

Surgical Technique
Distal Cut First

 **smith&nephew**
LEGION[®]
POROUS CR
Cruciate Retaining Femoral



Introduction

The LEGION® Total Knee System has been designed to offer the orthopaedic surgeon solutions to address intraoperative situations. Implant function is directly related to accurate surgical technique. LEGION instrumentation has been developed to be an easy-to-use system that will assist the surgeon in obtaining accurate and reproducible knee alignment.

The instrumentation can be used in minimally invasive or standard exposures. While it has been the designers' objective to develop accurate, easy-to-use instrumentation, each surgeon must evaluate the appropriateness of the following technique based on his or her medical training, experience and patient evaluation.

Nota bene

The technique description herein is made available to the healthcare 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.

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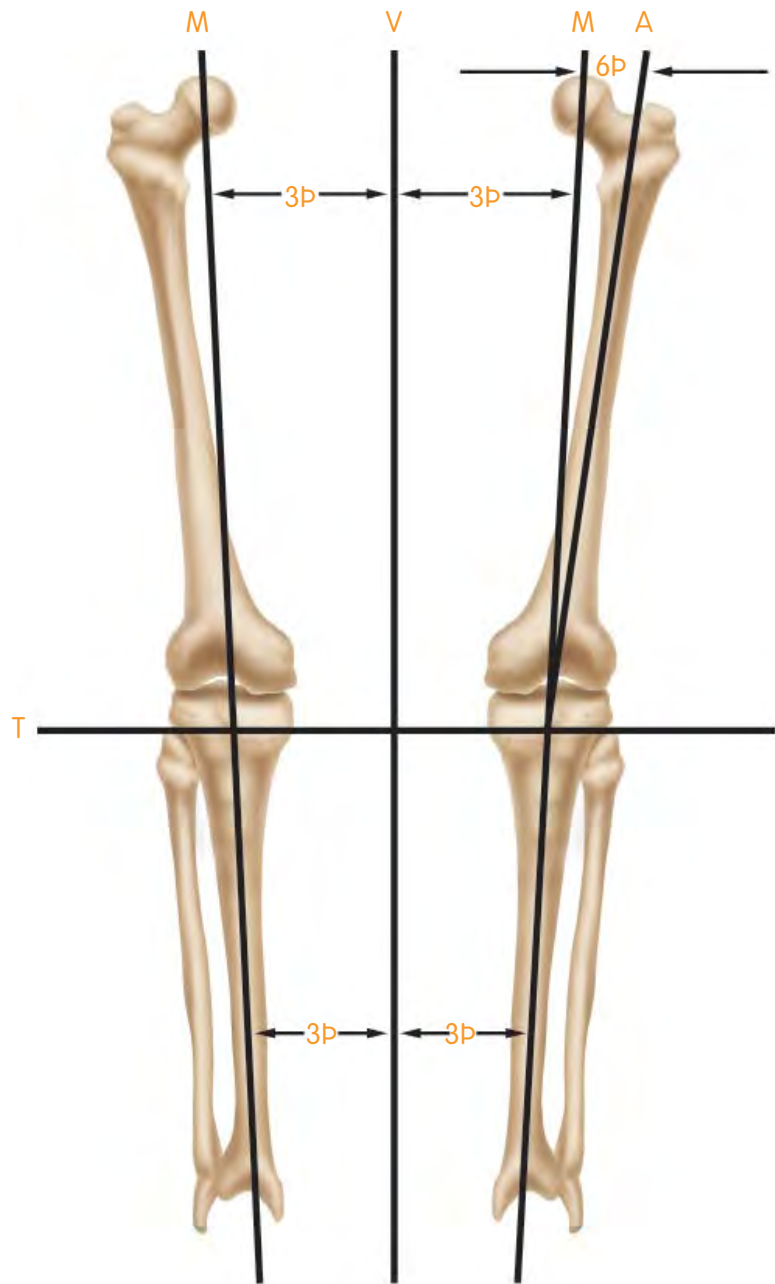
Preop Planning

Determine the angle between the anatomical and the mechanical axes. This measurement will be used intraoperatively to select the appropriate valgus angle so that correct limb alignment is restored. *(Beware of misleading angles in knees with a flexion contracture or rotated lower extremities.)* The T-template provided as part of the LEGION[®] templates will help in this determination.

