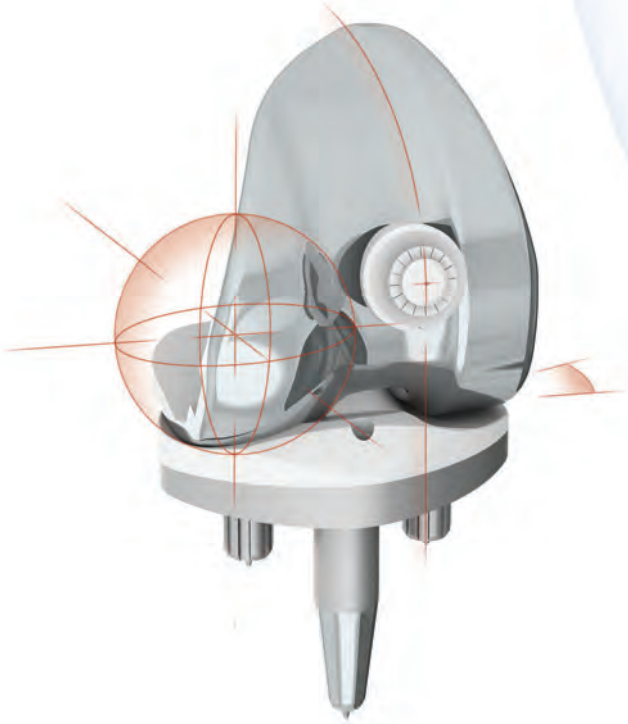
MatOrtho®



Medial Rotation Knee™

Landmark Operative Technique

Physiological Stability and
Mobility for the Active Knee
Without Compromise

Forever **Active**

Contents

Patents

EP1329205 / US6869448

Manufactured by

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For more information visit: www.MatOrtho.com

Introduction

The Medial Rotation Knee™ was developed using clinical experience gained since the first condylar knee replacement was performed at the Royal London Hospital in 1968[1, 2]. It has been in clinical use since 1994.

The tibiofemoral bearing design is based on the principle of medial rotation, which mimics the function of the normal healthy knee[3, 4]. It comprises a prominent spherical medial condyle, similar to a ball-and-socket joint, which stabilises the medial condyle throughout flexion. The lateral side is a conforming cylinder that permits some laxity and can be thought of as a stabilising 'outrigger'.

The patellofemoral design has been designed with a trochlear groove that aids more normal patellar tracking[5], positioned lateral to the midline throughout flexion to reflect the natural position of the patella. The deep trochlear groove and smooth single radius allow for increased conformity and stability of the patella throughout flexion.

This combination of asymmetric tibiofemoral and patellofemoral articulations provides optimal knee kinematics, whilst maintaining intrinsic stability throughout the functional flexion range. This superior combination of stability and mobility is associated with improved high-end function[6] and low revision rate[7].

Indications

Severely painful and/or disabled joint resulting from osteoarthritis, traumatic arthritis, rheumatoid arthritis or a failed previous implant.

Contraindications

Active local or systemic infection, severe osteoporosis or severe neurological, vascular or muscular compromise such that knee replacement is inappropriate.

Severe bone loss or collateral ligament instability.

References

1. Freeman and Swanson (1972) JBJS; 54-B(1): 170-171
2. Freeman et al. (1978) JBJS; 60-B(3): 339-344
3. Iwaki et al. (2000) JBJS; 82-B: 1189-1195
4. Monoot et al. (2009) KSSTA; 17: 927-934
5. Rhee et al. (2012) JBJS; 94-B (SUPP IX) : 90
6. Hossain et al. (2011) CORR; 469(1): 55-63
7. NJR for England, Wales, Northern Ireland and Isle of Man, 14th Annual Report (2017)

Step 1

Expose the knee to obtain full access.

Step 2

Remove all osteophytes and release any adhesions.

