



**PFC® SIGMA ROTATING  
PLATFORM KNEE  
SYSTEM with M.B.T Tray**



**PRIMARY PROCEDURE**

**WITH A CURVED OR**

**POSTERIOR STABILISED**

**IMPLANT**

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# Contents

Introduction	iv
Primary Procedure	1
Appendix I: Ligamentous Balance in Total-Knee Arthroplasty	32
Appendix II: P.F.C.® Sigma Rotating Platform Compatibility Chart	39

**This surgical technique should be used in conjunction with the P.F.C.® Sigma Knee System primary cruciate-retaining and cruciate-substituting procedure (Cat. No. 9068-45-000).**

**The P.F.C.® Sigma surgical procedure is followed to the point of proximal tibial resection.**

## Introduction

Total-knee replacement is performed on a wide range of patients with various pathologies and anatomical anomalies. Since no single arthroplastic approach is appropriate for every knee, the surgeon must be prepared, as the situation indicates, to preserve, sacrifice or substitute for the posterior cruciate ligament. Regardless of the approach used, it is essential that the balance in flexion and extension be confirmed.

The P.F.C.® Sigma Knee System incorporates both mobile-bearing and fixed-bearing options into one integrated system. (The P.F.C.® Sigma Rotating Platform (RP) tibial products articulate with existing P.F.C.® Sigma femoral and patellar components.) The Specialist® 2 Instruments, which are a single integrated set of instruments, are designed to assure fully accurate bone resection and to accommodate most surgical techniques and contingencies.

Soft tissue releases should be performed during the initial exposure to facilitate implantation of the P.F.C.® Sigma RP devices. In order to deliver the tibia forward relative to the femur, the medial capsular structures must be released from anterior to posterior, at least to the mid sagittal plane. **Special attention should also be taken to ensure flexion and extension gaps are equal and all soft tissues are subsequently balanced.**

**Please note that the posterior stabilised version of the P.F.C.® Sigma RP prosthesis requires a proximal tibial resection with a 0 degree posterior slope. For the curved version, the proximal tibial resection should match the patient's normal anatomy.**

# Surgical Technique: Primary Procedure

As part of the Specialist 2 System, several approaches to surgery are available. Either prepare the femur first then proceed to the tibia, or prepare the tibia first and proceed to the femur. Regardless, it is important for the ligaments to be balanced correctly. This can be assessed by using spacer blocks, laminar spreaders or the trial components themselves. This technique will begin with the distal femoral cut first, followed by the proximal tibia cut to balance the extension gap.

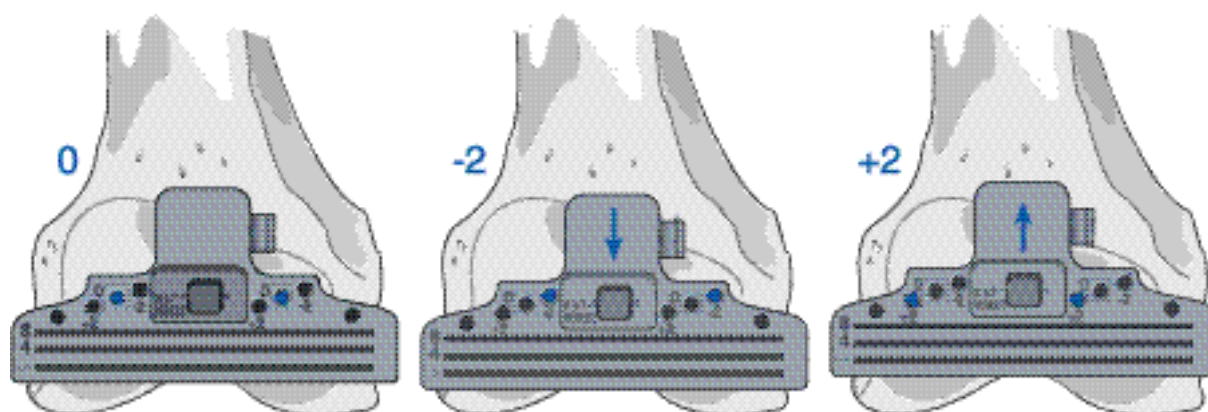
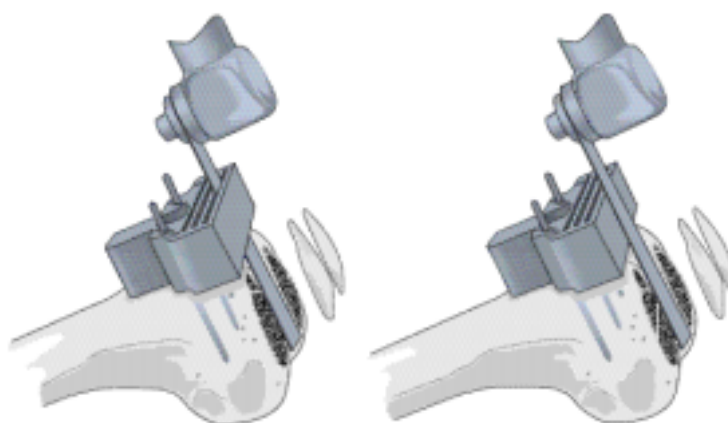
## Distal Femoral Cut

**Note: Distal femoral resection or proximal tibial resection can be done in any order.**

Resect the distal femur using the chosen resection level. The distal thickness of the Sigma femoral implant is 9 mm (10 mm on size 6).

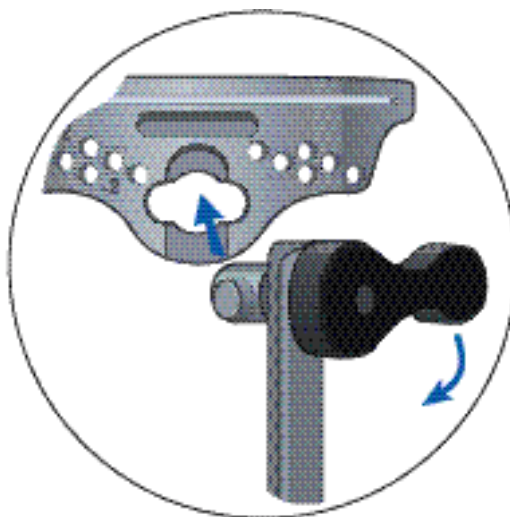
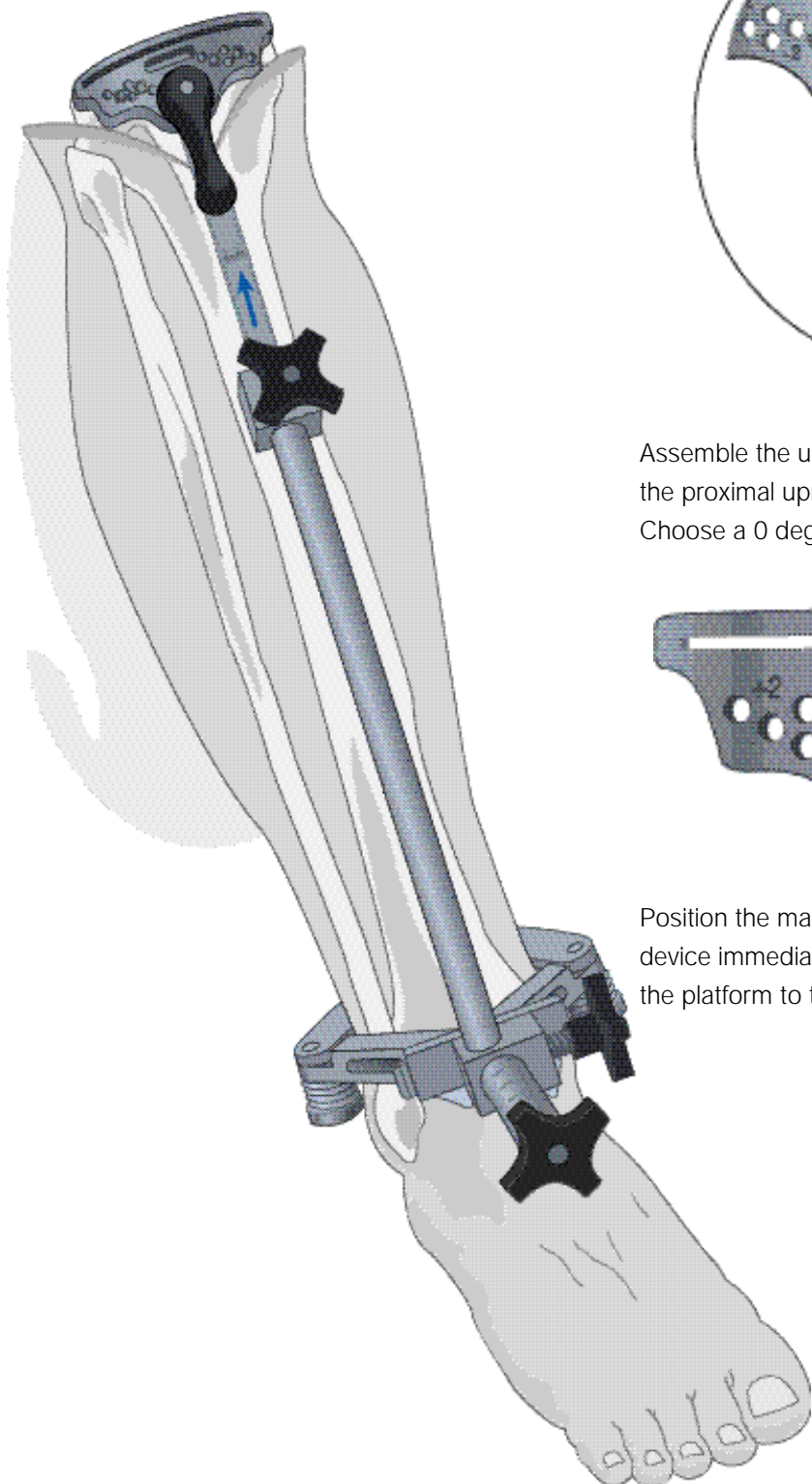
The holes on the block are designated -2, 0 and +2, indicating in millimetres the amount of bone resection each will yield supplemental to that indicated on the calibrated outrigger.

Position the oscillating saw blade through the slot or, where applicable, position the blade flush to the top cutting surface of the block. Resect the condyles and check the surface for accuracy.

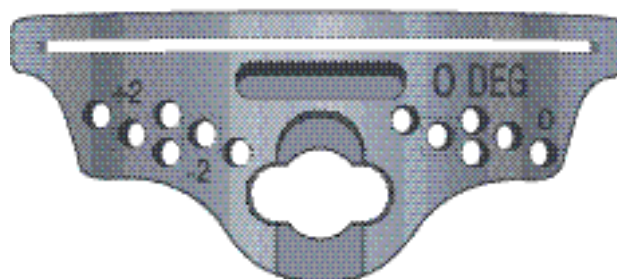


## Tibial Alignment

Place the knee in maximum flexion with the tibia distracted anteriorly and stabilised.



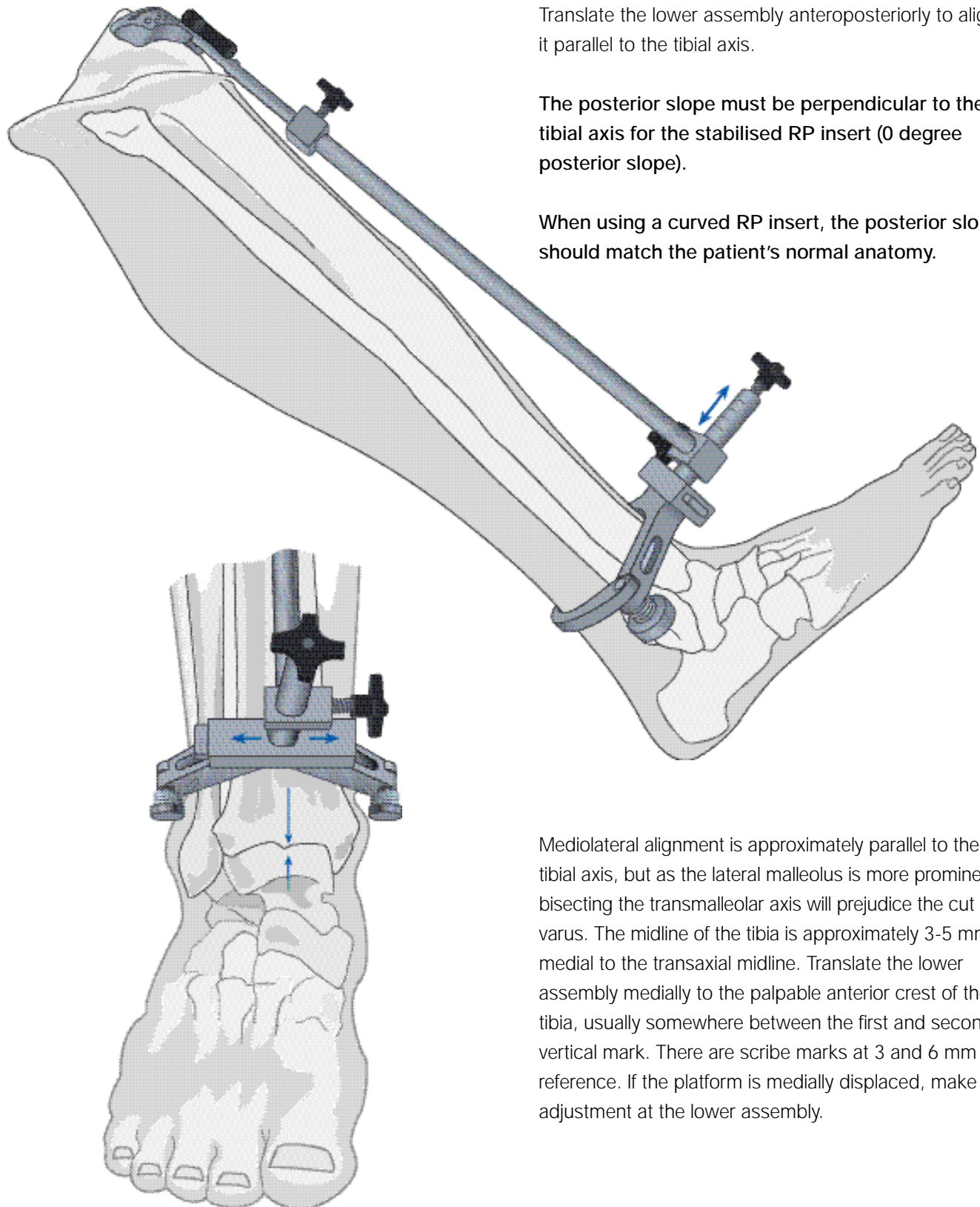
Assemble the upper cutting platform and secure it onto the proximal uprod of the tibial alignment device. Choose a 0 degree cutting block.



Position the malleolar clamp of the tibial alignment device immediately proximal to the malleoli. Raise the platform to the level of the condyles.



# Tibial Alignment



Translate the lower assembly anteroposteriorly to align it parallel to the tibial axis.

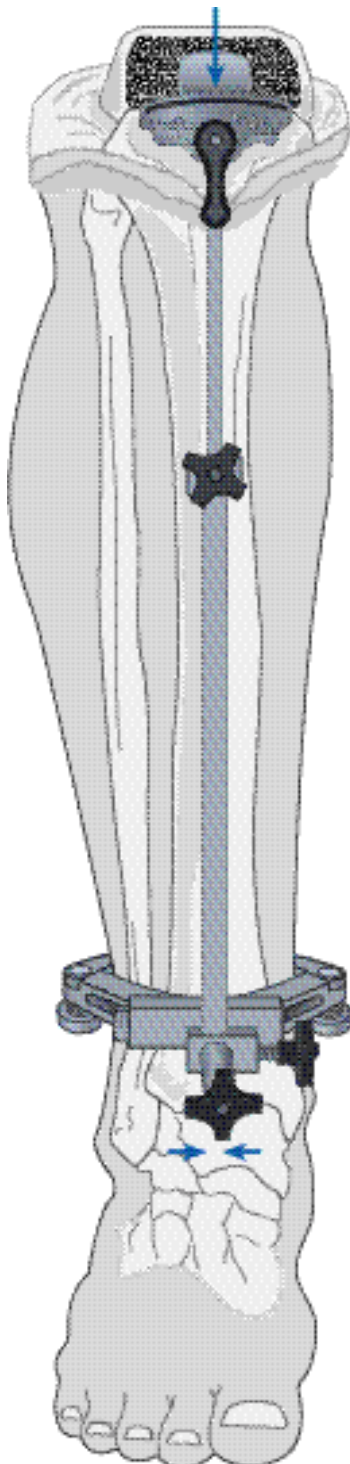
The posterior slope must be perpendicular to the tibial axis for the stabilised RP insert (0 degree posterior slope).

When using a curved RP insert, the posterior slope should match the patient's normal anatomy.

Mediolateral alignment is approximately parallel to the tibial axis, but as the lateral malleolus is more prominent, bisecting the transmalleolar axis will prejudice the cut into varus. The midline of the tibia is approximately 3-5 mm medial to the transaxial midline. Translate the lower assembly medially to the palpable anterior crest of the tibia, usually somewhere between the first and second vertical mark. There are scribe marks at 3 and 6 mm for reference. If the platform is medially displaced, make an adjustment at the lower assembly.

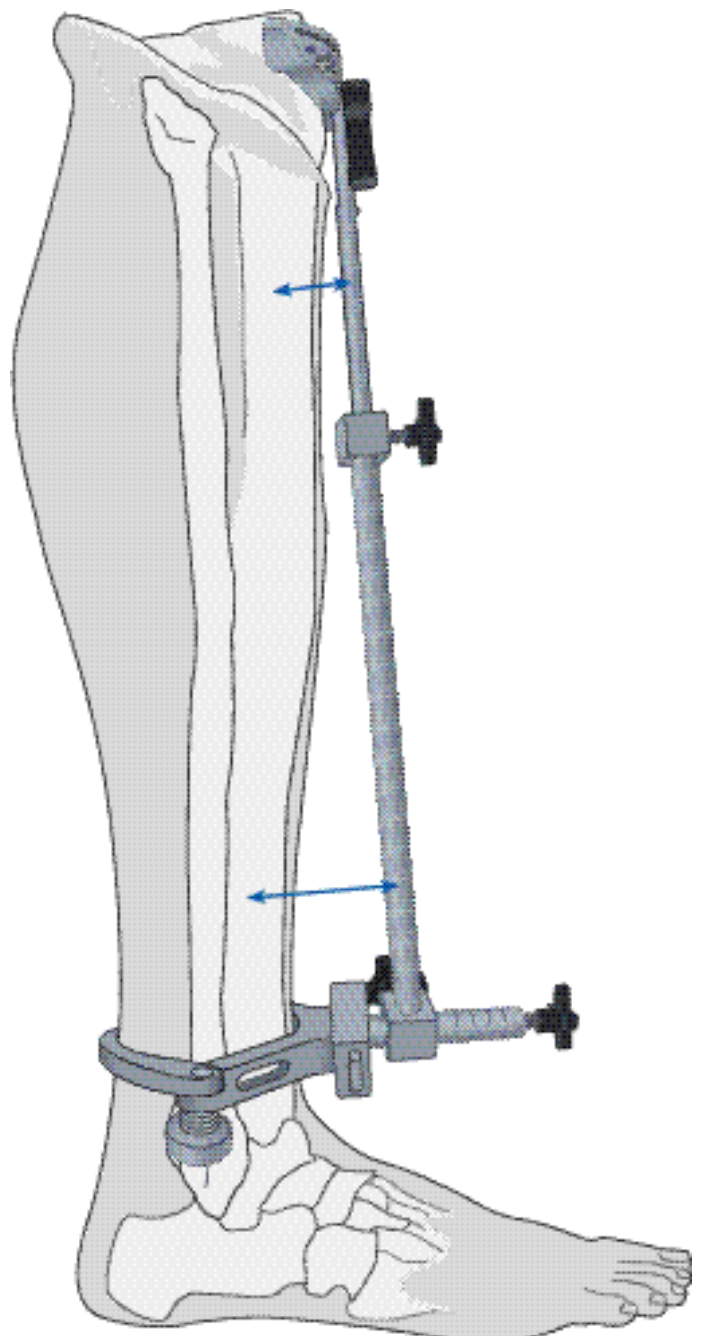
## Tibial Alignment

The distal portion of the long arm of the tibial alignment device should align with the centre of the talus.