Tip: Many surgeons prefer to simply select a standard angle for the distal femoral cut (i.e., 5°, 6° or 7°) based on the patient and surgical experience.

Recommended Sawblades*	
Cat. No.	Description
7151-2901	Stryker™ 2000 (Fanned)
7151-2905	Stryker 2000 (Straight)
7151-2911	Hall Powerpro (Fanned)
7151-2904	3M (Fanned)
7151-2908	3M (Straight)
7151-2910	VersiPower (Fanned)
Or any 0.053" or 1.35mm thickness sawblade	

*For MIS-style blocks only.



M = Mechanical Axis
 A= Anatomical Axis
 T= Transverse Axis
 T= Vertical Axis

Femoral Preparation

Intramedullary Femoral Alignment

1. Open the femoral canal with a 9.5mm intramedullary drill (*Figure 1*).

Instrument Assembly:

- a. Attach the selected valgus angle bushing (5°, 6° or 7°) to the valgus alignment guide. Check the bushing position to make sure that “left” is facing anteriorly when operating on a left knee and “right” is facing anteriorly when operating on a right knee.
- b. Attach a modular T-handle to the IM rod and insert through the alignment assembly (*Figure 2*).
- c. Assemble the distal femoral cutting block onto the valgus alignment guide. Positioning the block at the “primary” resection level will ensure the cut will equal the distal thickness of the femoral prosthesis. Lock by pressing the lever in a horizontal position toward the medial side.

Tip: If desired, the distal femoral cutting block may be set to resect an additional +2, +5 or +7mm of bone.

2. Slide the intramedullary rod of the assembly into the femoral canal until the alignment guide contacts the distal femur (*Figure 3*).

Tip: There may be times when only one side of the guide will touch bone.

3. Orient rotation of the assembly neutral to the posterior condyles (*Figure 4*) and impact one or both of the floating spikes into the distal femur.

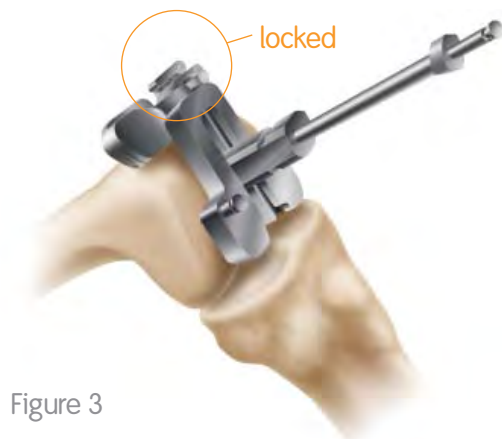


Figure 3



Figure 1



Figure 2

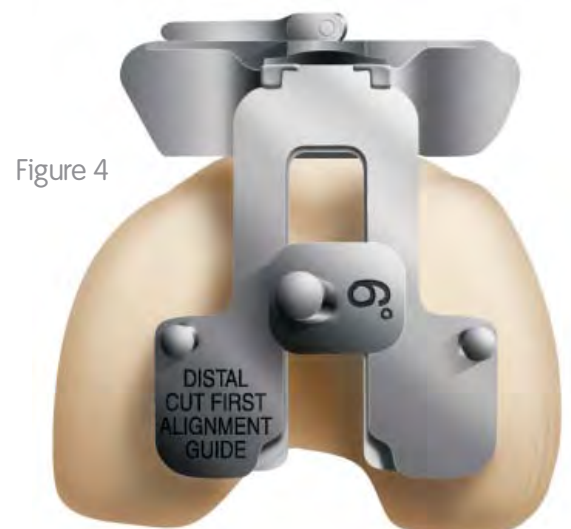


Figure 4

Femoral Preparation

Distal Femoral Resection

1. Using non-headed pins, pin the distal femoral cutting block to the anterior femur using the holes marked "0." Once adequate distal femoral resection is noted, an additional headed or non-headed pin should be placed obliquely to provide additional stability (*Figure 5*).
2. Unlock the lever on the valgus alignment guide, remove the intramedullary rod and the valgus alignment assembly using the universal extractor (*Figure 6*). Only the distal femoral cutting block should remain on the femur.
3. Resect the distal femur (*Figure 7*), then remove the distal femoral cutting block.