Step 3

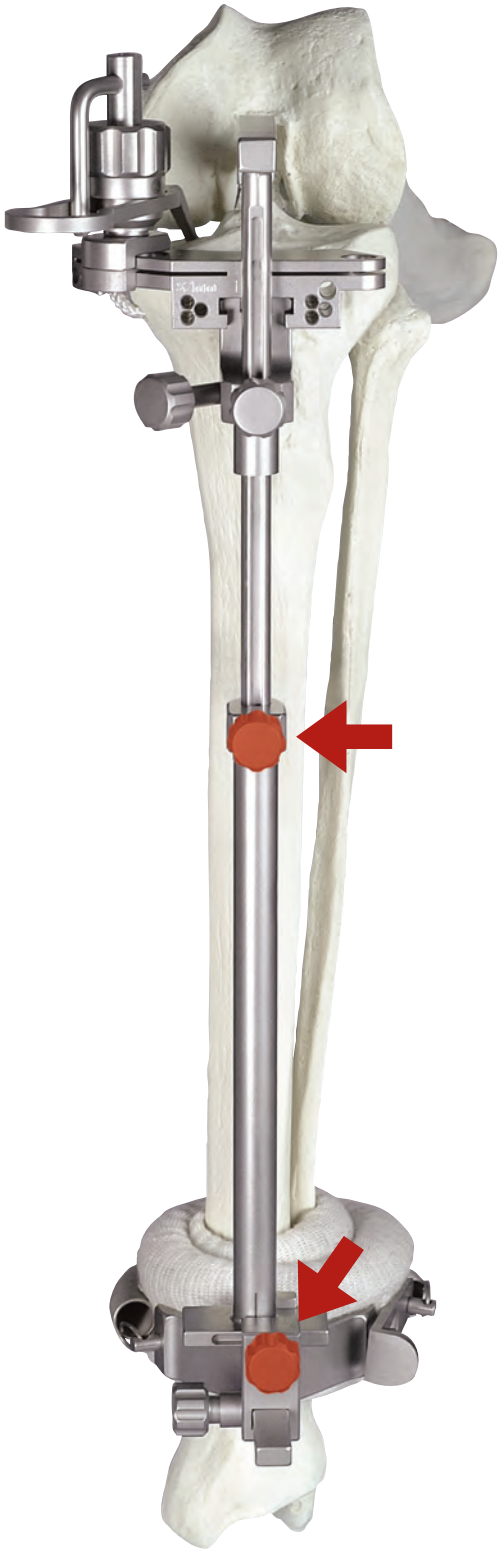
Resect the posterior cruciate ligament for better access to the knee and to avoid limited range of motion.

Step 4

Assemble the Tibial Cutting Guide with the Tibial Cutting Block and Tibial Stylus and align with the leg.

