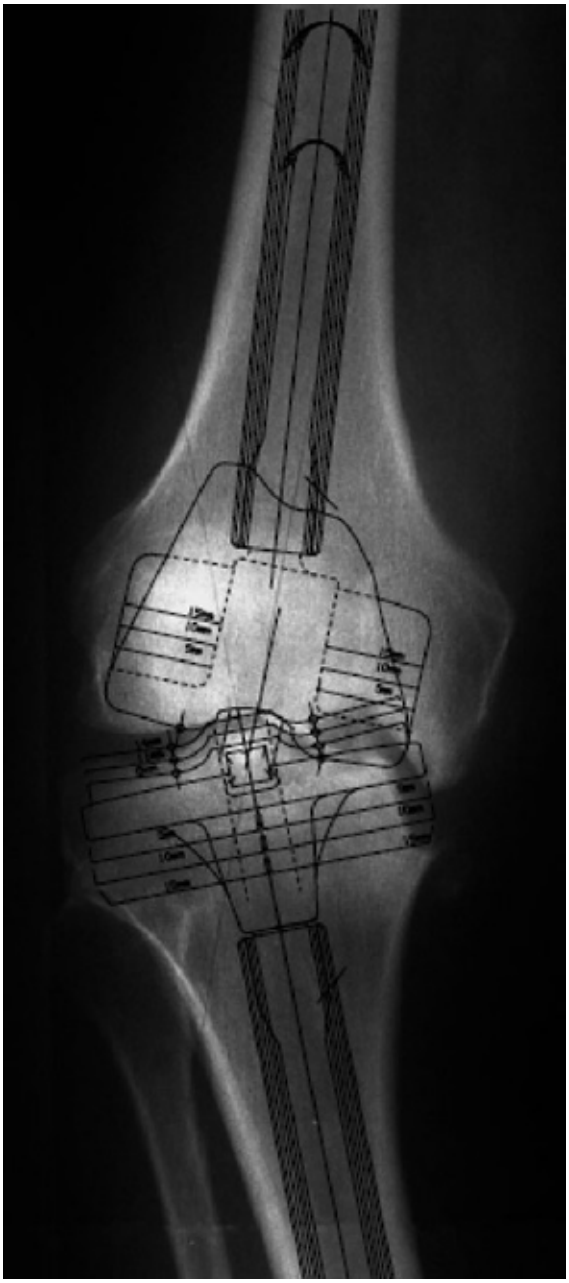
Postoperative Result



Immediately postoperative; functional and pain-free reconstruction with RT-PLUS◇ Modular knee.

Preoperative Planning

A full-leg X-ray with the patient in the standing position is recommended for preoperative-planning purposes. If this is not possible, an X-ray of the thigh, including the femoral head, should be taken. The X-ray images of the knee joint at three levels should be available for planning the surgery. A tangential patellar exposure, a frontal exposure and an exposure sagittal to the leg axis must be taken.



For preoperative planning there are X-ray templates available: with scale of 1.15:1, Lit. No. 1941, and with scale of 1:1, Lit. No. 1942 (see page 82). The lateral view of the condyles is decisive. If these are no longer completely intact, it is possible to switch to the condylar width. In cases of doubt, the smaller implant should be selected to prevent the prosthesis components from protruding. In normal cases, the size determination and the correct positioning of the prosthesis are controlled intraoperatively with relevant instruments, and planning may also be possible on the unrestored other leg.

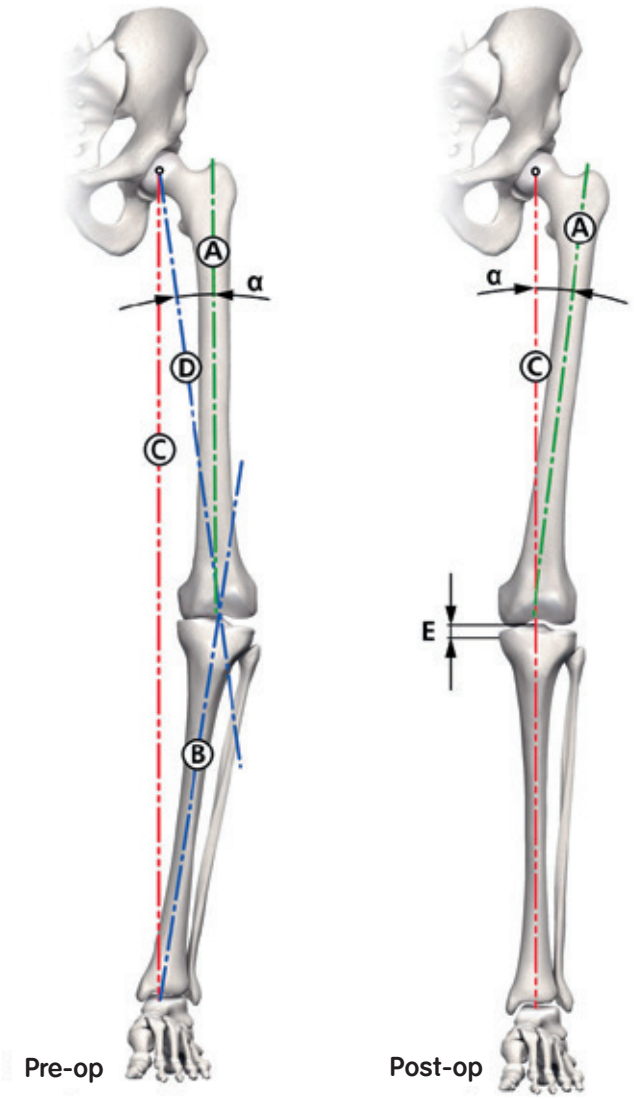
Important

The femoral and tibial component sizes can all be combined with the next size up or down (see product overview on page 83 ff). This does not apply to combinations of sizes 2 and 4.

Large deviations of the femoral neck angle as well as severe deformities of femur and tibia (e.g. posttraumatic axial deformities) must be taken into consideration during surgical planning.

In rare cases of deformities away from the knee joint that negatively influence the mechanical leg axis, additional corrective osteotomies may be indicated.

Planning of surgery using the radiograph

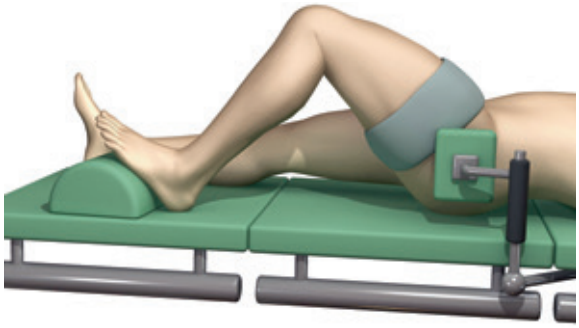


The following procedure is recommended for the anteroposterior whole-leg imaging process:

1. The femoral axis A (anatomical axis) is drawn onto the radiograph.
2. A line is drawn from the femoral head to the center of the knee (mechanical axis D) on the radiograph.
3. The angle measured between the anatomical and the mechanical axis = angle α determines the valgus angle.
4. The tibial axis B is drawn in and the tibial resection plane E is determined to avoid excessive resection, especially if defects are present.
5. The component sizes and resection depths are determined preoperatively using the X-ray templates (Lit. No. 1941 or 1942) in AP and the lateral planes.
6. The mechanical leg axis C should merge with lines D and B after correction.

A Anatomical femoral axis
B Anatomical tibial axis
C Mechanical leg axis
D Mechanical femoral axis
E Tibial resection depth (mm)
α Valgus angle

Positioning of the patient for the surgery

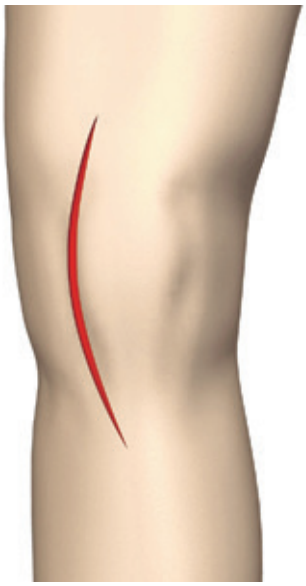


Surgery is performed whilst the patient is supine.

The operation can be performed with or without tourniquet. It is recommended to use a flexible cover for the leg which allows a stable positioning of the knee joint in 90° of flexion.

Most of the surgical steps are performed in this position.

Surgical procedure



The skin incision can be a midline or a parapatellar incision.

If scars are present from skin incisions made during previous operations, use these for access is advisable in order to reduce the risk of cutaneous blood flow disorders. Medial arthrotomy or an approach adapted to the pathologic situation is recommended.

After the usual preparation (meniscus resection, removal of osteophytes and synovectomy if necessary), the cruciate ligaments are sectioned and if necessary, the collateral ligaments are removed close to the bone.

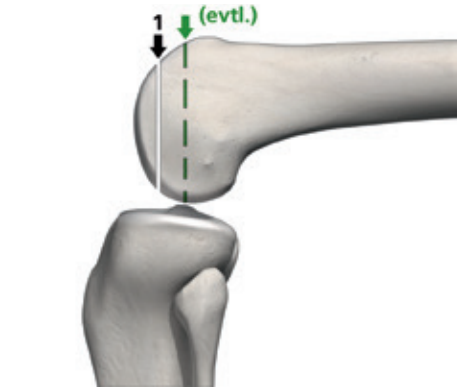
Implant components removal

In case of an implant must be removed at the beginning of the revision surgery, Smith & Nephew offers the surgeons a universal knee implant extraction system that contents all required tools for a safe and efficient removal of the femur and tibia component.

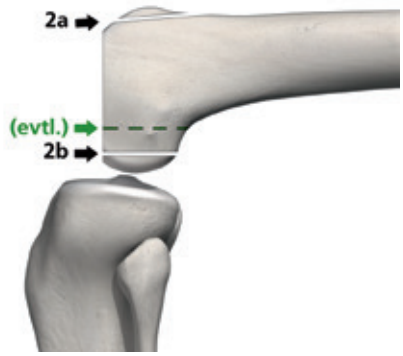
The instrument set consists of a basic set (no. SAP 75210243/0944290) and sterile packaged, single-use chisel-blades and saw-blades (see surgical technique Lit. No. 2025).

Overview of the resection sequences for primary application

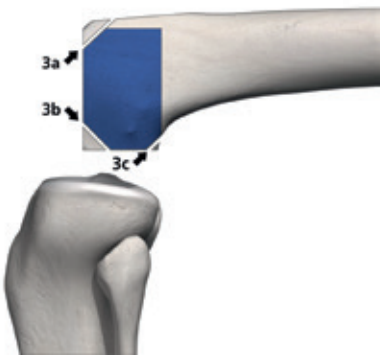
It is important that the flexion and extension gaps are identical.



1. Distal femoral resection and optional distal augment resection



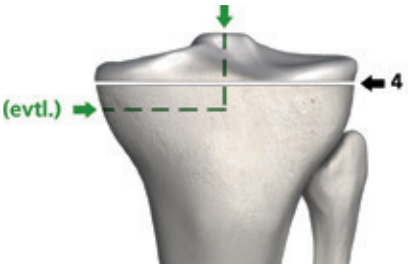
2. AP femoral resections and optional posterior augment resection



3. Chamfer resections and cutting out of the box. Remove residual posterior condyles if present.

Important

To avoid the risk of a condyle fracture, we recommend to prepare the box after tibial preparation



4. Tibial resection and optional augment resection

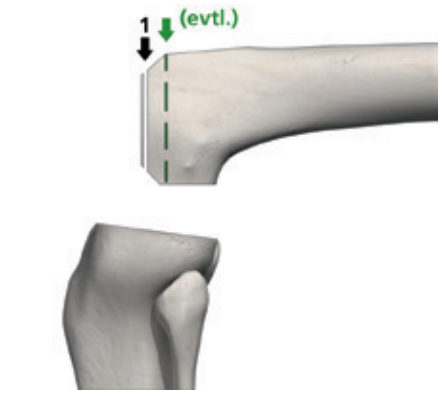
5. Patellar resection (optional)

Important

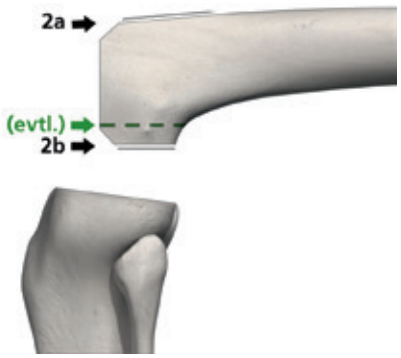
For the standard instrument set, use 1.00mm saw blades for all bone resections!
For the 1.27mm instrument slot option, use the corresponding 1.27mm saw blades.
See Lit. No. 01218 for corresponding connection.

Overview of the resection sequences for revision application

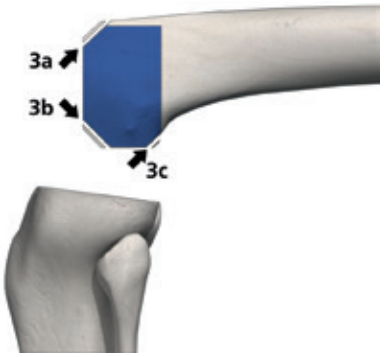
The bone resections are refreshed after extraction of the primary implants.



1. Distal femoral resection and optional distal augment resection



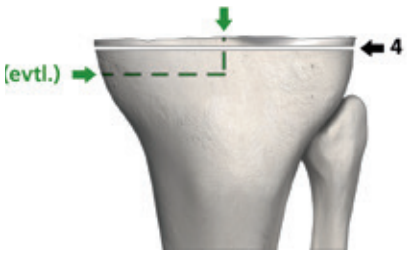
2. AP femoral resections and optional posterior augment resection



3. Chamfer resections and cutting out of the box. Remove residual posterior condyles if present.

Important

To avoid the risk of a condyle fracture, we recommend to prepare the box after tibial preparation.



4. Tibial resection and optional augment resection

5. Patellar resection (optional)

Important

For the standard instrument set, use 1.00mm saw blades for all bone resections!
For the 1.27mm instrument slot option, use the corresponding 1.27mm saw blades.
See Lit. No. 01218 for corresponding connection.

Use of Speedpins

Alternatively, speedpins can be used in order to rigidly fix instruments (e.g. cutting blocks) to the bone.

The speedpins are available in different lengths and types:

Speed-Pins with Rim Ø 3.2 / 30mm
– 6x PAC (Art. Nr. 42000089/75006487)

Speed-Pins Ø 3.2 / 65mm
– 6x PAC (Art. Nr. SYS251354/75009338)

Speed-Pins Ø 3.2 / 80mm
– 6x PAC (Art. Nr. SYS251355/75009339)

Speed-Pins Ø 3.2 / 110mm
– 6x PAC (Art. Nr. SYS251356/75009340)

AO Adapter for Speed-Pins
(Art. Nr.: SYS251316/75009310)

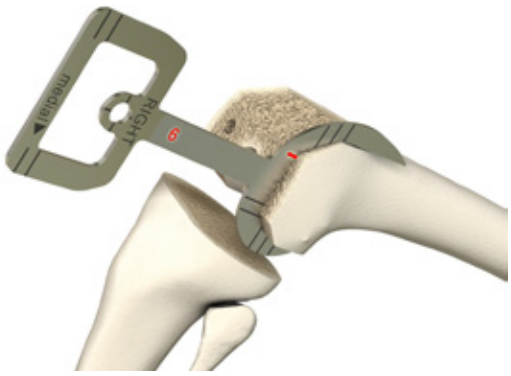
Access: Please refer to the relevant surgical textbooks for the initial access to the knee.

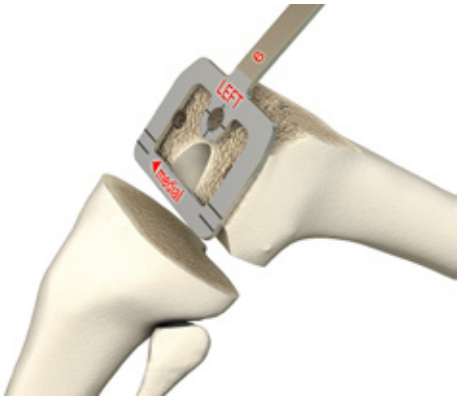
Important

In addition to the bone resections, it is important to correct any ligament imbalance by appropriate soft-tissue procedures. If necessary, a general release should be performed on the side of the contracture.

The leg is flexed and any osteophytes on the femur and tibia should be removed. This will provide good exposure of the knee joint, which facilitates size determination.

Femoral-size determination



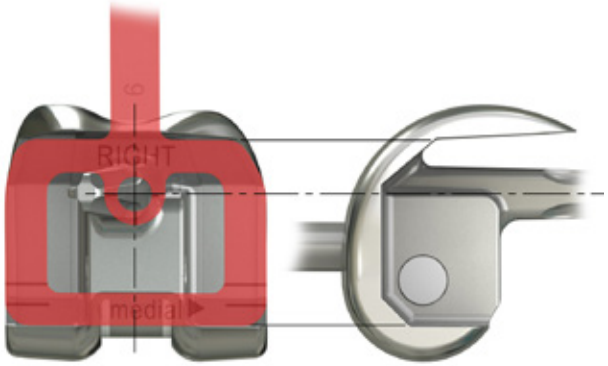


The femoral sizers (2, 4, 6, 8 and 10) are used to determine the size sagittally based on the inside-outside contours and ventrally based on the anteroposterior resections and the mediolateral contours. The additional marking lines correspond to the augmentation blocks.

The marked lines, as well as the internal/external contours of the femoral sizer are showing the location of the cuts and therefore the final implant position.

The line in the sagittal view as well as the hole in the frontal view of the femoral sizer shows the position of the femoral IM canal, i.e. the position of the stem.

Make sure that the laser markings ensure correct positioning: e.g. **LEFT** and **Medial.**



Femoral opening

Set the adjustable IM femoral drill guide to the planned size of the femoral component (size marking 2, 4, 6, 8 or 10) and insert under the quadriceps into the center of the femur. The distal stop should be flush onto the condyles, on the distal resection, respectively. Make sure that the gauge lies flat against the anterior femoral cortical bone in the direction of the femoral axis.

Important

The IM femoral drill guide needs to be positioned slightly medial to "Whiteside line" (3 to 4mm).

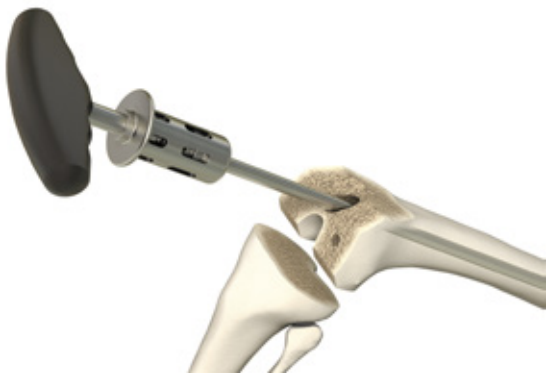
To ensure optimal positioning of the femoral drill guide on the condyles, gently tap the ML area, not the drill guide section of the instrument.

Open the femoral IM canal with the Ø 8/14mm IM stepped drill as far as the stop. The drill direction is along the femoral axis.

Important

The femoral IM canal, which determines the position of the implant stem, must be opened carefully (reference for the femoral position) so as to prevent the development of a relative extension position (risk of notching) or flexion position (projecting patella).

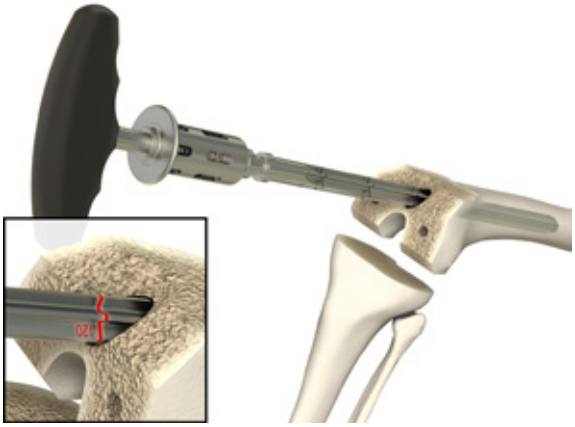
To stabilize the adjustable IM femoral drill guide, a bone pin (75mm long) can be inserted.



Carefully insert the Ø 8mm IM rod using the modular handle approximately up to the isthmus of the femoral IM canal and then remove.

It is important to work carefully to prevent excessive pressure in the IM canal.

Preparing the femoral anchorage



Reamers are used carefully and in progressive stages (starting with Ø 10mm) to ream to the required stem diameter and depth. The reference for the laser marking depth is the final distal bone resection.

Reamers are available in Ø 10, Ø 12, Ø 14, Ø 16, Ø 18 and Ø 20mm. The depth indicator is on the reamer: observe the laser markings (95, 120, 160 and 200).

Important

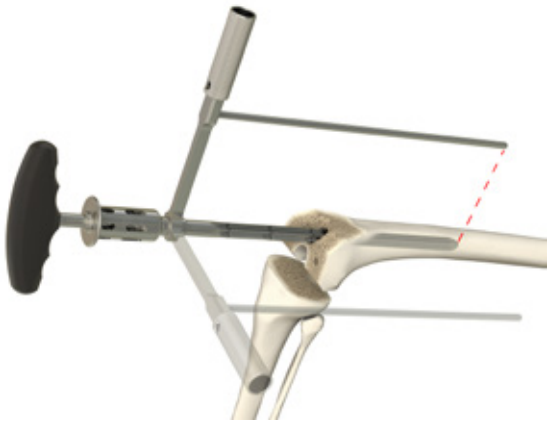
When using cemented stems, the Ø 12mm reamer is used to drill to the desired depth, and the corresponding non-cemented trial stem is used. Cemented stems are available in 95mm, 120mm and 160mm lengths. The optional cemented trial stems are only used with the trial components (not with the instruments)!

The 200mm length is only available in the non cemented version.

