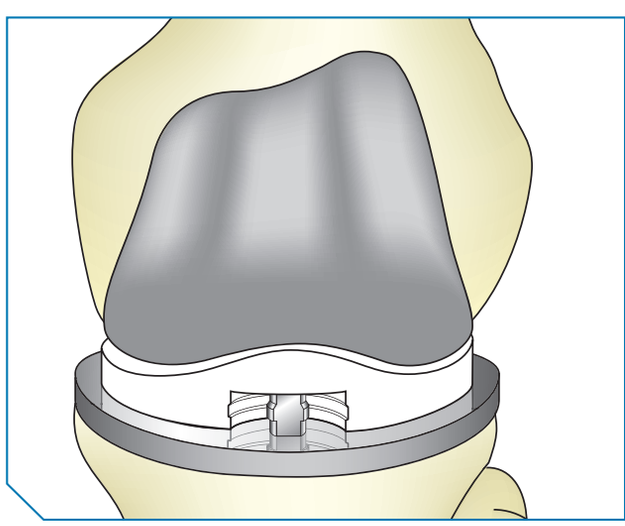
Corin

rotaglide+
total knee system

operative technique



restoring quality of life

introduction

The Rotaglide+ Instrumentation is designed for use with the Rotaglide+ Total Knee System. The surgical objective of the Rotaglide+ Instrumentation is to place the prosthetic components in the anatomical position with respect to the physiological axes of the knee joint, whilst maintaining stability throughout the full range of knee flexion.

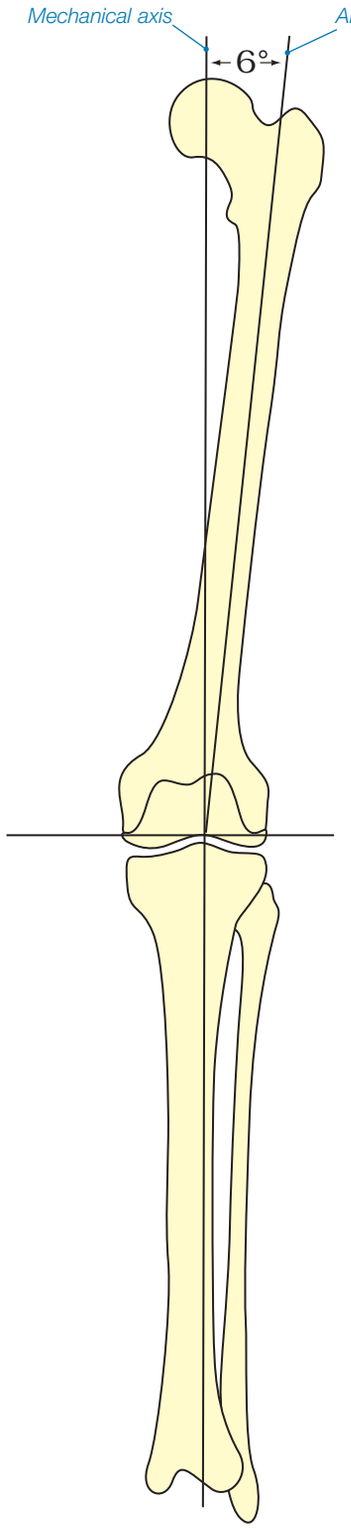
The instrumentation builds in 3° of external rotation of the femoral component to allow anatomical patella tracking. It is recommended that the joint is reconstructed with a standing knee valgus of between 3° and 9° and the tibial component at 90° to the mechanical axis in the coronal plane.

In order to mimic the natural inclination of the proximal tibia, the tibial component is placed in 10° of posterior tilt in the sagittal plane.

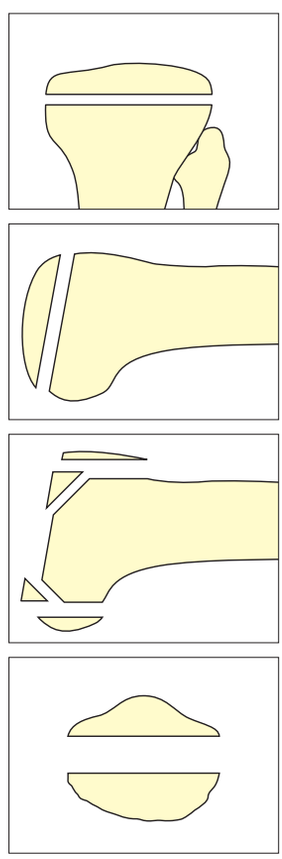
Soft tissue tension must be assessed and adjusted so that it is balanced with the knee both in flexion and extension. Further to this, the instrumentation allows all cuts to be revisited and accurate downsizing can be achieved to allow the operating surgeon to balance the joint.

It is important that a 1.27mm thick saw blade, with non-offset teeth, is used with this system, as the use of thinner blades will compromise the accuracy of the cuts.

Note also that this system utilises 3.2mm diameter pins exclusively.