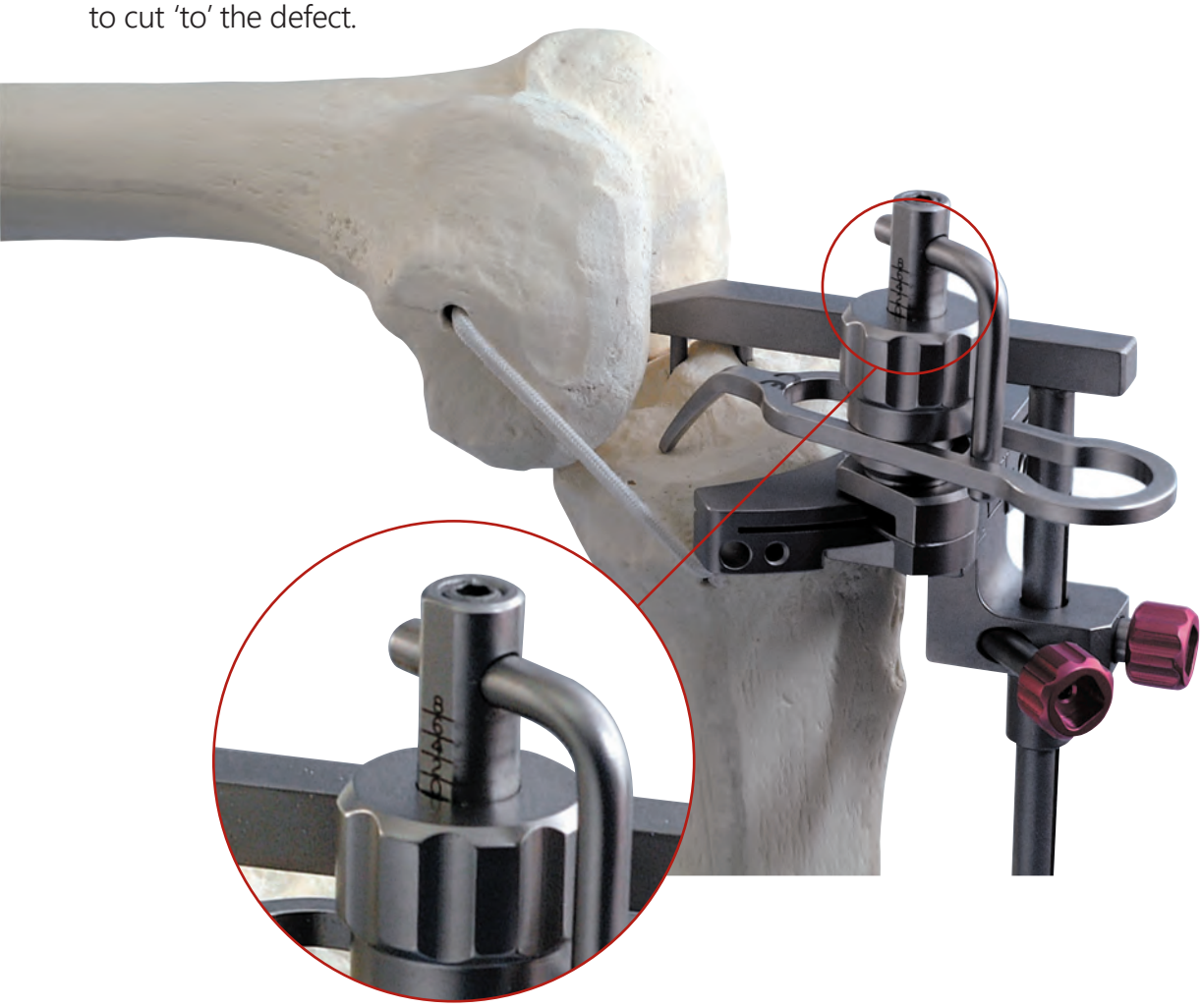
The guide should be centred on the medial side of the tibial tubercle and be parallel to the shaft of the tibia when viewed laterally.

Optionally, the proximal spikes can be used to stabilise the Tibial Cutting Guide whilst the Tibial Cutting Block and Tibial Stylus remain free.