Important

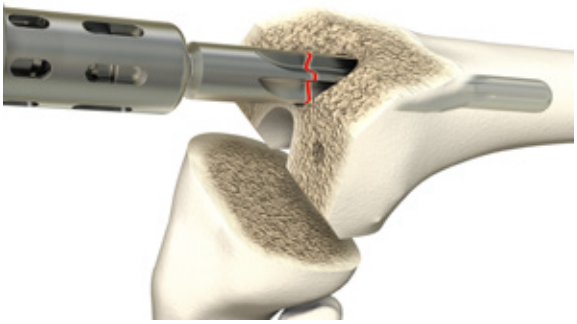
In primary procedures, check reaming depth after distal femoral resection. Laser marking depth has to be aligned to the distal bone resection.

Controlling the stem position



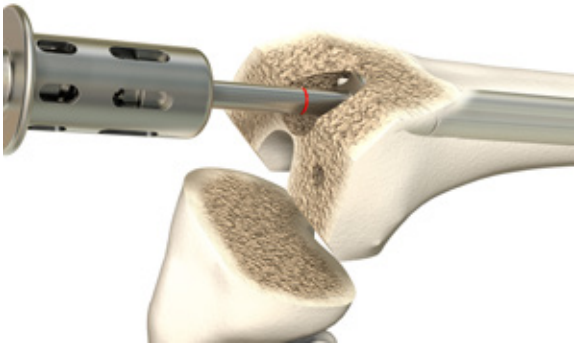
An extramedullary reamer alignment guide, which is attached to the reamer, can be used to check the position of the stem in axial alignment and depth (the end of the reamer alignment guide corresponds to the tip of the reamer).

Preparing the femoral stem connection

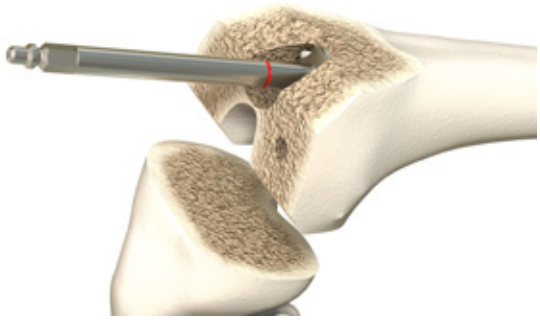


If you ream only to diameters Ø 10, Ø 12 or Ø 14mm, the stem connection recess has to be reamed with the Ø 10/16mm stepped reamer up to the laser marking (corresponding to the resection level).

IM positioning and control with trial stems



The chosen trial stem is attached to the extension for trial stem (Ø 8mm) and with the modular handle carefully inserted into the femoral IM canal so that the line marking is approximately level to the distal bone resection. It is important to avoid putting excessive pressure in the femoral IM canal. The modular handle is now removed.

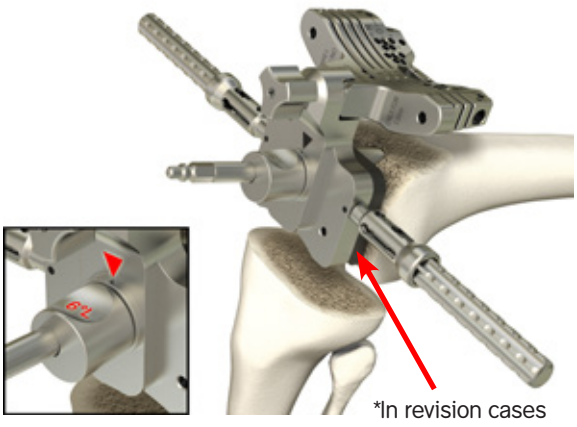


With too short IM guidance, the alignment may result incorrect (varus/valgus or extension/flexion).

Important

Do not turn counterclockwise when placing the trial stem. Possible risk of loosening the trial stem!

Locating the distal femoral cutting block



*In revision cases

The 6° femoral bushing corresponds to the angle a determined in the preoperative planning. The femoral bushing is inserted into the femoral suspension device, so that depending on which side the operation is performed, the mark L for left knee or «R» for right knee is visible on the arrow ▼.

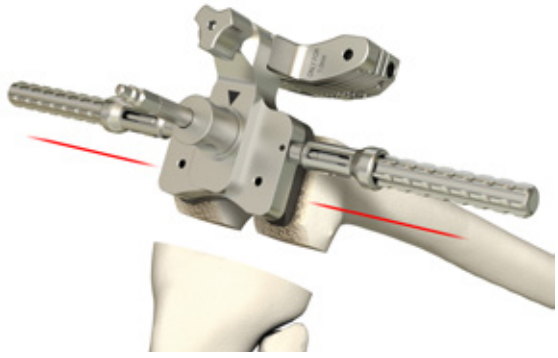
Important

Make sure that the femoral bushing is inserted in the correct (L or R) position. Adjustment and correction occurs by removing it, rotating it trough 180°, and reinserting it.

The femoral/tibial cutting block is screwed to the femoral suspension device and positioned over the trial stem extension (Ø 8mm). The handles can be attached.

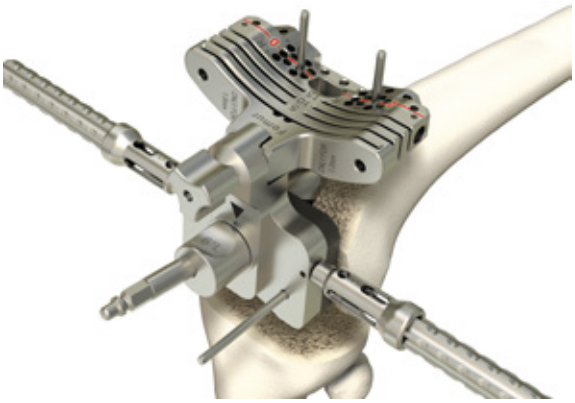
Important

In revision cases, the revision spacer for femoral condyle is attached to the femoral suspension device (black plastic component in picture). This substitutes the missing distal bone substance. The resulting resection remains still 2mm.



Align the device with regard to rotation. Note that the removable handles are parallel to the epicondylar axis.

After preliminary drilling with the Ø 3.2mm drill, the femoral suspension device is fixed with a bone pin (75mm long) from distal.



After preliminary drilling with the Ø 3.2mm drill, fix the femoral/tibial cutting block with two bone pins (75mm long) through the holes marked 0. This position resects 9mm from the distal femur, which corresponds to the distal thickness of the femoral prosthesis without femoral blocks.

Important

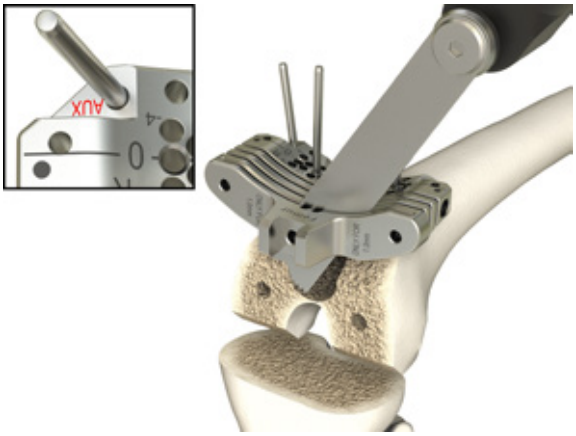
In order to prevent any conflict with the trial stem, give preference to the most lateral 0 pin hole of the femoral/tibial cutting block (for left knee use both 0 L pin holes and for right knee use the 0 R pin holes).

Remove the bone pin on the femoral suspension device using the pin extractor. After loosening the fixation screw remove the reamer using the modular handle.
Now remove the suspension device.

The resection depth can be adjusted proximally and distally in 2mm increments (± 4mm).

By using the resection stylus, the distal femoral resection can be checked.

Distal femoral resection



The femoral/tibial cutting block is slid onto the bone. The distal femoral resection is then performed using a 1mm (or 1.27mm option) saw blade through the 0 saw slot (closed slot with facet).

For locking the femoral/tibial cutting block, an additional pin can be inserted into the oblique holes marked with AUX. After resection, the pin can be removed.

When using distal femoral augmentation blocks the resection is performed through the open saw slots. Augmentation blocks of 5mm, 10mm and 15mm are available.

Important

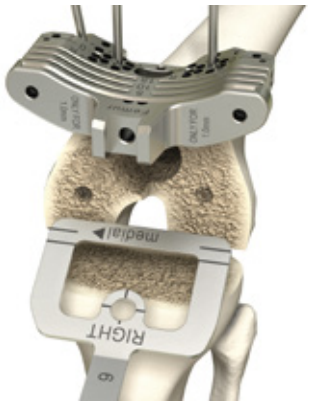
If there is an extension deficit, it is recommended to move the distal resection 2–4mm proximally to adjust the extension gap. For hypermobile patients, a 2mm smaller distal femoral resection is recommended.

The distal resection is the reference for the following steps and has to be checked for accuracy.

Important

The femoral/tibial cutting block does not have to be removed yet because it will be used later.

Controlling the femoral size

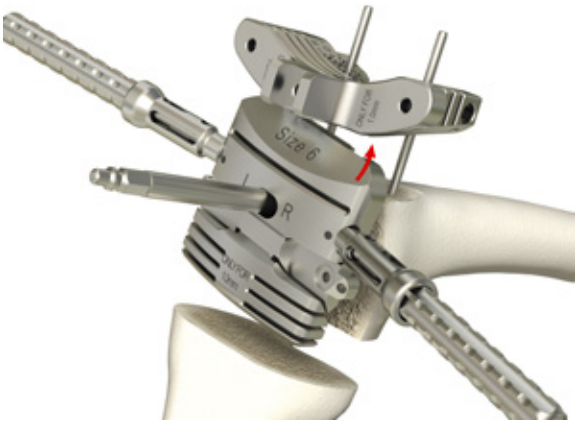


The femoral size is again controlled and definitively determined.

During medial/lateral measurement, take the external width of the sizer as reference.

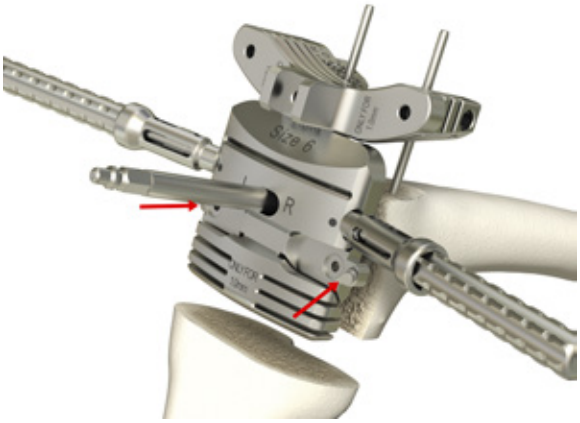
Remove the side handles from the femoral/tibial cutting block and assemble them with the AP femoral cutting block.

Locating the AP femoral cutting block



The chosen trial stem is attached to the extension for trial stem (Ø 8mm) and inserted into the femoral IM canal. The AP femoral cutting block is placed on top.

When using distal femoral augmentation blocks, the corresponding blocks must be fixed on the AP femoral cutting block. Respect the thickness (5mm, 10mm or 15mm) and size (2, 4 or 6, 8, 10).



The rotation of the AP femoral cutting block is adjusted by applying anteriorly the femoral/tibial cutting block.

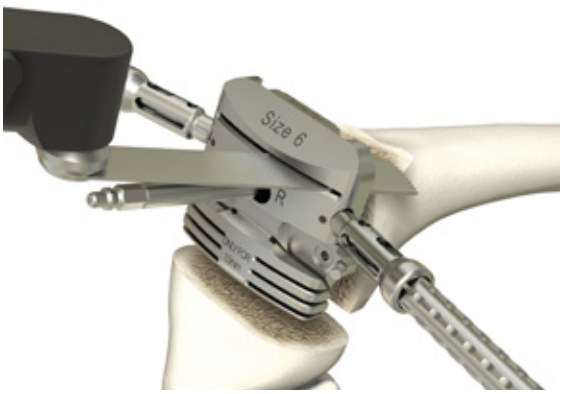
If the rotation of the AP femoral cutting block has to be readjusted, the rotation is set visually in relation to the epicondylar axis with the aid of the handles attached on the side.

After preliminary drilling with the Ø 3.2mm drill, the AP femoral cutting block is fixed with two bone pins (38mm including head) through the lateral 45° oblique holes.

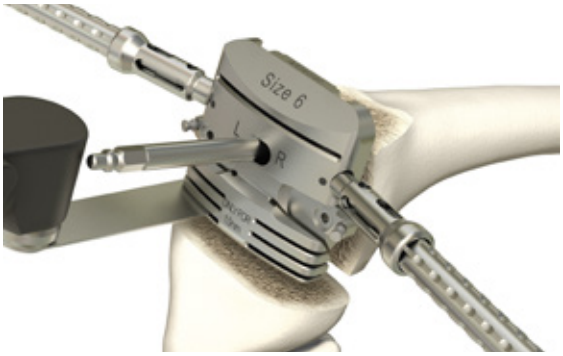
Checking the resections

With the resection stylus, the anterior and posterior resection plane and height are checked.

AP and chamfer resections



The anterior femoral resection is made through the closed saw slot with the 1mm (or 1.27mm option) saw blade (anterior slot with facet).

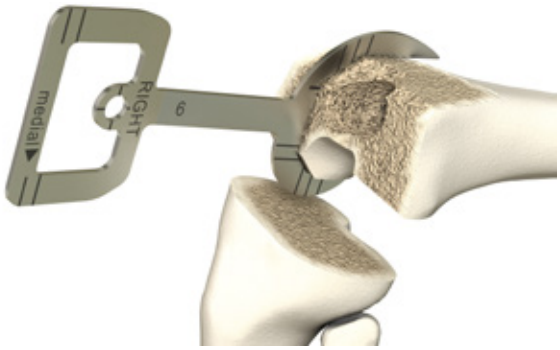


The posterior femoral resection is made through the two open posterior saw slots (slots with facet).

When using posterior femoral augmentation blocks, the resection is made through the open 5mm and 10mm saw slots.

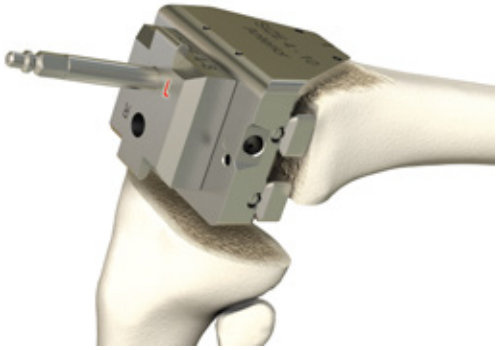
The femoral chamfer resections are made through the corresponding slots (slots with facet).

Resections checking



The AP femoral cutting block is removed and the femoral resections can be checked.

Preparing the femoral box (IM = intramedullary)



Important

This application is performed when bone tissue is not available to ensure good instrument support (especially in the anterior bone area and after explantation of a prosthesis). In case of good distal and anterior bone support, the EM (extramedullary) femoral box preparation is preferred (see page 30).

In order to improve support for the Hohmann retractor, we recommend preparing the femoral box after tibial preparation.

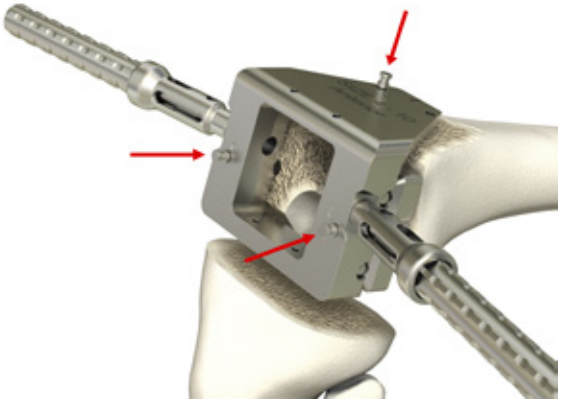
Slide the trial stem already used with the trial stem extension (Ø 8mm) into the femoral IM canal again using the modular handle and now detach the modular handle.

Slide the box saw guide IM positioning device (size 2 or sizes 4–10) onto the extension up to the distal cut with the box saw guide positioning device (observe size). It is important for the box saw guide to be flush with the cut surfaces.

When using distal femoral blocks, mount the appropriate blocks on the femoral cutting block. Observe the appropriate thickness (5mm, 10mm or 15mm).

The side handles can be attached to the box saw guide positioning device.

If required (absent anterior bone tissue), adjust rotation with the aid of the side handles, reference to the femoral epicondyle.



Fix the box saw guide IM positioning device with pins with head (38mm) through the distal holes.

Together with the trial stem and the trial stem extension, withdraw the box saw guide positioner using the trial stem handle, which is attached to the trial stem extension.

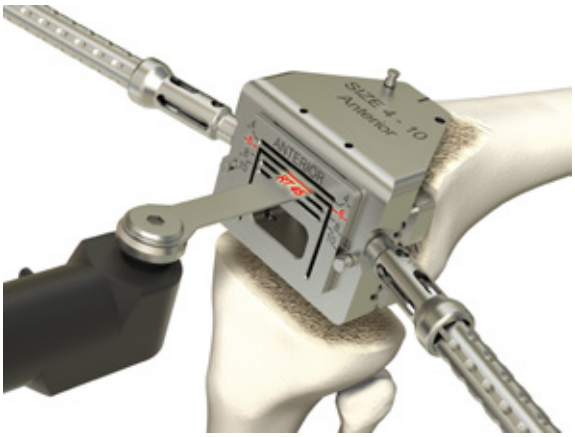
For more stability, a pin with head (38mm) can be positioned through the anterior medial hole of the box saw guide IM positioning device.

The IM box saw guide (guide for size 2 and sizes 4–10) can be slid in the positioning device.

Perform the cuts with a special 13mm wide narrow saw blade, which is introduced up to the RT 45 mark (marking reference correspond to 45mm depth).

Important

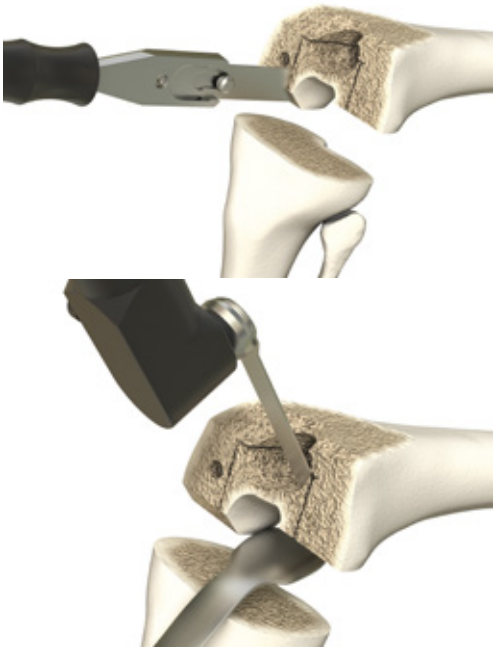
Protect vessels and nerves in the popliteal fossa.



In the case of the guide for sizes 4–10, perform the anterior box cut through the saw slot of the respective size.

Remove the box saw guide.

Remove all the pins, the IM box saw guide and the positioning device.

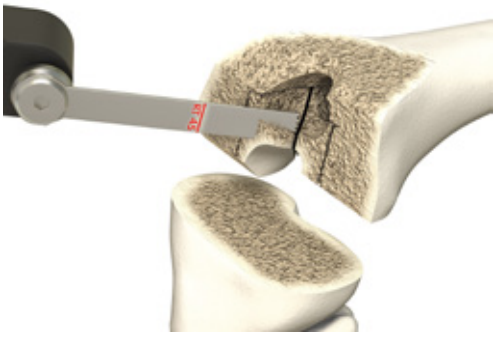


Excavate the femoral box with a thin straight osteotome and a bone rongeur along the outer limits marked and prepared with the narrow saw blade (with the osteotome or the saw blade, the two lateral box cuts are carefully extended posteriorly).

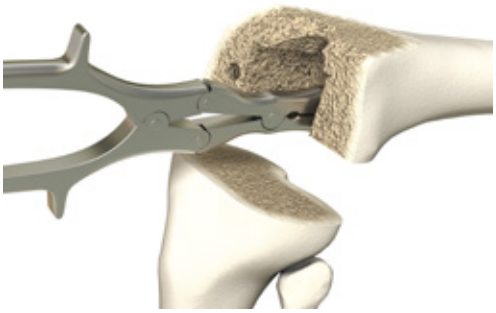
From anterior, into the IM canal hole, the narrow saw blade (or an osteotome) is introduced for cutting the posterior cortical box bone.

Important

To protect the important posterior soft tissues, a Hohmann retractor is placed centrally onto the posterior condyle.

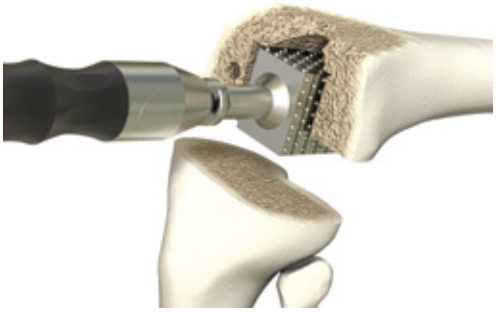


Depending on the bone quality and for more accuracy, the femoral box can be excavated as well by performing “cross” cuts with the narrow saw blade, taking the vertical reference cuts as reference. The remaining triangle is finally removed by using a bone rongeur.



Pay attention to the depth line marked with RT 45!

If necessary, finalize the femoral box by using a bone rongeur.

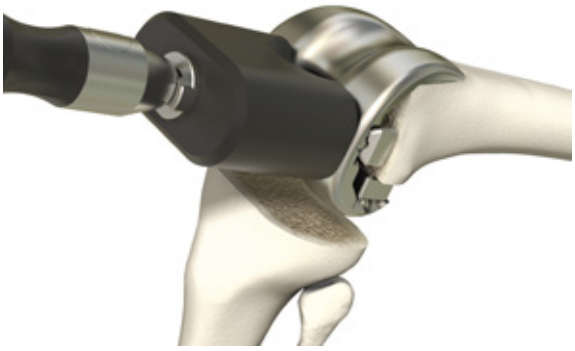


Check box position and box depth and finalize with the box rasp (rasps for size 2 and for sizes 4–10).