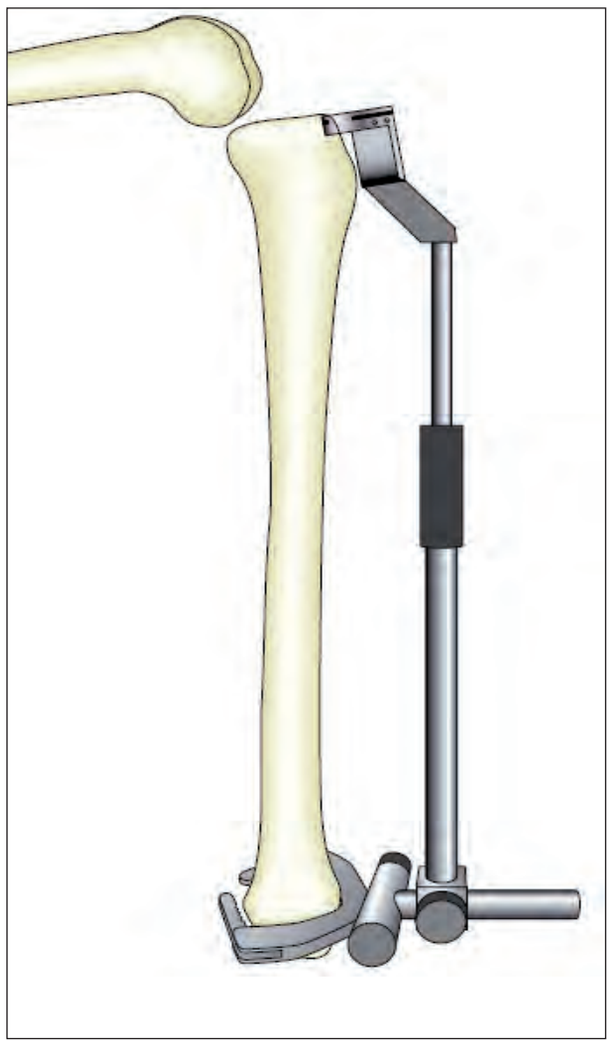
Instrumented cuts



initial EM tibial preparation

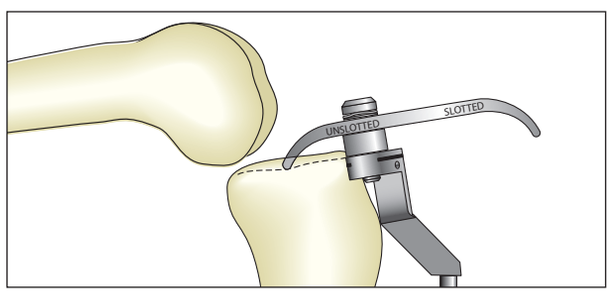
Assemble the ankle clamp with the EM tibial alignment guide and tibial resection guide. With the knee in 90° or more of flexion, the calliper arms of the ankle clamp are opened and placed around the ankle. The tibial resection guide at the proximal end of the jig is placed onto the anterior surface of the tibia at approximately the correct resection level. Neutral rotation is achieved by placing the proximal end of the jig just medial to the tibial tubercle and by checking that the anterior post of the ankle clamp points to the second metatarsal.

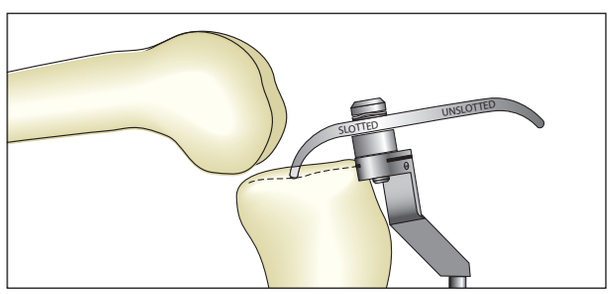
The adjuster screw on the right hand side of the ankle clamp (as viewed from the front), is loosened to allow the distal end of the jig to slide on the ankle clamp. Adjustment is carried out until the alignment tube of the EM alignment guide is parallel to the long axis of the tibia when viewed from the side. This will provide a resection with 10° of posterior slope.



measuring the tibial cut

The stylus is placed into one of the holes on the tibial resection guide and the tip of the stylus allowed to rest in the deepest point of the defect on the tibial plateau. It is important to note that the stylus offers two options: (a) to cut along the top surface of the tibial resection guide or (b) to cut through the slot in the tibial resection guide. The stylus is clearly marked slotted or unslotted. The tibial resection guide is then pinned, with a minimum of four pins, to the anterior tibia, two of the pins being located in the holes positioned on the engraved line, thus allowing adjustment if necessary. The other two locking pins should be used with the angled holes at either side of the tibial resection guide to provide extra stability of the block during resection.



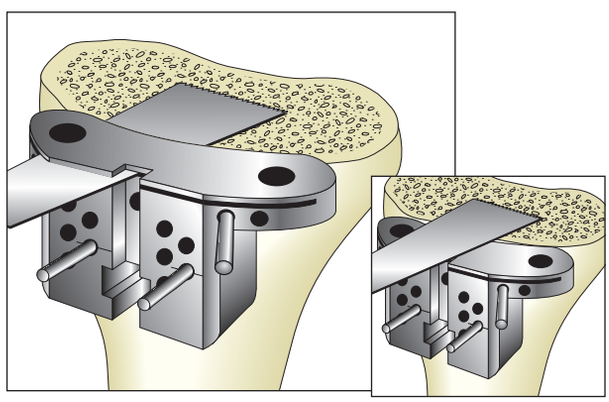


tibial resection

The stylus is removed and the tibia resected, by placing an oscillating saw either on the top surface of the tibial resection guide, or through the slot, as required by the block positioning.

The resected tibia should be checked to ensure that the cut is flat and that a 10° posterior slope has been achieved.

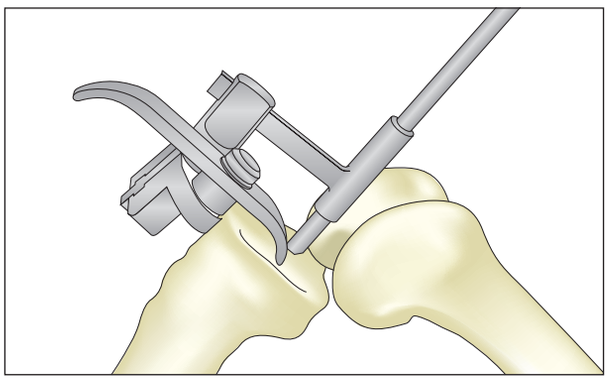
If the surgeon chooses to retain the posterior cruciate ligament, care should be taken when resecting the proximal tibia to preserve the PCL attachment.



initial IM **tibial** preparation

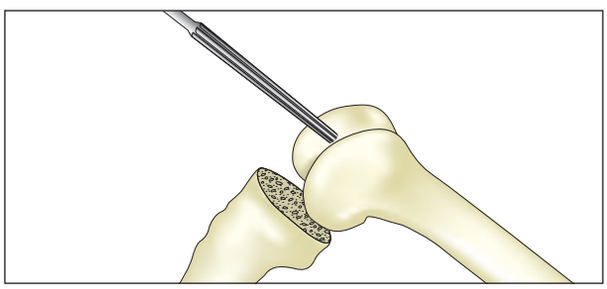
The IM canal tapered drill is used to penetrate the cortex of the proximal tibia. The IM rod and handle is pushed into the canal only as far as the engraved line. The handle is then removed.

The IM tibial alignment guide is assembled with the tibial resection guide and stylus. The assembly is placed onto the IM rod as shown. Position and pinning of the tibial resection guide is carried out as per the EM method. The IM rod and alignment guide are removed and the resection performed in the same manner as for the EM instrumentation.