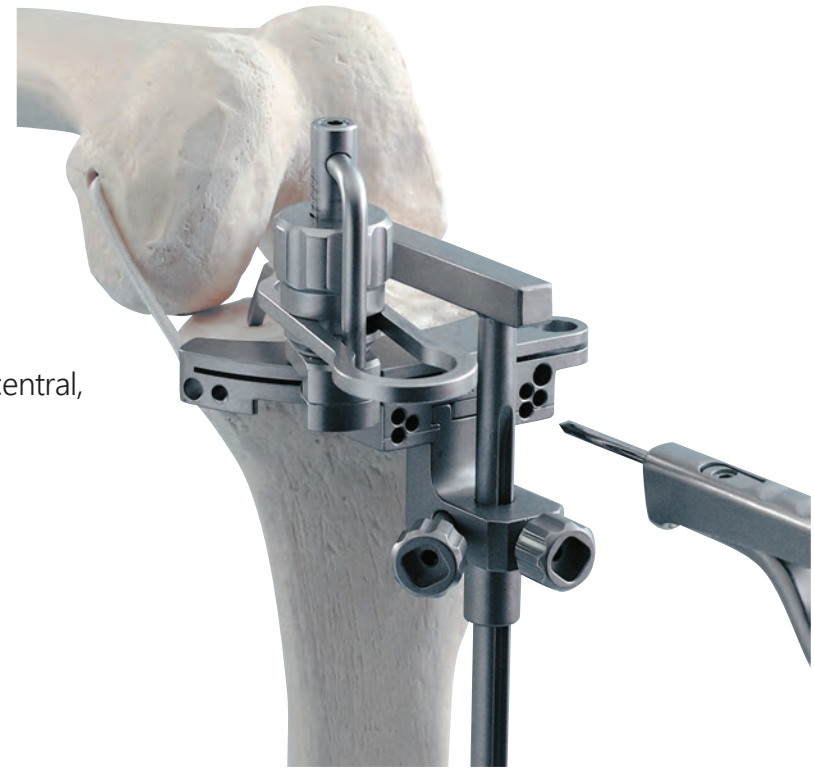
Step 5

Set the Tibial Stylus on the defect at 0, in order to cut 'to' the defect.



Step 6

Pin the Tibial Cutting Block through the central, bottom two holes.



Step 7

Remove the Tibial Cutting Guide using the hook and slap hammer, if required. Position the Tibial Cutting Block, until it touches the tibia, pinning medially to secure.

Step 8

Cut the tibia from each side with a 1 mm saw blade. After removing the bone, check that the cut is flat; to do this, the Tibial Cutting Block can be repositioned on the pins and 'sighted' through the slots.

Step 9

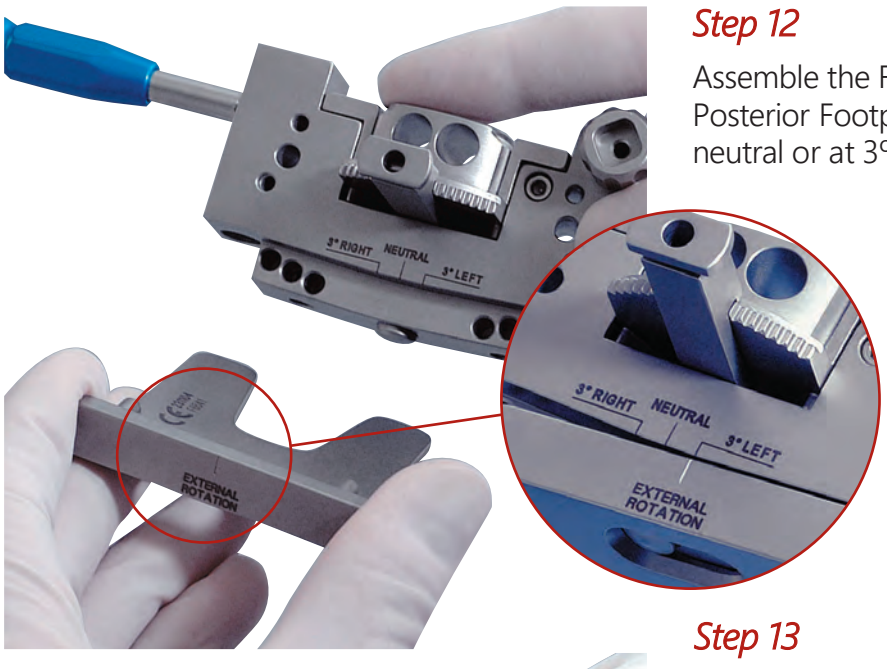
Punch an Intermedullary (IM) start hole 5-10 mm proximal of the Intercondylar (IC) notch, and 5-10 mm medial of the midline.

Step 10

Fully advance the IM Drill to find the correct path of the femoral shaft.

Step 11

Insert the IM Rod, leaving 50-60 mm protruding from the femur, then remove the handle.