Important

Introduce the box rasp only in the longitudinal direction; do not jam or tilt it because this can cause breakage of the femoral condyle.

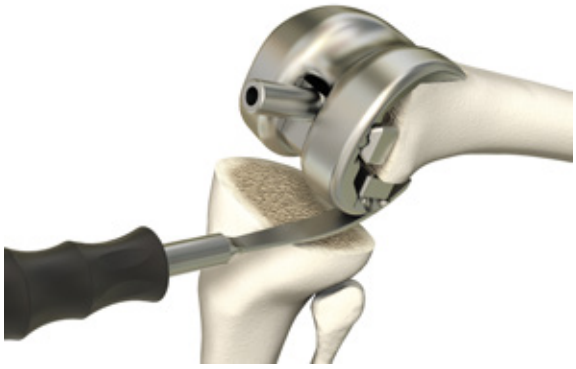
Controlling the femoral resections and anchorage

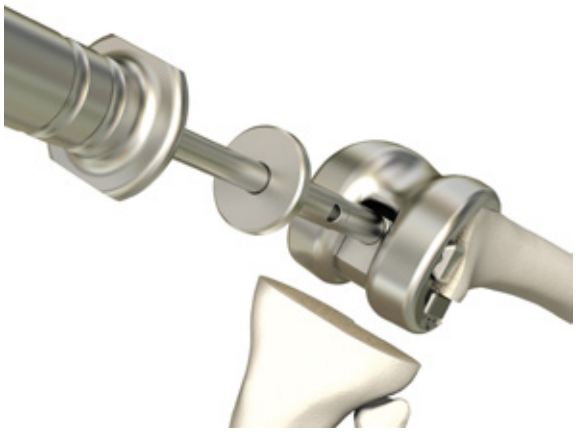


The femoral trial is screwed on the trial stem (corresponding to the last reamer) and inserted with the impactor.

When using distal and/or posterior femoral augmentation blocks, corresponding femoral trial blocks (5mm, 10mm or 15mm) are available, which are fixed laterally on the femoral trial.

Removing the dorsal condyle residue





Important

This must be checked in all cases!

After having completed the femoral resections, use the curved osteotome to remove all osteophytes as well as protruding posterior condyles. At this point, a posterior contracture can also be released. This will improve flexion and prevent possible damage to the polyethylene insert by these bony projections.

The femoral trial is used as reference for resection of the bone with the curved osteotome.

Important

It is recommended to leave the femoral trial component assembled with the stem and eventually augmentation blocks as reference, respectively as comparison component when assembling the definitive implant.

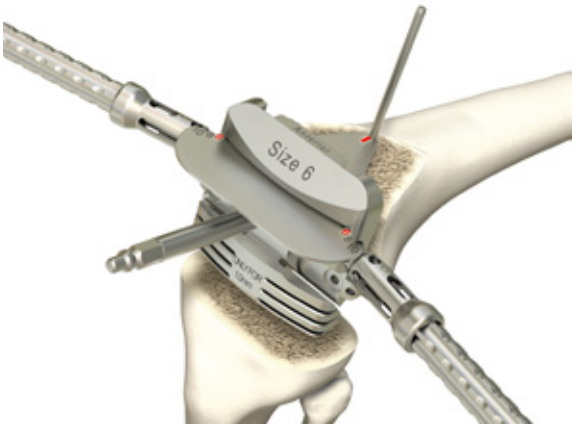
The femoral trial can be removed by using the slap hammer.

If necessary, the femoral trial can be left in place for protecting the femoral condyle during tibial preparation. If removed, the femoral box may be filled by two folded compresses.

Optional EM Femoral Box Preparation

If bone tissue is available distally and anteriorly to ensure good instrument support, the “EM femoral box processing” version can be proceeded (this version is faster and easier in handling).

EM Preparation of the femoral box

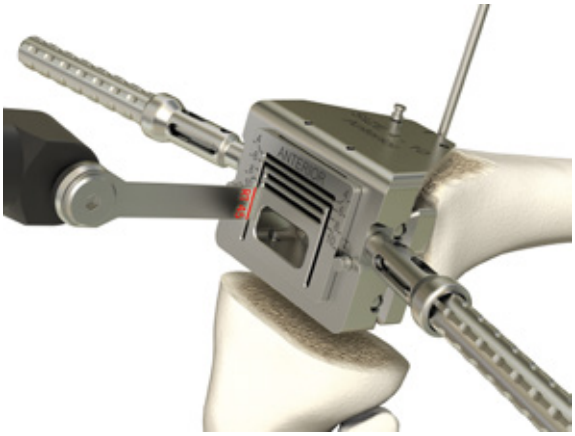


In order to improve support for the Hohmann retractor, we recommend preparing the femoral box after tibial preparation.

Important

For this application, anterior bone substance has to be available!

In order to mark the center of the femoral box and the mediolateral position of the femoral component, respectively, the centering template is inserted through the anterior saw slot of the AP femoral cutting block. Its position is marked with the electrocauter or a pin in the anterior cortical bone.



On the anterior cortical bone marking, the femoral box saw guide IM positioning device with the respective box saw guide (guides for size 2 and sizes 4–10) is aligned and fixed with bone pins.

It is important that the box saw guide is flush with the resections.

When using distal femoral augmentation blocks, the corresponding blocks must be fixed on the box saw guide. Consider the thickness (5mm, 10mm or 15mm).

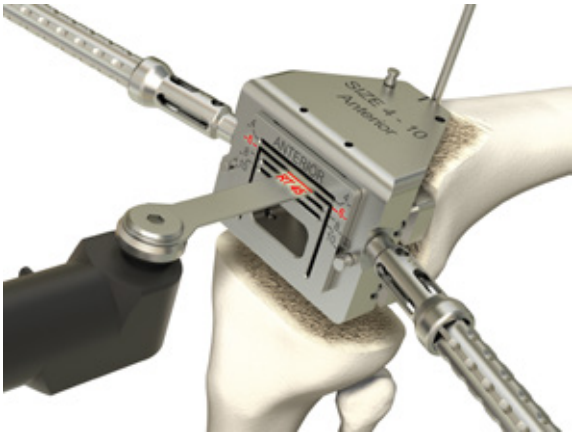
For more stability, a pin with head (38mm) can be positioned through the anterior medial hole of the box saw guide IM positioning device.

The side handles can be attached on the box saw guide IM positioning device.

Perform the cuts with a special 13mm wide narrow saw blade, which is introduced up to the RT 45 mark.

Important

Protect the vessels and nerves in the popliteal fossa.

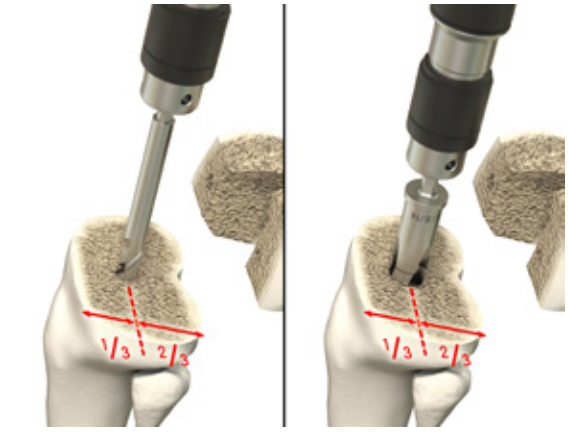


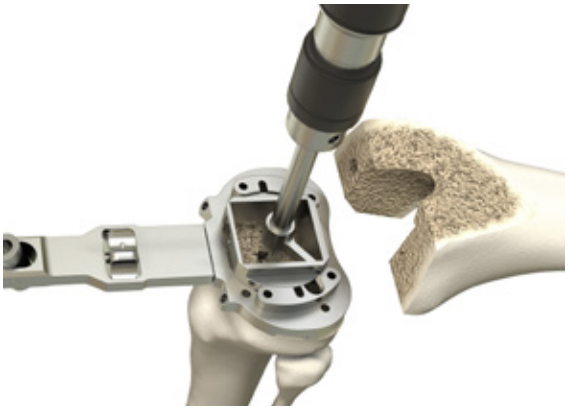
In the case of the guide for sizes 4–10, perform the anterior box cut through the saw slot of the respective size.

Remove the box saw guide.

The leg is flexed and any remaining osteophytes and the intercondylar eminence are removed if necessary.

Tibia opening





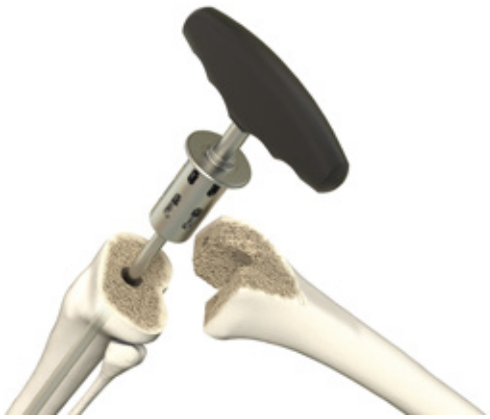
Open the tibial IM canal with the Ø 8mm drill or directly with the Ø 8/14mm stepped drill.

Position the hole centrally ML and one-third from the anterior cortical bone.

Also, the tibia can be opened by placing the tibial sizer trial assembled with the tibial chisel guide onto the proximal bone resection. The tibial IM canal can now be opened by using the Ø 8mm drill.

Important

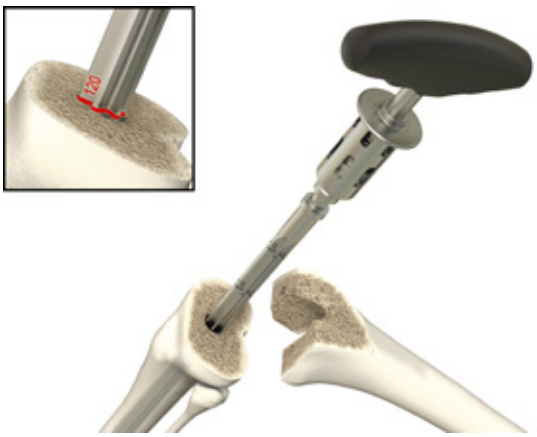
For primary procedures, the intercondylar eminence has to be resected first, in order to enable positioning of the tibial sizer.



Carefully insert the Ø 8mm IM rod using the modular handle approximately up to the isthmus of the tibial IM canal and then remove.

It is important to work carefully to prevent excessive pressure in the IM canal.

Preparing the tibial anchorage



Reamers are used carefully and in progressive stages (starting with Ø 10mm) to ream to the required stem diameter and depth. The reference for the laser marking depth is the final tibial bone resection.

Reamers are available in Ø 10, Ø 12, Ø 14, Ø 16, Ø 18 and Ø 20mm. The depth indicator is on the reamer: observe the laser markings (95, 120, 160 and 200).

Important

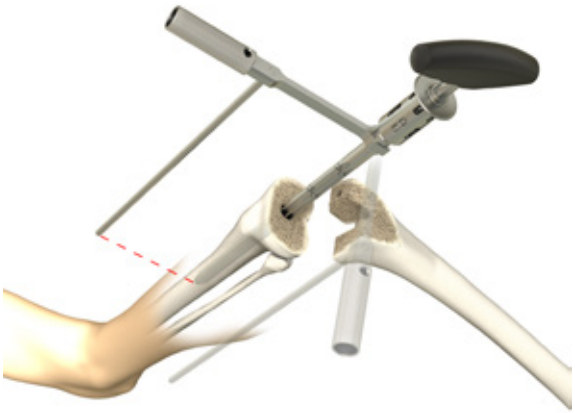
When using cemented stems, the Ø 12mm reamer is used to drill to the desired depth, and the corresponding noncemented trial stem is used. Cemented stems are available in 95mm, 120mm and 160mm lengths. The optional cemented trial stems are only used with the trial components (not with the instruments).

The 200mm length is only available in the noncemented version.

Important

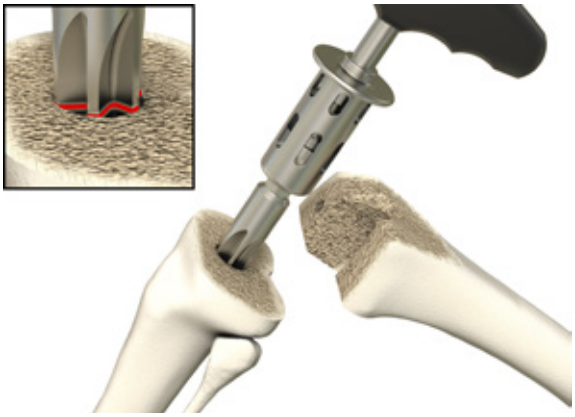
In primary procedures, check reaming depth after tibial resection. Laser marking depth has to be aligned to the tibial bone resection.

Controlling the stem position



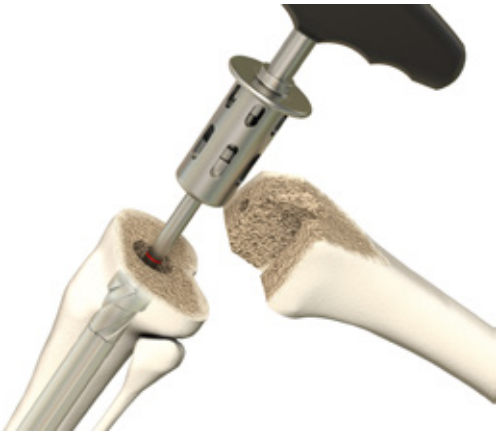
An extramedullary reamer alignment guide, which is attached to the reamer, can be used to check the position of the stem in axial alignment and depth (the end of the reamer alignment guide corresponds to the tip of the reamer).

Preparing the tibial stem connection



If you ream only to diameters Ø 10, Ø 12 or Ø 14mm, the stem connection recess has to be reamed with the Ø 10/16mm stepped reamer up to the laser marking (corresponding to the resection level).

IM positioning and control with trial stems



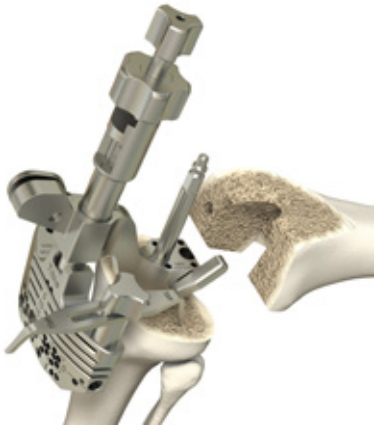
The chosen trial stem is attached to the extension for trial stem (Ø 8mm) and with the modular handle carefully inserted into the tibial IM canal so that the line marking is approximately level to the proximal bone resection. It is important to avoid putting excessive pressure in the tibial IM canal. The modular handle is now removed.

With too short IM guidance, the alignment may result incorrect (varus/valgus or extension/flexion).

Important

Do not turn counterclockwise when placing the trial stem. Possible risk of loosening the trial stem!

Locating the tibial cutting block



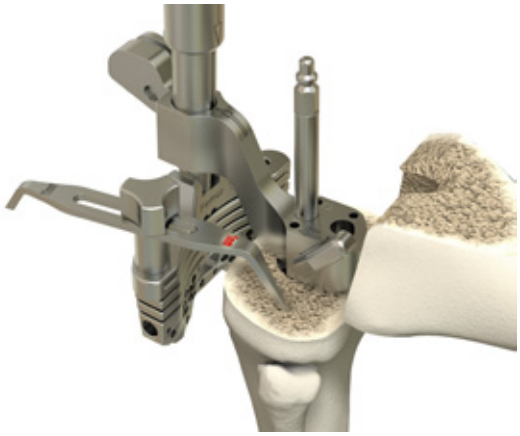
The two tibial resection guide IM components are coupled together by jointing arrow ⇩ to arrow ⇧ and pressing the button.

The femoral/tibial cutting block is attached to the tibial resection guide IM with the top small grub screw and slid completely onto the trial stem extension (Ø 8mm).

Ensure the lock lever is set to OPEN to slide in place the tibial resection guide IM. The lock lever is then reversed to fix the tibial resection guide IM in place.

The femoral/tibial cutting block is first lifted upwards by pressing the button so the tibial stylus can be attached.

Setting the resection height



The tibial stylus is positioned on the tibial plateau. The tibial stylus can be used for both primary resections (11mm marking) and for revision resections (1mm marking).

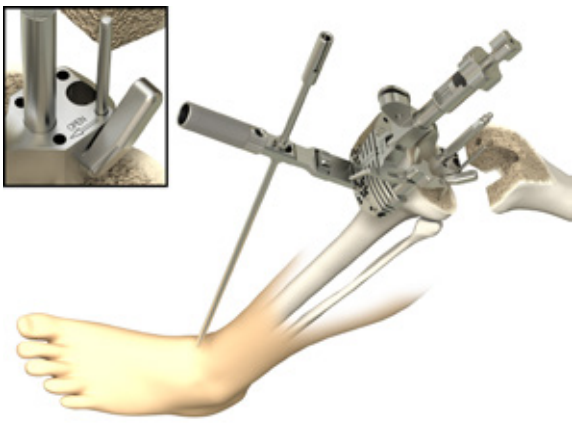
Important

In primary procedures, the 11mm tibial stylus is positioned on the lowest point of the less damaged condyle.

In revision procedures where no tibial augmentation blocks are required, the 1mm tibial stylus is positioned on the lowest area of the tibial plateau.

In revision procedures where augmentation blocks are required the 1mm tibial stylus is positioned on the lowest point of the less damaged condyle.

Controlling the alignment and the tibial resection



The alignment is checked again with the axial alignment rod. The rod tip must point to the center of the ankle joint.

The tibial stylus can now be removed.

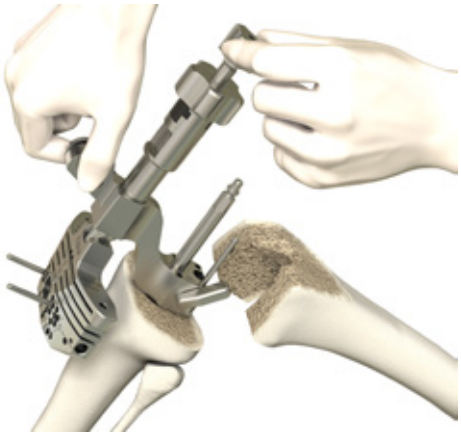
for fixing the rotation of the tibial resection guide, a pin can be inserted in one of the 4 proximal holes.

The resection height is checked with the resection stylus. The femoral/tibial cutting block can be adjusted using the large grub screw ± 6mm.

The top small grub screw is used for assembling the femoral/tibial cutting block only.

After preliminary drilling with the Ø 3.2mm drill, the femoral/tibial cutting block is fixed with two bone pins (75mm or 100mm long) through the holes marked 0.

Handles can be attached.

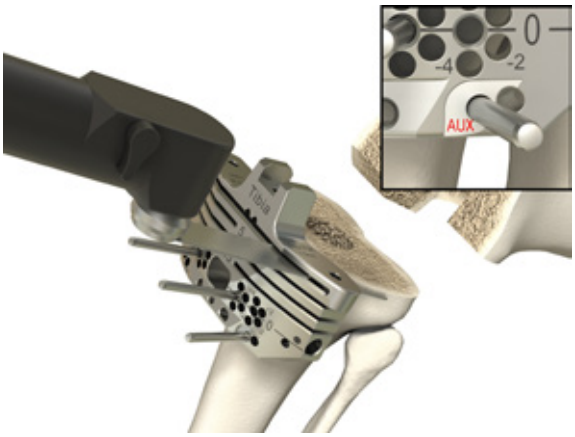


The lock lever is set to OPEN and the tibial resection guide IM is removed from the femoral/tibial cutting block by unscrewing the top small grub screw.

The trial stem with the extension is also removed by using the modular handle.

The femoral/tibial cutting block is slid onto the bone.

Tibial resection

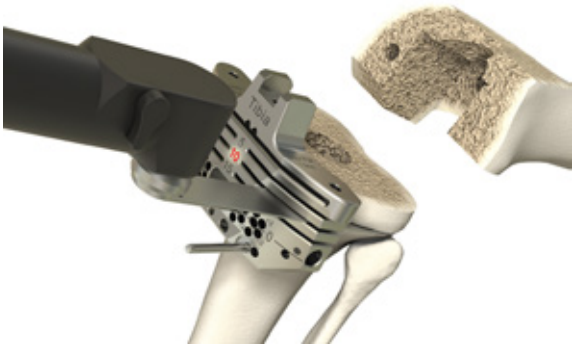


The tibial resection is performed using a 1mm (or 1.27mm option) saw blade through the 0 saw slot (closed slot with facet).

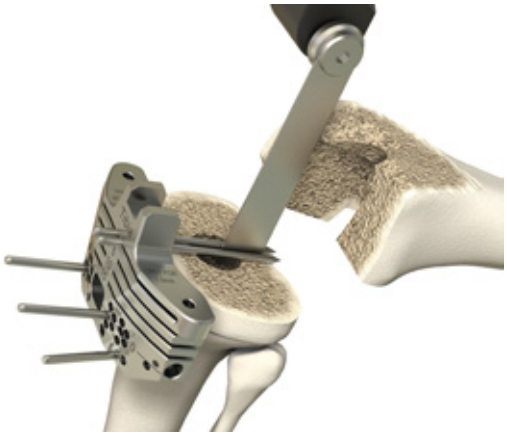
For stable locking of the femoral/tibial cutting block, an additional pin can be inserted into the oblique holes marked with AUX. After resections, the pin can be removed.

Important

The ligaments must be protected during all resections.



When using tibial blocks, the resection is conducted through the open saw slots. Blocks 5mm, 10mm and 15mm high are available.