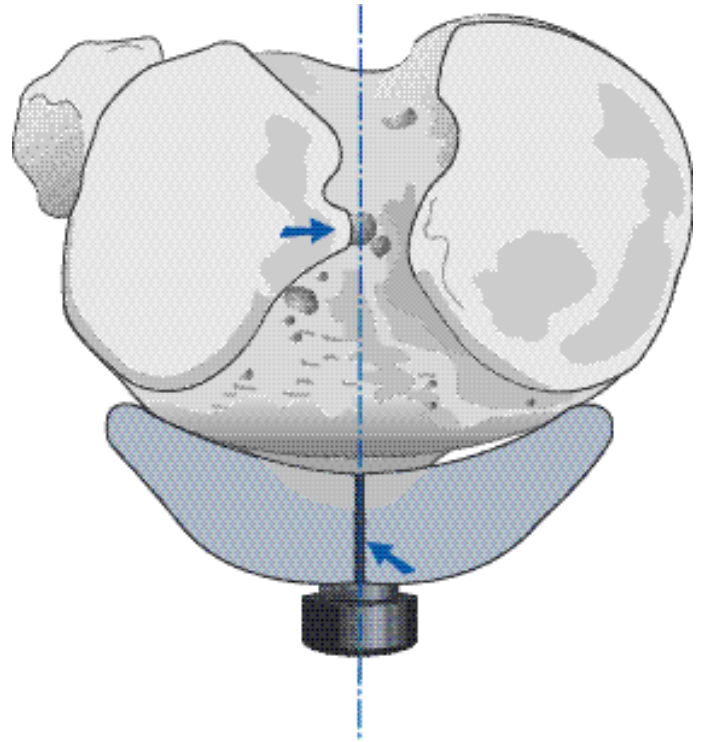
Lateral alignment is similarly confirmed.

**Note:** Where indicated, make varus/valgus corrections by sliding the distal portion of the tibial alignment to the appropriate location.



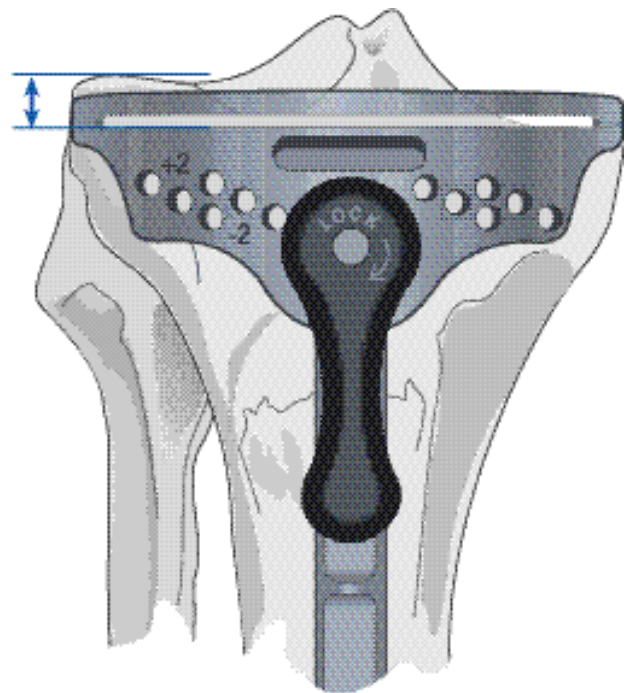
# Upper Platform

Align the upper platform with the medial third of the tibial tubercle and the medial margin of the lateral intercondylar eminence with the extremities of the cutting surface against the anterior cortex.



The exact level of resection will vary according to patient anatomy. As the mediolateral transverse plane of the tibial plateau is usually 3 degrees from the perpendicular and the projected cut is perpendicular to the anatomic axis, more bone is typically removed from the lateral condyle.

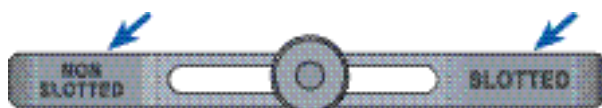
- Composite thickness of the Sigma RP tibial inserts (curved and stabilised) is 10 mm, 12.5 mm, 15 mm, and 17.5 mm.





# Tibial Stylus

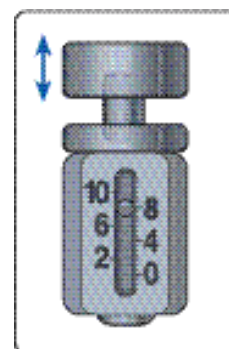
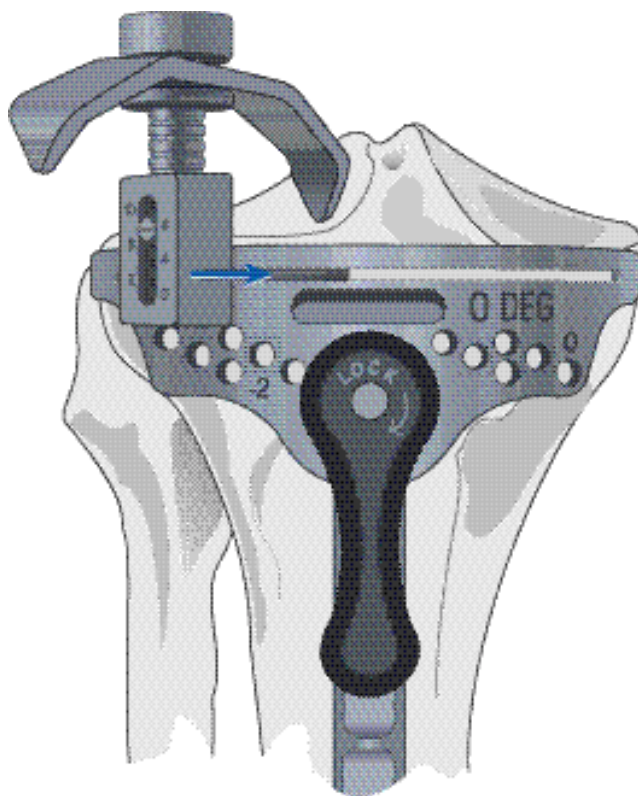
The stylus determines the exact level of resection.



The outrigger of the stylus is marked nonslotted and slotted at either end. When the tibial resection is performed from the surface of the block, choose the nonslotted end of the outrigger; conversely, when the resection is performed through the slots, choose the slotted end of the outrigger. There is a 4 mm difference between the top surface and the slot.

Insert the cylinder foot into the slot of the cutting block and adjust to the appropriate level. It is calibrated in 2 mm increments, indicating the amount of bone and residual cartilage to be resected.

A level of 10 mm is suggested when resection is based on the less involved condyle. Adjust the block so that the stylus rests on the centre of the condyle and the cutting block is secured by the large anterior set screw.



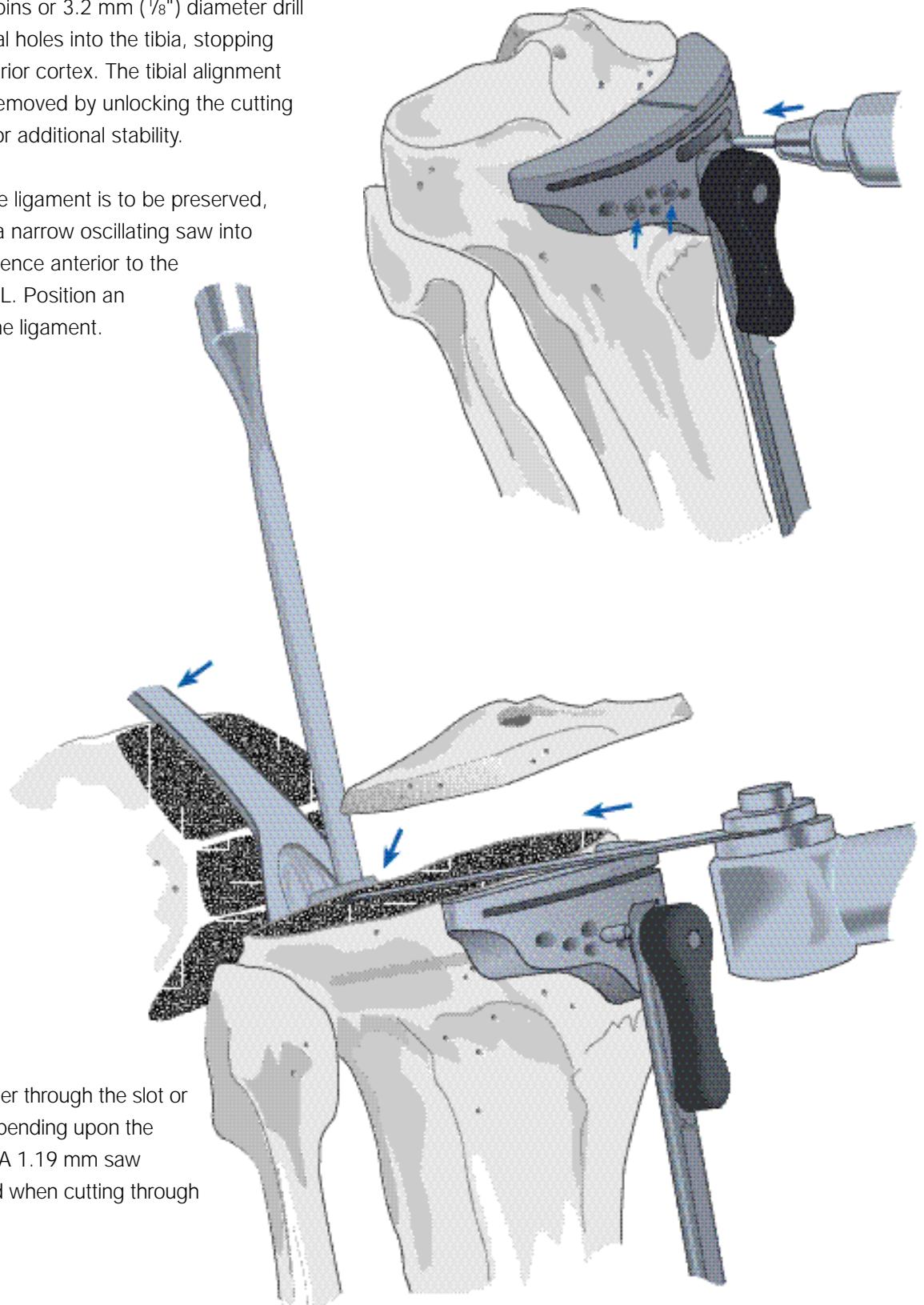
Select level 0 when resection is based on the more involved condyle and does not result in excessive contralateral resection. Secure the cutting block by the large anterior set screw.

**Note:** When this indicates greater than 10 mm of resection from the contralateral condyle, a higher level is indicated. Augment the deficiency with cement or bone graft as the situation dictates.

# Securing the Platform and Tibial Resection

Introduce Steinmann pins or 3.2 mm ( $\frac{1}{8}$ ") diameter drill bits through the central holes into the tibia, stopping well short of the posterior cortex. The tibial alignment device can either be removed by unlocking the cutting block or left in place for additional stability.

If the posterior cruciate ligament is to be preserved, cut an entry slot with a narrow oscillating saw into the intercondylar eminence anterior to the attachment of the PCL. Position an osteotome to shield the ligament.

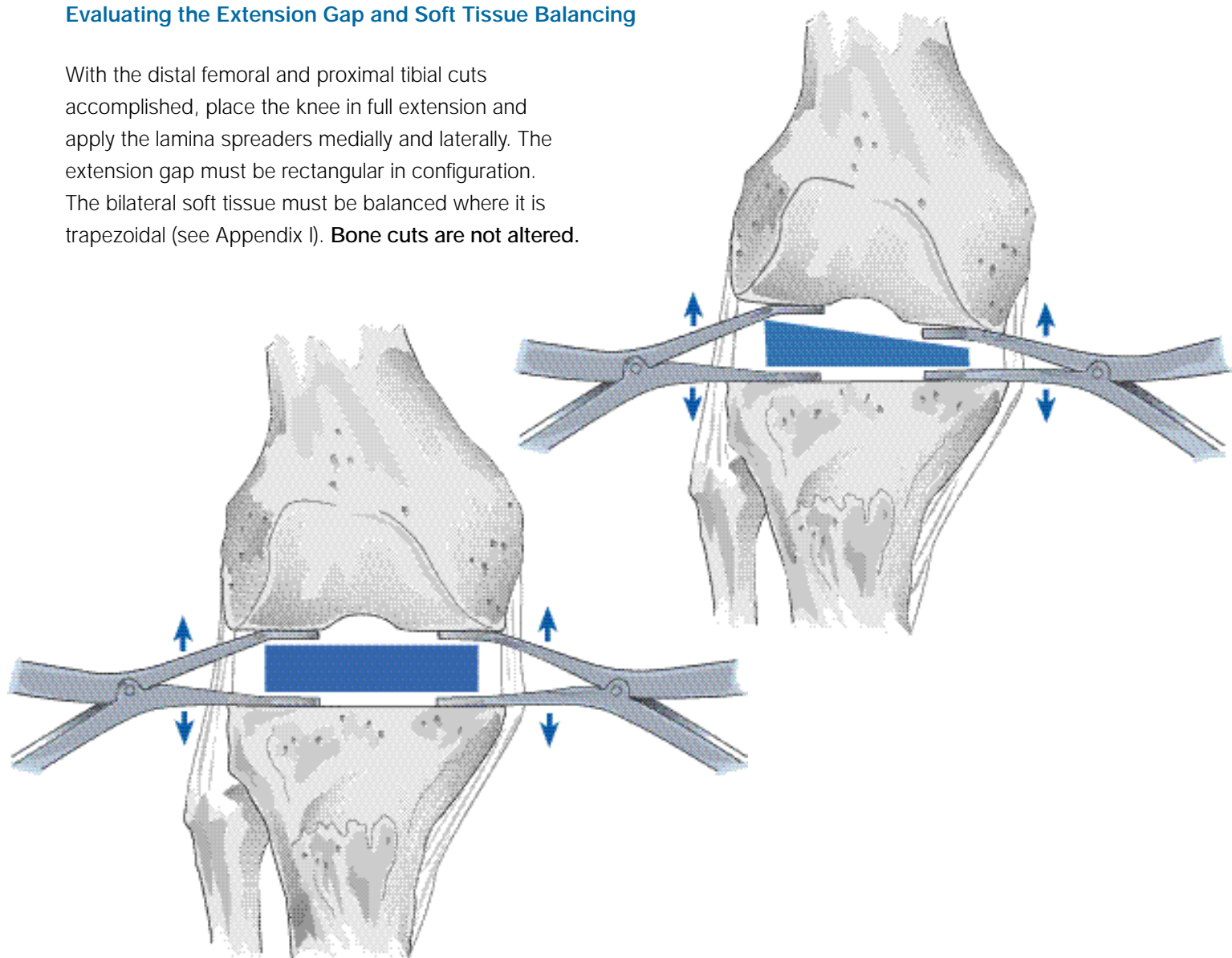


Resection is made either through the slot or on the top surface, depending upon the stylus reference used. A 1.19 mm saw blade is recommended when cutting through the slots.

# Evaluation of Extension Gap

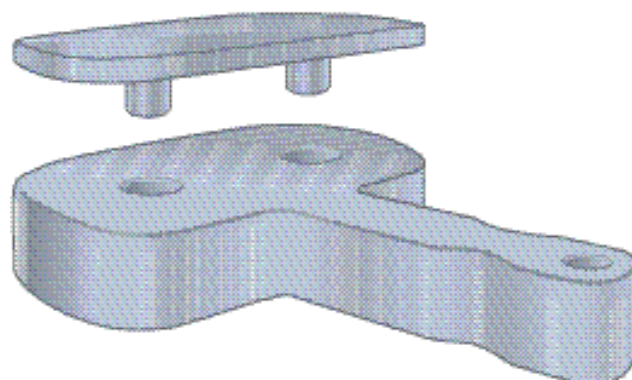
## Evaluating the Extension Gap and Soft Tissue Balancing

With the distal femoral and proximal tibial cuts accomplished, place the knee in full extension and apply the lamina spreaders medially and laterally. The extension gap must be rectangular in configuration. The bilateral soft tissue must be balanced where it is trapezoidal (see Appendix I). **Bone cuts are not altered.**



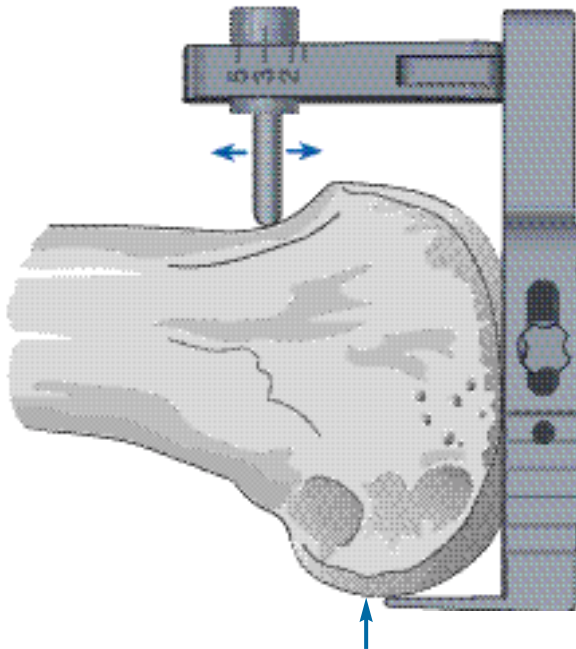
A set of spacer blocks are available to measure the gap and indicate the appropriate thickness of the tibial insert and the distal femoral implant, subject to re-evaluation at trial reduction.

When using blocks to assess flexion and extension gaps, use a 1 mm shim for the extension gap. Remove the shim when assessing the flexion gap. This will compensate for the 1 mm difference between the distal and posterior resection levels.