Tip: If the distal femoral resection is not adequate, remove the oblique headed pin, and reposition the block through the pin holes marked +2, +4, or +6mm for the desired level of resection and re-insert the oblique pin.

See the sawblade chart on page 2 for sawblades that work with LEGION[®] MIS cutting block tolerances.



Figure 5

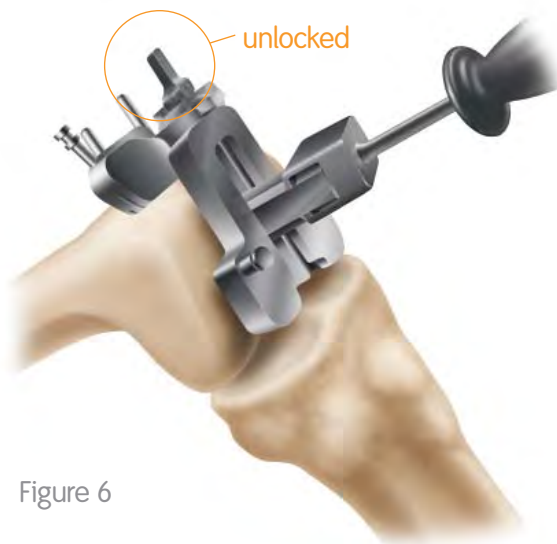


Figure 6



Figure 7

The sizing guide allows for external rotation to be set from zero to six degrees based on surgeon preference and patient anatomy. Rotational alignment may be checked by aligning the A-P axis with the pointer on the sizing guide (Figure 8a) or by ensuring that the laser marked lines on the face of the guide are parallel with the epicondylar axis (Figure 8b). The rotational adjustment knob on the lower portion of the guide is turned to dial in rotation (Figure 8c).

A unique feature of the sizing guide for this system is that it may be used in a traditional fixed posterior referencing manner or can be adjusted anteriorly or posteriorly when the component is in between sizes and the surgeon wishes to fine-tune femoral placement. With posterior referencing, the larger size is usually chosen, which has the advantage of balancing the flexion and extension spaces. Possible disadvantages to posterior referencing may include either notching the anterior cortex or overstuffing the patellofemoral joint. With anterior referencing, the smaller size is usually chosen, which reapproximates the patellofemoral joint and reduces the chance of notching but may leave the knee loose in flexion.

Surgeons wishing to use the guide in a fixed posterior referencing manner should turn to page 7. However, the guide also allows for adjustable anterior or posterior referencing. When in between sizes, the surgeon can choose to adjust sizing up to 4mm anteriorly, thereby taking up to an additional 4mm off the posterior condyles, or up to 2mm posteriorly, taking up to an additional 2mm off of the anterior cortex. To use the sizing guide in this manner, femoral size is read from the graduations on the stylus arm relative to the anterior surface.

If the anterior surface of the guide is in between two sizes when it is at the zero position, the