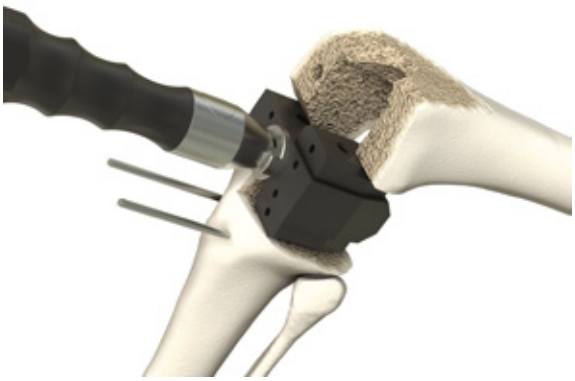
As guidance for the vertical tibial augmentation block cut, two bone pins (length 75mm or 100mm) are inserted into the two proximal holes level with closed saw slot. The vertical cut is performed between the two pins to the depth of the augmentation block.

Important

If the femoral/tibial cutting block is distally or proximally relocated (purpose of thicker or thinner bone resection), this is moved to the right (±2mm) or parallel (±4mm). If the relocation is to the right, the vertical cut should be performed on the outside of the right pin rather than between the pins.

The femoral/tibial cutting block is now removed.

Check flexion and extension gap



The tension in flexion and extension is checked with spacers. The spacers (8, 11 and 14) represent the femoral component and the full tibial component heights (tibial component and tibial insert).

When using augmentation blocks, the corresponding spacer blocks must be fixed to the spacer. Note the corresponding thickness (5mm, 10mm or 15mm). These can be fixed either on the tibial side or on the femoral side.

If necessary, further release or resection are performed.

To release the spacer blocks, a long pin can be inserted in the hole and used as a lever.

The two bone pins in the tibia are then removed.

Tibial size determination

The chosen trial stem is attached to the extension for trial stem (Ø 8mm) and with the modular handle carefully inserted again into the tibial IM canal so the line marking is approximately level to the proximal bone resection. It is important to avoid putting excessive pressure in the tibial IM canal. The modular handle is now removed.

The tibial sizer trial and the handle are assembled and placed intramedullarly with the tibial chisel guide over the extension for trial stem (Ø 8mm) and applied onto the proximal bone resection.

The tibial sizer trial should completely cover the cortex without projecting beyond the tibia. In case of doubt a lateral projection is preferred, because a medial projection may cause irritation of the pes anserinus. If the projection is not acceptable, a smaller size should be used (pay attention to the size combination!). The correct tibial size is then determined.

Important

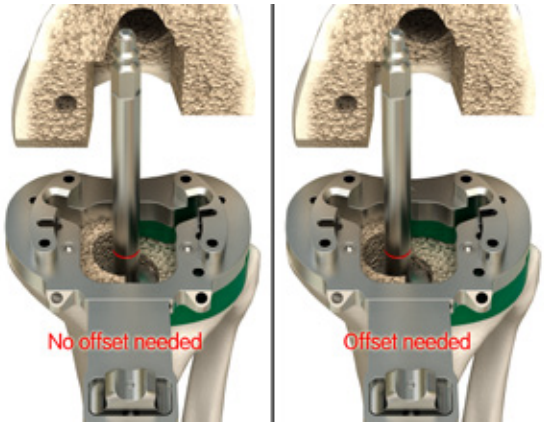
Pay attention to the size combination! Size 2 tibial component cannot be combined with size 4 femoral component and vice versa.

By use of tibial blocks, the corresponding blocks are to be attached to the tibial sizer. Note the corresponding heights (5mm, 10mm or 15mm) and side (Rlat/Lmed or Llat/Rmed).

Important

The 15mm tibial blocks are anatomically bent ML and posterior. Therefore, the under contour is always a size smaller than the upper contour.

Setting the need of an offset stem



After tibial size determination, the trial stem extension position is observed and if it looks centered to the internal tibial sizer contour, no offset stem is requested (next steps follow on page 40).

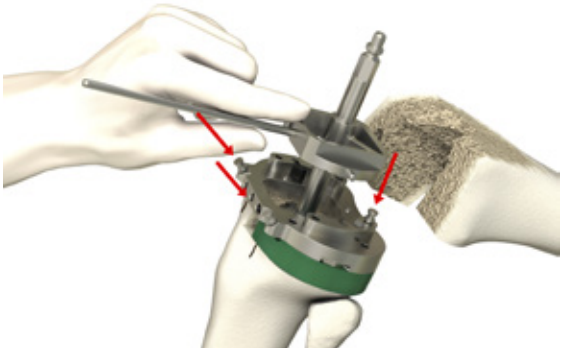
If, on the contrary, the trial stem extension position is not centered to the internal tibial sizer contour, an offset stem is requested (next steps on page 42 ff).

For more accuracy, the chisel guide can be placed and the need of an offset can be controlled by visualizing an overhanging of the tibial sizer.

Setting the tibial rotation (without offset)

With the chisel guide in place, the tibial rotation is determined anatomically statically (orientation to the tibial tuberosity and the axial alignment rod tip must point to the center of the ankle joint).

Mark the rotation position on the anterior cortical bone by using the electrocauter.

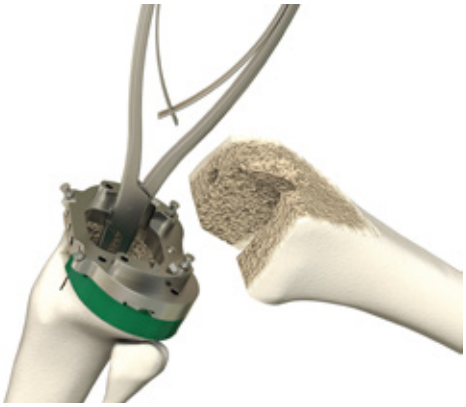


After preliminary drilling with the Ø 3.2mm drill, the tibial sizer is fixed with at least two bone pins with head.

Remove the tibial chisel guide and the trial stem and replace it with the tibial drill guide.

Positioning of the chisel guide is achieved by introducing and rotating the chisel guide clockwise in the tibial sizer. If insertion or removal proves difficult, a long pin can be used as a lever, which is placed in the anterior hole of the chisel guide.

In order to prepare the tibial trial, we recommend screwing the trial stem onto the tibial trial at this point.



If required, especially when confronted with very bad sclerotic bone quality, the tibial bone cavity can be pre-prepared before drilling and rasping by using the thin narrow 10mm osteotome. Apply the osteotome flush to the inner reference surfaces of the tibial chisel guide. This approach prevents bone fractures.

Remove the tibial chisel guide again and finish the cavity with a rongeur if necessary.

Preparing the tibial IM canal (without offset)

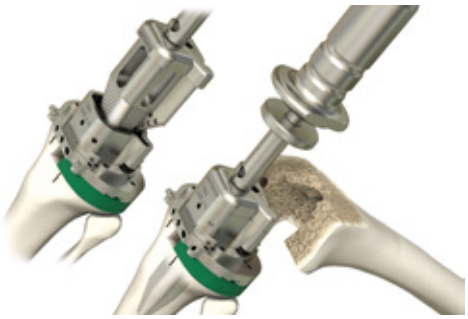
Prepare the proximal tibial anchorage with the stepped drill and the tibial rasp.

The tibial stepped drill is inserted into the drill guide that the drill is stopped from the guide.

Remove the tibial stepped drill and the drill guide and replace them with the tibial rasp guide.

Important

The tibial stepped drill is driven by hand by using the reamer handle.



With the tibial rasp, the proximal tibial cavity is definitively prepared. The rasp must be tapped into.

Important

In order to avoid bone fractures tap the rasp in carefully.

Important

In case of sclerotic bone, the rasp can be separated and tapped down separately for more accuracy.

Remove the tibial rasp, the rasp guide and the tibial sizer trial.

Preparing the tibial trial (without offset)

The neutral adapter is screwed on the tibial trial anchorage end.

The selected trial stem is screwed on the neutral adapter.

By use of tibial blocks, the corresponding blocks are to be attached to the tibial trial. Note the corresponding heights (5mm, 10 mm or 15mm) and side (Rlat/Lmed or Llat/Rmed).

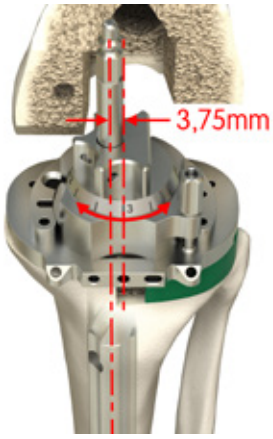
Important

The 15mm tibial blocks are anatomically bent ML and posterior. Therefore, the under contour is always a size smaller than the upper contour.

Optional Tibial Anchorage Preparation with Offset

Preparing the tibial anchorage for offset stems

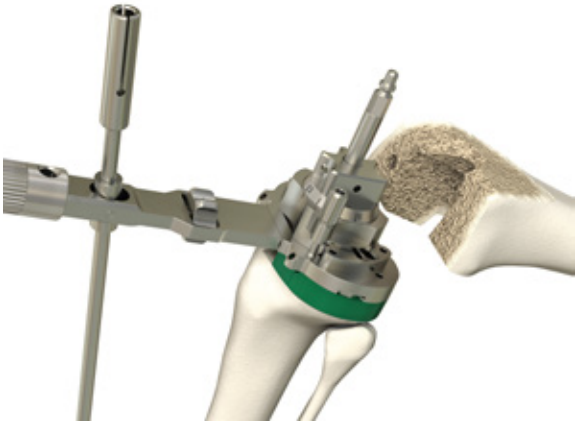
Positioning the tibial sizer and setting the rotation



After measuring the size of the tibia, the tibial sizer with premounted tibia eccentric connection (3.75mm) is positioned on the Ø 8mm extension of the trial stem.

The tibial sizer is positioned with the transfer guide so it does not overhang. It should be in good contact with the cortical bone all round.

When using tibial blocks, place the corresponding blocks on the tibial sizer. Note the corresponding thickness (5mm, 10mm or 15mm) and side (Rlat/Lmed or Llat/Rmed).

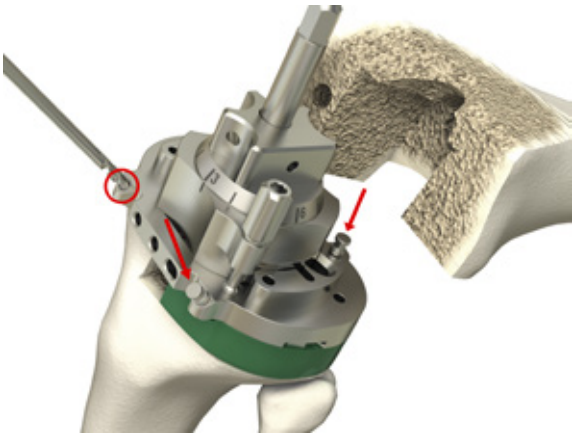


Important

The 15mm tibial blocks are anatomically bent ML and posterior. Therefore, the under contour is always a size smaller than the upper contour.

The tibial rotation is determined anatomically statically (orientation to the tibial tuberosity and the axial alignment rod tip must point to the center of the ankle joint).

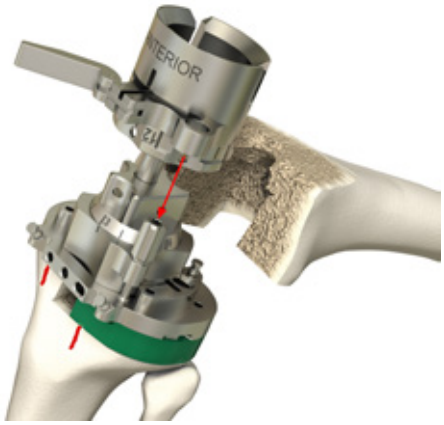
The stems are available with the offset of 3.75mm integrated (monobloc).



When the position and rotation have been correctly adjusted, the tibial sizer is fixed with bone pins with head using the anterior inclined pin holes and from the top.

The rotation can be marked with an electrocautery.

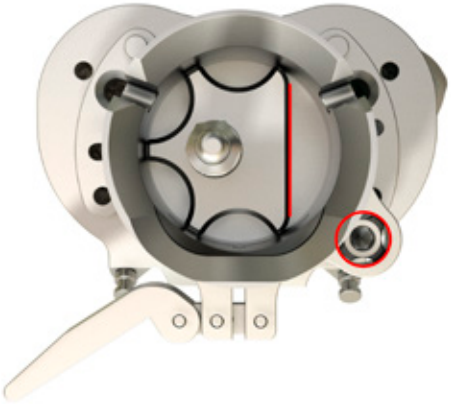
Record the offset position



Place the offset memory device, with open lever arm, onto the tibial eccentric attachment for taking over the offset position. The below ring of the offset memory device is movable as long as the lever arm is open.

As references taken for the offset memory device are the flat reference and the fixation screw position of the tibial eccentric attachment.

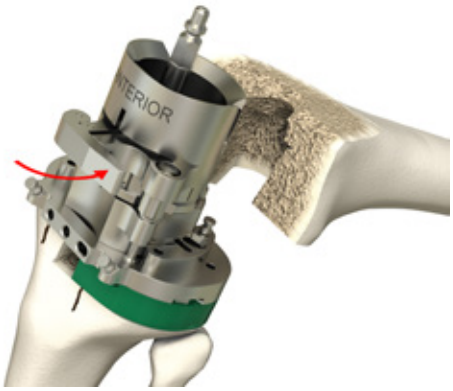
The offset memory device is set / adjusted, until the flat side of the bottom ring and the round bushing of the top part are adjusted so that the memory device is slipped over the tibial eccentric attachment.



To facilitate setting, preadjust approximately the position of the offset memory device.

Important

The memory device takes the offset position and acts as a guide for assembling the trial components later as well for assembling the final implants.



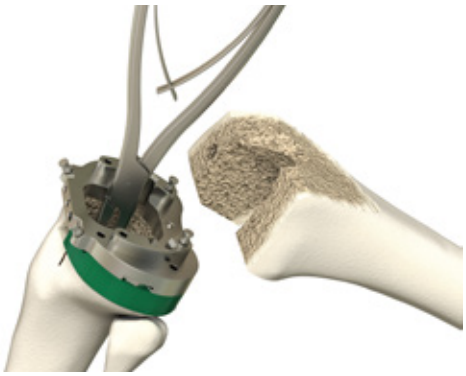
Lock the lever arm to set the offset reference on the memory device.

Hold the transfer guide when tensioning the lever.

The transfer guide is removed and the trial stem can be pulled out.

Important

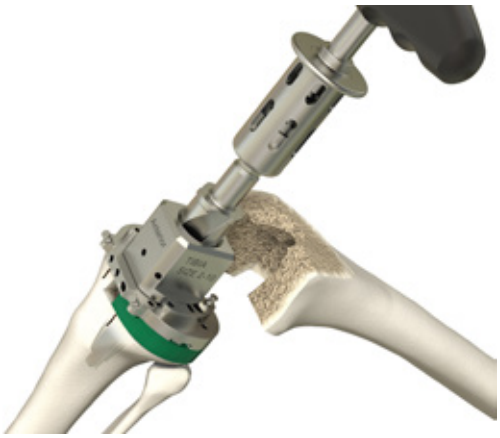
Never open the lever arm of the memory device before the final stem has been set.



If required, especially when confronted with very bad sclerotic bone quality, the tibial bone cavity can be pre-prepared before drilling and rasping by using the thin narrow 10mm osteotome. Apply the osteotome flush to the inner reference surfaces of the tibial chisel guide. This approach prevents bone fractures.

Remove the tibial chisel guide again and finish the cavity with a rongeur if necessary.

Preparing the tibial IM canal (with offset)



As for the tibial anchorage without offset preparation, prepare first the proximal tibial anchorage with the stepped drill and then finalize with the tibial rasp.

The tibial stepped drill is inserted into the drill guide that the drill is stopped from the guide.

Remove the tibial stepped drill and the drill guide and replace them with the tibial rasp guide.

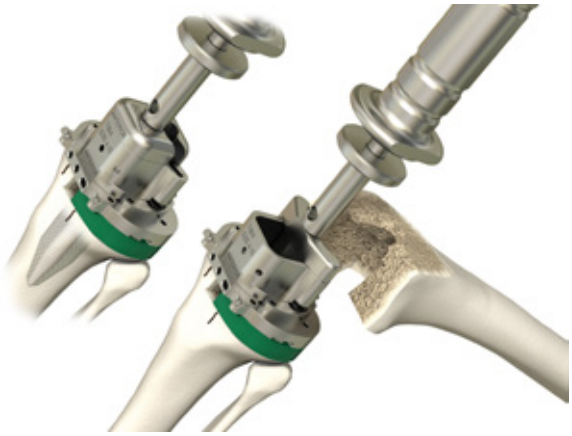
Important

The tibial stepped drill is driven by hand by using the reamer handle.

With the tibial rasp, the proximal tibial cavity is definitively prepared. The rasp must be knocked so far that the rasp is stopped from the guide.

Important

In order to avoid bone fractures tap the rasp in carefully.

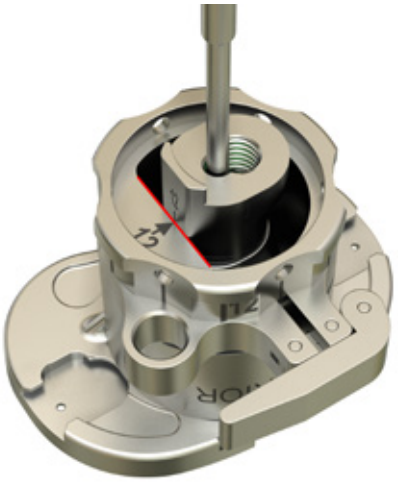


Important

In case of sclerotic bone, the rasp can be separated and tapped down separately for more accuracy.

Remove the tibial rasp, the rasp guide and the tibial sizer trial.

Preparing the tibial trial (with offset)



The memory device is first positioned onto the tibial trial, taking the fins as reference for a correct stable positioning.

Never open the lever arm of the memory device before the final stem has been set.

Assembly is carried out on the instrument table.

The eccentric adapter (3.75mm offset) is now placed onto the tibial trial anchorage ends and positioned flush with the reference. Now the offset adapter is fixed by screwing it on the tibial trial.

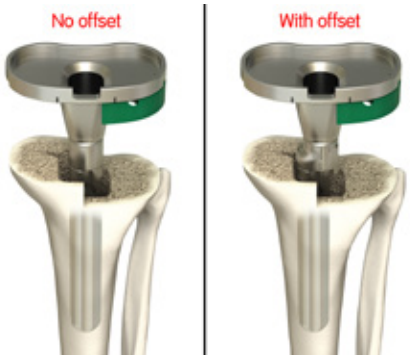
The selected trial stem is screwed to the tibial trial (on top of the eccentric adapter).

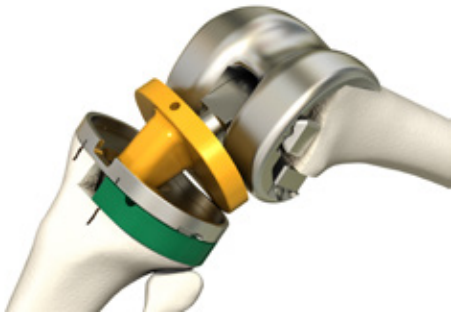
By use of tibial blocks, the corresponding blocks are to be attached to the tibial trial. Note the corresponding heights (5mm, 10mm or 15mm) and side (Rlat/Lmed or Llat/Rmed).

Important

The 15mm tibial blocks are anatomically bent ML and posterior. Therefore, the under contour is always a size smaller than the upper contour.

Trial reduction





The purpose of the trial reduction is to check the radius of movement, patella guidance and the tension of the soft-tissue mechanism.

The tibial trial together with the trial stem (depending on the last reamer diameter and depth) are inserted using the impactor.

Important

It is possible that the same trial stem is required on the femur and on the tibia. In this case, for the femoral trial fit a shorter trial stem with the same diameter or one of equal length with a smaller diameter, or do not fit a trial stem at all.

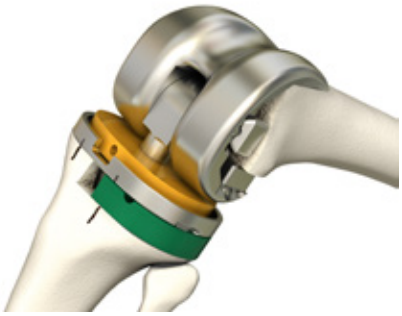
The femoral trial together with the trial stem (depending on the last reamer diameter and depth) are inserted using the impactor.

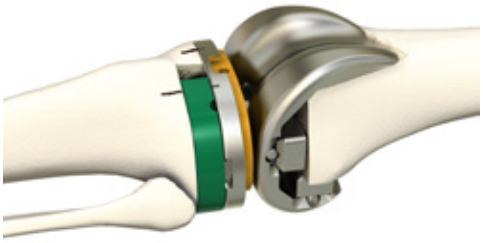
Important

If the tibial and/or the femoral trial components are not setting properly flush to the bone resection, the respective IM canal anchorage has to be reamed again deeper with the last used reamer.

By using blocks, there are appropriate block trials available (5mm, 10mm and 15mm), which are fixed sidewise to the tibial trial or respectively to the femoral trial

Attach the appropriate tibial insert trial, which has been previously defined with the spacer, onto the rotation peg of the femoral trial in the 90° flexed position and insert it into the tibial trial by hand.