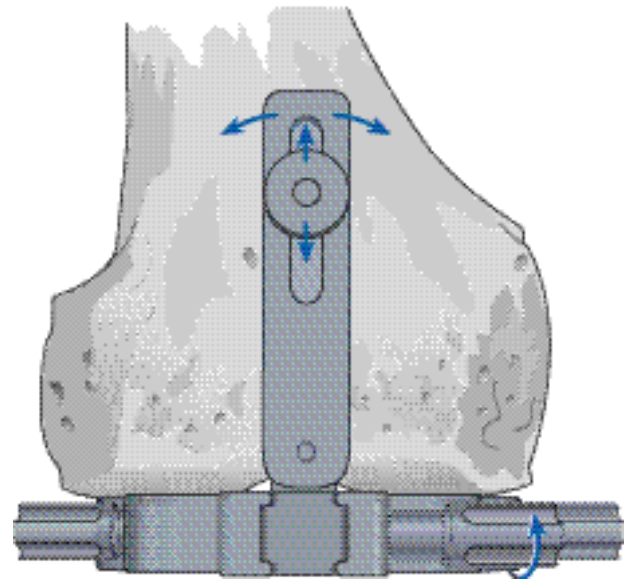


## The Femoral Sizing Guide: Anterior Down/Posterior Up



Care should be taken if there are deficient medial or lateral posterior condyles as this may affect femoral rotation.

Seat the chosen sizing guide (anterior down/posterior up) flush and centred on the prepared distal femoral surface. Allow the stylus to move freely within the guide, and move it proximal to the articular surface.



Pass the stylus over the anterior cortex immediately proximal to the articular surface. At the appropriate level where the stylus is not impeded, turn the stylus locking knob clockwise until it is tight to fix its position.

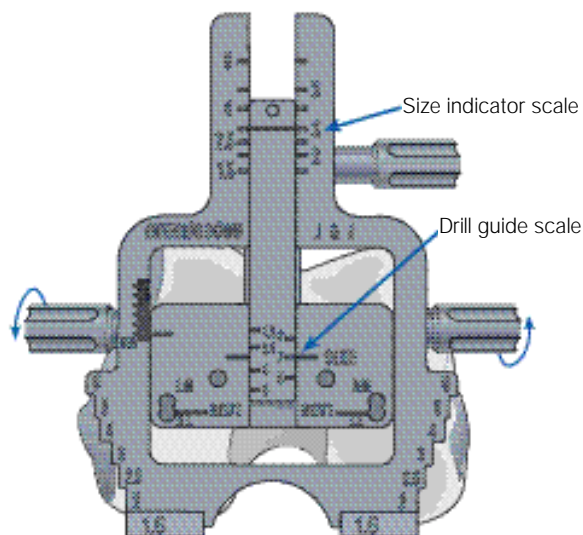
# Rotational Alignment/Anterior Down

The Femoral Sizing Guide is available in two formats:

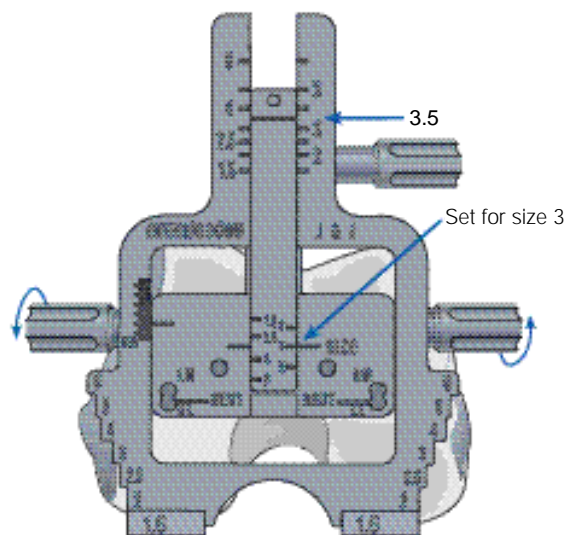
- anterior reference (anterior down)
- posterior reference (posterior up)

## Anterior down

Use the sizing guide to position the femoral A/P chamfer cutting block so the anterior flange of the prosthesis will fit flush with the anterior cortex of the femur. When the sizing device indicates a whole size, 8 mm will be resected from the posterior condyles, corresponding to the posterior condyle thickness of the prosthesis. The serrated edges of the drill guide show the M/L dimension of the femoral component.



The Anterior Reference Femoral Sizing Guide

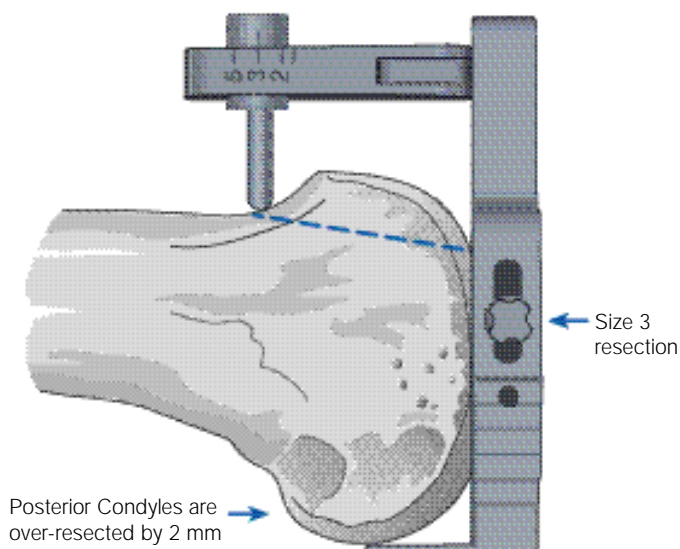


Decide whether to up or down size based on where the femur measures between sizes.

## Option 1

If choosing to downsize when the upper scale reads 3.5, set the sizing guide to size 3 and use a size 3 A/P cutting block. Because the guide uses the anterior cortex as the reference, the anterior cut level remains constant and more bone will be resected from the posterior condyles.

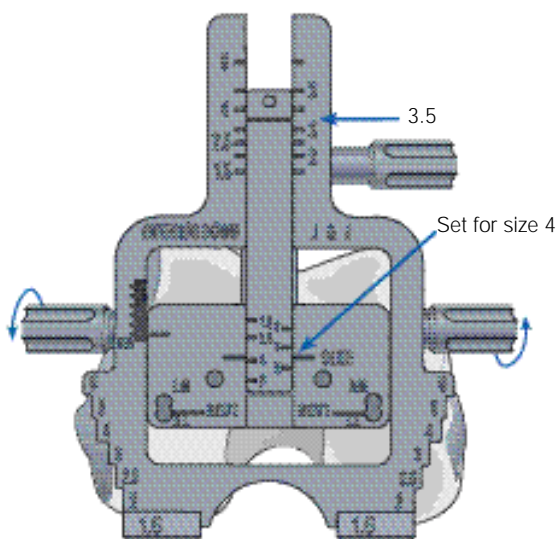
The extra posterior resection increases the size of the flexion gap. If, at trial reduction, there is marked laxity in flexion, remove more distal femur and use a thicker tibial insert.



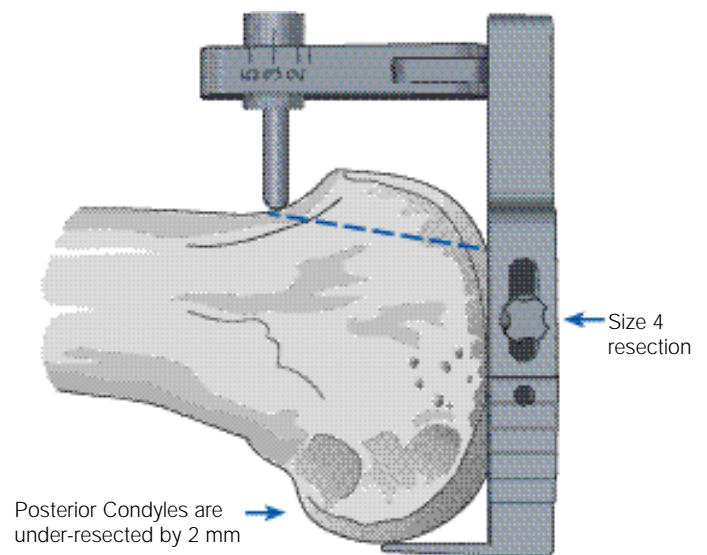


**Option 2**

When electing to upsize the femur, set the sizing guide to size 4 and use a size 4 A/P cutting block. The anterior cut remains constant and less bone is removed from the posterior condyles.



The under-resection of the posterior condyles will decrease the size of the flexion gap. Decreasing the tibial insert thickness may cause instability in extension. To maintain balance, it is generally better to downsize and accept an over-resection posteriorly.



# Rotational Alignment/Posterior Up

## Posterior Up

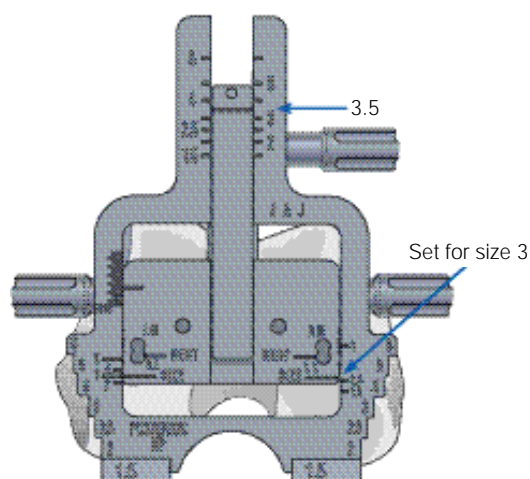
The posterior up sizing guide measures the femur in the same way as the anterior down guide. The sizing guide will position the femoral A/P chamfer cutting block so 8 mm will be resected from the posterior condyles, corresponding to the posterior condyle thickness of prosthesis.

Three options are available when the femur measures between sizes. (e.g. 3.5)

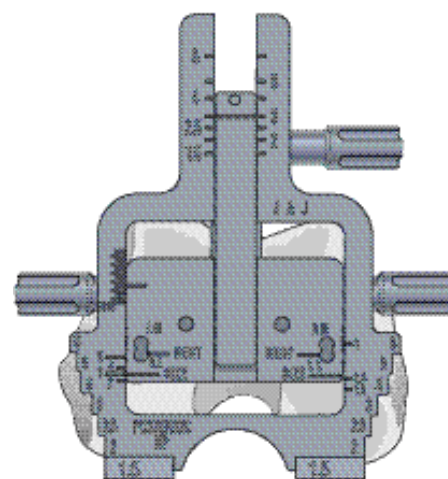
### Option 1

Downsize by setting the sizing guide to size 3 and use a size 3 cutting block.

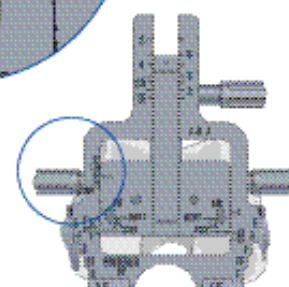
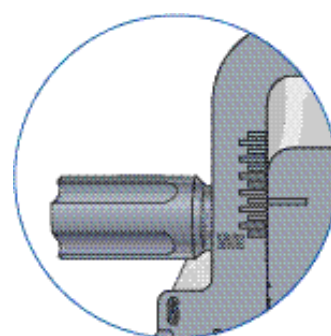
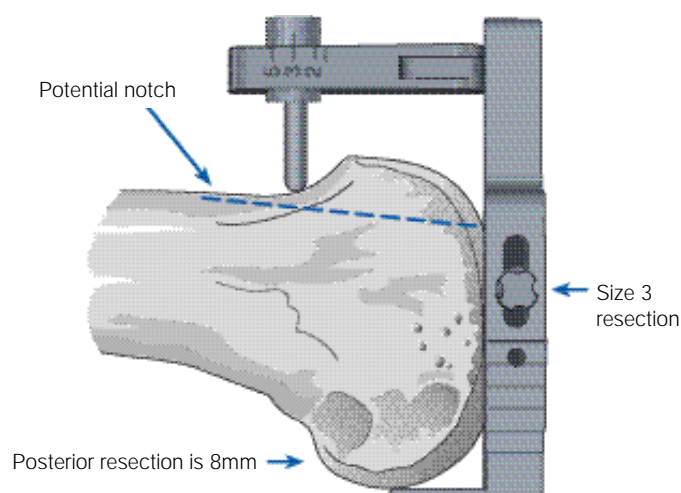
This will give an 8 mm posterior resection but will cause a larger anterior resection. **Increased anterior resection may notch the anterior cortex of the femur. Femoral shaft notching should be avoided, since there is an associated risk for fracture.**



Use the millimetre scale on the side of the drill guide to 'ease' the anterior cut by moving the drill guide anteriorly. This increases the posterior cut and thereby the flexion gap size. Keep a balance between the anterior cut and the flexion space.



The Posterior Reference Femoral Sizing Guide

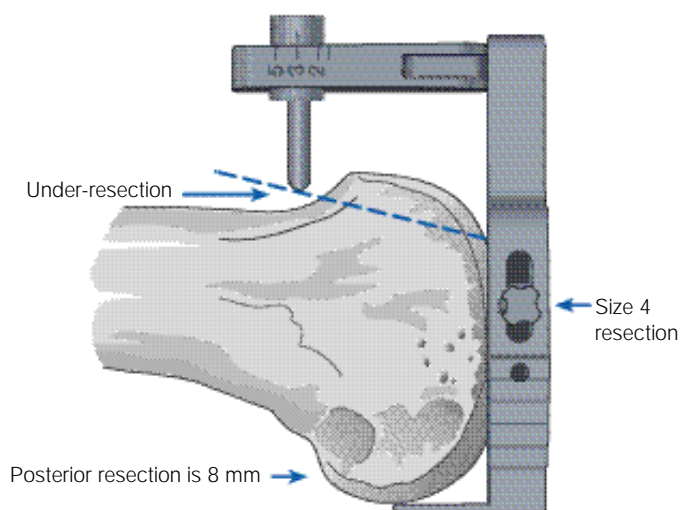
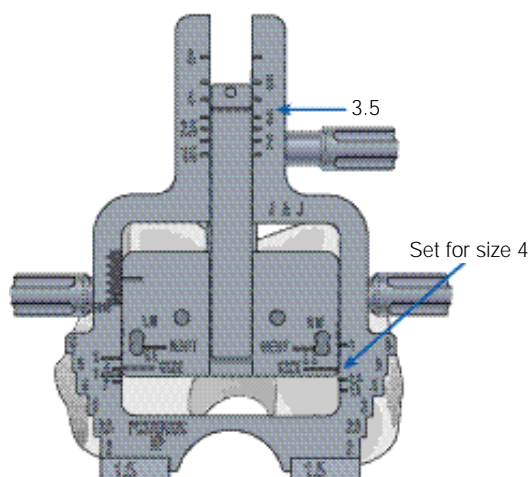


# Rotational Alignment/Posterior Up

## Option 2

Upsize by setting the sizing guide size to 4 and using a size 4 cutting block. This again will resect 8 mm from the posterior condyles but less anteriorly.

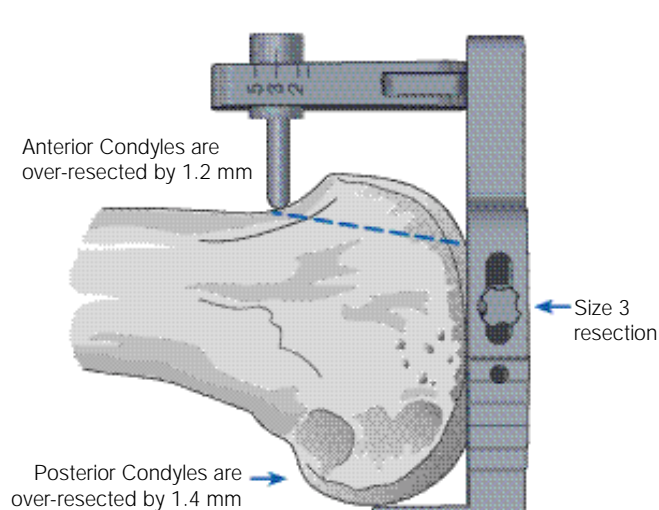
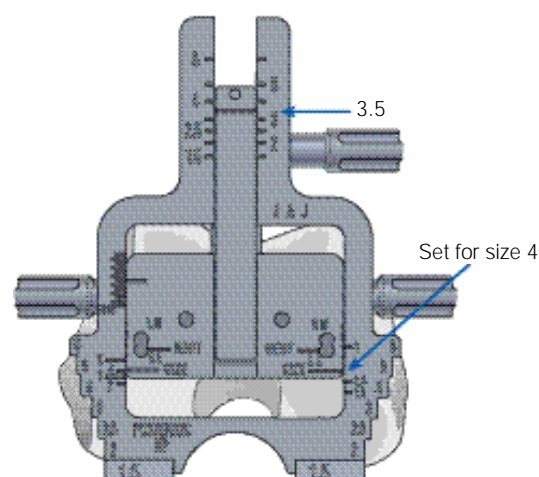
The under-resection of the anterior surface can have a significant effect on the patella. It may cause tightness of the joint and high forces to be transmitted to the patella since the anterior articular surface would be positioned too anterior. Using the millimetre scale allows the anterior resection to be increased. This will cause under-resection posteriorly and a potential tight flexion gap.



## Option 3

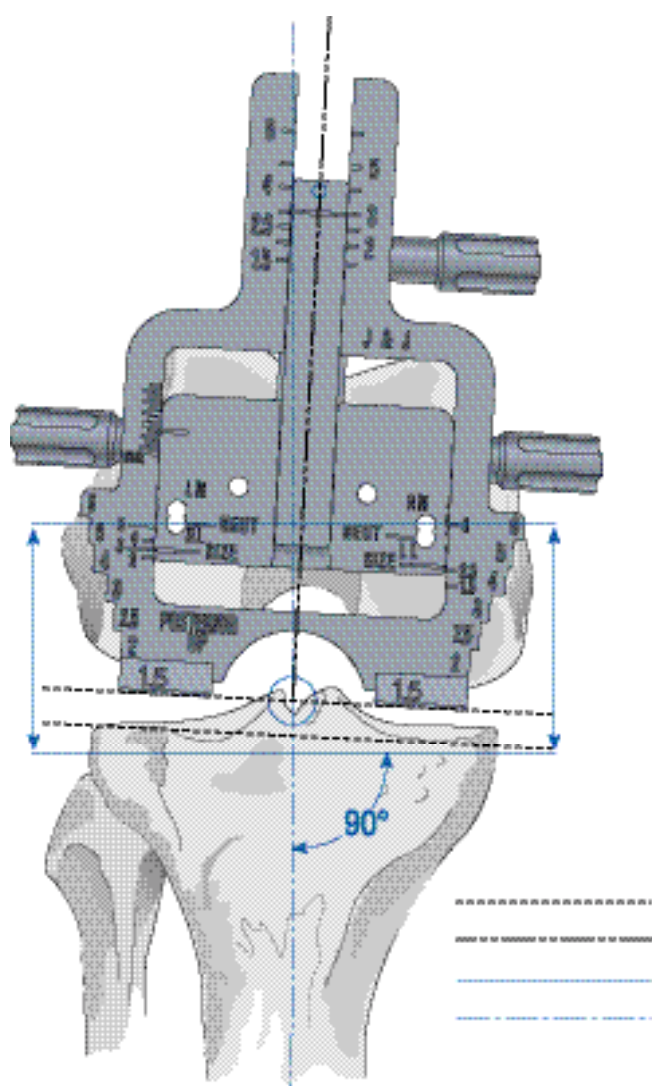
Divide the extra bone resection involved in downsizing between the anterior and posterior cuts by setting the sizing guide to 4 and using the size 3 cutting block. This increases the posterior resection by 1.4 mm and the anterior by 1.2 mm.

The two sizing guides assure a consistent posterior cut or a consistent anterior cut and the ability to accommodate femurs which fall between whole sizes.