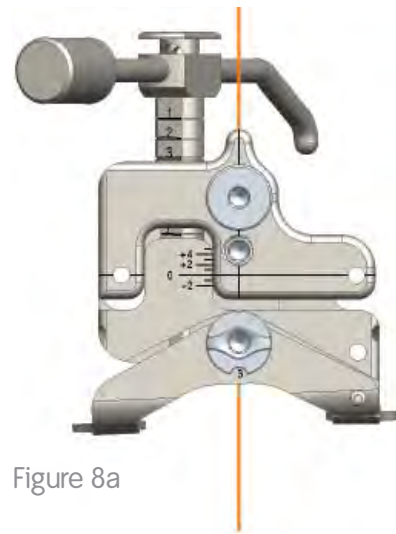


Figure 8a

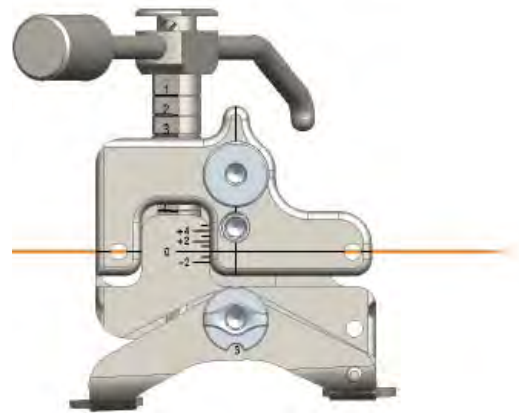


Figure 8b

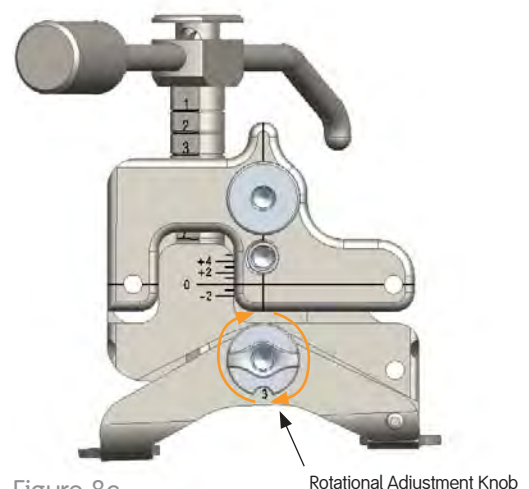


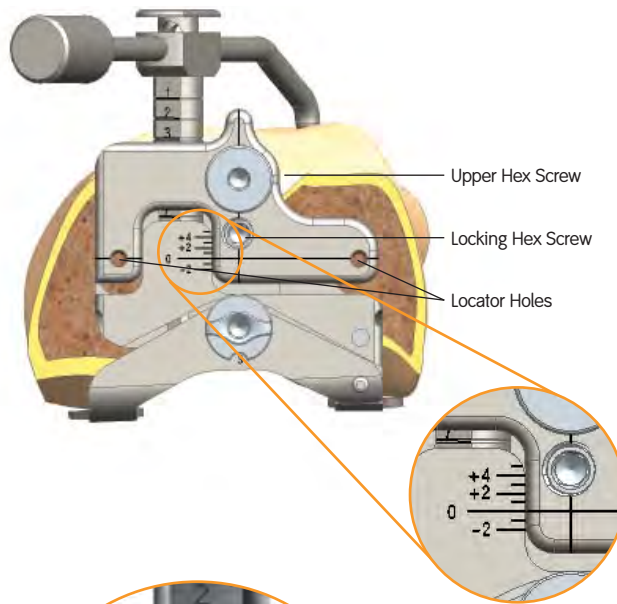
Figure 8c

Rotational Adjustment Knob

Femoral Preparation

upper hex screw can be rotated to shift the anterior face of the sizing guide up to the next smaller size or down to the next larger size on the stylus. As a result, the locator holes for the A-P cutting block are shifted either anteriorly or posteriorly to align with the next implant size (Figure 9)

Tip: The gap between the top of the sizing guide and the stylus graduation line indicates how much bone will be removed from either the anterior cortex or posterior condyles by choosing the next larger size (Figure 10).