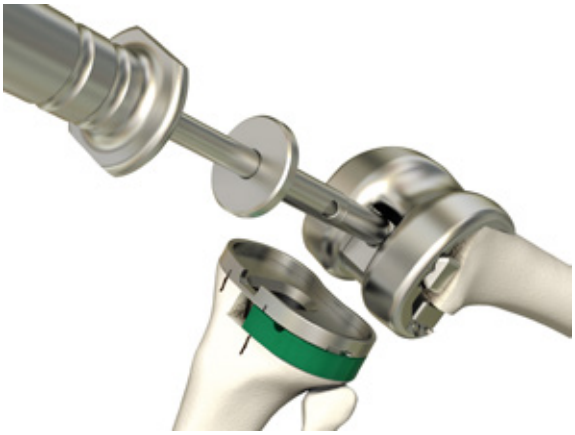


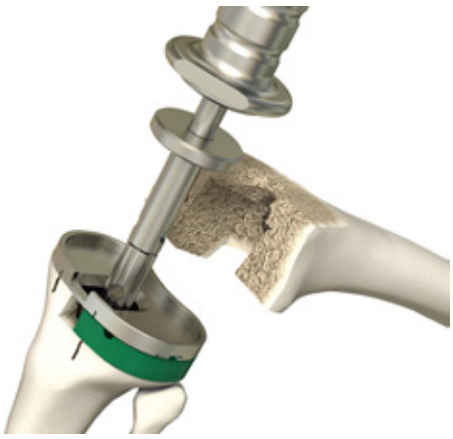


The implant fit, the kinematics of the knee joint and patellar function are checked.

Important

At this point a definitive decision should be taken regarding patella replacement (see instructions on page 48 ff).





When the definitive implants have been selected, get the components ready for assembly (see instructions on page 50 ff).

Remove the trial components with the slap hammer, starting with the femur.

Important

For removing the tibial trial component, an adapter needs to be assembled in between with the slap hammer.

As reference, it is recommended to leave assembled the trial components with stem and eventually blocks. They are used for controlling or as comparison with the definitive implant.

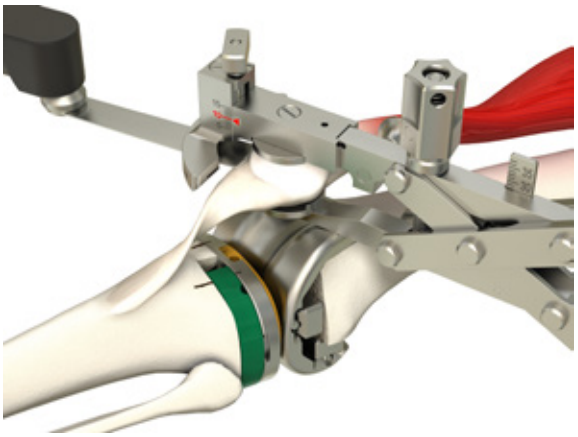
Patellar Preparation

The leg is extended. The soft tissue on the posterior surface of the patella is exposed preserving the ligaments.

Important

If the posterior surface of the patella is not replaced, the patella is freed of osteophytes and denerved.

Positioning the patella clamp and patella resection



The patellar instruments permit the use of the “onlay” technique, in which 10mm of the bone are resected and replaced by a 10mm thick patellar implant (if an 8mm thick patellar implant is planned, resect just 8mm accordingly).

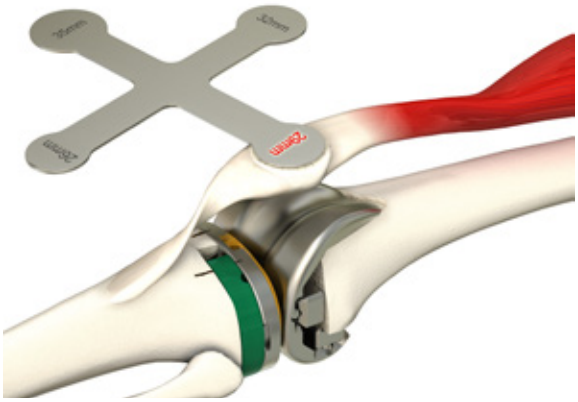
An alternative option is the “inlay” technique, in which the implant is partially countersunk (3mm to 5mm). Here, the patella is only resected approx. 7mm to 5mm below the ridge. The thickness of the residual bony patella should not be less than 12mm. See also the “Milling” section on page 49.

After placing the patellar cutting guide on the patellar clamp with the ratchet, grasp the patella with the clamp. The patellar thickness can be read from the millimeter scale on the handle.

Adjust the patella osteotomy insert (millimeter scale) to the height to be resected and resect the patella with the oscillating saw (1mm or optional 1.27mm saw blade with unset teeth).

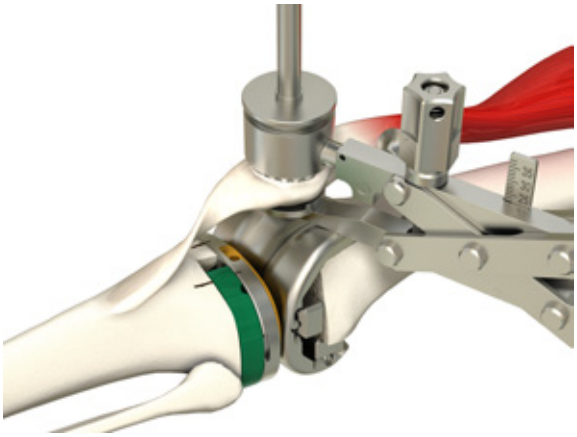
When resecting, ensure that the saw blade does not wander, e.g. due to sclerotic bone sectors.

Patellar size determination



Determine patellar size using the patellar sizer. Supplied sizes are Ø 26, Ø 29, Ø 32 and Ø 35mm. Note that the patellar component is implanted with a slight medial offset, thus matching the position of the natural patellar ridge. Small implant sizes are recommended for small patellae to enable this offset to be reproduced.

Milling

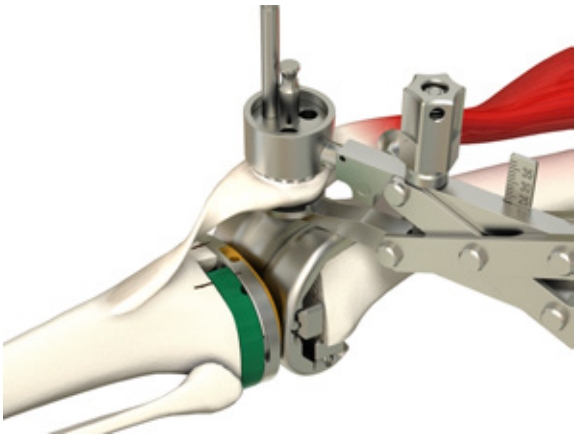


Mount the patellar bushing onto the patellar clamp with the ratchet.

Select the patellar reamer to match the corresponding patella size. Depending on the selected anchoring technique, mill briefly ("onlay" technique) or countersink by 3mm to 5mm ("inlay" technique). Milling down to the stop results in a depth of 5mm.

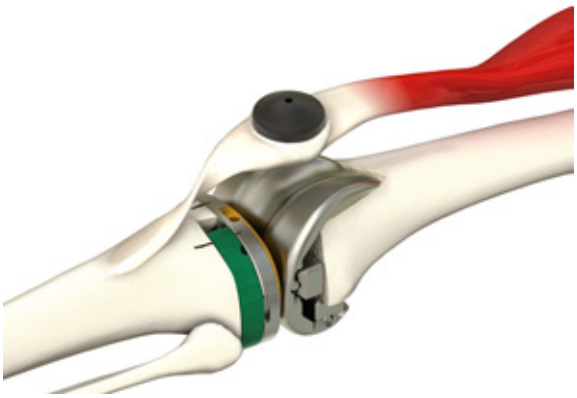
Patellar implants with a height of 10mm are recommended as standard. Implants with a height of 8mm are available as an alternative for thin patellae.

Drill anchoring holes



Using patellar drill guide and the patellar drill with stop, prepare the anchoring holes for the pegs.

Trial reduction



Patellar trials are available for trial reduction.

Assembling the Implant Components

The assembling block is essential for safe and gentle assembling of the implants.

Important

When assembling the implant components, always start with the stem first. Then the blocks can be fixed. Otherwise the block screw may come loose during impacting.

Be aware; if any screw or clamp is missing from the respective component or for any reason is not sterile, a set of replacement screws and clamp (page 65) is available.

Assembling the tibial component

The tibial component (page 62) is positioned in the specified position on the assembling block.

The stem (page 66) is inserted into the taper. It is recommended to turn the stem so that the security screw is positioned medially (lower stress in this zone), and that no fin but a groove is anteriorly positioned (thereby a larger surface is in contact with the internal cortical bone).

Important

Pay attention that the tapered connection is undamaged, clean and dry before mounting, and when using noncemented stems, that a pocket is anterior, not a rib.

Fixing the stem (cemented/noncemented) to the tibial component

The prepared automatic hammer with adapter is placed on the stem. The stem is securely attached to the tibial component by **three times impacting** on the stem.

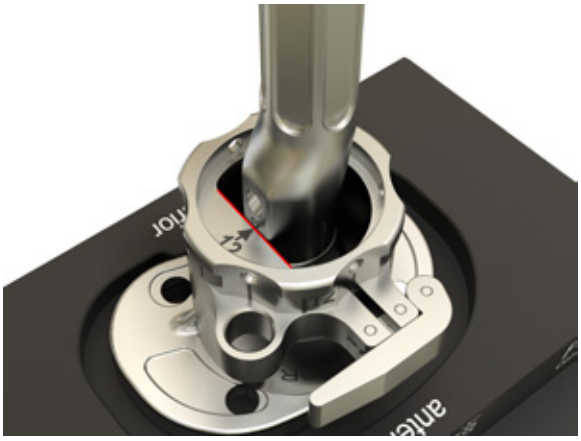
Important

When using 200mm stems, place the cross-shaped stem protector into the adapter for automatic hammer.

A stem connection with 3° posterior slope is integrated into the tibial component.

If an offset stem has been planned, the memory device will be needed and placed onto the tibial component (see the following page)!

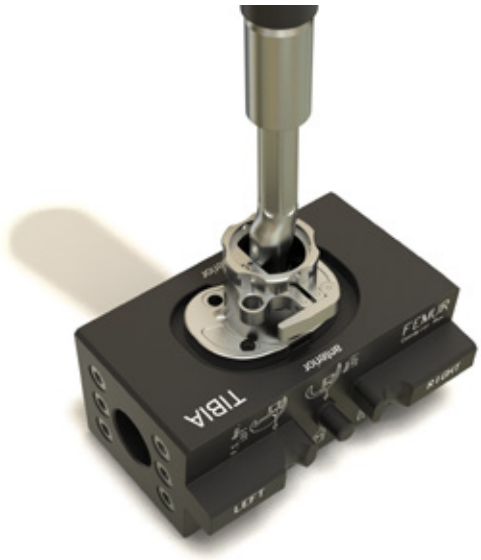
Fixing an offset stem to the tibial component



After having placed the tibial component on the assembling block, the memory device is positioned onto the tibial component, taking the fins as reference for a stable correct positioning.

Important

Never open the lever arm of the memory device before the final stem is set.



The offset stem (page 67) is placed onto the taper of the tibial component and set to the offset position with the aid of the memory device. The straight surface on the offset elbow of the stem must be flush with the straight internal surface of the memory device.

Important

Pay attention that the tapered connection is undamaged, clean and dry before mounting.

The prepared automatic hammer with adapter is, as with straight stem, placed on the stem. The stem is securely attached to the tibial component by **three times impacting** on the stem.

The memory device can now be removed.

Securing the stem

With the stem screw, the stem is additionally secured. The screw has to be tightened with the provided screwdriver.

Important

The screwdriver for stems must be used carefully due to its slim design.

Assembling the tibial blocks

There are blocks with a thickness of 5mm, 10mm and 15mm available for the tibial components (page 65).

To enable tibial block assembly the required PE pegs must first be removed.

Important

When using blocks, care must be taken to ensure that the femoral implants are dry and clean. Observe the appropriate size combinations.

The tibial blocks are also fixed mechanically with the preassembled screws with the screwdriver with torque. The required torque is reached when the line reaches the “Stem/ Block” position (4.5 Nm).

The tibial blocks can be inserted either medially or laterally (except tibial blocks size 15mm). The 15mm tibial blocks are anatomically conical tapered and therefore differently used (R-Lat/L-Med, respectively; L-Lat/R-Med).

The screws are screwed into the block through the tibial component and must always be countersunk.

Assembling the femoral component

The femoral component (page 62) is positioned in the specified position on the assembling block.

Fixing the stem (cemented/noncemented) to the femoral component

The stem (page 66) is inserted into the taper. It is recommended to turn the stem so that the security screw is positioned medially (lower stress in this zone, and in addition this will facilitate the screwing later on), and that no fin but a groove is anteriorly positioned (thereby a larger surface is in contact with the internal cortical bone).

Important

Pay attention that the tapered connection is undamaged, clean and dry before mounting, and when using noncemented stems, that a pocket is anterior, not a rib.

The prepared automatic hammer with adapter is placed on the stem. The stem is securely attached to the femoral component by **three times impacting** on the stem.

Important

When using 200mm stems, place the cross-shaped stem protector into the adapter for automatic hammer.

A stem connection with 6° valgus angle is integrated into the femoral component.

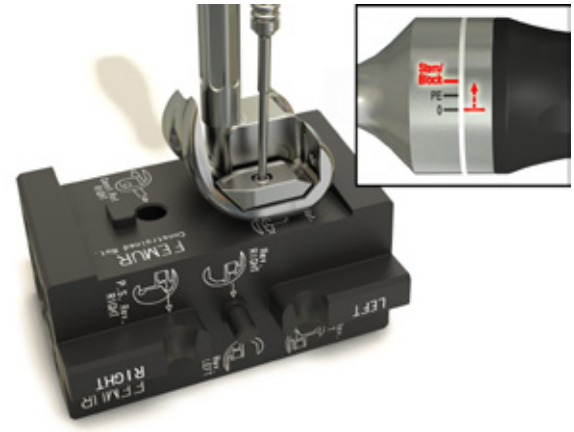
Securing the stem

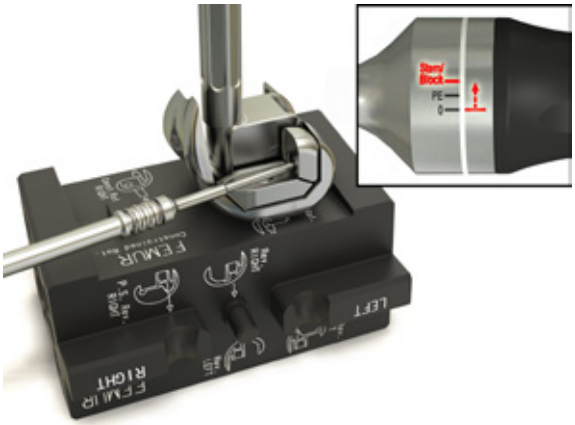
With the stem screw, the stem is additionally secured. The screw has to be tightened with the provided screwdriver.

Important

The screwdriver for stems must be used carefully due to its slim design.

Assembling the femoral blocks





There are blocks with a thickness of 5mm, 10mm and 15mm available for the femoral components (15mm only distal) (page 64).

Important

When using blocks, care must be taken to ensure that the femoral implants are dry and clean. Observe the appropriate size combinations.

The femoral blocks are also fixed mechanically with the preassembled screws with the screwdriver with torque. The required torque is reached when the line reaches the “Stem/Block” position (4.5 Nm).

The distal and posterior femoral blocks (5mm, 10mm and 15mm) can be inserted either medially or laterally.

Important

When using distal and posterior blocks, it is recommended to tightly screw the posterior block first and then the distal block. This is particularly advisable when using a 15mm distal block.

Mix the bone cement according to the respective manufacturer's instructions. Clean, wash and dry the bone bed sufficiently. Modern cementing techniques using a vacuum mixer and jet lavage are recommended.

The RT-PLUS◇ Modular knee is used with cement, with the exception of noncemented stems. First cement the tibial component and then the femoral component.

Important

With sclerotic bone it is recommended to drill several holes using a Ø 3.2mm drill. This improves anchorage between the bone cement and the bone.

Ti_6Al_4V stems: The backs of the condyles and the box walls of the femoral component are coated with cement. The back of the tibial component is coated with cement (back of plateau and box). The Ti_6Al_4V stems are not cemented.

Important

When implanting Ti_6Al_4V stems, pay attention that the rotation alignments of the femoral and tibial components correspond already when the stems are inserted in the definitive implant positions. This prevents unnecessary rib notches occurring in the IM canal.

CoCr stems: The medullary plugs are accordingly placed deeper than the components (stem tip). It is recommended to fill up the IM canals using a cement gun.

Implanting the tibial and femoral components

In 90° flexed position, the tibial component is hammered in using the corresponding impactor. Excess cement is carefully removed. While the cement is setting, the implant components must be under continuous pressure.

Important

Make sure that cement is applied between the fin connections and stem connection when using tibial blocks.

There is no difference in the procedure when implanting a straight or an offset stem.

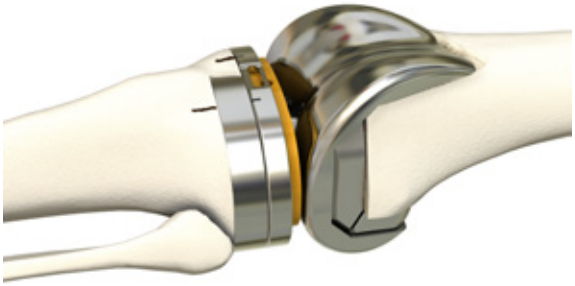
The femoral component is hammered in using the impactor. Here too, continuous pressure must be maintained and excess cement removed.

Important

Make sure that the posterior femoral condyles do not come into contact with the tibial component when impacting the femoral component. We recommend covering the tibial component with a compress.

Before the femoral component cement has set, the plastic lug that protects the box against the entry of cement must be removed.

Last controlling



Prior to definitive assembly of the tibial insert it is possible to use the tibial insert trial for a final trial reduction.

Before the cement has set, the excess cement must be removed in extension.

Insertion of the tibial insert

The tibial insert of the corresponding size (see page 63) may only be inserted when the cement has fully hardened.

In 90° flexed position, the tibial insert is placed on the femoral component rotation peg and slid into the tibial component by hand.

Important

Note the correct anatomical alignment. It is important to make sure that no soft tissue is coming between the tibial insert and the tibial component.

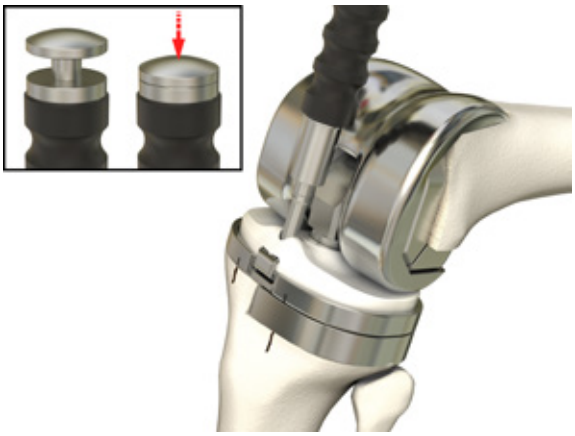
In order to prevent the anterior metal clamp from falling out, handle the tibial insert carefully.

Fixation of the tibial insert

Place impacting attachment on the plug inserter.

In extension position, the tibial insert clamp is manually completely inserted from anterior to posterior by using the plug inserter with the impacting attachment fitted.

It should end up positioned completely against the tibial insert and the tibial component.



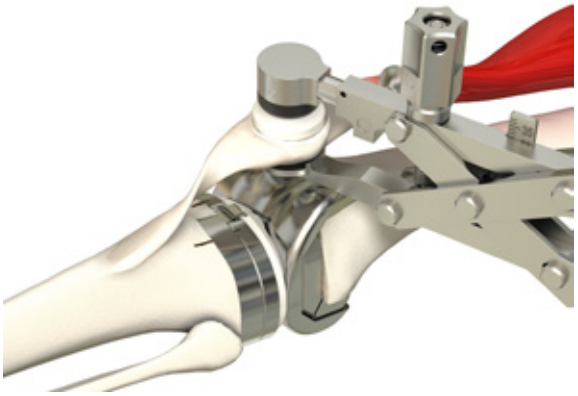
Remove the impacting attachment from the plug inserter.

In order to secure the clamp, the plug inserter, in 90° flexed position, is placed into the anterior tibial insert hole over the polyethylene plug. With complete pressure till it stops on the plug inserter, the polyethylene plug is set into the clamp.

Important

If a tibial insert needs to be removed from the tibial component, the polyethylene plug is drilled to a depth of 6–8mm using a Ø 3.2mm drill and the clamp is removed from anterior. Make sure that such removed tibial insert will not be reused.

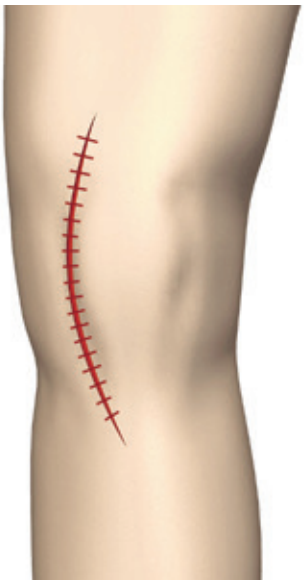
Implanting the cemented patellar component



If patellar replacement is indicated, the patellar component (page 62) of the TC-PLUS◇ knee system is used since the geometry of the patellar groove matches this implant.

Mount the patellar inserter on the patellar clamp with the ratchet. Coat the back of the patellar component with cement and fill the three peg holes of the patella with cement. Insert the patellar component by hand with the leg extended and press in, using the patellar clamp with the ratchet fitted with the patellar inserter. Remove excess cement. Leave the clamp in place until the cement has completely set.

Wound closure



The wound must again be rinsed out thoroughly after implantation. Close the wound in layers, inserting two intra-articular and one subcutaneous Redon drain.

Postoperative Treatment

Rehabilitation

The operated leg is immobilized in a splint and the knee joint is cooled. Isometric contraction exercises should be performed on the first postoperative day. Thrombosis prophylaxis is required until full load can be borne.

On the second postoperative day, after removing the drains, assisted movement exercises and the use of a motorized splint (CPM) are started. The operated leg can generally bear a load early on.