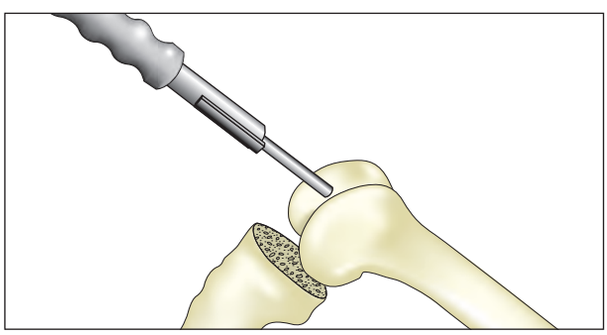


initial **femoral** preparation

The IM canal tapered drill is used to penetrate the cortex of the distal femur (the correct entry point is in line with the medullary canal, medial to the mid point between the distal condyles and 1cm anterior to the origin of the posterior cruciate ligament).

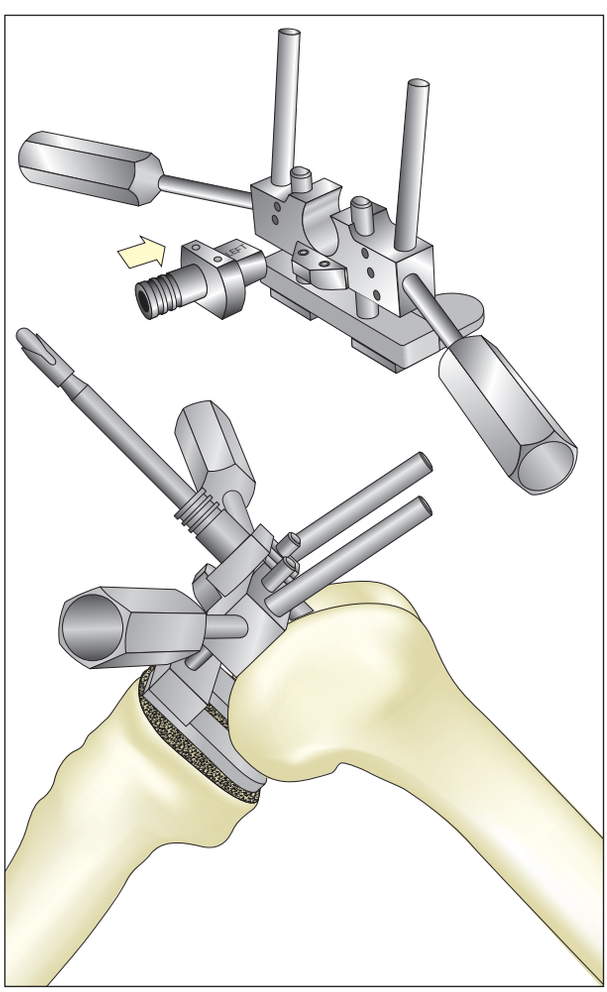


The IM rod and handle are assembled and the rod is then pushed into the canal only as far as the engraved line. The handle is then removed.



positioning the **femoral alignment** guide

The valgus angle to be recreated is determined from pre-operative templating. IM bushing guides are available in 3°, 5°, 7° and 9° angles. The required IM bushing guide is assembled onto the femoral alignment guide, ensuring that the appropriate mark for left or right is visible when viewed from above. The base is also assembled into the femoral alignment guide so that the feet point towards the femur. The assembly is then passed over the IM rod. The neutral axis of the femoral alignment guide is determined by placing the feet under the posterior condyles of the femur. If defects are present then one or both of the feet on the femoral alignment guide may be rotated out of the way.



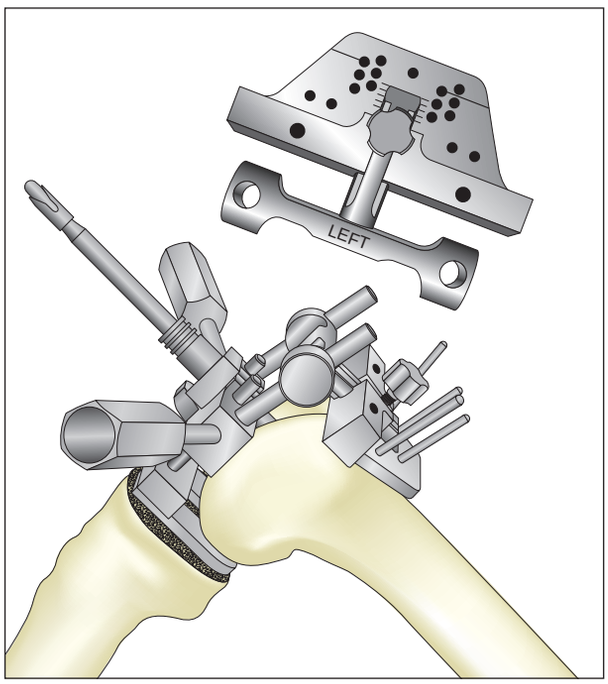
positioning the **distal resection** guide

Assemble the distal resection guide onto the appropriate left or right distal guide support arm and lock firmly in the nominal position (where the distal guide support arm 'bottoms out' on the distal resection guide). This provides a minimum resection to replace bone with metal.

If more resection is required then the position of the distal resection guide on the distal guide support arm can be adjusted using the scale, which is in 2mm increments. Place this assembly onto the femoral alignment guide and pin the distal resection guide in place through the holes marked by the engraved line. A visual check should be made to confirm that sufficient distal femur will be resected.

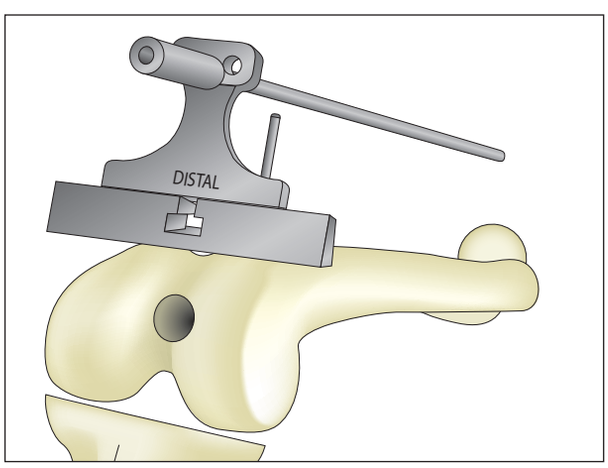
If it is determined that more resection is required, reposition the distal resection guide by moving it back onto the next set of pin holes. Pin the distal resection guide in place by passing two pins through two angled holes on the block. This will prevent the block from "riding-up" during the resection.