Sizing Guide Procedure: Rotation

1. Flex the knee, approximately 90° so the posterior condyles are accessible.
2. Choose appropriate sizing guide, "LEFT" for a left knee and "RIGHT" for a right knee.
3. Position the femoral sizing guide flush against the distal femur, while ensuring the posterior paddles are contacting the underside of both posterior condyles. Once correct position of sizing guide is established, place a pin through lateral pivot pinhole located in the posterior-lateral corner on the face of the sizing guide (Figure 11).
4. Adjust the external rotation of the sizing guide to be aligned anatomically with the Epicondylar and/or A/P axis. This can be achieved by turning the ROTATIONAL ADJUSTMENT KNOB clockwise (0-6) using a hex screwdriver (Figure 12).
5. Once rotation is set, sizing can be established either by fixed posterior referencing or adjustable referencing.

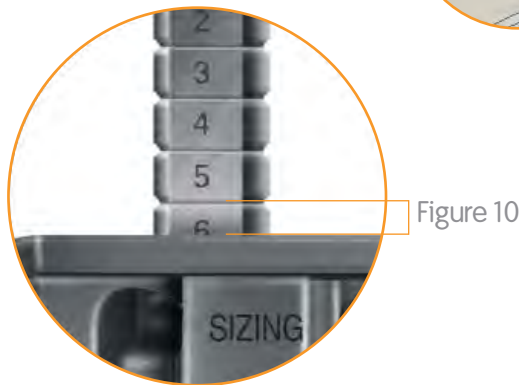


Figure 11

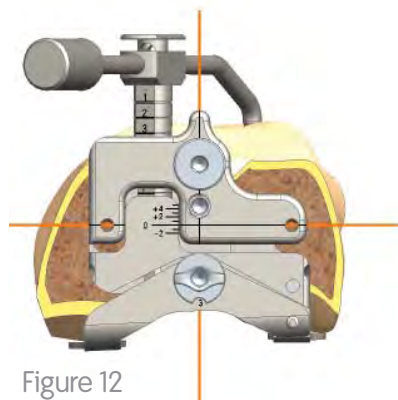


Figure 12

Sizing Guide Procedure: Fixed Posterior Referencing

1. Ensure that the anterior surface of the sizing guide is set in the "0" position.
2. Drill and insert two pins through the locator holes of the sizing guide to secure the guide.
3. Position the sizing guide stylus so that it contacts the lateral ridge of the anterior femoral cortex (highest point on the anterior cortex of the femur). (Figure 13)
4. Determine the size of the component from the graduations on the shaft of the stylus.
5. If the femur is between sizes, chose the larger size.
6. Remove the pins and the sizing guide

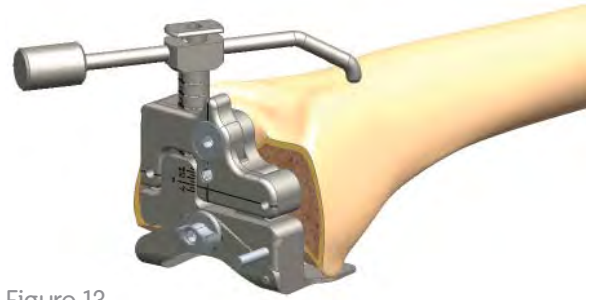


Figure 13

Sizing procedure: Adjustable Anterior or Posterior Referencing

1. Ensure that the anterior surface of the sizing guide is set in the "0" position.
2. Drill and insert two pins through the oblique holes of the sizing guide to secure the guide.
3. Position the sizing guide stylus so that it contacts the lateral ridge of the anterior femoral cortex (highest point on the anterior cortex of the femur). (Figure 14)
4. Determine the size of the component from the graduations on the shaft of the stylus.
5. If the indicated size is in-between sizes, you can turn the UPPER HEX SCREW (Figure 14) to shift the anterior surface up to an additional 4mm to the next smaller size or down an additional 2mm to the next larger size (Figure 15 a and b). Once the appropriate size is selected, turn the LOCKING HEX SCREW to lock the anterior surface and drill holes into position (Figure 14).
6. Drill the locator holes on the anterior face of the sizing guide to set position for the cutting block.
7. Remove the pins and sizing guide.