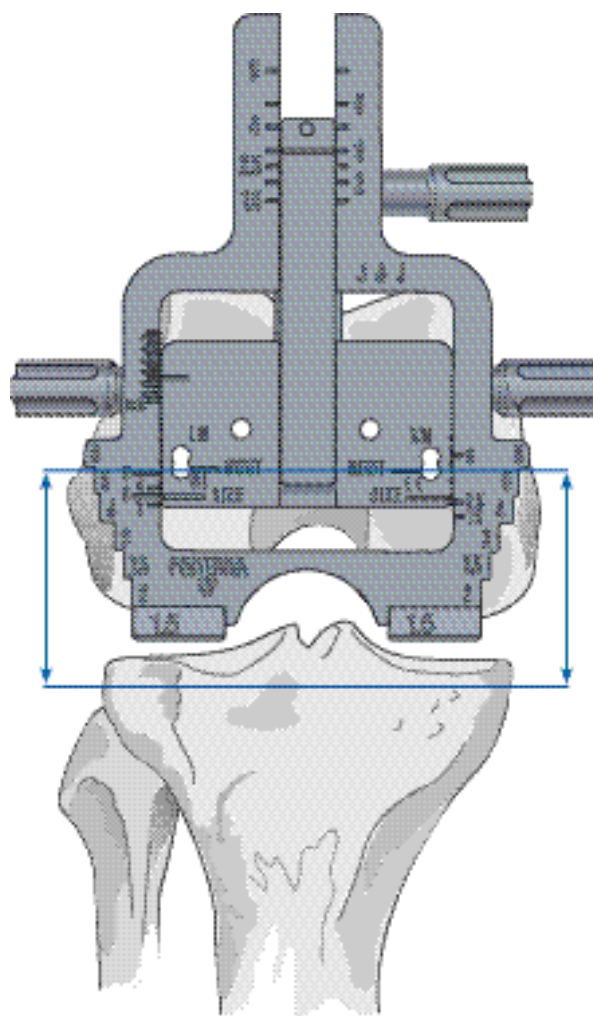


## Rotational Alignment/Posterior Up

Control internal/external rotation of the A/P cuts by resting the skids of the sizing guide on the posterior condyles. The natural joint line lies medially oblique by approximately three degrees. The tibial resection at 90 degrees to the tibial mechanical axis effectively rotates to prosthetic joint line three degrees laterally (external rotation). The anterior and posterior cuts must be externally rotated in order for the flexion gap to be a parallel/rectangular space. Follow the legend on the sizing guide, which places the medial pin in the upper hole and the lateral pin in the lower hole. Offsetting the holes produces a three degree external rotation of the cutting block.



No rotation is achieved if the posterior 'neutral' holes are used.



- Natural joint line
- Perpendicular to natural joint line
- Prosthetic joint line
- Perpendicular to prosthetic joint line

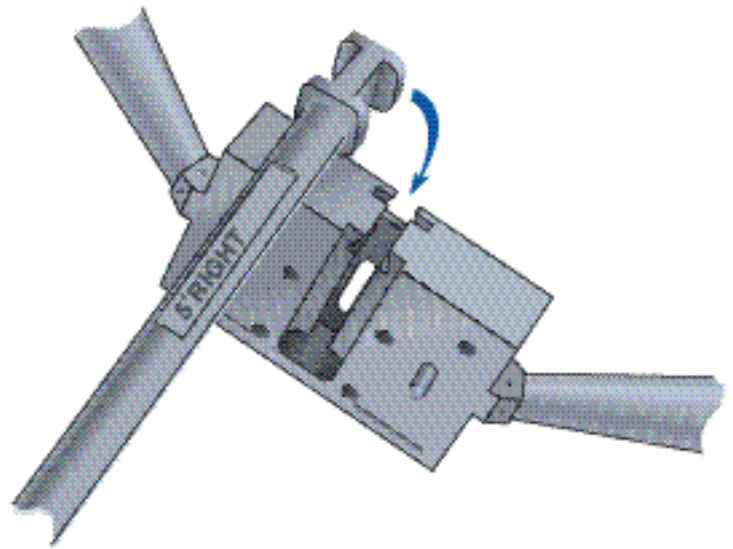
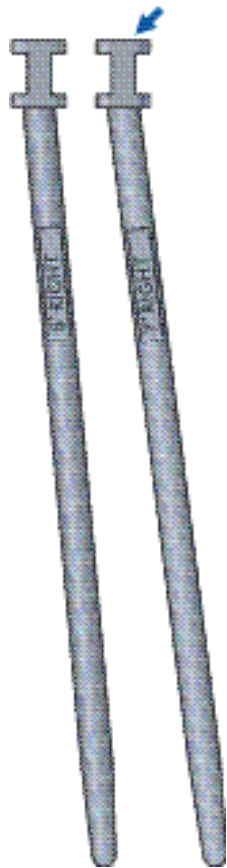


# Femoral Component Sizing and Preparation

## Alternative Method:

### Using the Femoral A/P Sizing and Cutting Block

Select the appropriate rod and assemble it to the appropriately sized femoral A/P cutting block with the appropriate RIGHT/LEFT designation to the anterior. Retract the pins.



Note: Alternatively, the femoral sizing guide can be used to position and size the component (see pages 9-14). With positioning established, use the appropriately sized A/P cutting block.

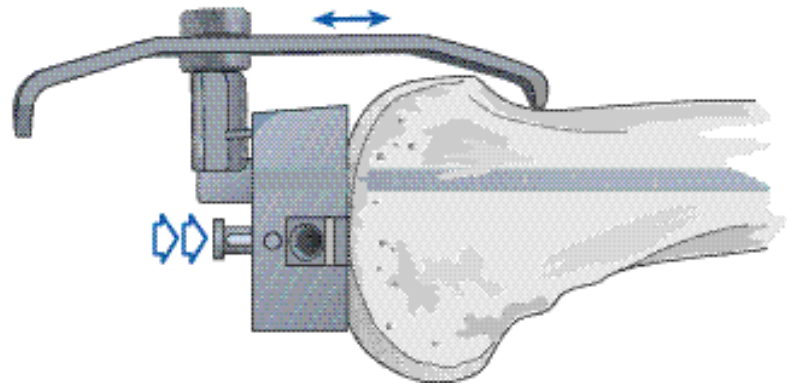
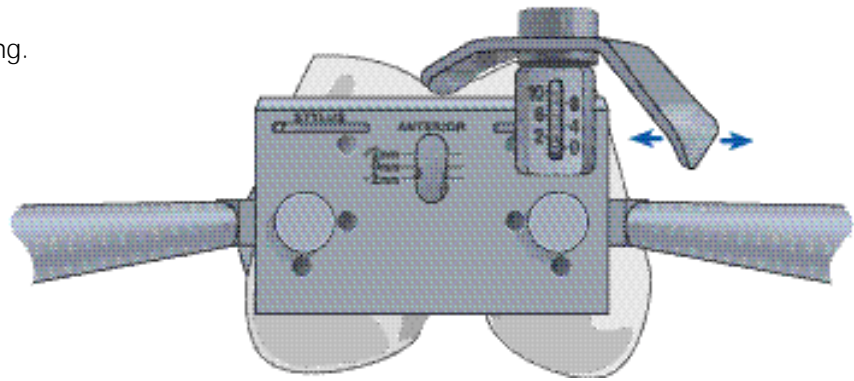


## Positioning the Cutting Block

Insert the chosen I.M. rod into the canal so the A/P block is allowed to slide up or down to facilitate sizing. The cutting block is seated flush to the cut distal surface.

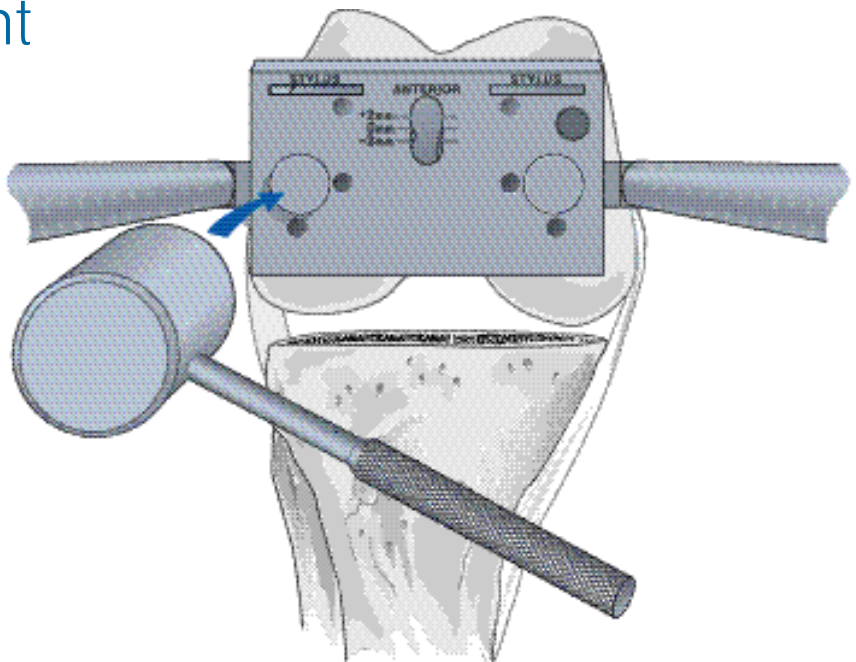
Fully seat the foot of the stylus assembly in its receptacle on the anterior surface of the block so that it reads 0.

Adjust the cutting block posteriorly until the stylus, which has the arm marked **non-slotted** positioned toward the bone, is in contact with the anterior femoral cortex.

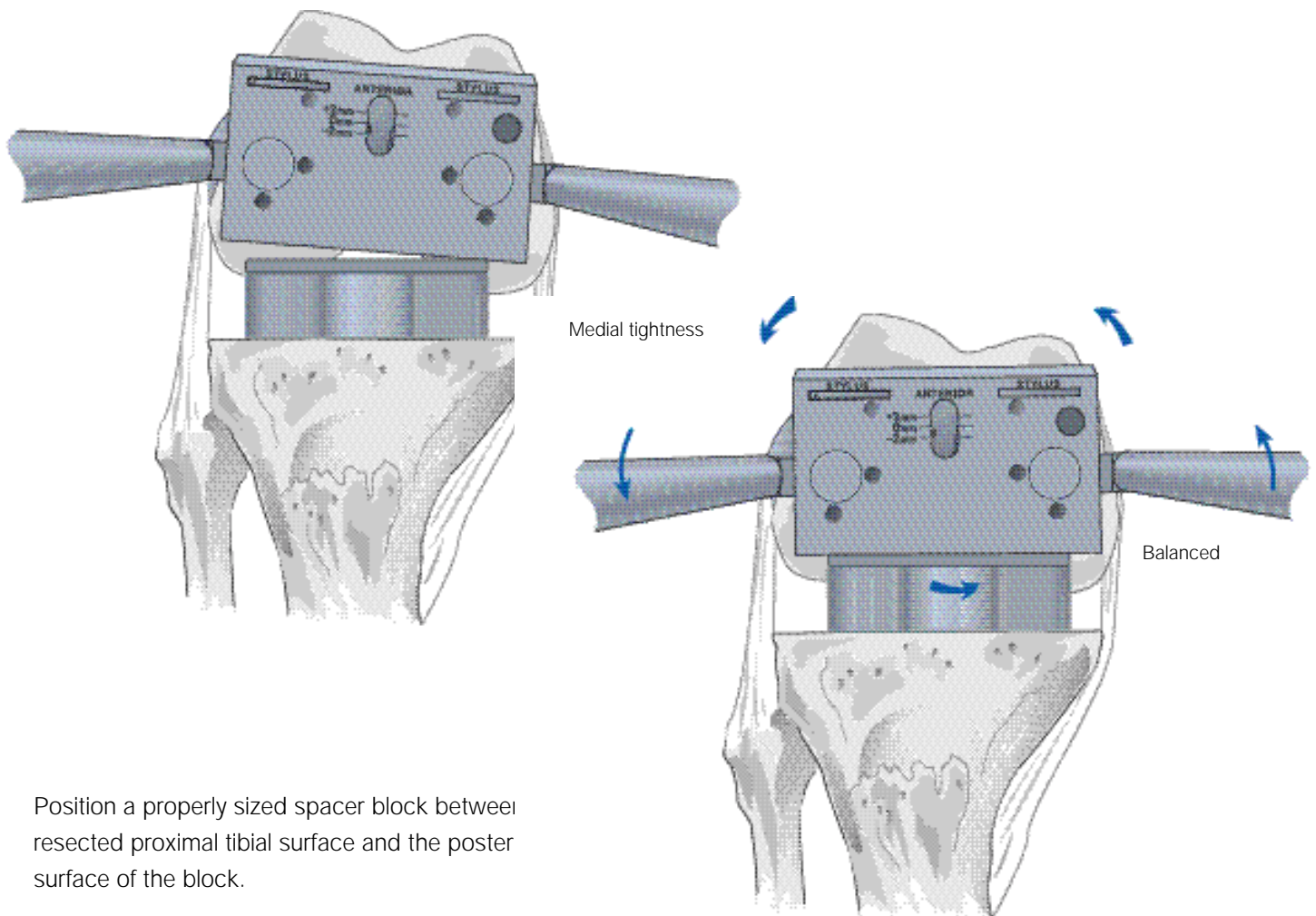


## Rotational Adjustment

Determine rotation with the knee in 90 degrees of flexion and position the block so that its posterior surface is parallel to the resected tibial plateau, creating the desired rectangular flexion gap. Tap the retractable pins into the distal femur when the collateral ligaments are equally tensioned.



## Evaluating the Flexion Gap



Position a properly sized spacer block between resected proximal tibial surface and the poster surface of the block.

**Note:** Further ligamentous release is not recommended at this stage.

The goal is a rectangular flexion gap with the collateral ligaments equally tensioned.

The following guidelines are available for the determination of rotation of the A/P cutting block:

1. Place the A/P cutting block parallel to the trans-epicondylar axis.
2. Place the anterior margin of the block perpendicular to the anteroposterior axis.
3. Position the block parallel to the resected proximal tibia (with the knee at 90 degrees flexion and collateral ligaments equally tensioned).

## Measuring the Flexion Gap

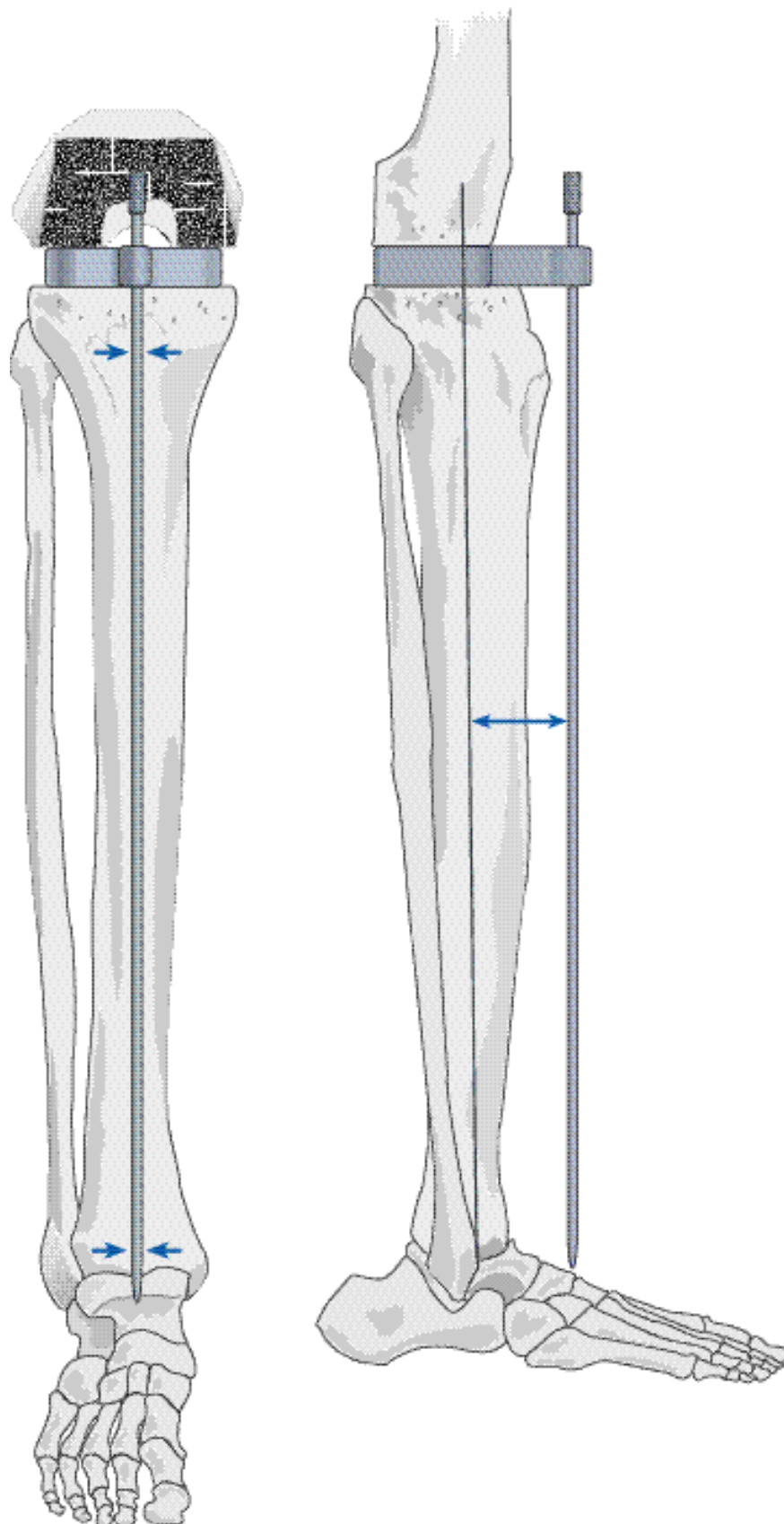
Use spacer blocks to measure the gap at 90 degrees of flexion. When using blocks to assess flexion and extension gaps, use a 1 mm shim for the extension gap. Remove it when assessing the flexion gap. This will compensate for the 1 mm difference between the distal and posterior resection levels.

Where further distal femoral resection is required to establish equivalent flexion and extension gaps, return the Steinmann pins to their original position in the anterior femoral cortex and the distal femoral cortex. Reposition the distal femoral cutting block using the holes designated +2 and +4 as indicated.

The long alignment rod should pass through the centre of the talus and lie parallel to the lateral tibial axis.

Femoral and proximal tibial cuts are now completed. Ligament balance has been achieved.