Loosen the screw on the distal guide support arm, remove the IM rod and the femoral alignment guide complete with the distal resection guide support arm, leaving the distal resection guide in place.



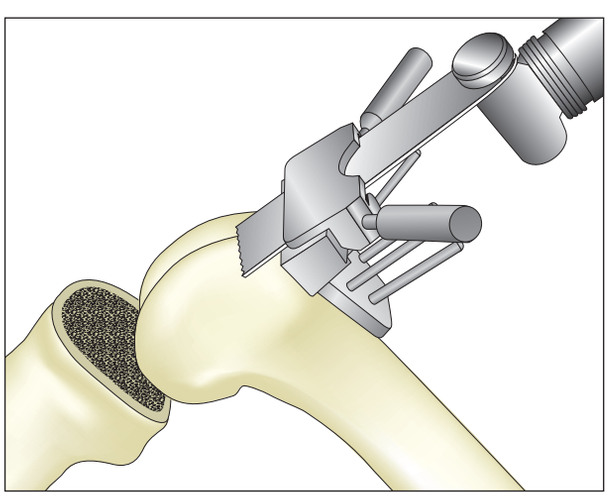
checking **alignment**

The alignment can be checked by placing the tibial/distal alignment guide into the two holes above the cutting face such that the word 'DISTAL' is visible when looking from the knee towards the hip. The alignment rod can now be passed through the central hole in the alignment guide. The rod should point to the centre of the femoral head, and should be parallel to the long axis of the femur.



distal **femoral** resection

If desired the saw capture can be attached to the distal resection guide. Complete the distal femoral resection.

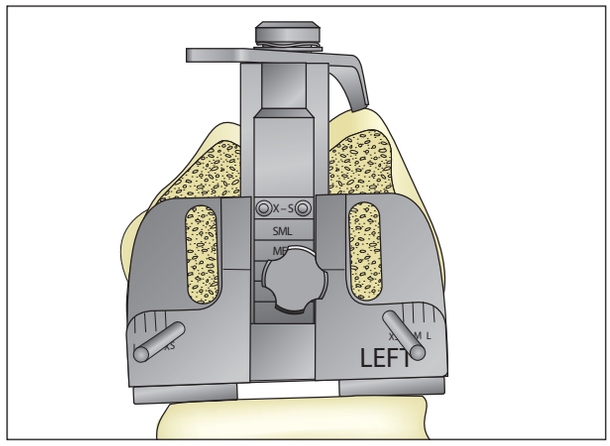


femoral sizing guide

Pre-operative templating will provide a guide to the final size of component, but the definitive size is chosen intra-operatively.

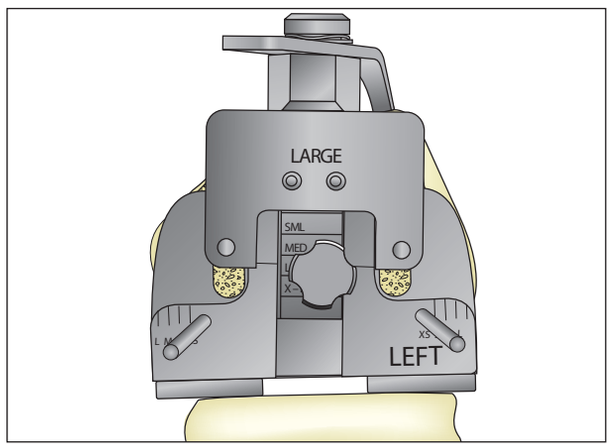
The femoral sizing guide is assembled using the stylus arm with the appropriate left or right base. This is then placed onto the femur, ensuring that the distal face sits flush on the resected distal surface and that the feet sit firmly against the posterior condyles. The base can then be pinned in place. The tip of the stylus should be placed on the anterior cortex of the femur and locked in position with the screw. The correct size of the femur is referenced between the transverse lines on the slide. If the size indicator is positioned on a line, then the smaller of the two sizes should be used.

As a further aid, the medial-lateral widths of the femurs are shown on the sizing guide bases.



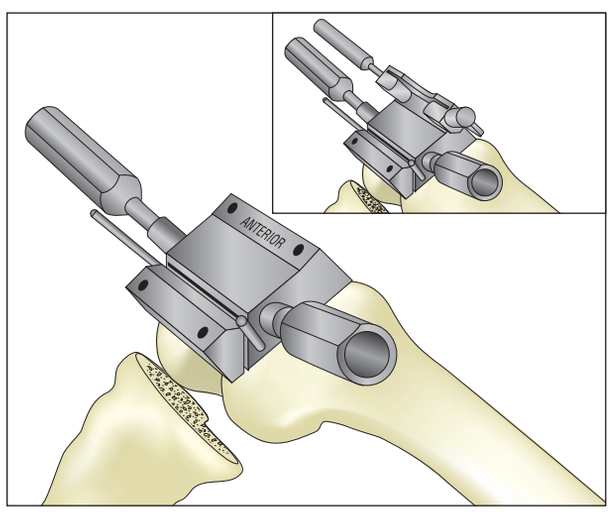
femoral drill guide

The appropriate size left or right drill guide should be selected and assembled onto the pegs on the back of the femoral sizing guide stylus arm. The reference drill holes for the 4-in-1 resection guides may now be drilled using the 3.2mm drill.



femoral resection guide

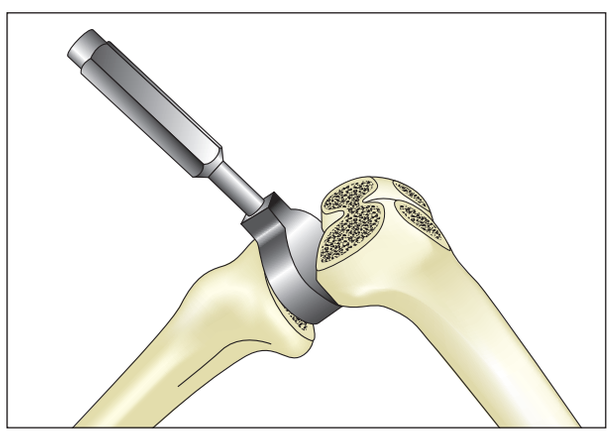
Select the appropriate size 4-in-1 resection guide and place the pegs into the pre-drilled holes. Attach the modular handles to the resection guide if required. Ensure the proximal face of the block is flush with the distal femur. The resection guide impactor may be used if required. The saw capture may be used if required for the anterior and posterior cuts.



checking the **flexion/ extension** gap

If a flexion/extension gap check is required, complete only the anterior and posterior cuts and remove the block.