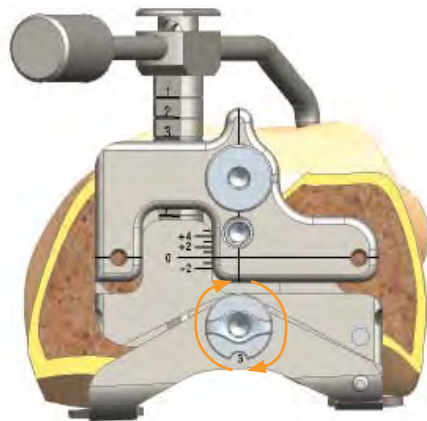
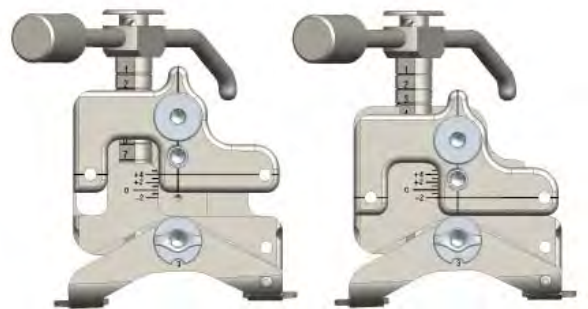


Figure 14



Anterior Reference shift of 4mm

Posterior Reference shift of 2mm

Figure 15a and b

Femoral Preparation

A-P Femoral Resection

1. Position the fixed spikes on the A-P cutting block into the predrilled holes.

Tip: It is not necessary that the block be centered M-L on the distal femur.

2. Ensure that the cutting block is flush with the resected distal femur. Several holes in the A-P block allow fixation of the block. Place one pin centrally through one of the middle holes just medial or lateral to the quick-connect attachment. For additional stability, a headed pin may be placed through the holes on the medial or lateral side of the block (*Figure 16*).



Figure 16

3. Complete the anterior, posterior and chamfer cuts (*Figures 17-20*). The block is designed to allow for angling of the sawblade during the cuts.

Tip: To maintain block stability, the anterior chamfer cut should be completed last.

Tip: Some surgeons prefer to make the chamfer cuts after assuring that the flexion and extension spaces are equal. If desired, chamfer cuts may be made through the posterior stabilized femoral housing block or through dedicated chamfer cutting blocks.

Tip: To achieve an optimal press fit, ensure that a flat, clean cut is made to all of the femoral resection cuts.

Tip: Some surgeons find they can achieve a better press fit if they diverge the anterior and posterior saw cuts. This can be done by slightly angling the saw in an anterior direction while making the anterior cut, and angling the saw in a slightly posterior directions while making the posterior cut.



Figure 17



Figure 18



Figure 19



Figure 20

Femoral Preparation

Downsizing the Femoral Component

1. Attach the downsizing drill guide to the cut femur, placing the spikes on the back of the plate into the same location holes used for the A-P cutting block (*Figure 21*).
2. Drill new location holes through the downsizing drill guide (shifted 2mm anterior).
3. Place the smaller A-P cutting block into the new location holes. Redo the posterior, anterior and chamfer cuts.

Tip: It is useful to mark the original pin track holes with methylene blue in order to properly identify the new holes.



Figure 21

Femoral Component Trialing

1. Flex the knee to 90° and insert the femoral trial using the femoral trial impactor.
2. Place the appropriate trial onto the tibia.
3. Insert the 9mm articular insert trial
4. Perform a trial range of motion. The alignment marks on the front of the femoral and tibial trials should line up. The quick connect handle may be attached to the tibial trial and used to set the appropriate rotational alignment.
5. Mark the correct tibial rotational alignment on the anterior tibia using a cautery knife.
6. Place the patellar trial into the prepared patella.
7. Perform a trial range of motion to assess patellar tracking.
8. Adjust medial-lateral placement of the femoral trial, if necessary to maximize tracking.
9. For cruciate retaining femorals, prepare the femoral lug holes through the femoral trial with the femoral lug punch.
10. Remove the femoral trial by attaching the end of the universal extractor to the femoral trial. Remove the patella trial.

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