**Note:** With a size 6, there is a 2 mm difference between flexion and extension on the femoral component.

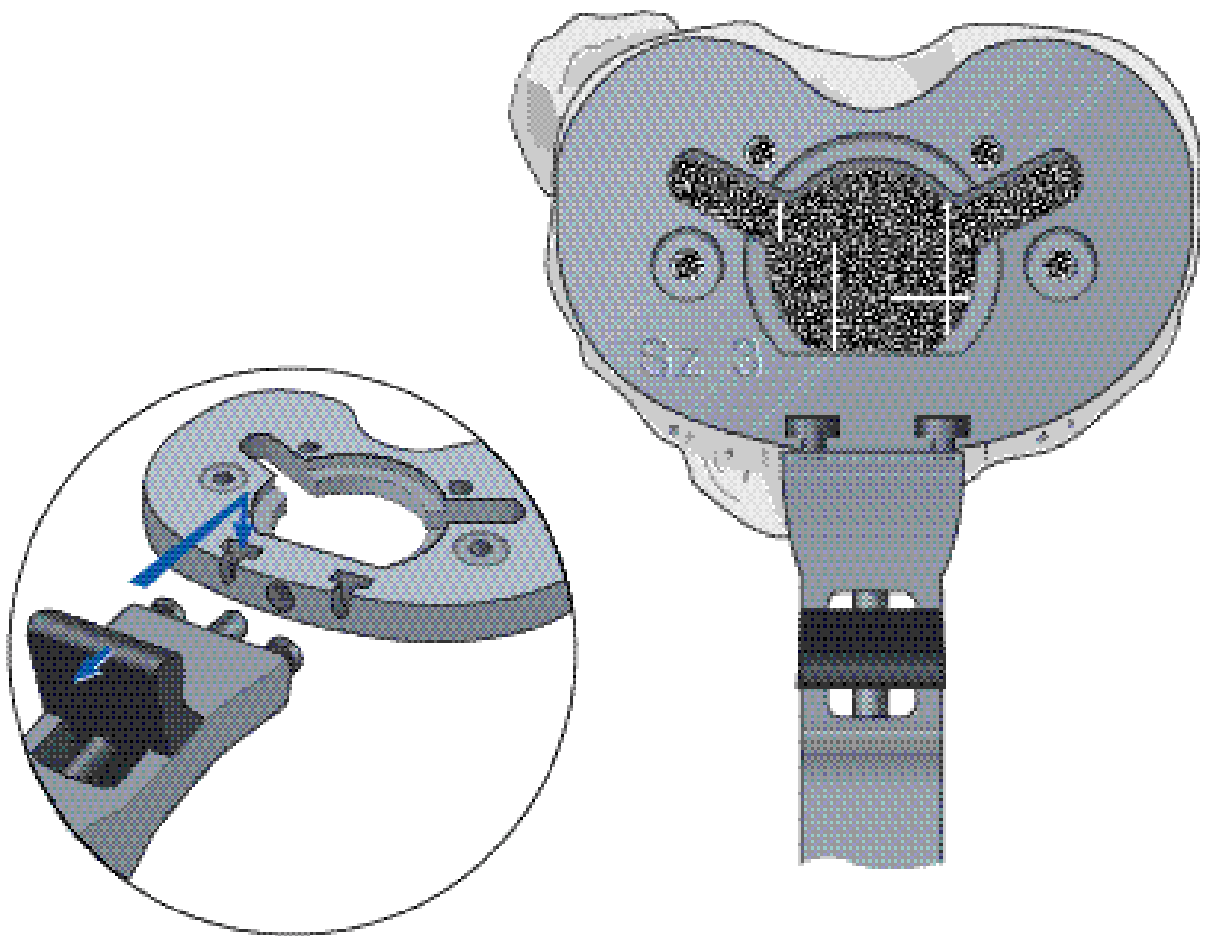


# Plateau Preparation & Initial Trial Reduction

## Build-a-Trial Tibial Preparation

With the knee in full flexion and the tibia subluxed anteriorly, assemble the alignment handle onto the M.B.T. tray trial.

Connect the tibial tray alignment handle to the M.B.T. tray trial by retracting the lever, inserting the two pins into the anterior portion of the tray trial and releasing the lever. Place the tray trial onto the resected tibial surface.



There are two options available to assess the knee during trial reduction. One or both may be used.

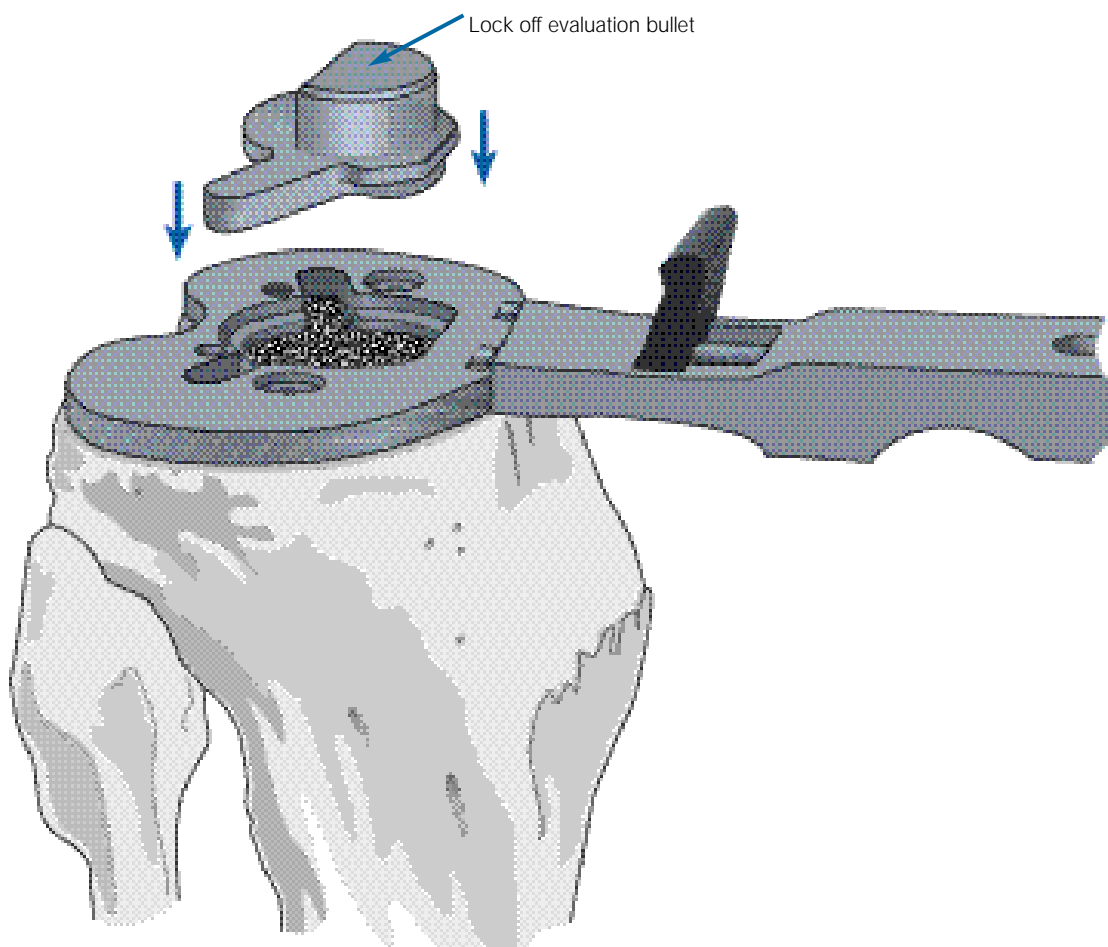
**1. Trial reduction with trial bearing in non-rotation mode.**

This option is useful when the tibial tray component size is smaller than the femoral size (bearing size **MUST** match femoral size). With equivalent sizes the bearing rotation allowance is 8°. For a tibial tray one size smaller than the femoral component, this bearing rotation

allowance reduces to 5°. In this situation, finding the neutral position with respect to the femur is therefore more important in order to prevent bearing overhang and soft tissue impingement.

Position the appropriate sized femoral trial onto the femur.

Position the lock-off evaluation bullet into the cut-out of the M.B.T.tibial tray trial.

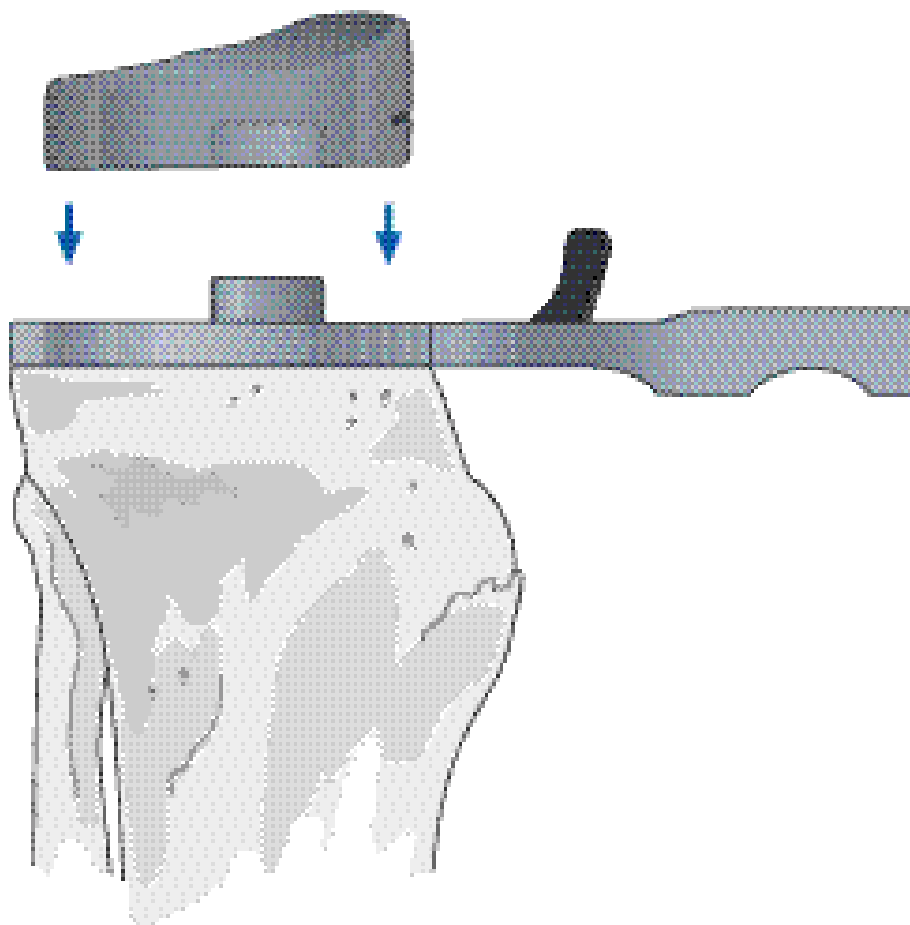




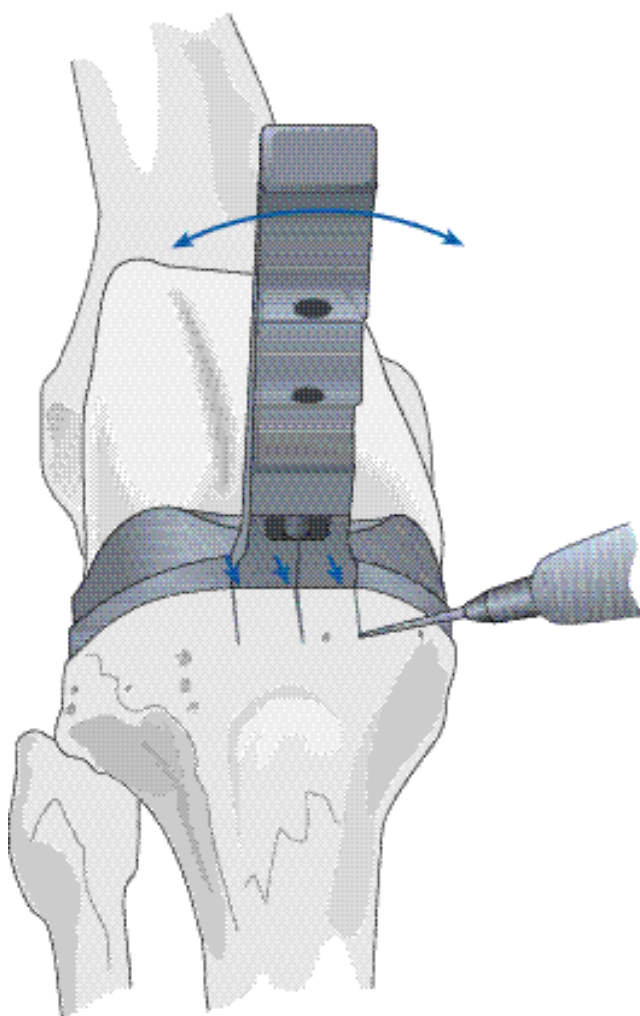
Select the tibial insert trial that matches the chosen femoral size and style, curved or stabilised, and insert it onto the M.B.T. tray trial.

With the trial prosthesis in place, extend the knee carefully, noting the anteroposterior stability, medial/lateral stability and overall alignment in the A/P and M/L plane.

If there is any indication of instability, substitute a tibial insert trial with the next greater thickness and repeat reduction. Select the insert which gives the greatest stability in flexion and extension whilst still allowing full extension.



Rotational alignment of the tibial tray is adjusted with the knee in full extension, using the alignment handle to rotate the tray and trial insert into congruency with the femoral trial. The rotation of the tibial tray is usually centred on the junction between the medial and central one-third of the tibial tubercle.



The appropriate position is marked with electrocautery on the anterior tibial cortex.

Overall alignment can be confirmed using the two part alignment rod, attaching it to the tibial alignment handle.

Fully flex the knee, and remove the trial components. Replace the M.B.T. tray trial back on the proximal tibia, and align the handle with the electrocautery marks. Assessment can be made of the overall tibial coverage.

## 2. Trial Reduction with trial bearing free to rotate.

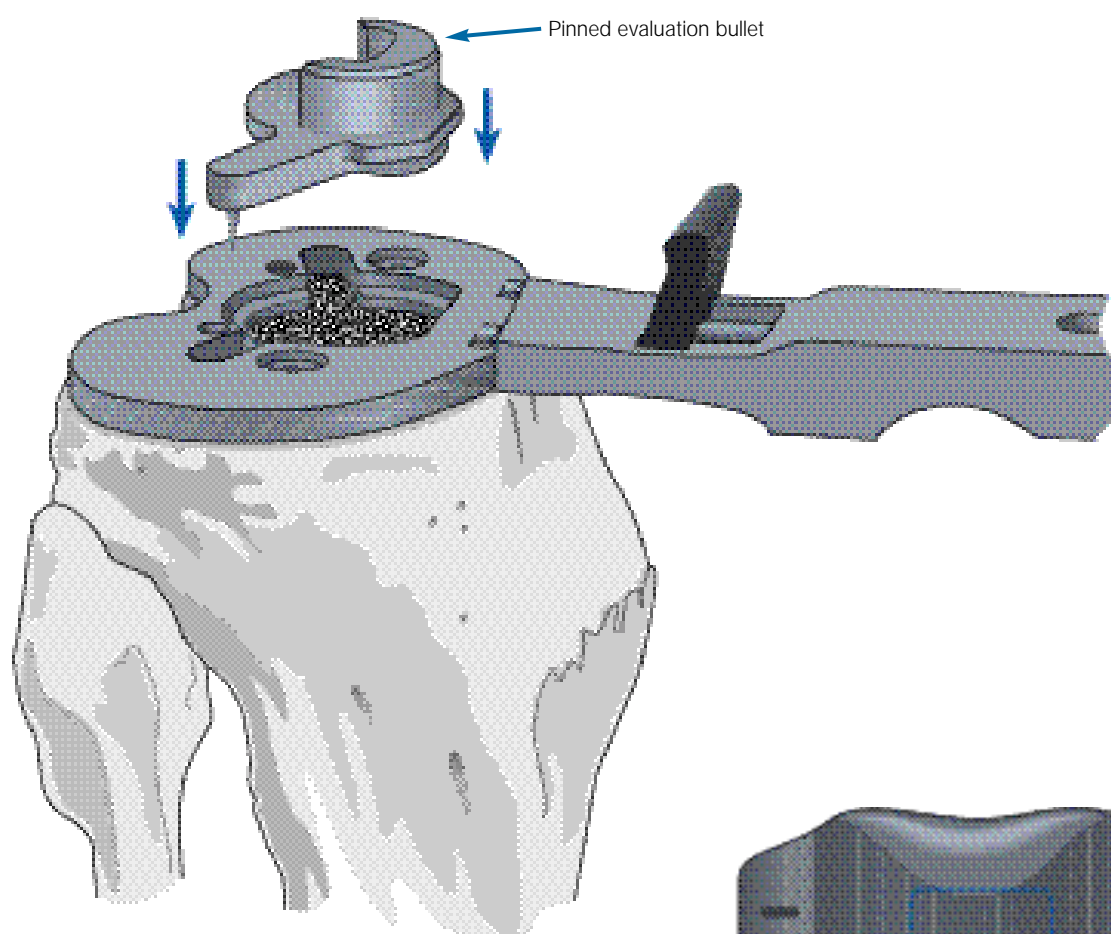
This trial reduction can be done instead or in addition to the one described above.

Position the appropriate sized femoral trial onto the femur, and place the appropriate sized M.B.T. trial tray onto the resected tibial surface.

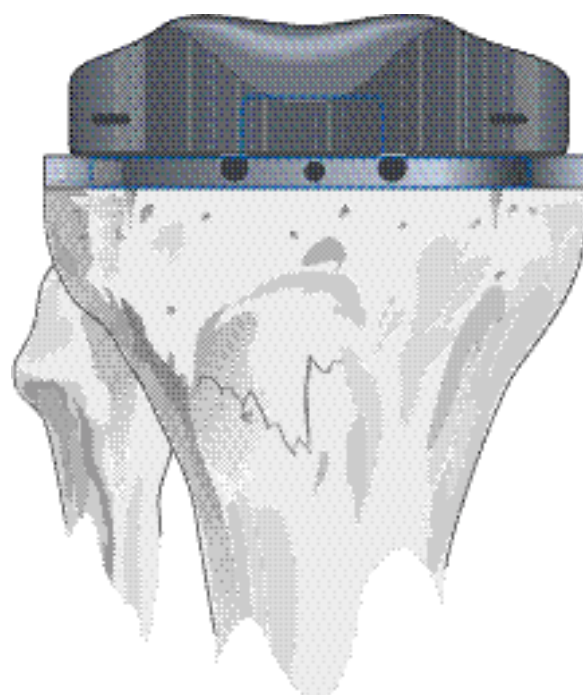
Assess the position of the tray to achieve maximal tibial coverage (align the handle with the electrocautery marks if procedure described in 1 has been followed). The rotation of the tibial tray is usually centred on the junction between the medial and central one-third of the tibial tubercle.

**Note: Excessive mal-rotation of the tibial tray relative to the femoral component can result in excessive bearing overhang and impingement with soft tissues.**

Position the pinned evaluation bullet into the cut-out of the M.B.T. tibial tray trial, and tap down lightly to secure the tray to the proximal tibia.



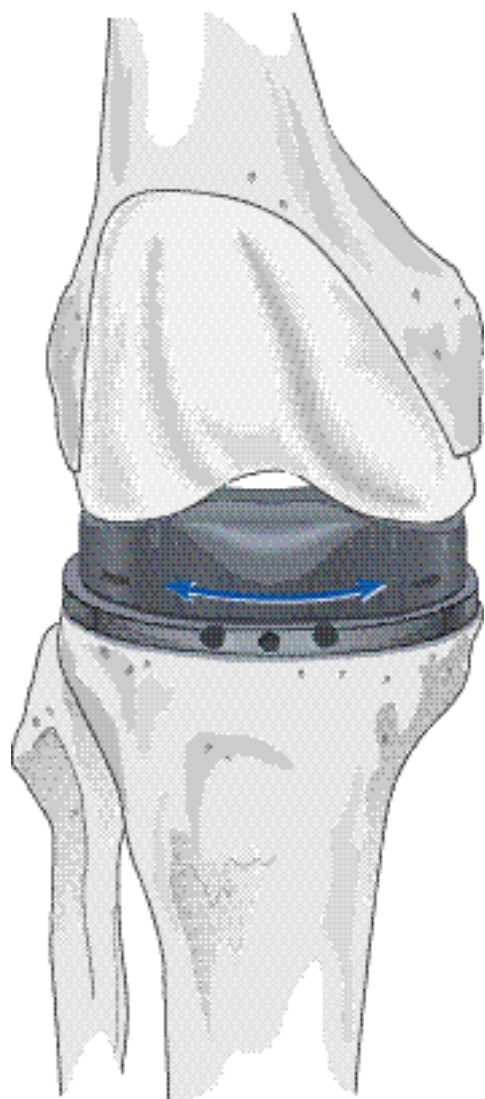
Select the tibial insert trial that matches the chosen femoral size and style, curved or stabilised, and insert it onto the M.B.T. tray trial.