Place the appropriate spacer mounted on the tibial spacer handle into the flexion and extension gaps to check for correct balance. (N.B. The spacers represent the thickness of the femur, metal tibia and tibial plastic).

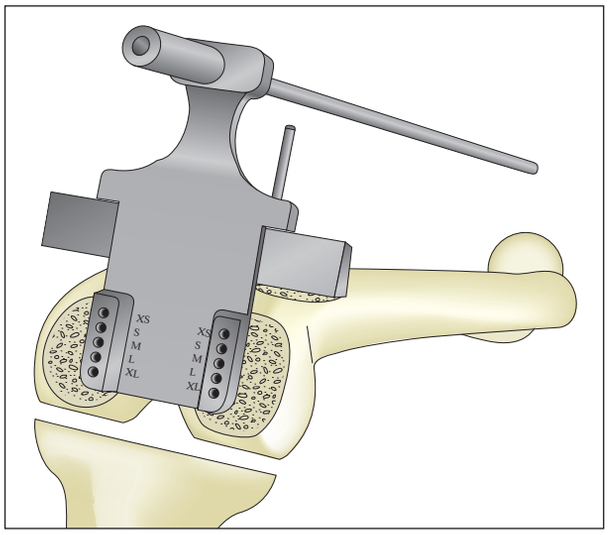


flexion/extension **gap** adjustment

If the knee is too tight in both flexion and extension, the proximal tibia should be resected accordingly.

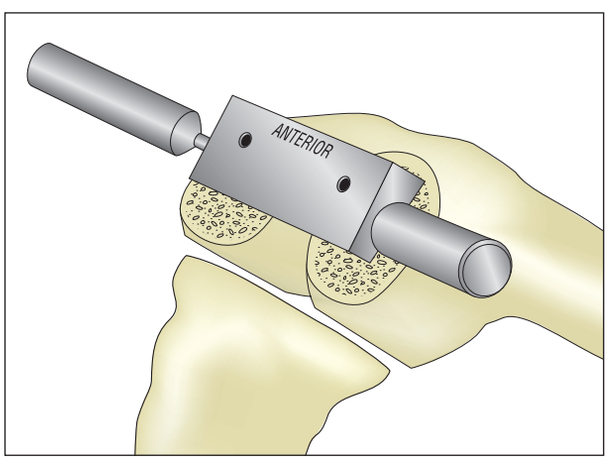
If the joint is correct in flexion but too tight in extension, additional distal femoral resection should be made accordingly. This is done by using the distal re-alignment guide.The distal re-alignment guide attaches to the distal resection guide allowing exact re-positioning of the distal resection guide. The distal resection guide should be pinned in place using the holes marked by the centre line. The distal resection guide may then be incremented back using the pin holes and the distal face of the femur may be re-cut with or without the saw capture.

Once the correct flexion/extension gap has been established, the definitive chamfer cuts can be made. If required, the holes for the 4-in-1 and chamfer resection guides may be re-drilled by using the appropriate holes in the distal re-alignment guide.



downsizing the **femoral component**

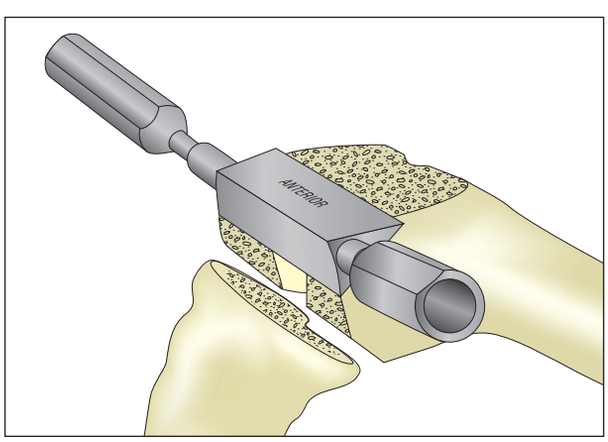
If the joint is too tight in flexion but correct in extension, it may be necessary to resect more posterior condyle and therefore use a smaller femoral implant. This is facilitated by using the femoral downsizing drill guide which allows the 4-in-1 resection guide positioning holes to be re-drilled for the smaller size 4-in-1 resection guide. The smaller 4-in-1 resection guide may then be used to resect the posterior condyles. When the knee is balanced to the surgeon's satisfaction the desired 4-in-1 resection guide (or the correct chamfer resection guide if required) should be replaced and pinned and the two chamfer cuts made.



making the **chamfer** cuts

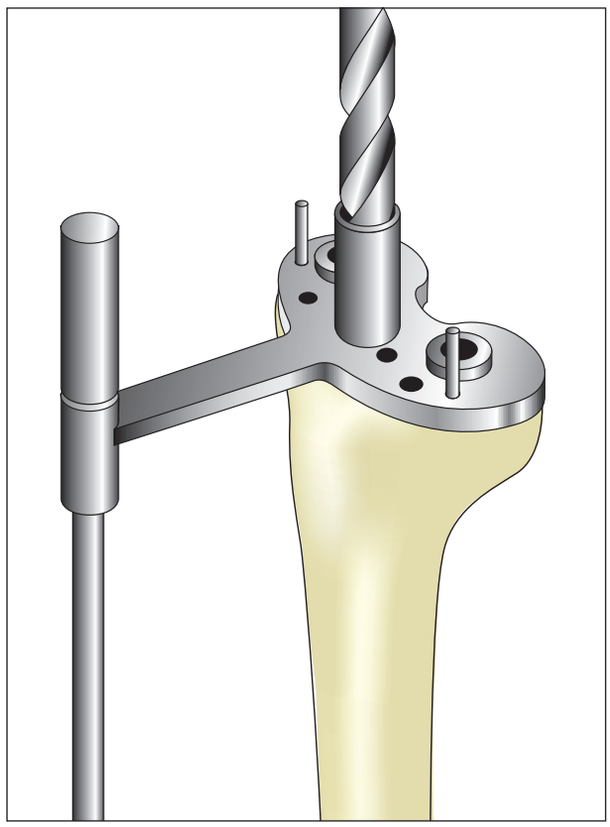
Complete the anterior, posterior, posterior chamfer and anterior chamfer resections and remove the 4-in-1 resection guide.