Mobilization of the patient initially occurs with a walking frame or crutches, which can be limited as steadiness of gait improves.

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Müller C, Basad E, Melzer C
Mid-Term Result With A New Rotating Hinge Total Knee Arthroplasty (Poster)
AAOS Annual Meeting, March 5–9, 2008, San Francisco, USA

Sterilization

Implants

All the implants described in this Surgical Technique are sterile when they are delivered by the manufacturer. Resterilization is not allowed.

Instruments

System components and instruments are not sterile when they are delivered. Before use they must be cleaned by the usual methods in accordance with internal hospital regulations and sterilized in an autoclave in accordance with the legal regulations and guidelines applicable in the relevant country. (For detailed information please refer to leaflet Lit. No. 03389.)

The correct settings are given in the instructions for use issued by the autoclave manufacturer. Instrument manufacturers and dealers accept no responsibility for sterilization of products by the customer.

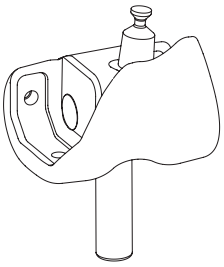
Implants

RT-PLUS◇ Modular Implants for Cemented Application

Femoral components left

right Set No.: SAP 75300190

SAP No.	Art. No.	Size
75005554	24322	2
75005555	24324	4
75005556	24326	6
75005557	24328	8
75005558	24330	10

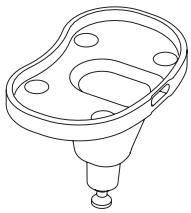


SAP No.	Art. No.	Size
75005549	24312	2
75005550	24314	4
75005551	24316	6
75005552	24318	8
75005553	24320	10

Tibial components

Set No.: SAP 75300191

SAP No.	Art. No.	Size
75005559	24332	2
75005560	24334	4
75005561	24336	6
75005562	24338	8
75005563	24340	10



Patellar components

Set No.: SAP 75300029 (8mm)/75300028 (10mm)

SAP No.	Art. No.	Size	Height
75004784*	21182*	Ø 26mm	8mm
75004787	21192	Ø 26mm	10mm
75004785*	21183*	Ø 29mm	8mm
75004788	21193	Ø 29mm	10mm
75004786*	21184*	Ø 32mm	8mm
75004789	21194	Ø 32mm	10mm
75004790	21195	Ø 35mm	10mm

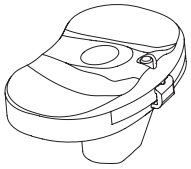
* Special sizes (on request)

The patellar components are the same as those of the TC-PLUS◇ knee system.

Tibial inserts

Set No.: SAP 75300188

SAP No.	Art. No.	Size	Height
75005461	24046	2	8mm
75005470	24047	2	11mm
75005481	24048	2	14mm
75005482	24056	4	8mm
75005483	24057	4	11mm
75005484	24058	4	14mm
75005485	24066	6	8mm
75005486	24067	6	11mm
75005487	24068	6	14mm
75005488	24076	8	8mm
75005489	24077	8	11mm
75005490	24078	8	14mm
75005491	24086	10	8mm
75005492	24087	10	11mm
75005493	24088	10	14mm

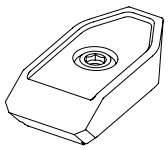


The tibial inserts are the same as those of the RT-PLUS◇ knee system.

Femoral blocks distal

Set No.: SAP 75300194

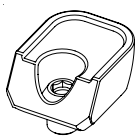
SAP No.	Art. No.	Size	Height
75005574	24371	2	5mm
75005575	24372	2	10mm
75005576	24373	2	15mm
75005577	24374	4	5mm
75005578	24375	4	10mm
75005579	24376	4	15mm
75005580	24377	6	5mm
75005581	24378	6	10mm
75005582	24379	6	15mm
75005583	24380	8	5mm
75005584	24381	8	10mm
75005585	24382	8	15mm
75005586	24383	10	5mm
75005587	24384	10	10mm
75005588	24385	10	15mm



Femoral blocks posterior

Set No.: SAP 75300196

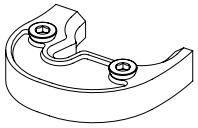
SAP No.	Art. No.	Size	Height
75005564	24350	2	5mm
75005565	24351	2	10mm
75005566	24352	4	5mm
75005567	24353	4	10mm
75005568	24354	6	5mm
75005569	24355	6	10mm
75005570	24356	8	5mm
75005571	24357	8	10mm
75005572	24358	10	5mm
75005573	24359	10	10mm



Tibial blocks

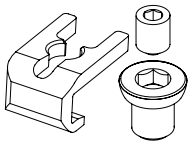
Set No.: SAP 75300195

SAP No.	Art. No.	Size	Height	
75005539	24300	2	5mm	
75005540	24301	2	10mm	
75005589	24390	2	15mm	R-Lat/L-Med
27505594	24395	2	15mm	L-Lat/R-Med
75005541	24302	4	5mm	
75005542	24303	4	10mm	
75005590	24391	4	15mm	R-Lat/L-Med
75005595	24396	4	15mm	L-Lat/R-Med
75005543	24304	6	5mm	
75005544	24305	6	10mm	
75005591	24392	6	15mm	R-Lat/L-Med
75005596	24397	6	15mm	L-Lat/R-Med
75005545	24306	8	5mm	
75005546	24307	8	10mm	
75005592	24393	8	15mm	R-Lat/L-Med
75005597	24398	8	15mm	L-Lat/R-Med
75005547	24308	10	5mm	
75005548	24309	10	10mm	
75005593	24394	10	15mm	R-Lat/L-Med
75005598	24399	10	15mm	L-Lat/R-Med



Set of spare screws and clamp

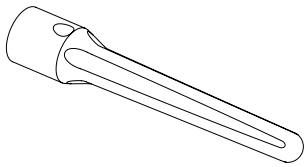
SAP No.	Art. No.	Quantity	Description
75005538	24289	1	Set of Spare Screws and Clamp: 1 Tibial Insert Clamp 1 Stem Screw 2 Tibial Block Screw



Cemented stems (conical) [CoCrMo]

Set No.: SAP 75300192

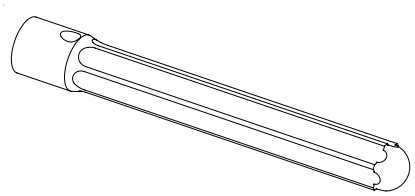
SAP No.	Art. No.	Size	Height
75005515	24232	Ø 12mm	95mm
75005514	24231	Ø 12mm	120mm
75005516	24233	Ø 12mm	160mm



Noncemented stems – straight [Ti_6Al_4V]

Set No.: SAP 75300193

SAP No.	Art. No.	Size	Height
75005517	24251	Ø 10mm	95mm
75005518	24252	Ø 12mm	95mm
75005520	24254	Ø 14mm	95mm
75005519	24253	Ø 16mm	95mm
75005521	24256	Ø 12mm	120mm
75005524	24259	Ø 14mm	120mm
75005522	24257	Ø 16mm	120mm
75005525	24260	Ø 18mm	120mm
75005523	24258	Ø 20mm	120mm
75005531	24266	Ø 12mm	160mm
75005532	24267	Ø 14mm	160mm
75005533	24268	Ø 16mm	160mm
75005534	24269	Ø 18mm	160mm
75005535	24270	Ø 20mm	160mm
75005526	24261	Ø 12mm	200mm
75005529	24264	Ø 14mm	200mm
75005527	24262	Ø 16mm	200mm
75005530	24265	Ø 18mm	200mm
75005528	24263	Ø 20mm	200mm

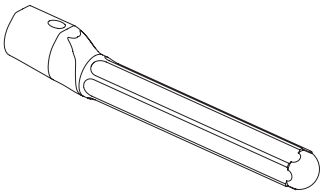


Cemented and noncemented stems are identical for femoral and tibial components of RT-PLUS◇ Modular knee systems.

Noncemented stems – 3.75mm offset [Ti_6Al_4V]
(for tibial component only)

Set No.: SAP 75300224

SAP No.	Art. No.	Size	Height
75100160	24400	Ø 10mm	95mm
75100161	24401	Ø 12mm	95mm
75100162	24402	Ø 14mm	95mm
75100163	24403	Ø 16mm	95mm
75100164	24404	Ø 12mm	120mm
75100165	24405	Ø 14mm	120mm
75100166	24406	Ø 16mm	120mm
75100167	24407	Ø 18mm	120mm
75100168	24408	Ø 20mm	120mm
75100169	24409	Ø 12mm	160mm
75100170	24410	Ø 14mm	160mm
75100171	24411	Ø 16mm	160mm
75100172	24412	Ø 18mm	160mm
75100173	24413	Ø 20mm	160mm



RT-PLUS◇ Modular Instrument Set (1mm)

Set No.: SAP 75210210
Art. No. 0944264

Trial stems and reamers

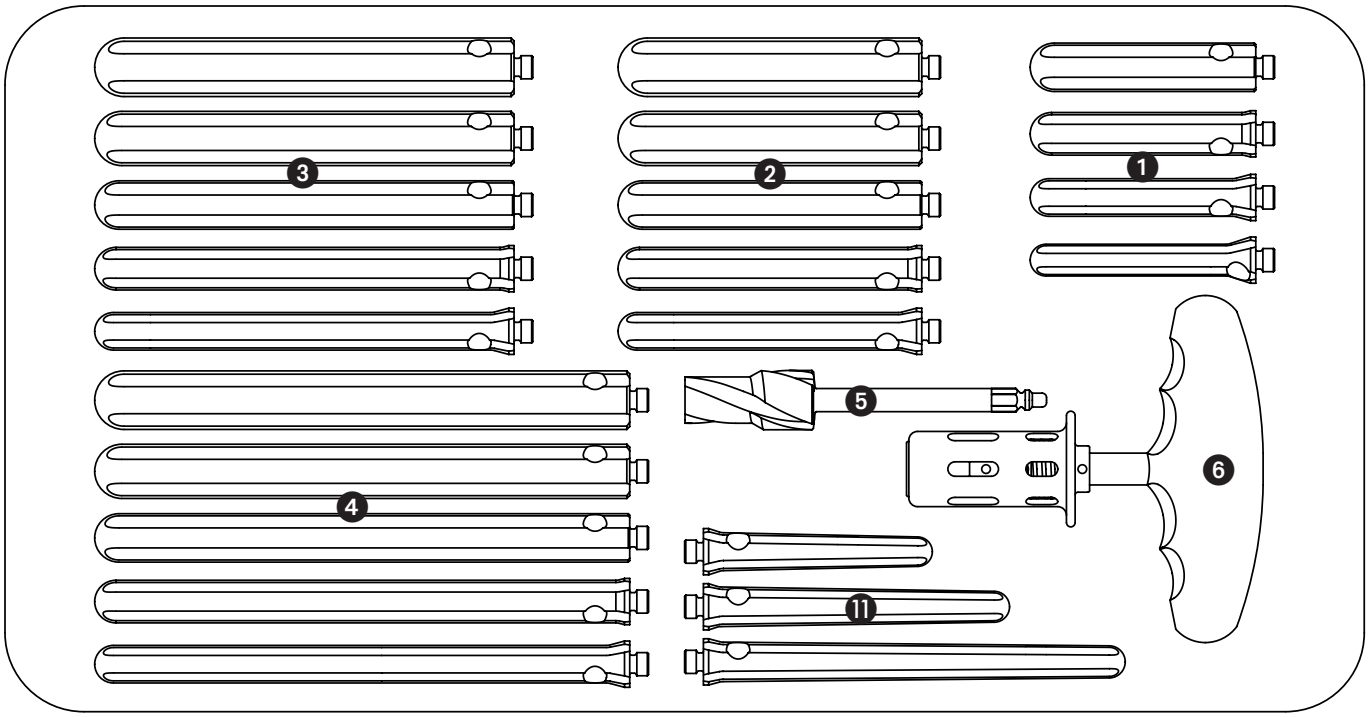
Case Set No.: SAP 75210238
Art. No. 0944277

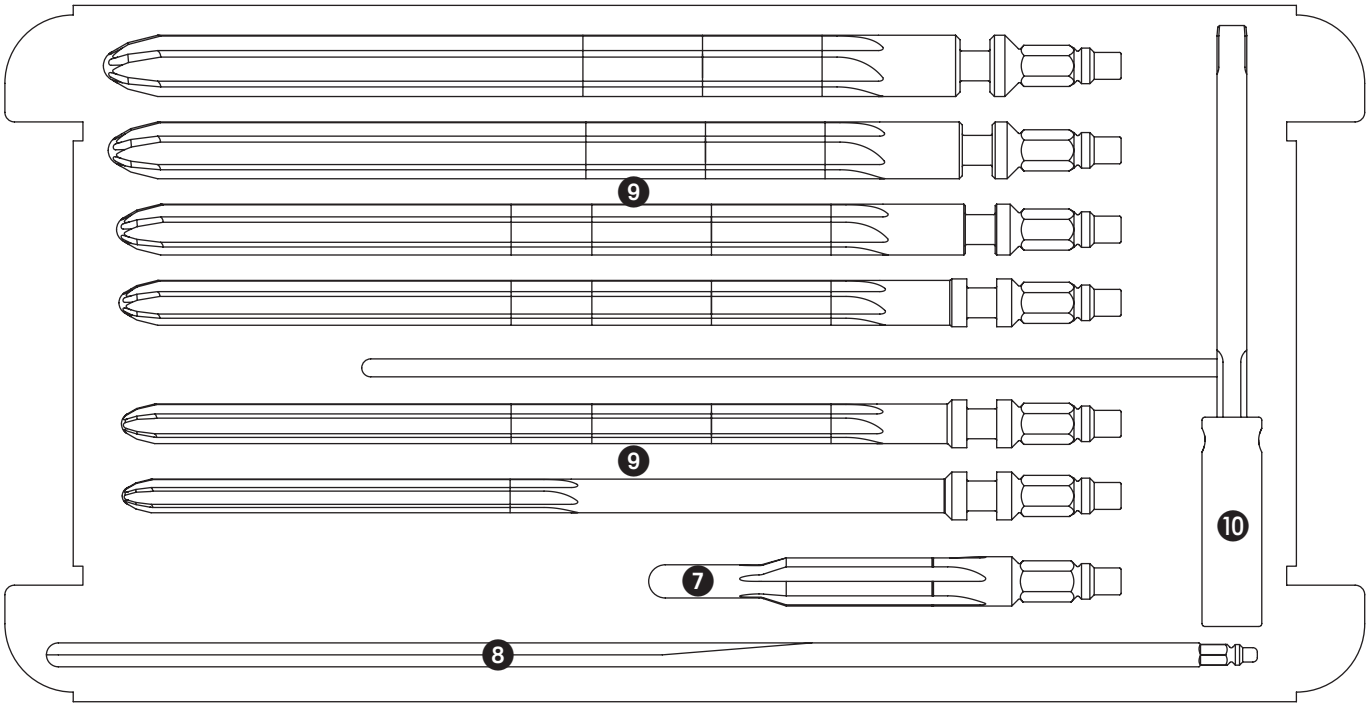
	SAP No.	Art. No.	Description	Size	Quantity
	75005464	**240462**	**Case Trial Stems, Empty**		**1**
	75007661	**990019**	**Case Lid**		**1**
❶	75005341	240112	Trial Stem	Ø 10/95mm	1
	75005342	240113	Trial Stem	Ø 12/95mm	1
	75005343	240114	Trial Stem	Ø 14/95mm	1
	75005344	240115	Trial Stem	Ø 16/95mm	1
❷	75005345	240116	Trial Stem	Ø 12/120mm	1
	75005346	240117	Trial Stem	Ø 14/120mm	1
	75005347	240118	Trial Stem	Ø 16/120mm	1
	75005348	240119	Trial Stem	Ø 18/120mm	1
	75005349	240120	Trial Stem	Ø 20/120mm	1
❸	75005350	240121	Trial Stem	Ø 12/160mm	1
	75005351	240122	Trial Stem	Ø 14/160mm	1
	75005352	240123	Trial Stem	Ø 16/160mm	1
	75005353	240124	Trial Stem	Ø 18/160mm	1
	75005354	240125	Trial Stem	Ø 20/160mm	1
❹	75005355	240126	Trial Stem	Ø 12/200mm	1
	75005356	240127	Trial Stem	Ø 14/200mm	1
	75005357	240128	Trial Stem	Ø 16/200mm	1
	75005358	240129	Trial Stem	Ø 18/200mm	1
	75005340	240111	Trial Stem	Ø 20/200mm	1
❺	75023717	22000513	Extension for Trial Stem	Ø 8mm	1
❻	75007098	600112	Reamer + Trial Stem Handle	–	1
	75005463	**240461**	**Tray Reamer, Empty**		**1**
❼	75005360	240142	Stepped Reamer	Ø 10/16mm	1
❽	75007168	600232	IM Rod	Ø 8mm	1
❾	75005413	240380	Reamer	Ø 10mm	1
	75005414	240381	Reamer	Ø 12mm	1
	75005415	240382	Reamer	Ø 14mm	1
	75005416	240383	Reamer	Ø 16mm	1
	75005417	240384	Reamer	Ø 18mm	1
	75005418	240385	Reamer	Ø 20mm	1
❿	75005419	240387	Reamer Alignment Guide EM	–	1

Optional Cemented Trial Stems (on request)

Set No.: SAP 75200247
Art. No.0944045

	SAP No.	Art. No.	Description	Size	Quantity
⓫	75005338	240109	Trial Stem Conical	Ø 12mm/95mm	1
	75005422	240398	Trial Stem Conical	Ø 12mm/120mm	1
	75005339	240110	Trial Stem Conical	Ø 12mm/160mm	1





Femoral Instruments

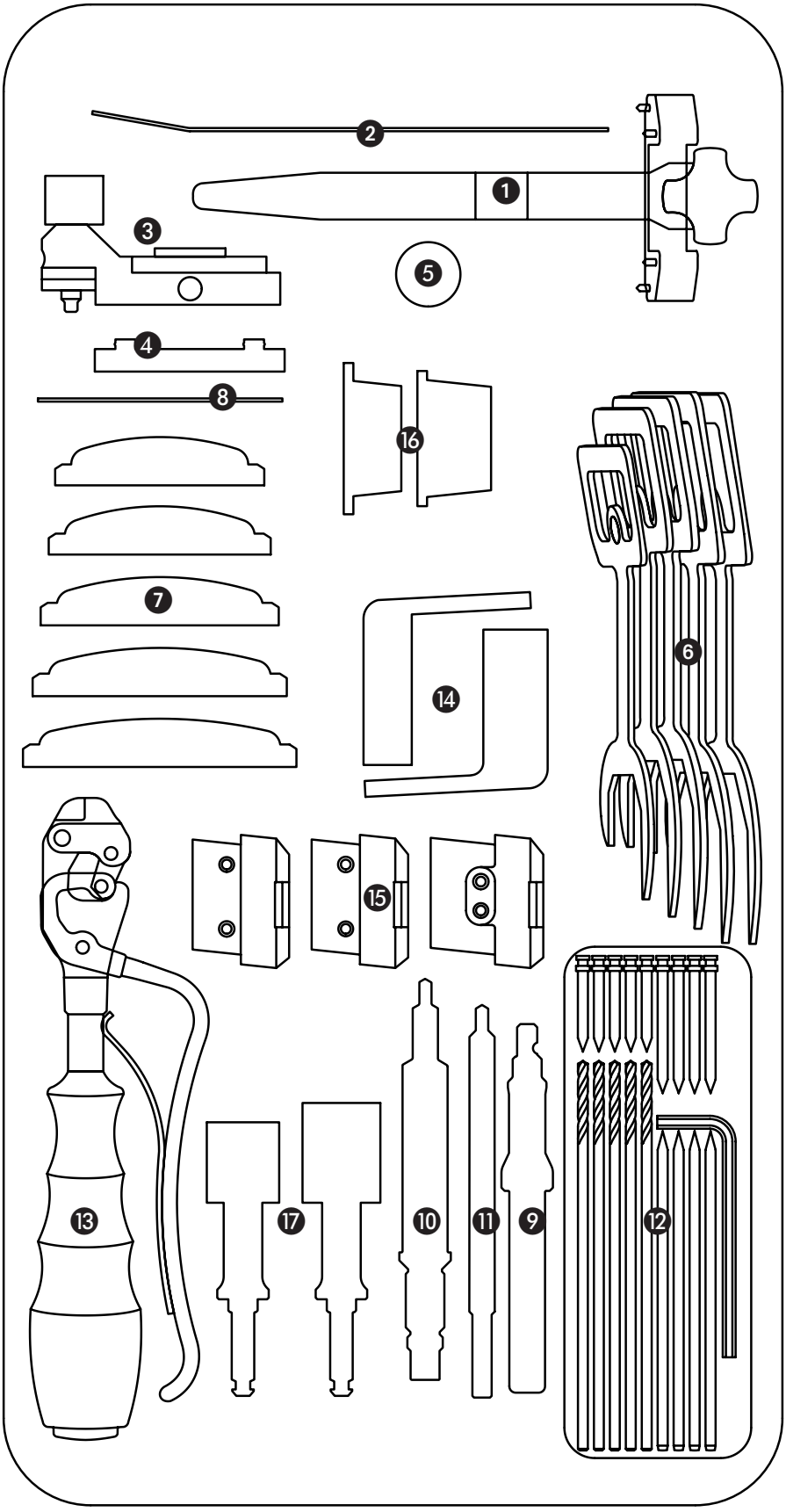
Case Set No.: SAP 75210239
Art. No.0944278