Carefully remove the tibial alignment handle, and, with the trial prosthesis in place, extend the knee carefully, noting the anteroposterior stability, medial/lateral stability and overall alignment in the A/P and M/L plane. Assessment of the bearing rotation and patellofemoral tracking can also be achieved. Overall alignment can be confirmed using the two part alignment rod, attaching it to the tibial alignment handle.

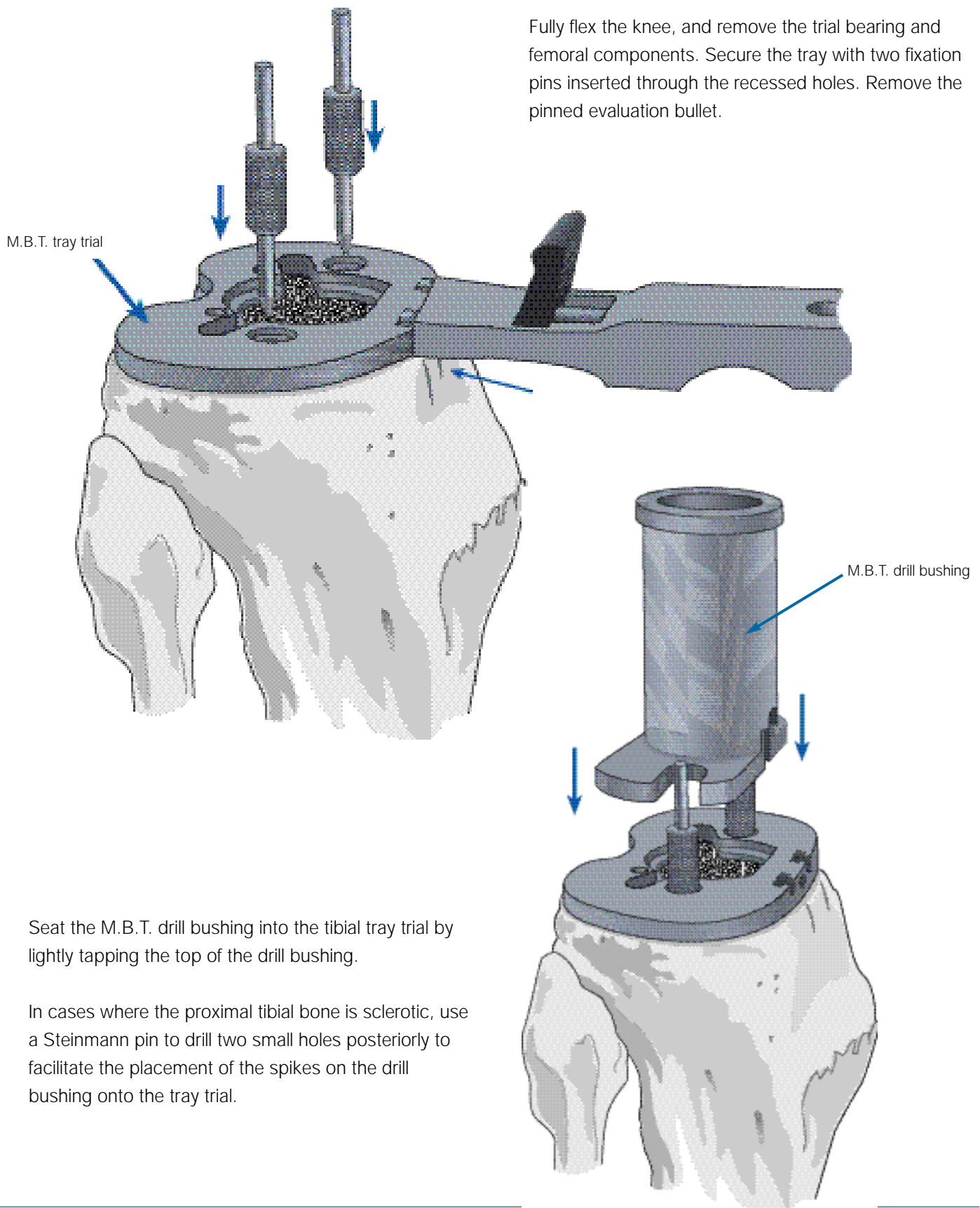
If there is any indication of instability, substitute a tibial insert trial with the next greater thickness and repeat reduction. Select the insert which gives the greatest stability in flexion and extension whilst still allowing full extension. Confirm tray rotation and position, and mark with electrocautery if this has not already been done.

At this stage it is possible to prepare the proximal tibia for a P.F.C.® Sigma fixed bearing tibial tray and insert if this is the preferred option. (Please refer to the primary surgical technique manual Cat No 9068-45-000).



## Central Stem Preparation

Fully flex the knee, and remove the trial bearing and femoral components. Secure the tray with two fixation pins inserted through the recessed holes. Remove the pinned evaluation bullet.



Seat the M.B.T. drill bushing into the tibial tray trial by lightly tapping the top of the drill bushing.

In cases where the proximal tibial bone is sclerotic, use a Steinmann pin to drill two small holes posteriorly to facilitate the placement of the spikes on the drill bushing onto the tray trial.



**For Cemented Application:**

Assemble the drill stop onto the M.B.T. drill and position at the selected tray size. Advance the M.B.T. drill through the M.B.T. drill bushing and into the cancellous bone, until it hits the drill stop.

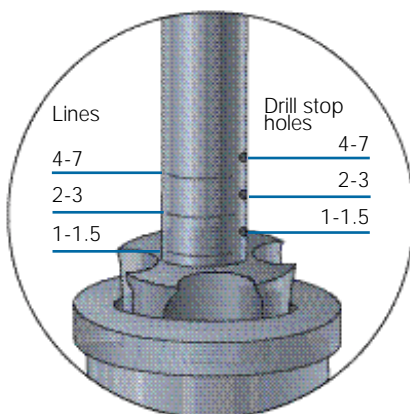
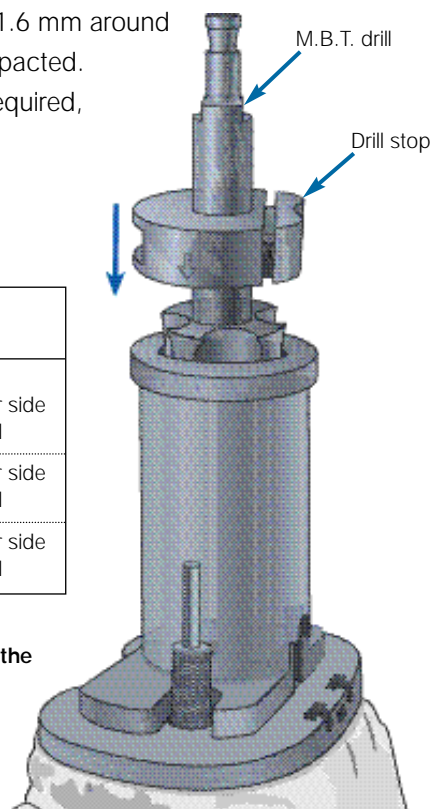
The M.B.T. drill creates a cavity that is line-to-line with the punch bushing and final implant. Cement will interdigitate as the tray is implanted. The porous tray will create a 'true' interference fit of 1.6 mm around the entire central stem when fully impacted. Should a larger cement mantle be required, please see the table below.

**Creating Central Stem Mantle**

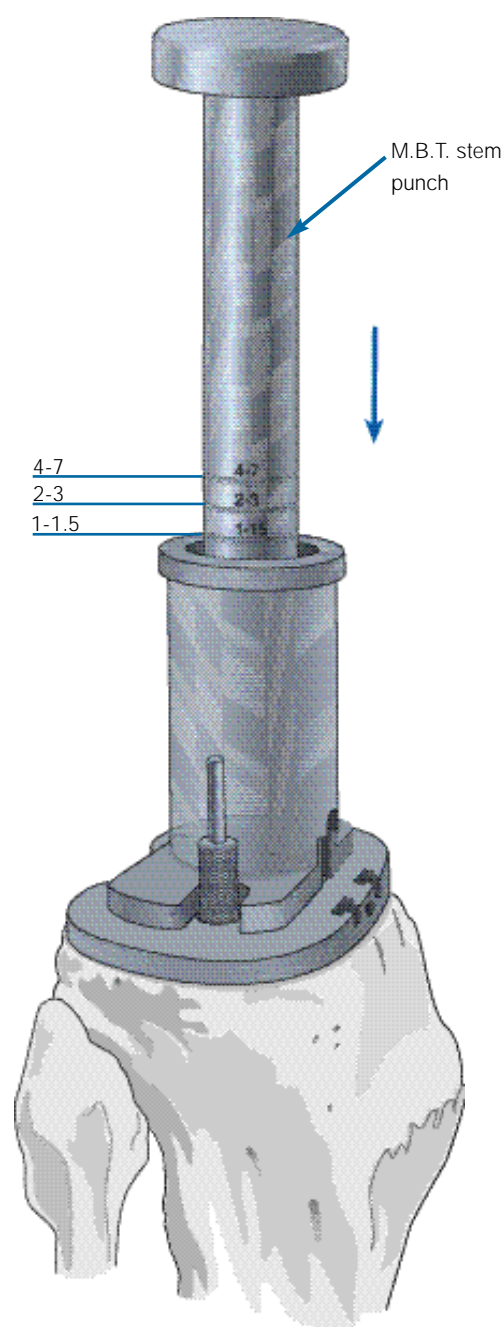
Tray Size	Drill Stop Seating	Cement Mantle
1-1.5	2-3	0.5 mm per side 4 mm distal
2-3	4-7	0.5 mm per side 4 mm distal
4-7	drill 'bottoms out' on tray trial	0.5 mm per side 4 mm distal

**Note:** If over-reaming is desired, remove the tray trial to avoid impingement of the reamer on the tray trial.

To compact cancellous bone, advance the drill in reverse.

**For Non-cemented Application:**

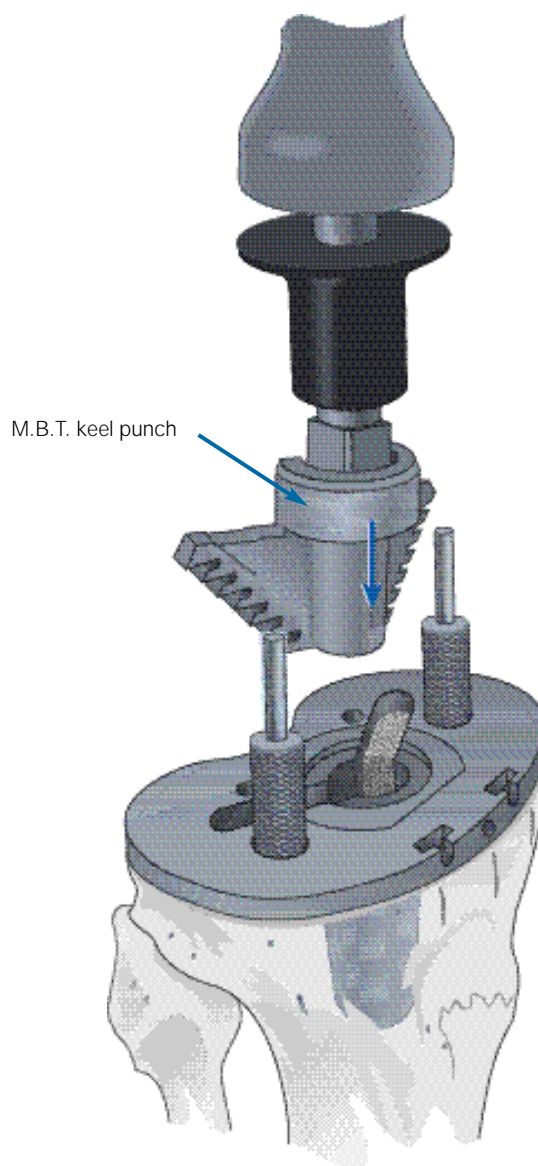
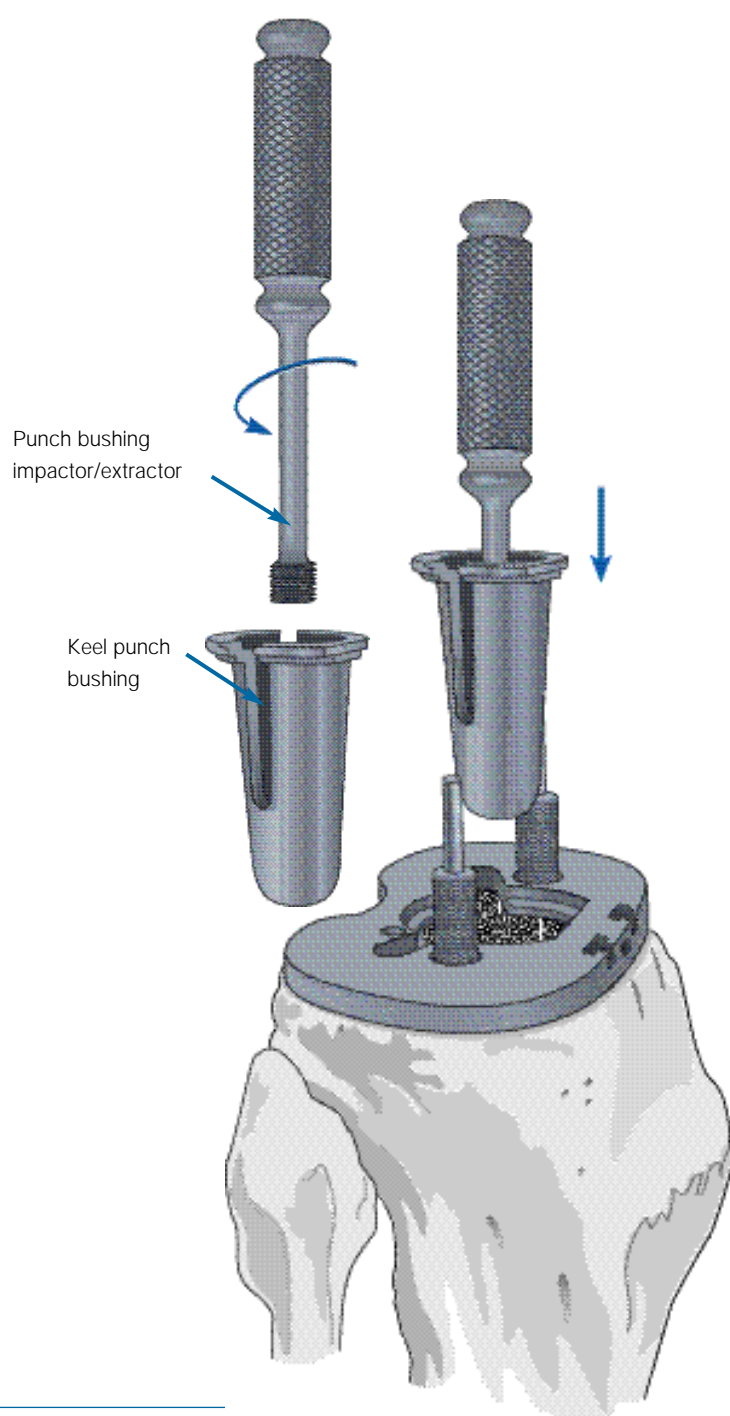
Advance the M.B.T. stem punch into the drill bushing and impact into the cancellous bone until the appropriate tray size marking is reached.



## M.B.T. Tray *with Keel* Preparation

Insert the M.B.T. keel punch bushing into the M.B.T. tibial tray trial, utilising the M.B.T. punch bushing impactor/extractor. When complete, the superior surface of the punch bushing should be flush with the superior surface of the tibial tray trial.

Remove the punch bushing impactor/extractor.



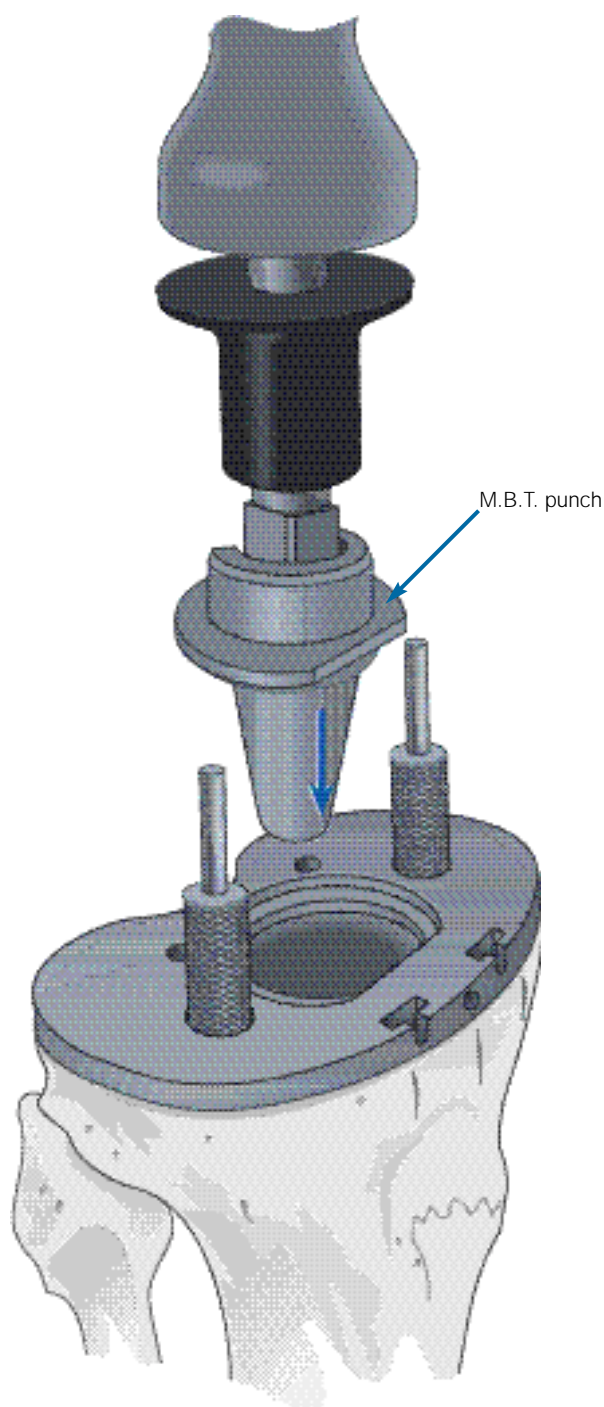
Assemble the universal handle to the appropriately sized M.B.T. keel punch and insert it into the M.B.T. punch bushing, being careful to avoid malrotation. Impact this composite into the cancellous bone until the shoulder of the punch is in even contact with the M.B.T. punch bushing. Disconnect the universal handle, leaving the M.B.T. punch in place.