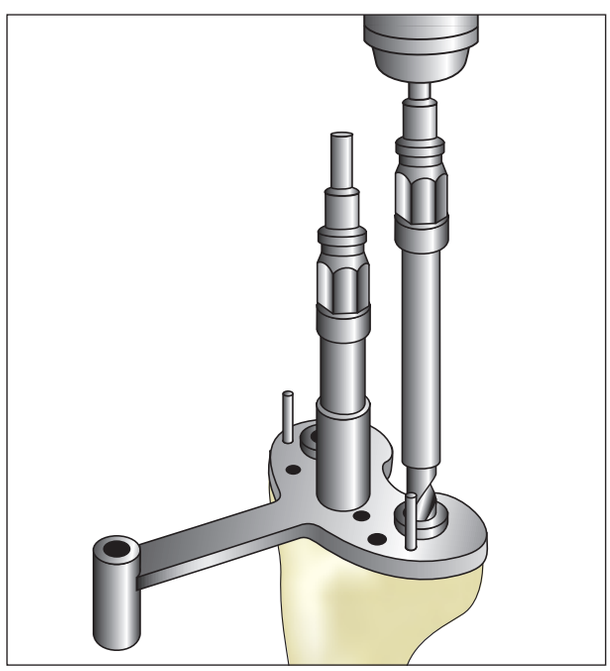
If unslotted cuts are preferred then the open chamfer resection guides may be used by placing the appropriate sized chamfer resection guide into the same pre-drilled holes as per the 4-in-1 resection guide for the chamfer cuts. The modular handles may be attached to the chamfer resection guides if required. The chamfer resection guides may be impacted using the resection guide impactor.

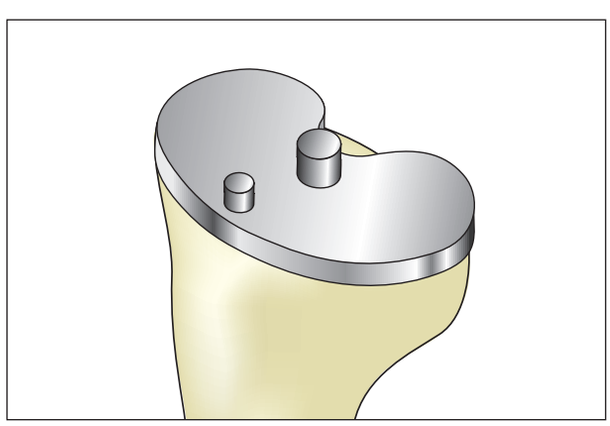


final **tibial preparation**

There are five sizes of tibial drill guides and the one that conforms optimally to the resected proximal tibia should be chosen. Alignment of the tibial drill guide is made by placing it so that the central handle is slightly medial to the tibial tuberosity. Using the EM alignment rod, an extra medullary alignment check may be made, ensuring that the rod is parallel to the long axis of the tibia. The tibial drill guide is then pinned in place. The tibial stem drill is inserted in the central tube and drilled to the marker line. The drill is left in place and the peg drill is used to prepare the peg holes through the appropriate guide holes. The instrument is then removed. A trial tibial tray of corresponding size is placed on to the prepared tibia. A meniscal trial corresponding to the tibial spacer previously selected is placed on to the appropriate trial tibial tray.

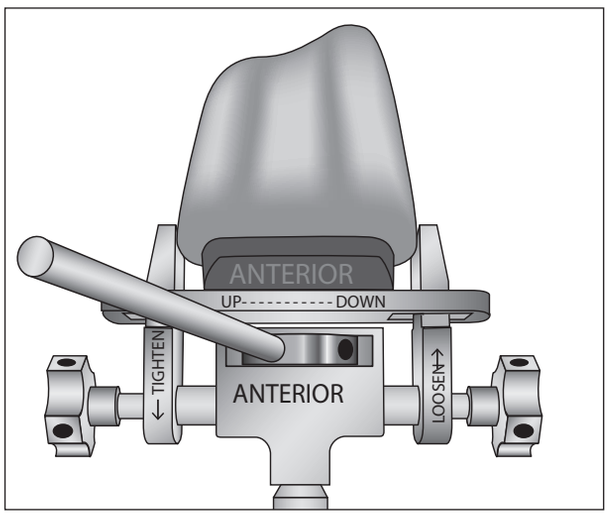






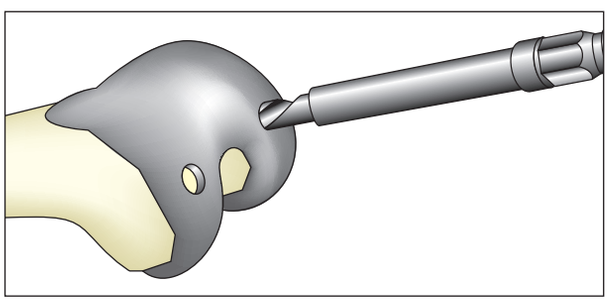
final **femoral preparation**

A trial femoral component of appropriate size is impacted on to the femur, using the femoral introducer/extractor fitted to the femoral introducer/extractor handle. The medial/lateral arms of the introducer/extractor should be adjusted to fit the trial before the plastic locking piece is advanced against the distal face of the trial femoral component. A tommy bar is provided to aid locking of the trial component. Final seating of the trial is achieved with the femoral/tibial impactor.



If the pegged femur is to be implanted, the pegged femoral trial should be placed on the resected femur such that it aligns centrally with the tibial tray and the femoral peg drill passed through the holes in the condyles of the pegged femoral trial.

If the stemmed femur is to be implanted, the femoral stem drill guide is placed onto the resected femur and the femoral stem drill passed through the left or right drill hole as appropriate. The appropriate stemmed femoral trial is then placed onto the femur.



trial reduction

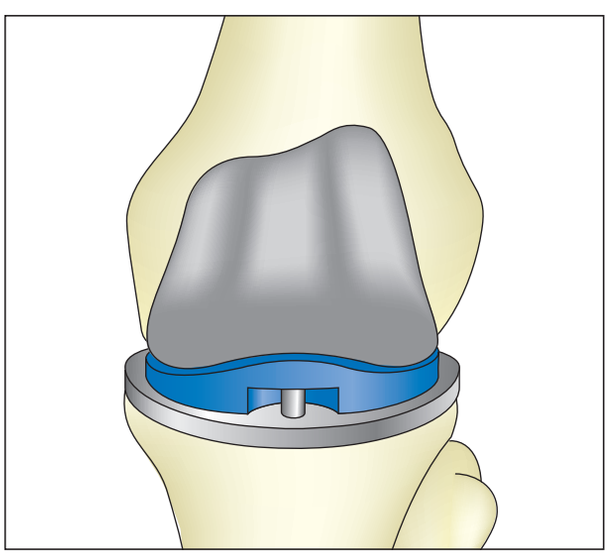
A trial reduction in flexion and extension is performed to ensure that the correct balancing of the knee joint has been achieved. If necessary, excise soft tissue adhesions posteriorly before implanting the definitive component.