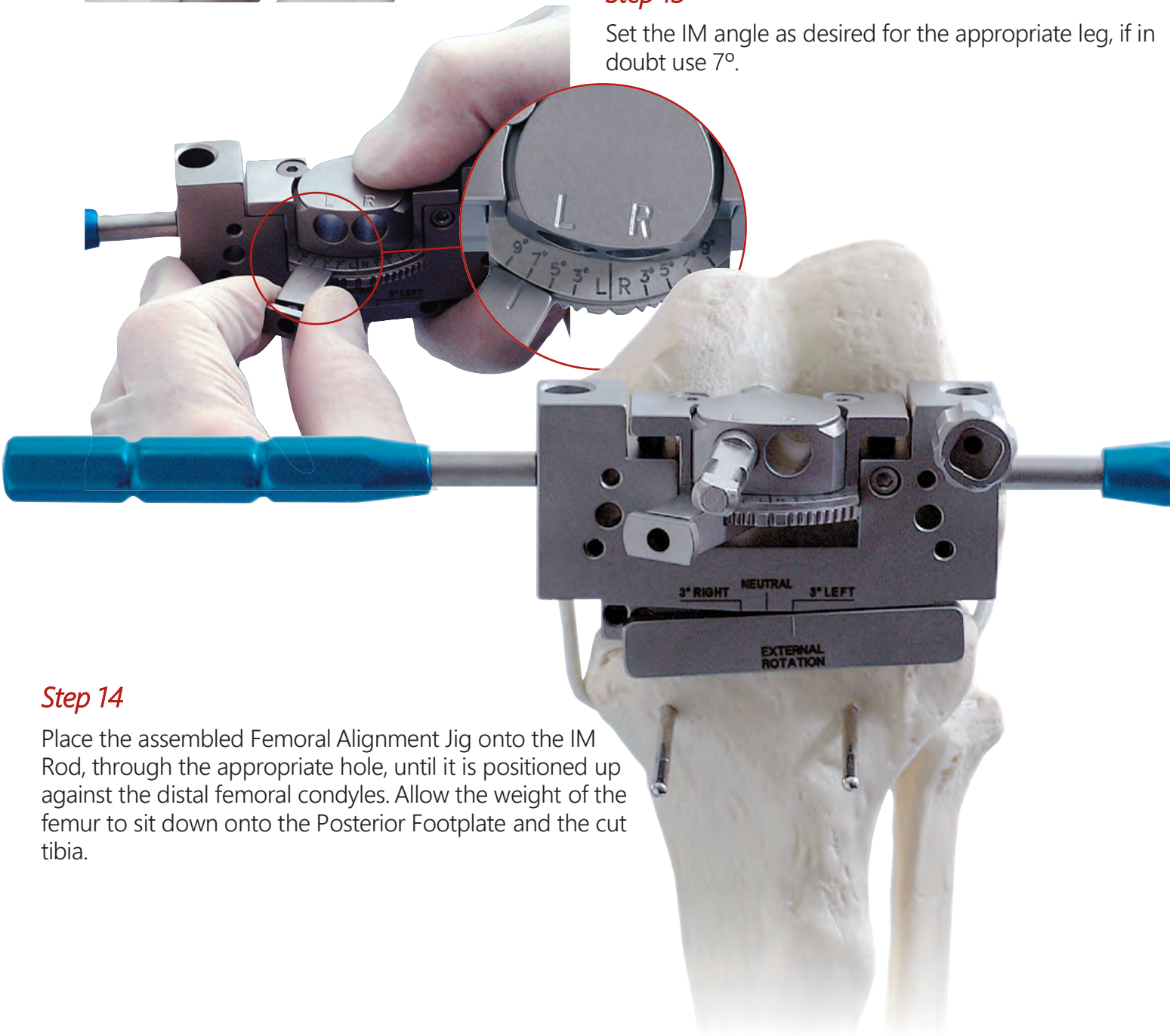


Step 12

Assemble the Femoral Alignment Jig. Fit the Posterior Footplate to the desired position, either neutral or at 3° for the correct leg.