	SAP No.	Art. No.	Description	Size	Quantity
	75005069	**22000403**	**Case Femoral Instruments, Empty**	**–**	**1**
	75007661	**990019**	**Case Lid**	**–**	**1**
❶	75005077	22000416	IM Femoral Drill Guide, Adjustable	Ø 14mm	1
❷	75005902	252746	Resection Stylus (1mm)	–	1
❸	75007148	600187	Femoral Suspension Device Revision	–	1
❹	75007144	600183	Femoral Distal Spacer Revision	7mm	1
❺	75007145	600184	Femoral Bushing	6°	1
❻	75005057	22000380	Femoral Sizer	2	1
	75005058	22000381	Femoral Sizer	4	1
	75005059	22000382	Femoral Sizer	6	1
	75005060	22000383	Femoral Sizer	8	1
	75005061	22000384	Femoral Sizer	10	1
❼	75100207	22000543	Femoral Cutting Block (1mm)	2	1
	75100208	22000544	Femoral Cutting Block (1mm)	4	1
	75100209	22000545	Femoral Cutting Block (1mm)	6	1
	75100210	22000546	Femoral Cutting Block (1mm)	8	1
	75100211	22000547	Femoral Cutting Block (1mm)	10	1
❽	75100222	22000548	Centering Template (1mm)	–	1
❾	75005857	252068	Quick Lock Handle	–	2
❿	75005079	22000418	Stepped Drill with Stop	Ø 8/14mm	1
⓫	75005663	251073	IM Drill with Starter Tip	Ø 8mm	1
⓬	75005659	251065	Pin Drill	Ø 3.2mm	2
	75007140	600179	Bone Pin	75mm	4
	75007141	600180	Bone Pin	100mm	4
	75007138	600177	Bone Pin with Head	25mm	4
	75007139	600178	Bone Pin with Head	38mm	4
	75018329	75018329	Allen Wrench	SW 3.5	1
⓭	75005420	240391	Pin Extractor	–	1
⓮	75005421	240395	Box Saw Guide Pos. Device IM	2	1
	75005398	240325	Box Saw Guide Pos. Device IM	4–10	1
⓯	75005399	240326	Box Saw Guide IM Positioning	2	1
	75005400	240327	Box Saw Guide IM Positioning	4–8	1
	75005401	240328	Box Saw Guide IM Positioning	10	1
⓰	75005408	240335	Box Saw Guide IM (1mm)	2	1
	75005409	240336	Box Saw Guide IM (1mm)	4–10	1
⓱	75005455	240451	Box Rasp	2	1
	75005456	240452	Box Rasp	4–10	1

Optional Drill with AO Connection (on request)

Set No.: SAP 75210232
Art. No. 0944271

SAP No.	Art. No.	Description	Size	Quantity
75005078	22000417	Stepped Drill with Stop (AO)	Ø 8/14mm	1
75005673	251097	IM Drill with Starter Tip (AO)	Ø 8mm	1
75005672	251096	Drill (AO)	Ø 3.2mm	1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Femoral Trials

Set No.: SAP 75200238
Art. No.0944036

	SAP No.	Art. No.	Description	Size	Quantity
	75005466	**240464**	**Case Femoral Trials, Empty**	**–**	**1**
	75007661	**990019**	**Case lid**	**–**	**1**
❶	75005384	240300	Femoral Trial Left	2	1
	75005385	240301	Femoral Trial Left	4	1
	75005386	240302	Femoral Trial Left	6	1
	75005387	240303	Femoral Trial Left	8	1
	75005388	240304	Femoral Trial Left	10	1
❷	75005403	240330	Femoral Trial Right	2	1
	75005404	240331	Femoral Trial Right	4	1
	75005405	240332	Femoral Trial Right	6	1
	75005406	240333	Femoral Trial Right	8	1
	75005407	240334	Femoral Trial Right	10	1
❸	75007156	600204	Femoral Block Trial	5mm	4
	75007157	600205	Femoral Block Trial	10mm	4
	75007154	600201	Femoral Block Trial	15mm	2
❹	75007169	600238	Curved Osteotome	–	1

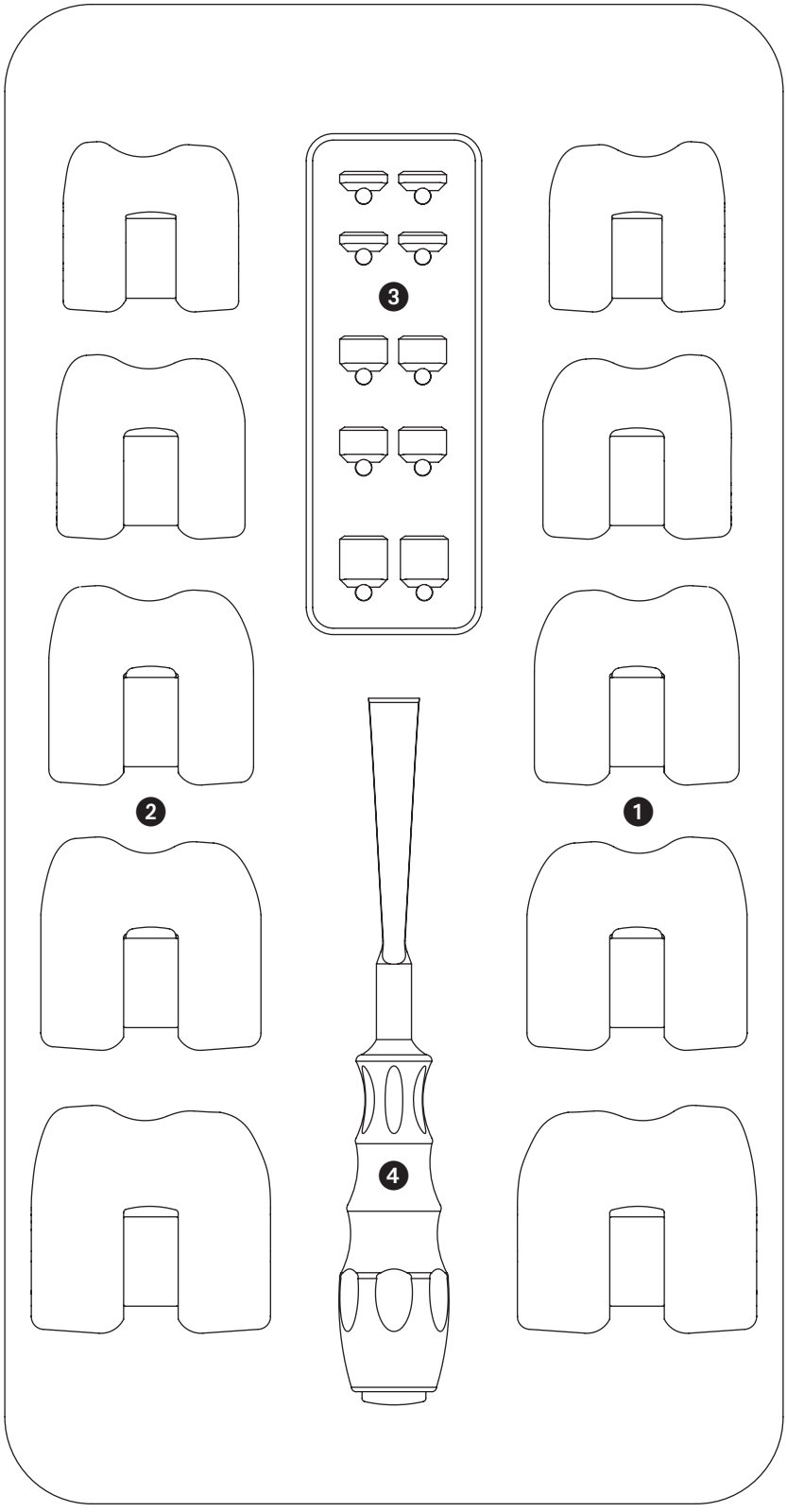
RT-PLUS° Modular Instrument Set (1.27mm)

Set No.: SAP 75210212
Art. No. 0944266

Optional 1.27mm Cutting Blocks (on request)

Set No.: SAP 75210240
Art. No. 0944279

SAP No.	Art. No.	Description	Size	Quantity
75000737	22000360	Femoral Cutting Block (1.27mm)	2	1
75000738	22000361	Femoral Cutting Block (1.27mm)	4	1
75000739	22000362	Femoral Cutting Block (1.27mm)	6	1
75000740	22000363	Femoral Cutting Block (1.27mm)	8	1
75000741	22000364	Femoral Cutting Block (1.27mm)	10	1
75000743	22000366	Femoral/Tibial Cutting Block (1.27mm)	–	1
75000744	22000367	Box Saw Guide IM (1.27mm)	2	1
75000745	22000368	Box Saw Guide IM (1.27mm)	4–10	1
75100223	22000549	Centering Template (1.27mm)	–	1
75017385	22000442	Resection Stylus (1.27mm)	–	1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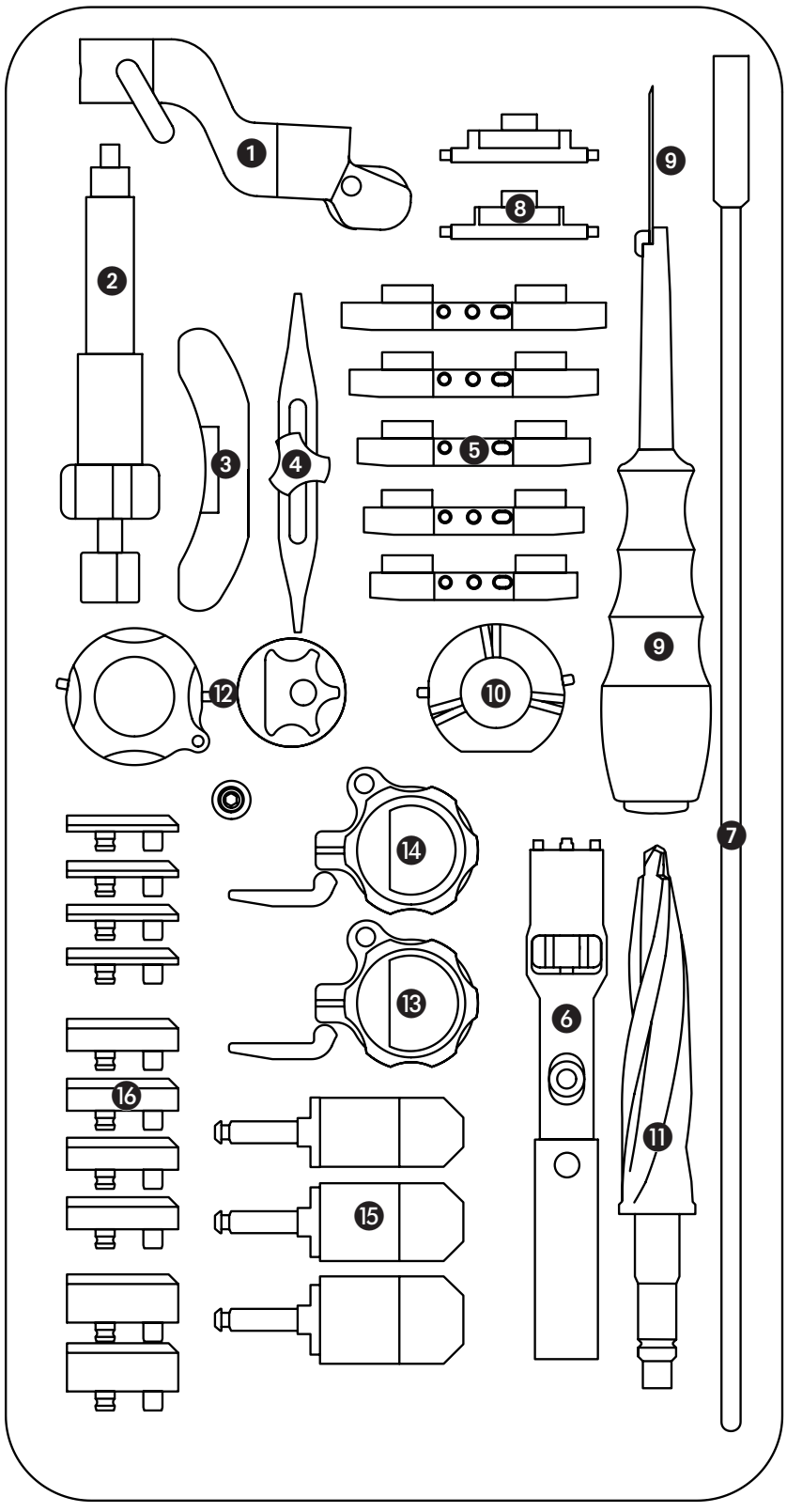
Case Set No.: SAP 75210241
Art. No.0944280

	SAP No.	Art. No.	Description	Size	Quantity
	75100386	**22000563**	**Case Tibial Instruments, Empty**	**–**	**1**
	75007661	**990019**	**Case Lid**	**–**	**1**
❶	75023718	22000514	Holder Tibial Resection Guide IM	–	1
❷	75023727	22000523	Support Tibial Resection Guide IM	± 6mm	1
❸	75100206	22000542	Femoral/Tibial Cutting Block (1mm)	–	1
❹	75010947	600173	Tibia Stylus	1mm/11mm	1
❺	75023722	22000518	Tibial Sizer	2	1
	75023723	22000519	Tibial Sizer	4	1
	75023724	22000520	Tibial Sizer	6	1
	75023725	22000521	Tibial Sizer	8	1
	75023726	22000522	Tibial Sizer	10	1
❻	75007137	600175	Tibial Sizer Handle	–	1
❼	75007135	600172	Axial Alignment Rod (I/II)	–	1
❽	75005410	240372	Tibial Chisel Guide	2	1
	75005411	240373	Tibial Chisel Guide	4–10	1
❾	75018080	22000443	Chisel Handle	–	1
	75100517	75100517	Chisel Blade	10mm/40mm	1
❿	75015051	240449	Tibial Drill Guide	–	1
⓫	75015047	240445	Stepped Drill	–	1
⓬	75100346	22000555	Tibial Eccentric Attachment (I/II/III)	3.75mm	1
⓭	75100350	22000559	Memory Device (I/II)	2/3.75mm	1
⓮	75100351	22000560	Memory Device (I/II)	4–10/3.75mm	1
⓯	75005457	240455	Spacer	8mm	1
	75005458	240456	Spacer	11mm	1
	75005459	240457	Spacer	14mm	1
⓰	75005381	240229	Spacer Attachment	5mm	4
	75005382	240230	Spacer Attachment	10mm	4
	75005402	240329	Spacer Attachment	15mm	2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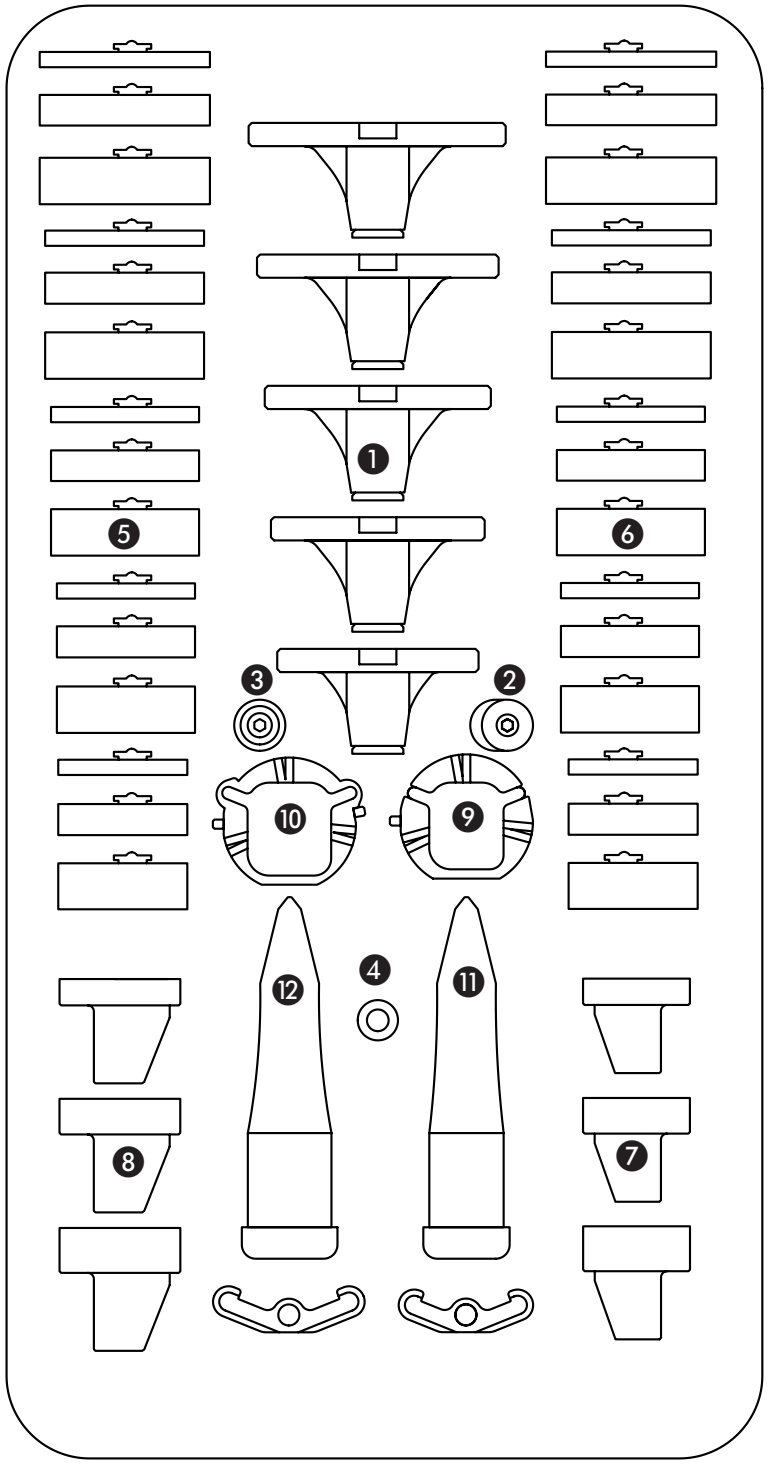
Tibial Trials

Case Set No.: SAP 75210242
Art. No.0944281

	SAP No.	Art. No.	Description	Size	Quantity
	75100385	**22000562**	**Case Tibial Trials, Empty**	**–**	**1**
	75007661	**990019**	**Case Lid**	**–**	**1**
❶	75100341	22000550	Tibial Trial	2	1
	75100342	22000551	Tibial Trial	4	1
	75100343	22000552	Tibial Trial	6	1
	75100344	22000553	Tibial Trial	8	1
	75100345	22000554	Tibial Trial	10	1
❷	75100347	22000556	Tibial Trial Excentric Adapter	3.75mm	1
❸	75100348	22000557	Tibial Trial Neutral Adapter	Neutral	1
❹	75100349	22000558	Adapter for Slap Hammer	M8	1
❺	75100627	75100627	Tibial Block Trial RLat/LMed	2/5mm	1
	75100628	75100628	Tibial Block Trial RLat/LMed	2/10mm	1
	75100629	75100629	Tibial Block Trial RLat/LMed	2/15mm	1
	75100630	75100630	Tibial Block Trial RLat/LMed	4/5mm	1
	75100631	75100631	Tibial Block Trial RLat/LMed	4/10mm	1
	75100632	75100632	Tibial Block Trial RLat/LMed	4/15mm	1
	75100633	75100633	Tibial Block Trial RLat/LMed	6/5mm	1
	75100634	75100634	Tibial Block Trial RLat/LMed	6/10mm	1
	75100635	75100635	Tibial Block Trial RLat/LMed	6/15mm	1
	75100636	75100636	Tibial Block Trial RLat/LMed	8/5mm	1
	75100637	75100637	Tibial Block Trial RLat/LMed	8/10mm	1
	75100638	75100638	Tibial Block Trial RLat/LMed	8/15mm	1
	75100639	75100639	Tibial Block Trial RLat/LMed	10/5mm	1
	75100640	75100640	Tibial Block Trial RLat/LMed	10/10mm	1
	75100641	75100641	Tibial Block Trial RLat/LMed	10/15mm	1
❻	75100642	75100642	Tibial Block Trial LLat/RMed	2/5mm	1
	75100643	75100643	Tibial Block Trial LLat/RMed	2/10mm	1
	75100644	75100644	Tibial Block Trial LLat/RMed	2/15mm	1
	75100645	75100645	Tibial Block Trial LLat/RMed	4/5mm	1
	75100646	75100646	Tibial Block Trial LLat/RMed	4/10mm	1
	75100647	75100647	Tibial Block Trial LLat/RMed	4/15mm	1
	75100648	75100648	Tibial Block Trial LLat/RMed	6/5mm	1
	75100649	75100649	Tibial Block Trial LLat/RMed	6/10mm	1
	75100650	75100650	Tibial Block Trial LLat/RMed	6/15mm	1
	75100651	75100651	Tibial Block Trial LLat/RMed	8/5mm	1
	75100652	75100652	Tibial Block Trial LLat/RMed	8/10mm	1
	75100653	75100653	Tibial Block Trial LLat/RMed	8/15mm	1
	75100654	75100654	Tibial Block Trial LLat/RMed	10/5mm	1
	75100655	75100655	Tibial Block Trial LLat/RMed	10/10mm	1
	75100656	75100656	Tibial Block Trial LLat/RMed	10/15mm	1