If a Rotaglide+ mobile insert is selected, it is essential to ensure that the meniscal bearing moves antero-posteriorly and rotates without evidence of anterior lift off. If this should occur it may be necessary to reflect posterior capsule and/or sacrifice the posterior cruciate ligament.

A final check should be carried out to ensure that there is no impingement with un-resected posterior condyle or osteophyte, which may reduce range of motion and cause post-operative pain.

Remove all trial components from each of the bones and prepare the bony surfaces for cement if applicable.

Care should be taken when handling the definitive implants and all polished surfaces should be protected.

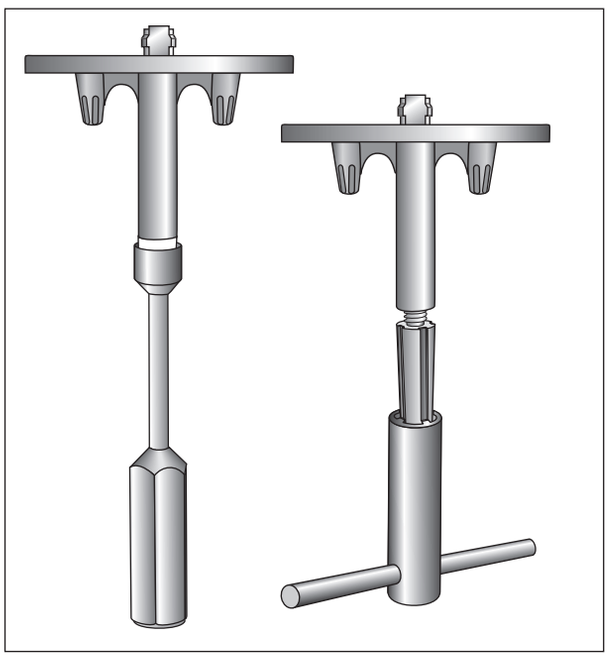


implantation of components

The recommended sequence of implantation is: tibial tray, polyethylene meniscal insert, femoral component and finally the patella.

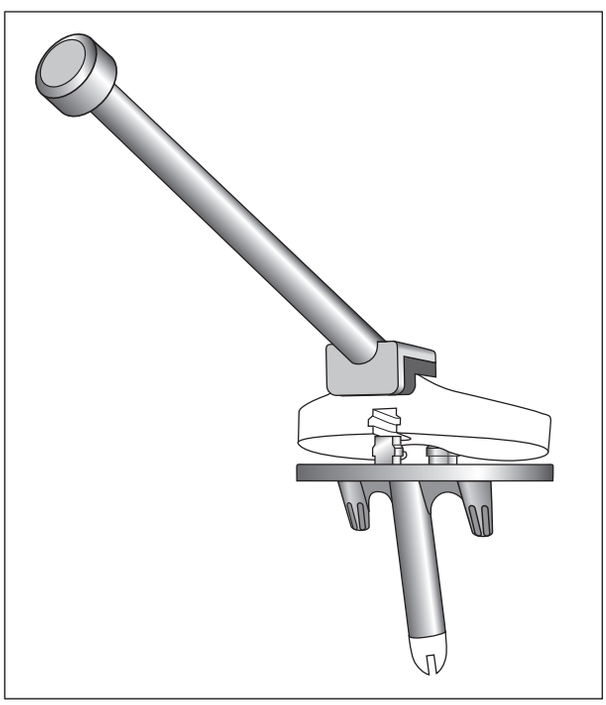
attachment of stem extensions

The UHMWPE boss peg is removed from the tibial tray stem or femoral component stem using the peg removal tool, the chosen length of stem extension screwed onto the component by hand and then fully tightened with the stem spanner.



fixed bearing components

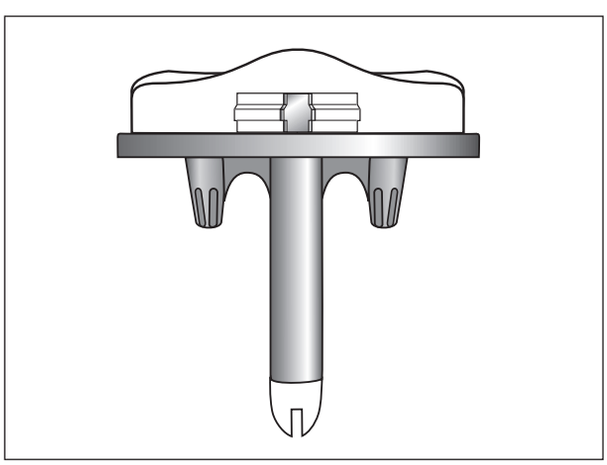
If the fixed bearing is chosen, it should be placed onto the tibial tray such that the posterior cut-out starts to engage on the posterior bollard and the anterior cut-out engages on the anterior bollard. This should be done at an angle of approximately 15-20°. The fixed bearing impactor is placed on the anterior/superior lip of the bearing and the bearing impacted until it is fully seated on the tibial tray.



mobile bearing components

If the mobile bearing is chosen, the appropriate size of UHMWPE bearing is placed onto the tibial tray with the knee in flexion. The chosen femoral component is then impacted onto the femur.

The minimum recommended thickness of insert is the 9.5mm insert, which has a minimum thickness of 6mm in the load bearing area as per BS EN 12564. 7mm inserts are available having a minimum thickness of 4mm, which is below the standard. These are for use only in patients with a small skeletal structure and low body weight, where the 9.5mm insert would lead to too much bone removal.