**If the bone of the medial or lateral plateau is sclerotic, it is helpful to initially prepare the keel slot with an oscillating saw or high speed burr.**

## M.B.T. Tray *without Keel* Preparation

Assemble the universal handle to the appropriately sized M.B.T punch. Impact this composite into the cancellous bone until the shoulder of the punch is in even contact with the M.B.T. tray trial. Disconnect the universal handle, leaving the M.B.T punch in place.

**Note:** The M.B.T. drill creates a cavity that is line-to-line with the punch bushing and final implant. Cement will interdigitate as the M.B.T. tray is implanted. The porous tray will create a 'true' interference fit of 1.6 mm around the entire central stem when fully impacted.

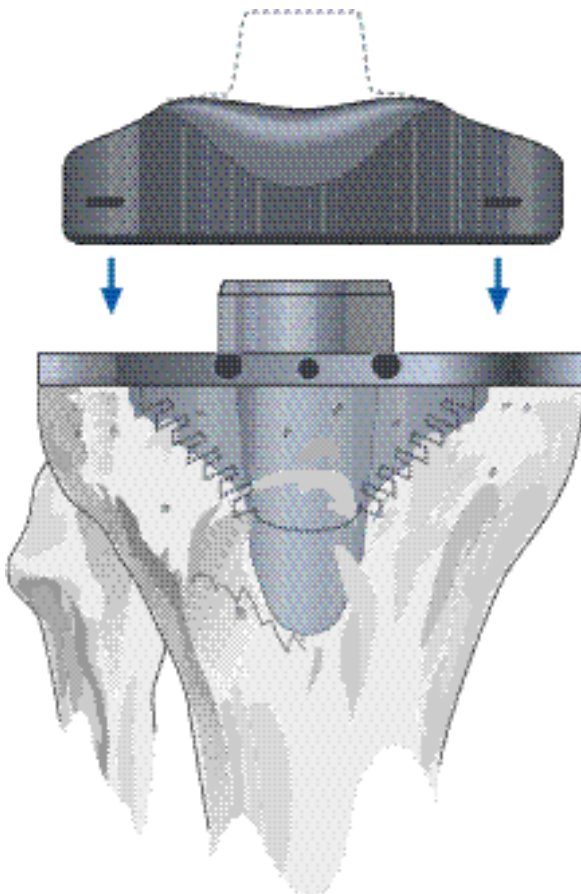


## Additional Trial Reduction

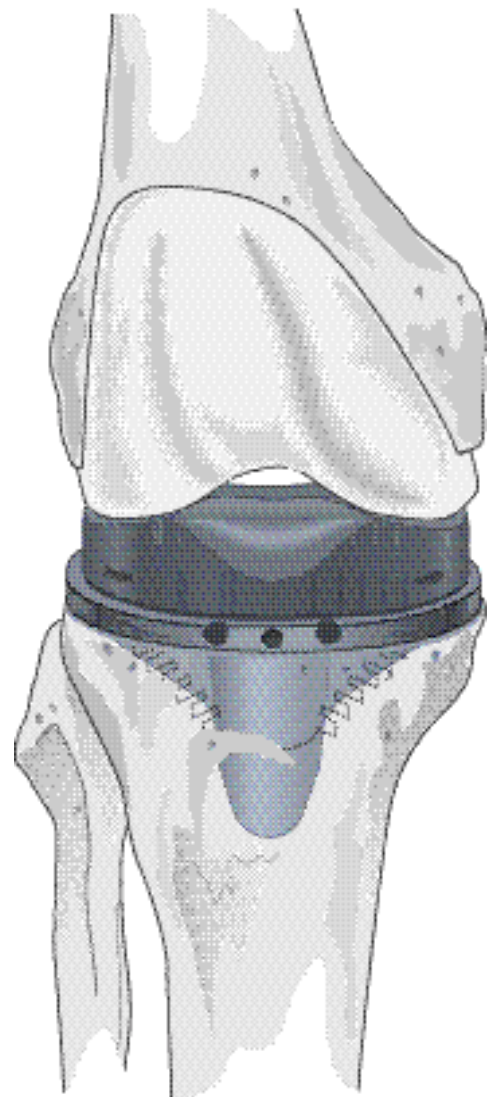
This trial reduction can be performed once the central stem has been prepared.

**Select the tibial insert trial that matches the chosen femoral size and style, curved or stabilised, and insert it onto the M.B.T. tray trial.**

RP Tibial Insert Trial  
(curved/stabilised)



With the trial prostheses in place, fully extend the knee carefully, noting the anteroposterior stability, medial/lateral stability and overall alignment in the A/P and M/L plane. If there is any indication of instability, substitute a tibial insert trial with the next greater thickness and repeat reduction. Select the insert that gives the greatest stability in flexion and extension while still allowing full extension.





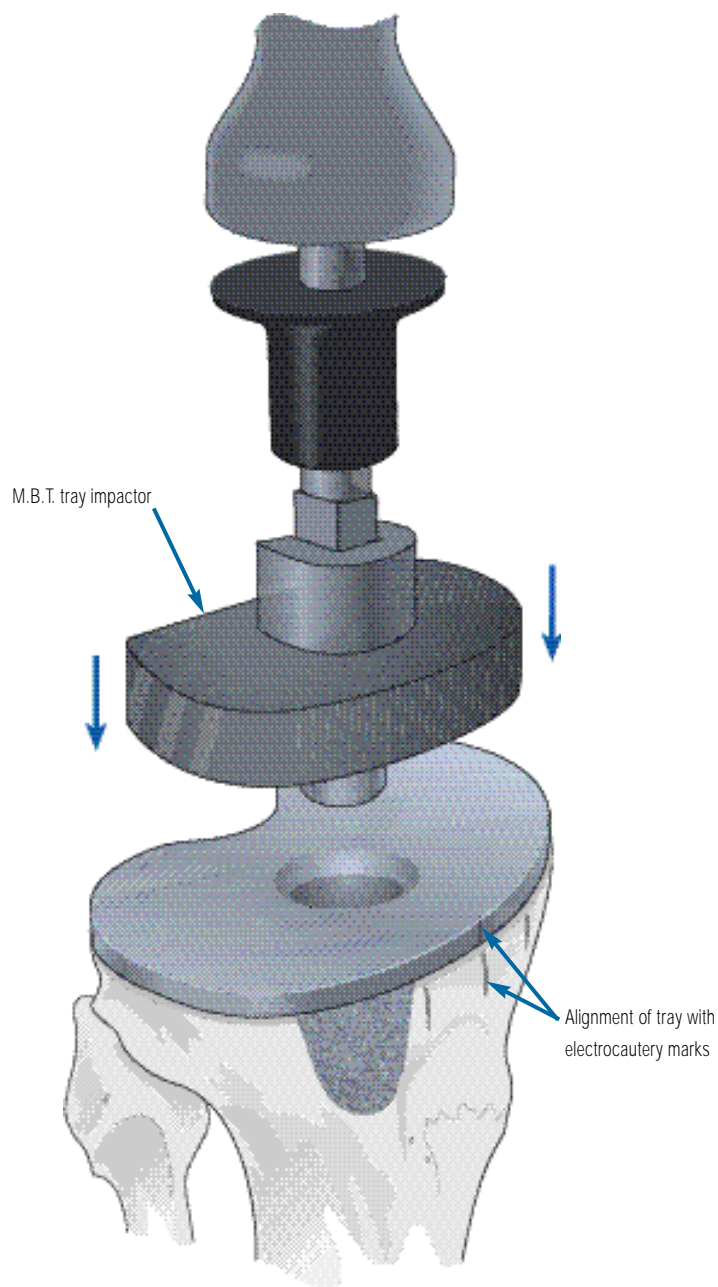
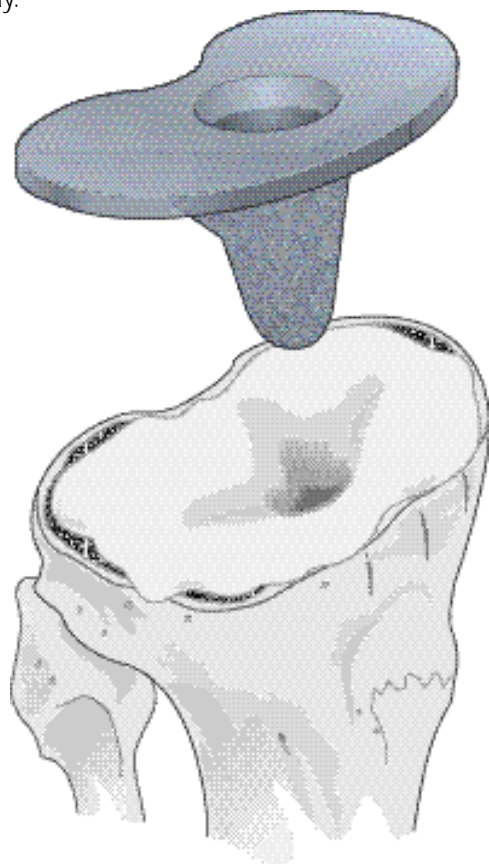
# Implanting the Components

## The Tibial Component

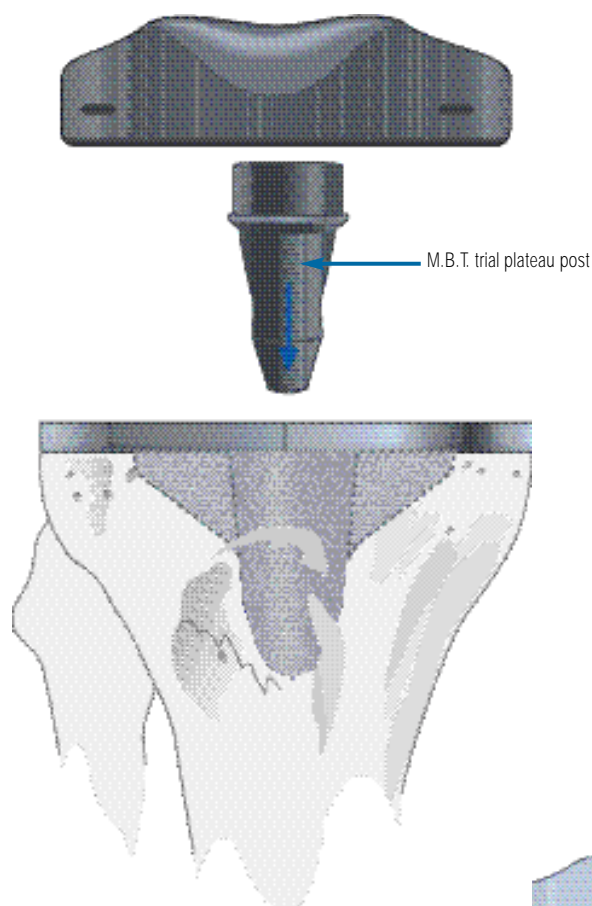
Thoroughly cleanse the entire site with pulsatile lavage. Prepare bone cement and apply it by syringe or with digital pressure in its low viscous state to assure maximal penetration into the trabecular bone.

Assemble the universal handle onto the M.B.T. tray impactor and carefully insert the tibial tray, avoiding malrotation. When fully inserted, deliver several mallet blows to the top of the universal handle. A swab may be inserted between the impactor and the component in order to protect the bearing surface.

The previous electrocautery marks will aid alignment of the tray.





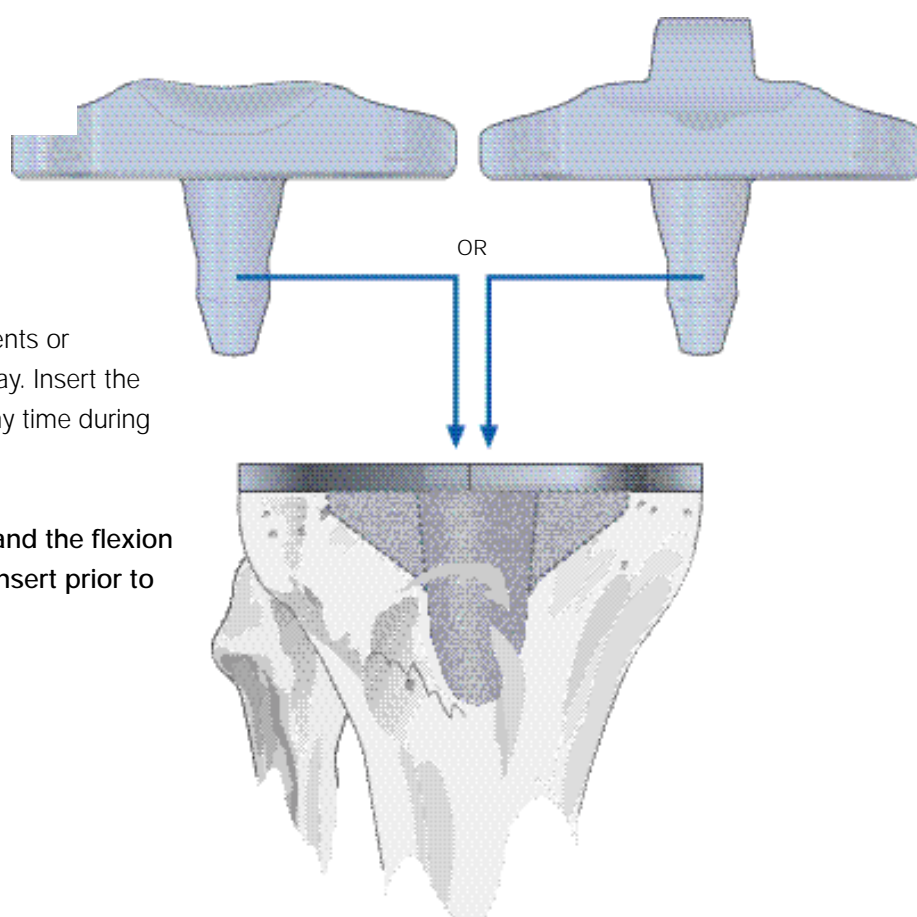


As the cement polymerises, position a trial femoral component on the prepared femur and the M.B.T. trial plateau post into the central stem of the M.B.T. tray component and insert the trial on the tibia. Take care to avoid scratching the proximal surface of the tibial tray. Place the knee in full extension and maintain equal pressure at the bone/tibial implant interface. Care should be taken not to hyperextend the knee as this could apply unequal pressure to the anterior portion of the tray thereby causing posterior lift-off. When the cement has set, place the knee in flexion and remove the trial femoral component. Carefully remove all extruded cement with special attention to the posterior compartment and entire periphery.

### The Tibial Insert

Carefully clear/remove any loose fragments or particulates from the permanent tibial tray. Insert the appropriate permanent tibial insert at any time during the cementing procedure.

When using a curved RP insert only and the flexion gap is snug, implant the permanent insert prior to cementing the femoral component.



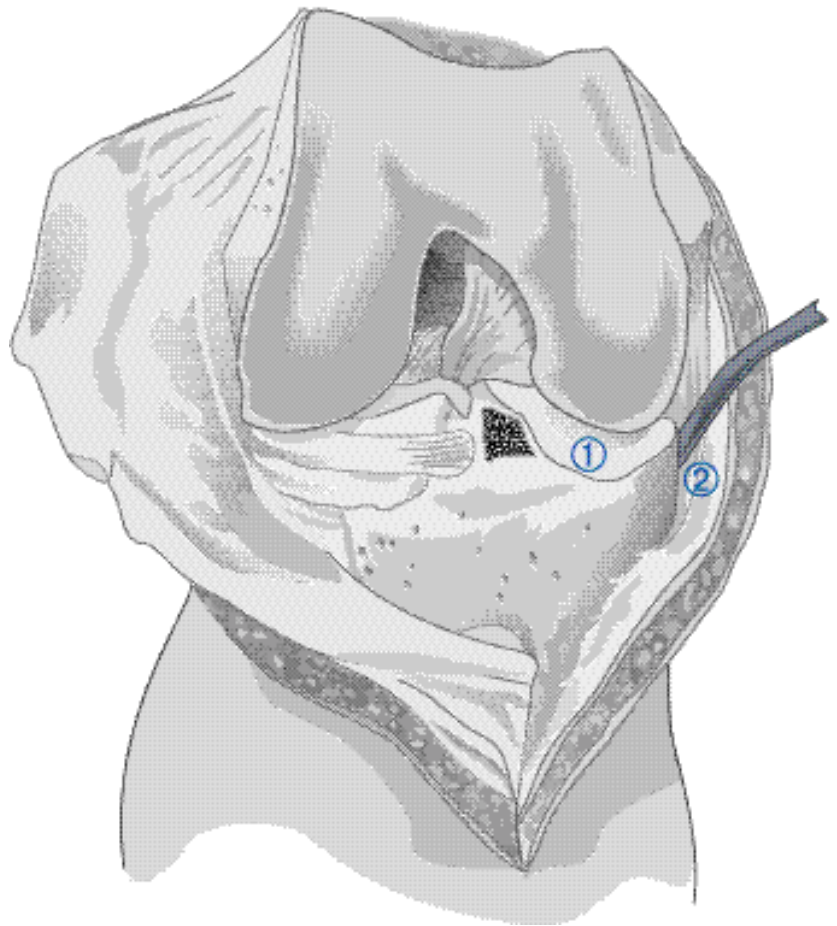
# Ligamentous Balance in Total Knee Arthroplasty

Following is the suggested sequence of ligamentous releases to correct varus or valgus deformity and quadriceps-mechanism imbalance. There is no general agreement on the order; however, there is on the principles:

- Perform preliminary soft tissue release at the start of surgery based upon pre-operative evaluation.
- Establish balance by eliminating soft tissue contractures, not by modifying the bone cuts.
- Ensure flexion/extension gaps are equal.
- Establish final correction at trial reduction.