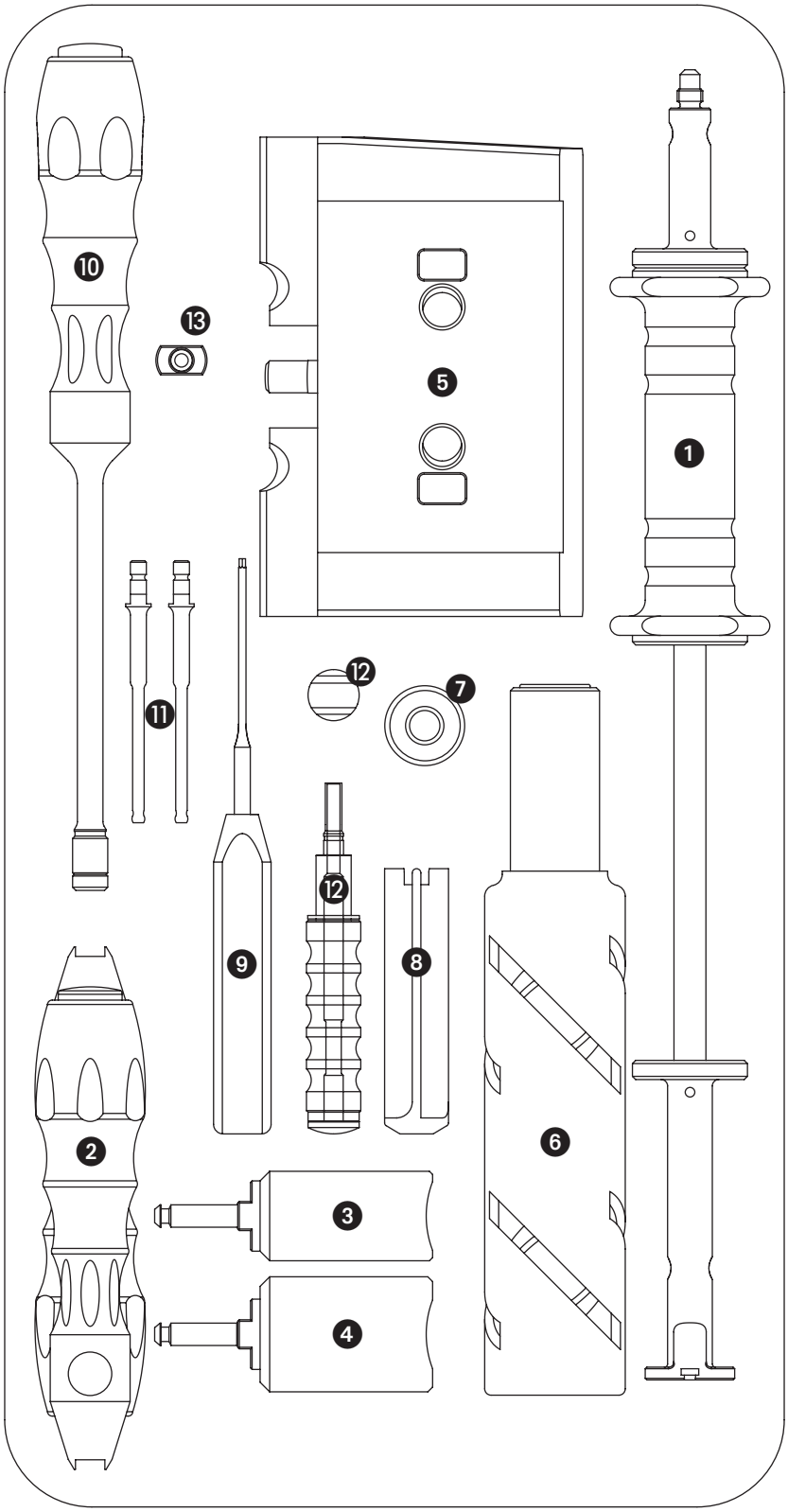
	SAP No.	Art. No.	Description	Size	Quantity
❼	75005064	22000398	Tibial Insert Trial	2/8mm	1
	75005065	22000399	Tibial Insert Trial	2/11mm	1
	75005066	22000400	Tibial Insert Trial	2/14mm	1
❽	75005333	240075	Tibial Insert Trial	4–10/8mm	1
	75005334	240076	Tibial Insert Trial	4–10/11mm	1
	75005335	240077	Tibial Insert Trial	4–10/14mm	1
❾	75015050	240448	Tibial Rasp Guide	2	1
❿	75015049	240447	Tibial Rasp Guide	4–10	1
⓫	75015046	240444	Tibial Rasp (I/II)	2	1
⓬	75015045	240443	Tibial Rasp (I/II)	4–10	1



Assembly Instruments

Case Set No.: SAP 75200241
Art. No. 0944039

	SAP No.	Art. No.	Description	Size	Quantity
	75005469	**240467**	**Case Assembly Instruments, Empty**	**–**	**1**
	75007661	**990019**	**Case Lid**	**–**	**1**
❶	75007142	600181	Slap Hammer	–	1
❷	75007202	600300	Modular Handle	–	2
❸	75007190	600288	Impactor	Small	1
❹	75007191	600289	Impactor	Large	1
❺	75007170	600239	Assembling Block	–	1
❻	75007166	600228	Automatic Hammer	–	1
❼	75007201	600299	Adapter for Automatic Hammer	–	1
❽	75007167	600230	Stem Protector Cross	–	1
❾	75005337	240093	Screwdriver for Stems	SW 2	2
❿	75005998	253271	Screwdriver with Torque	–	1
⓫	75007188	600279	Adapter with Spherical Hexagonal Head	SW 3.5	2
⓬	75005371	240176	Plug Inserter (I/II)	–	1
	75005372	240177	Impacting Connection	–	1
⓭	75005063	22000395	Adapter to Modular Handle	SW 6	1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Patellar Instruments (1mm)

Set No.: SAP 75200207
Art. No. 0944003

	SAP No.	Art. No.	Description	Size	Quantity
	75018088	**22000451**	**Case Patellar Instruments, Empty**	**–**	**1**
	75007661	**990019**	**Case Lid**	**–**	**1**
❶	75005702	251204	Patellar Clamp	–	1
❷	75005881	252203	Patellar Clamp Cutting Guide	1mm	1
❸	75005723	251292	Patellar Trial	Ø 26/10mm	1
	75005724	251293	Patellar Trial	Ø 29/10mm	1
	75005725	251294	Patellar Trial	Ø 32/10mm	1
	75005726	251295	Patellar Trial	Ø 35/10mm	1
❹	75005717	251278	Patellar Drill with Stop	Ø 5.5mm	1
❺	75005719	251282	Patellar Sizer	–	1
❻	75005716	251277	Patellar Inserter	–	1
❼	75005707	251230	Patellar Clamp Bushing	Ø 26mm	1
	75005708	251231	Patellar Clamp Bushing	Ø 29mm	1
	75005709	251232	Patellar Clamp Bushing	Ø 32mm	1
	75005710	251233	Patellar Clamp Bushing	Ø 35mm	1
❽	75005711	251240	Patellar Drill Guide	Ø 26mm	1
	75005712	251241	Patellar Drill Guide	Ø 29mm	1
	75005713	251242	Patellar Drill Guide	Ø 32mm	1
	75005714	251243	Patellar Drill Guide	Ø 35mm	1
❾	75005706	251216	Patellar Mill with Stop	Ø 26mm	1
	75005720	251283	Patellar Mill with Stop	Ø 29mm	1
	75005721	251284	Patellar Mill with Stop	Ø 32mm	1
	75005722	251285	Patellar Mill with Stop	Ø 35mm	1
❿	75005034	22000327	Bone Thickness Sizer	–	1

Patella Instrumentenset (1,27mm)

Set No.: SAP 75200313
Art. No. 0944183

❷	75006490	42000093	Patellar Clamp Cutting Guide (1.27mm)	–	1

Optional Patellar Trials 8mm (on request)

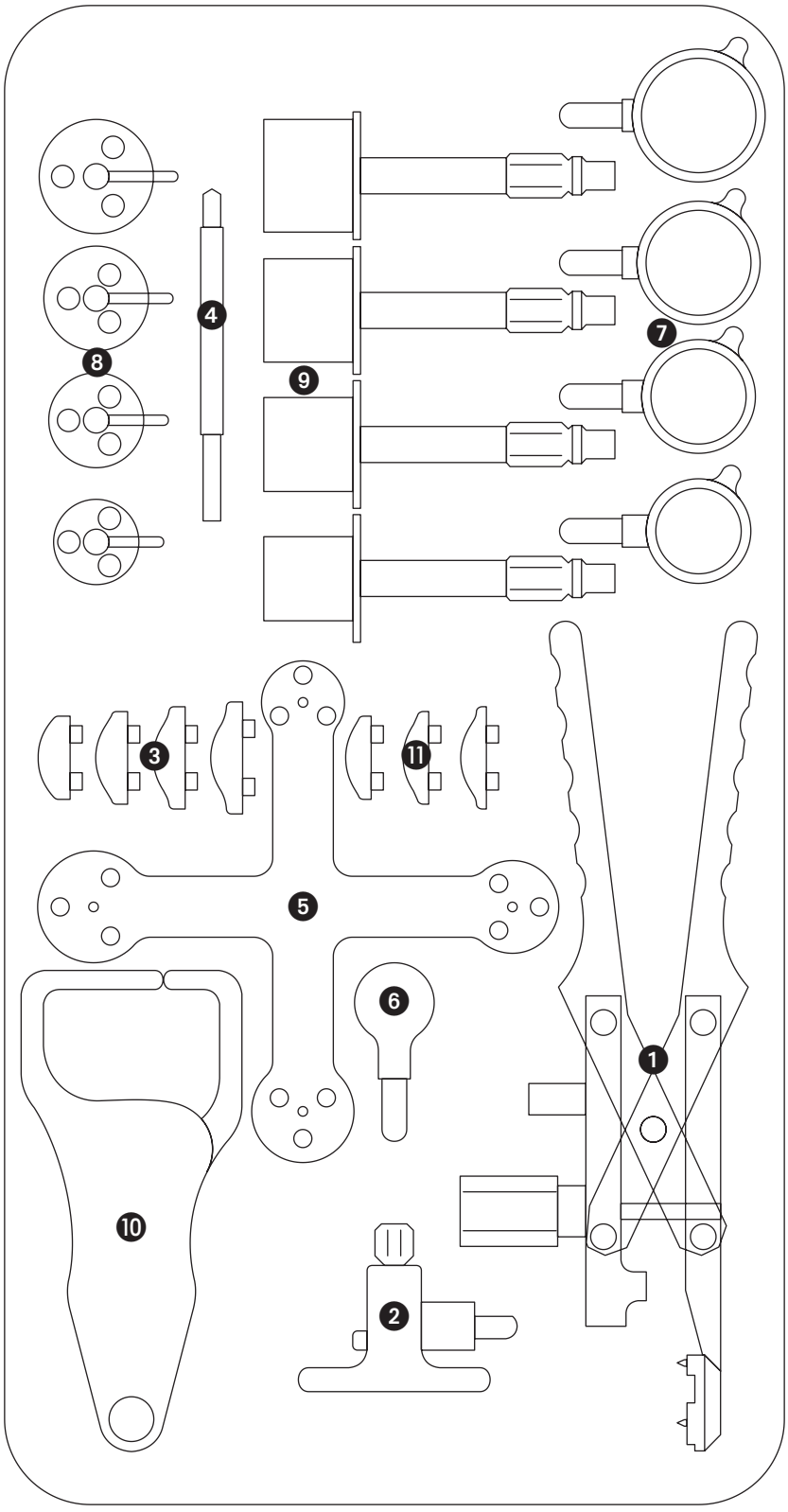
Set No.: SAP 75200212
Art. No. 0944008

	SAP No.	Art. No.	Description	Size	Quantity
⓫	75005703	251209	Patellar Trial	Ø 26/8mm	1
	75005704	251210	Patellar Trial	Ø 29/8mm	1
	75005705	251211	Patellar Trial	Ø 32/8mm	1

Optional Reamer/Drill with AO Coupling Type (on request)

Set No.: SAP 75200251
Art. No. 0944049

SAP No.	Art. No.	Description	Size	Quantity
75004871	22000038	Patellar Drill with Stop (AO)	Ø 5.5mm	1
75004989	22000280	Patellar Mill with Stop (AO)	Ø 26mm	1
75004990	22000281	Patellar Mill with Stop (AO)	Ø 29mm	1
75004991	22000282	Patellar Mill with Stop (AO)	Ø 32mm	1
75004992	22000283	Patellar Mill with Stop (AO)	Ø 35mm	1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Documents

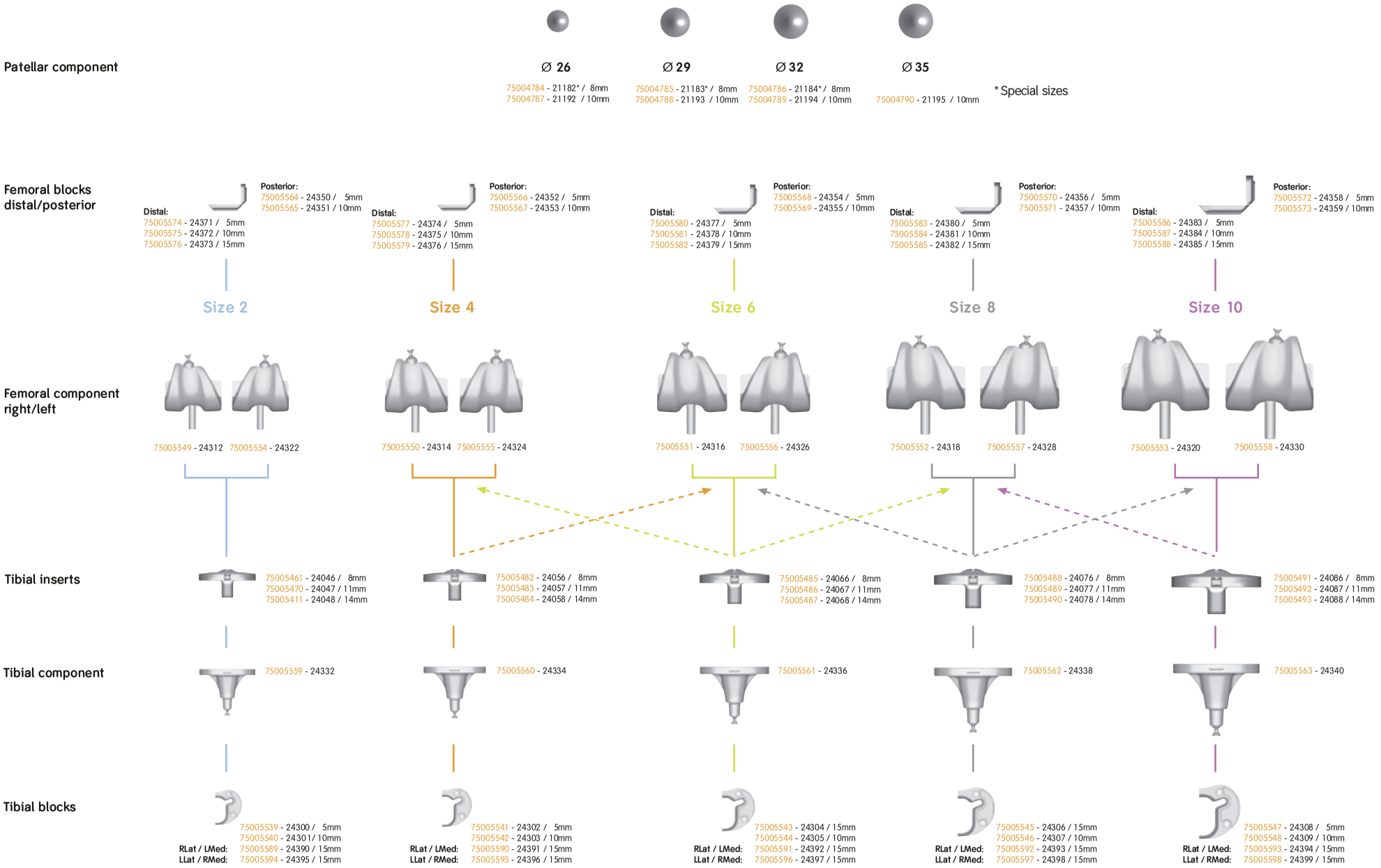
Note

The following documents are available for your assistance.

Product-accompanying Documents

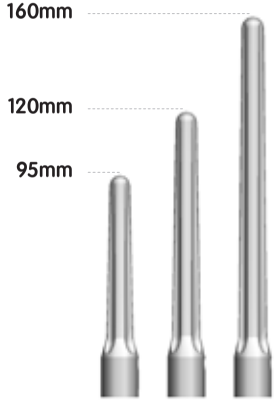
Name	Lit. No.
Sawblade Portfolio	01218
Surgical Technique Intramedullary Application	03307 (1922)
Product Information	1954
X-Ray Templates (1.15:1)	1942-A-B
X-Ray Templates (1:1)	1941-A-B
Product Overview	1955

Product overview (combination table)



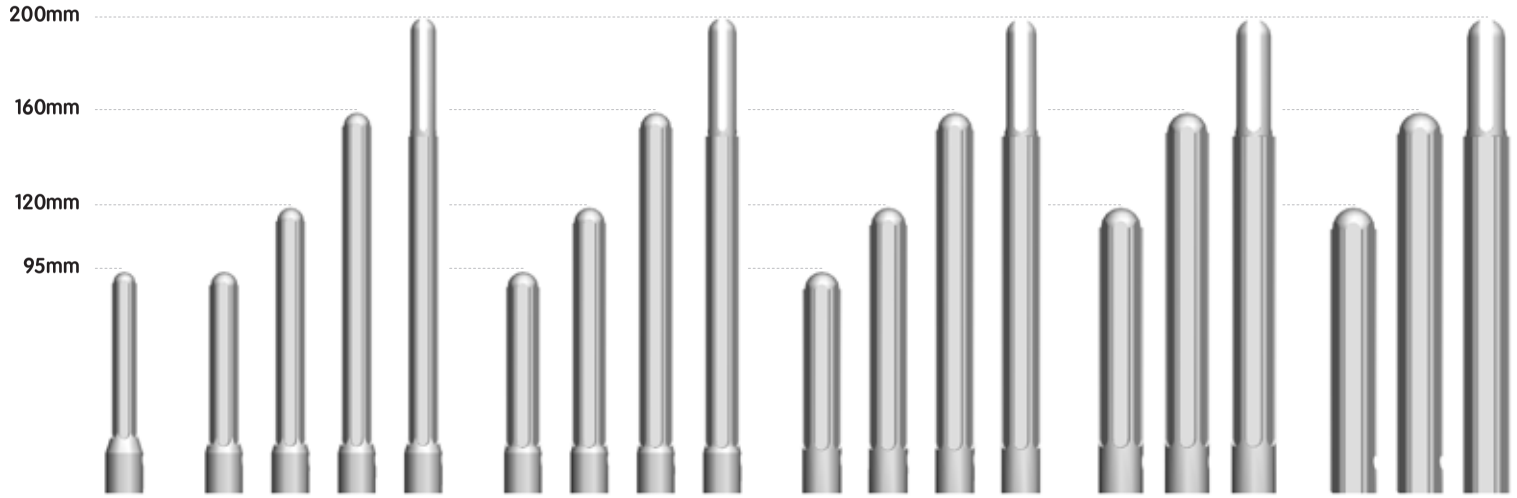
Straight stems

Cemented stems



75005515 - 24232 / 95mm
75005514 - 24231 / 120mm
75005516 - 24233 / 160mm

Noncemented stems



75005517 - 24251 / 95mm

75005518 - 24252 / 95mm
75005521 - 24256 / 120mm
75005530 - 24266 / 160mm
75005526 - 24261 / 200mm

75005520 - 24254 / 95mm
75005524 - 24259 / 120mm
75005531 - 24267 / 160mm
75005529 - 24264 / 200mm

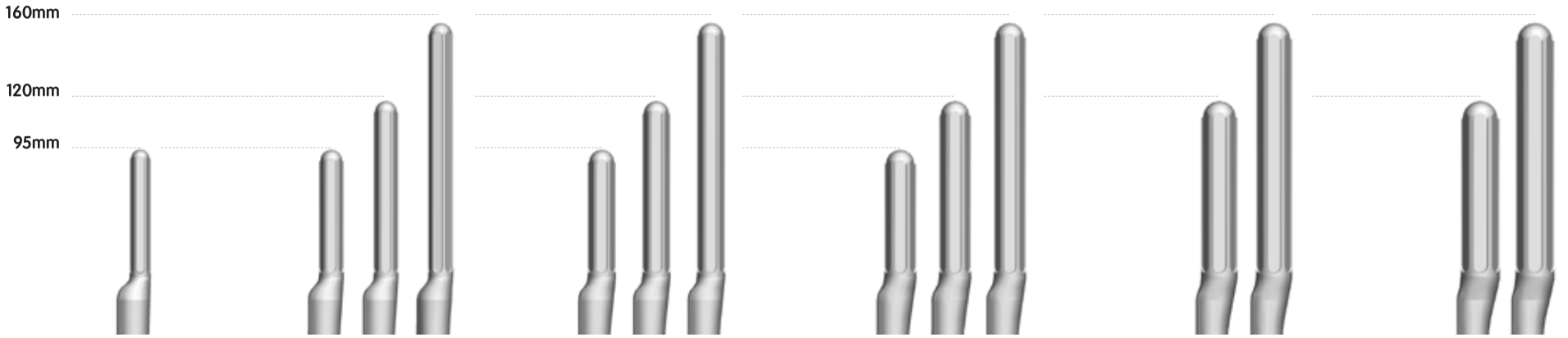
75005519 - 24253 / 95mm
75005522 - 24257 / 120mm
75005532 - 24268 / 160mm
75005527 - 24262 / 200mm

75005525 - 24260 / 120mm
75005533 - 24269 / 160mm
75005530 - 24265 / 200mm

75005523 - 24258 / 120mm
75005534 - 24270 / 160mm
75005528 - 24263 / 200mm

3,75mm Offset stems

Noncemented stems



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75100160 - 24400 / 95mm

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75100161 - 24401 / 95mm
75100164 - 24404 / 120mm
75100169 - 24409 / 160mm

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75100162 - 24402 / 95mm
75100165 - 24405 / 120mm
75100170 - 24410 / 160mm

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75100163 - 24403 / 95mm
75100166 - 24406 / 120mm
75100171 - 24411 / 160mm

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75100167 - 24407 / 120mm
75100172 - 24412 / 160mm

Ø 20

75100168 - 24408 / 120mm
75100173 - 24413 / 160mm

Manufacturer

Smith & Nephew Orthopaedics AG
Oberneuhofstrasse 10d
6340 Baar
Switzerland

Contact

03307-en V2 (1922) Ed. 05/15

CE 0123