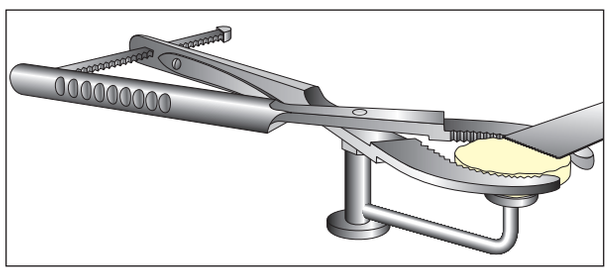
cementing technique

If bone cement is used, it is useful to reduce the knee after implanting all the components, as this will aid in compressing the bone cement. The knee should then be brought back into 90° of flexion and care taken to remove all excess bone cement, with particular attention being paid to clearing cement posteriorly from both the tibia and femur and from the inter-condylar area of the femur.

The wound is then closed according to the surgeon's usual practice.

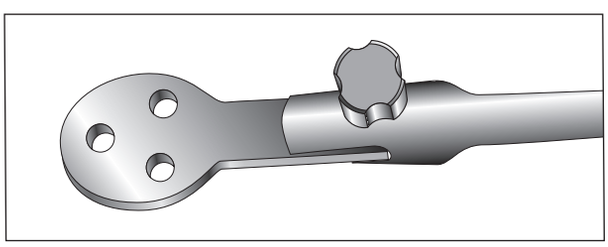
patella resection

The patella should be firmly grasped with the patella resection guide and the instrument locked. The instrument provides a depth gauge ensuring that a minimum of 10mm of bony patella remains providing the feeler arm cannot pass beneath bony surface. The patella should be measured before resection. The thickness of the offset dome patella is 8mm (small), 9mm (medium) or 10mm (large). The feeler arm is placed on the patella to ensure correct depth of cut. The patella is then resected.



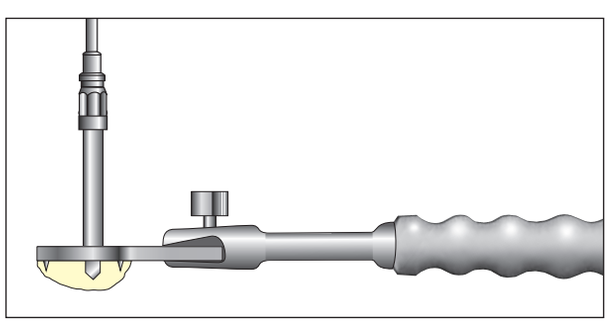
patella sizing

To size the patella, the peg drill guides are presented to the flat surface and the appropriate size chosen.



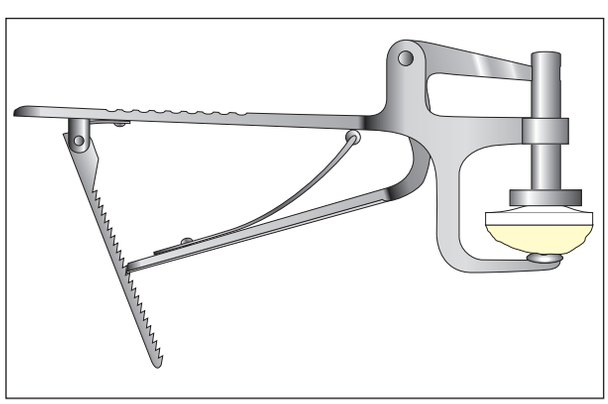
drilling the patella

Once the peg drill guide has been chosen it is inserted into the drill guide handle placed on the patella and lightly tapped into position ensuring the small spikes are fully buried into the surface of the patella. The patella drill is then passed through each hole. Remove the instrument and place the appropriate trial patella 3-peg concentric dome or 3-peg offset dome on the bony surface and perform a trial reduction in conjunction with the trial tibial insert and trial femur.



cementing the patella

When cementing the patella, pressure is applied using the patella pressurisation clamp.



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ordering information

Pegged Femurs

	Extra Small	Small	Medium	Large	Extra Large
Left	102.410	102.411	102.412	102.413	102.414
Right	102.420	102.421	102.422	102.423	102.424
Left Porous Ti-coated	102.410T	102.411T	102.412T	102.413T	102.414T
Right Porous Ti-coated	102.420T	102.421T	102.422T	102.423T	102.424T
Left Bi-coated	102.410B	102.411B	102.412B	102.413B	102.414B
Right Bi-coated	102.420B	102.421B	102.422B	102.423B	102.424B

Stemmed Femurs

	Extra Small	Small	Medium	Large	Extra Large
Left	102.010	102.011	102.012	102.013	102.014
Right	102.020	102.021	102.022	102.023	102.024
Left Porous Ti-coated	102.010T	102.011T	102.012T	102.013T	102.014T
Right Porous Ti-coated	102.020T	102.021T	102.022T	102.023T	102.024T
Left Bi-coated	102.010B	102.011B	102.012B	102.013B	102.014B
Right Bi-coated	102.020B	102.021B	102.022B	102.023B	102.024B

Latched Tibial Base Plates

	Extra Small	Small	Medium	Large	Extra Large
Latched	102.100	102.101	102.102	102.103	102.104
Latched Ti-coated	102.100T	102.101T	102.102T	102.103T	102.104T
Latched Bi-coated	102.100B	102.101B	102.102B	102.103B	102.104B

Tibial Augmentation Blocks

	Extra Small	Small	Medium	Large	Extra Large
4mm	117.911	117.918	117.912	117.919	117.913
6mm	117.921	117.928	117.922	117.929	117.923
8mm	117.931	117.938	117.932	117.939	117.933
10mm	117.941	117.948	117.942	117.949	117.943
12mm	117.951	117.958	117.952	117.959	117.953

Fixed UHMWPE Tibial Inserts

	Size 1	Size 2	Size 3
9.5mm	102.301	102.311	102.321
12mm	102.302	102.312	102.322
14.5mm	102.303	102.313	102.323
17mm	102.304	102.314	102.324
19.5mm	102.305	102.315	102.325
22mm	102.306	102.316	102.326
24.5mm	102.307	102.317	102.327

Mobile UHMWPE Tibial Inserts

	Size 1	Size 2
9.5mm	102.202	102.212
12mm	102.203	102.213
14.5mm	102.204	102.214
17mm	102.205	102.215
19.5mm	102.206	102.216
22mm	102.207	102.217
24.5mm	102.208	102.218
27mm	102.209	102.219

Dome Patella

Small (26mm OD)	102.603
Medium (29mm OD)	102.604
Large (34mm OD)	102.605

Asymmetric Dome Patella

Small (35/29mm)	102.607
Medium (39/33mm)	102.608
Large (43/37mm)	102.609

Boss Peg

Boss Peg UHMWPE	102.110

Stem Extensions

30mm	102.111
50mm	102.112
70mm	102.113