## Medial Ligamentous Release for Fixed Varus Deformity

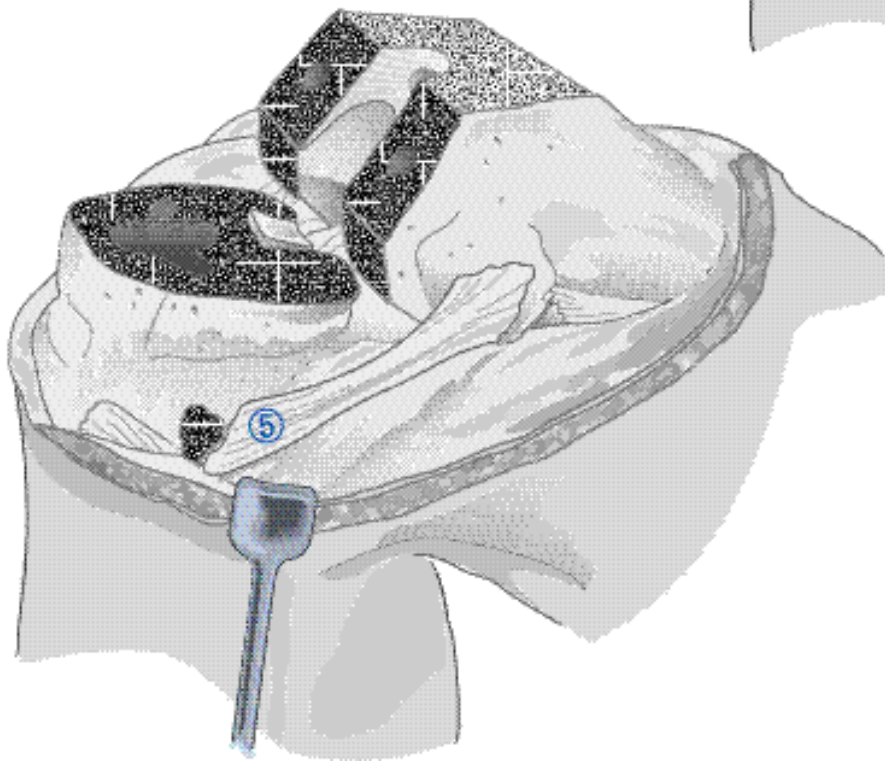
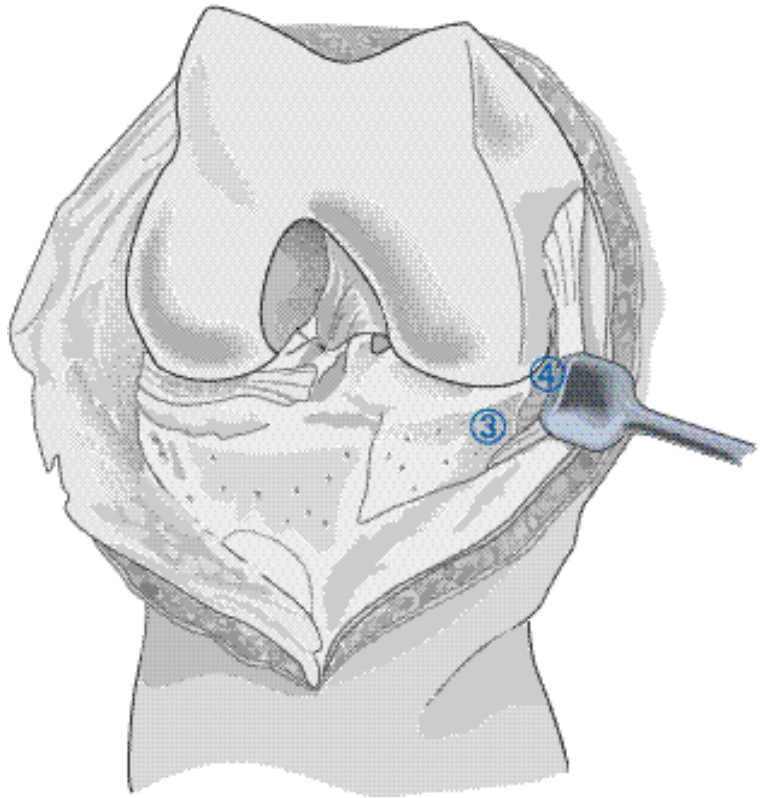
After removing peripheral osteophytes, excise the medial meniscus (1) and the meniscotibial ligament (2). In rheumatoid arthritis and minimal deformity, this is often sufficient.



If further release is indicated, release the posterior expansion of the deep medial collateral ligament from its tibial attachment (3) using a curved osteotome.

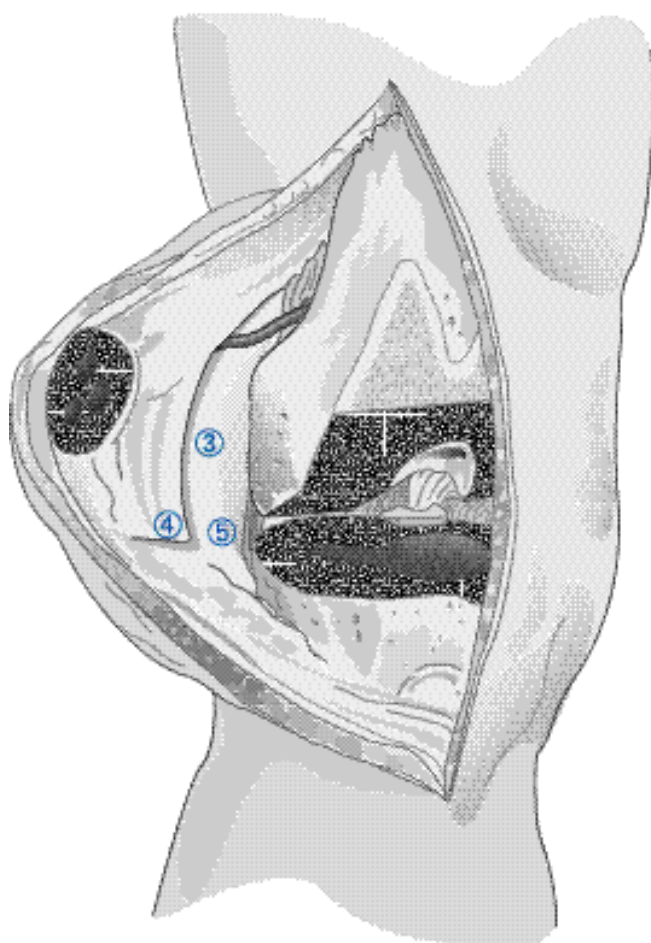
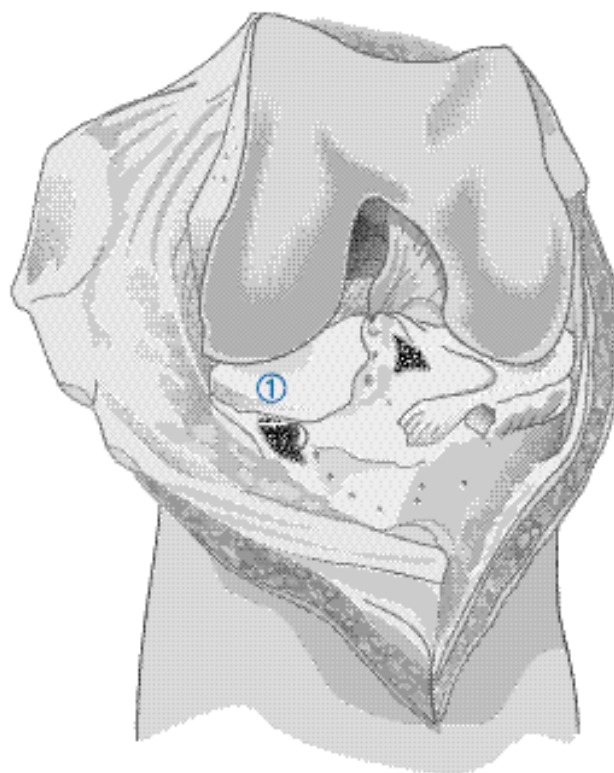
If further release is still indicated, denude the medial tibia subperiosteally (4).

Release the superficial portion of the medial collateral ligament from its tibial attachment (5) if further release is still indicated. Generally, this is indicated only in severe deformity associated with significant flexion contracture.



# Lateral Ligamentous Release for Fixed Valgus Deformity

Following removal of peripheral osteophytes, initial release comprises lateral meniscectomy (1) and release of the iliotibial band from its tibial insertion (2). A lateral quadriceps retinacular release is indicated when there is poor patellar tracking at trial reduction.



Perform lateral retinacular release on the internal surface in the longitudinal plane. Take care that the lateral superior genicular artery is protected. Isolate it at the intermuscular septum as it penetrates the retinaculum superficially. Then, retract it proximally as the retinacular incision is carried to the level of the joint line and distally as the incision is extended superiorly to the intermuscular septum (3).

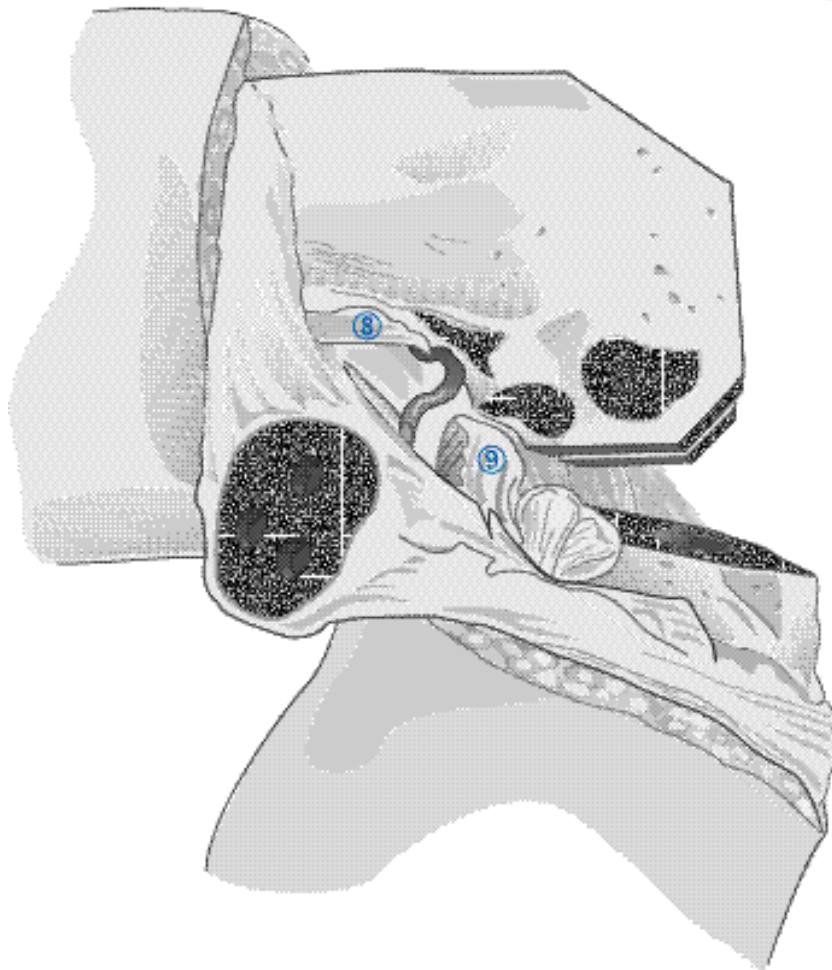
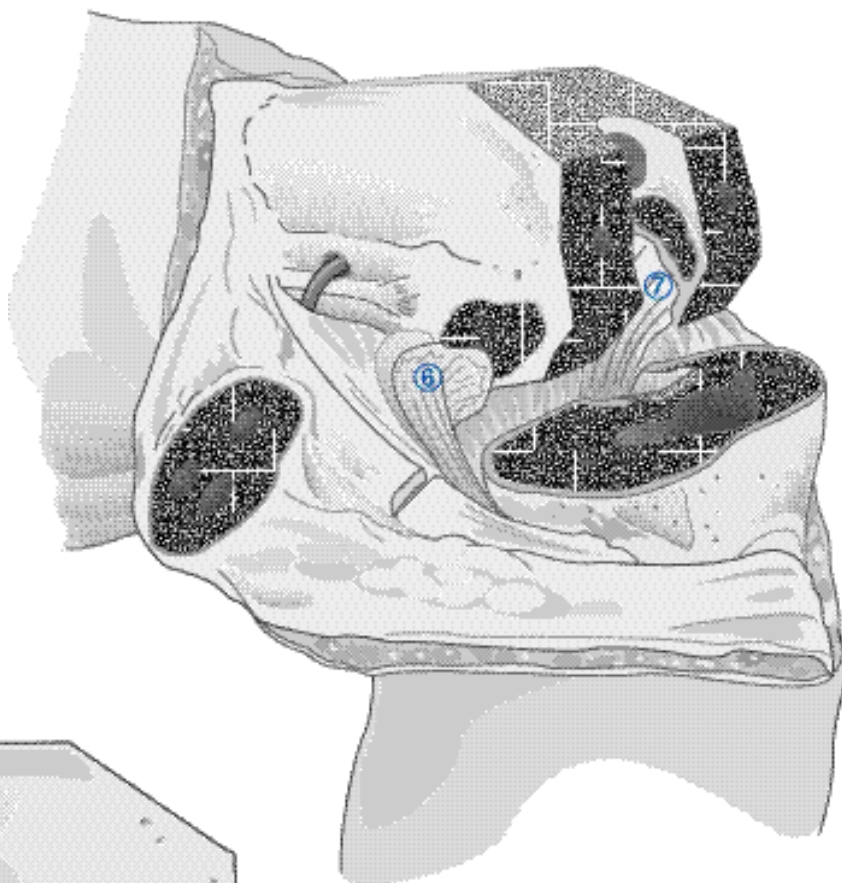
If indicated, further release is effected by extending the distal terminus of the incision transversely to the lateral margin of the patellar tendon (4) and posteriorly to the lateral collateral ligament (5).



If further release is once again indicated, release the lateral collateral ligament and popliteus tendon from the femoral epicondyle, allowing them to slide posteriorly (6).

If further release is indicated, evaluate the posterior cruciate ligament and, if necessary, sacrifice it (7).

**Note:** Priority of steps 6 and 7 is a matter of preference.

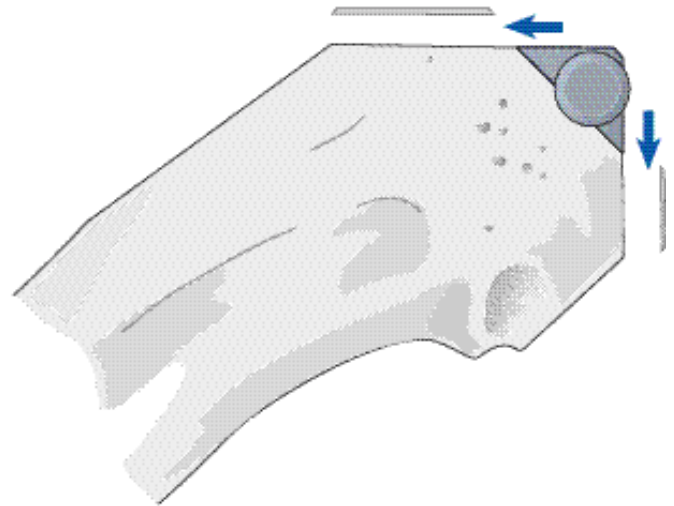
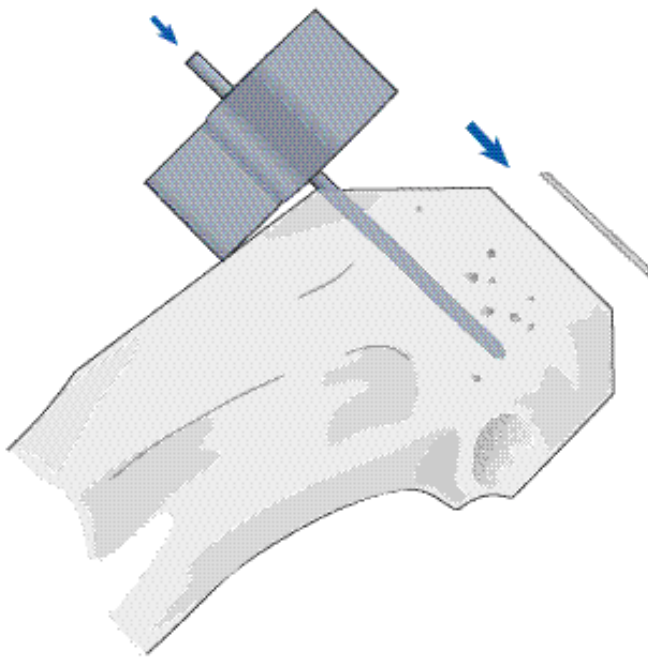


If balance requires still further release, extend the dissection posteriorly, freeing the intermuscular septum (8) and the lateral head of the gastrocnemius (9).

Take care that the posterolateral neurovascular structures are preserved and that the insertion of the *biceps femoris*, which overlies the common peroneal nerve, remains intact.

## Balancing Flexion and Extension Gaps

If the joint line is maintained, flexion and extension gaps are usually balanced at trial reduction, but where there is pre-operative deformity and contracture, imbalance may be present

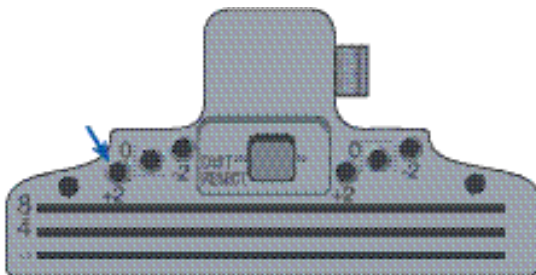


### Residual Flexion Contracture

Where there is restriction in extension but not in flexion, remove additional bone from the distal femur. This affects the extension gap but not the flexion gap. Where contracture persists, following appropriate retinacular release and removal of posterior osteophytes and scar tissue, depending on severity, remove an additional 2-4 mm of distal femur.

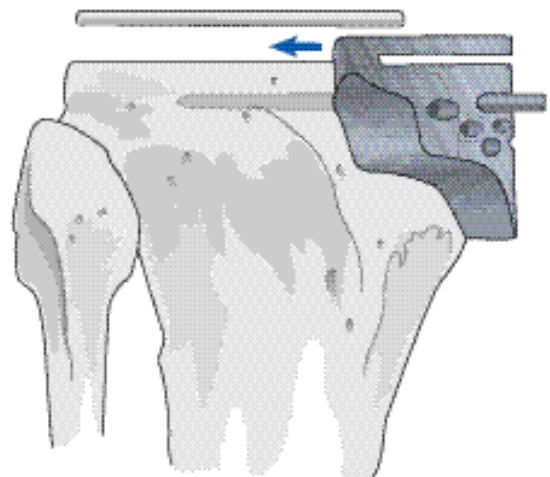
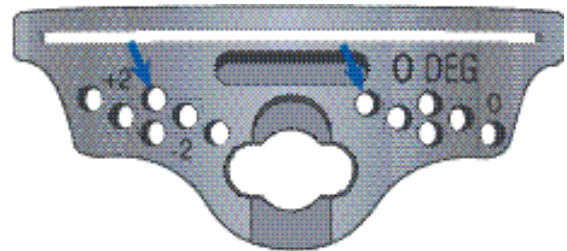
Return the Steinmann pins to their original position in the anterior femur and return the distal femoral cutting block to the pins using the holes designated +2 as the degree of contracture indicates. Revise the distal cut accordingly.

Chamfers are subsequently revised to maintain the correct configuration; anterior and posterior cuts are not. This affects ligamentous tension in extension but not in flexion.



### Residual Tightness in Flexion and Extension

A thinner tibial insert or additional tibial resection is indicated, as either will affect both flexion and extension gaps. If resection is selected, it is recommended that 2 mm of proximal tibia be removed. Return the Steinmann pins to their drill holes in the anterior tibial cortex, and reposition the cutting block on the pins using the holes designated +2. Accordingly revise the cut.



# Rotating Platform Knee System

## Tibial Insert & Tibial Tray Compatibility

Rotating platform tibial inserts match femoral components size-to-size

### MOBILE BEARING TIBIAL (M.B.T.) TRAY Sizing • AP/ML (mm)

		1.5 41/62	2 43/65	2.5 44/67	3 46/70	4 49/75	5 53/81	6 57/97	7 60/92
RP Tibial Inserts Sizing • AP/ML (mm)	2 39/61	Curved							
		Stabilised							
	2.5 40/64								
	3 42/66								
	4 44/69								
	5 47/74								
	6 50/79								



Cruciate Retaining



ΣRP Curved  
10,12.5,15,17.5 (mm)



Cruciate Substituting



ΣRP Stabilised  
10,12.5,15,17.5 (mm)



Mobile bearing  
tibial trays

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