Step 13

Set the IM angle as desired for the appropriate leg, if in doubt use 7°.

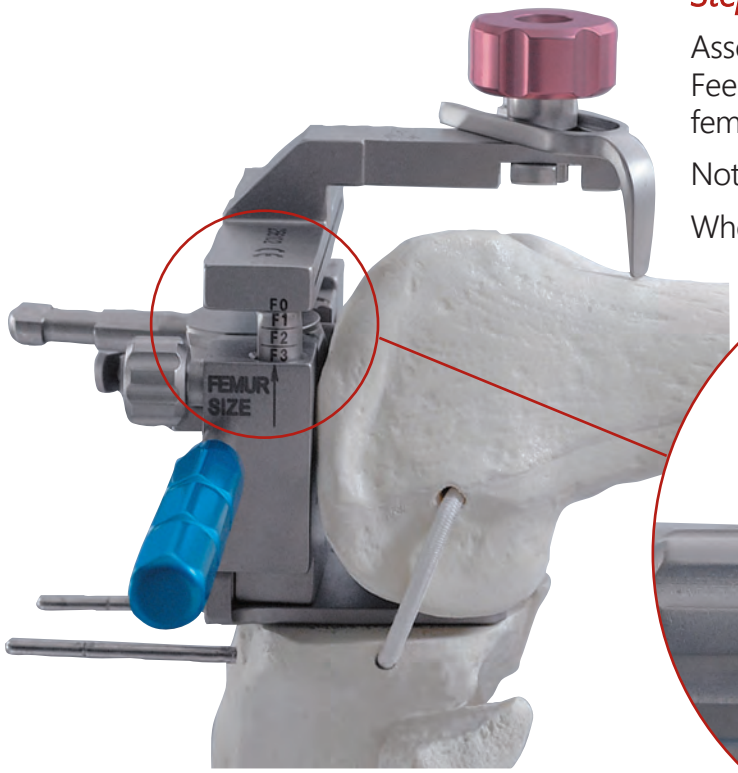


Step 14

Place the assembled Femoral Alignment Jig onto the IM Rod, through the appropriate hole, until it is positioned up against the distal femoral condyles. Allow the weight of the femur to sit down onto the Posterior Footplate and the cut tibia.

Step 15

Optionally, check for external alignment; change the IM angle with the Small Adjuster if necessary.

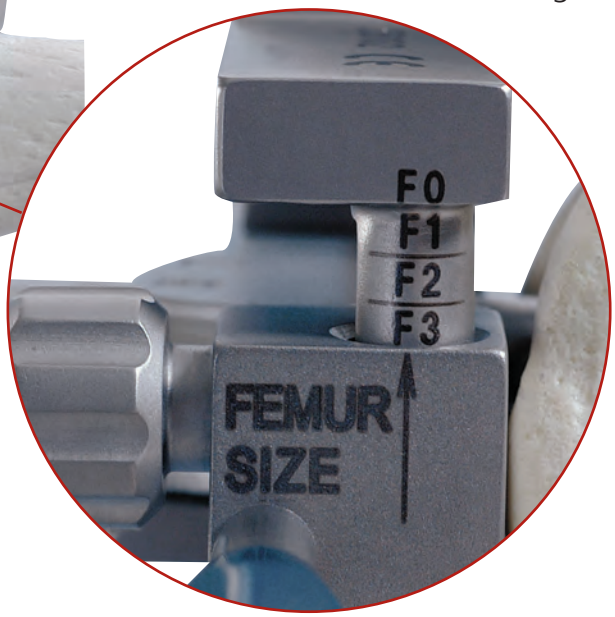


Step 16

Assemble the Anterior Saw Slot unit with the Anterior Feeler Arm and fit into position to touch the lateral femoral ridge. This will be the exit point for the cut.

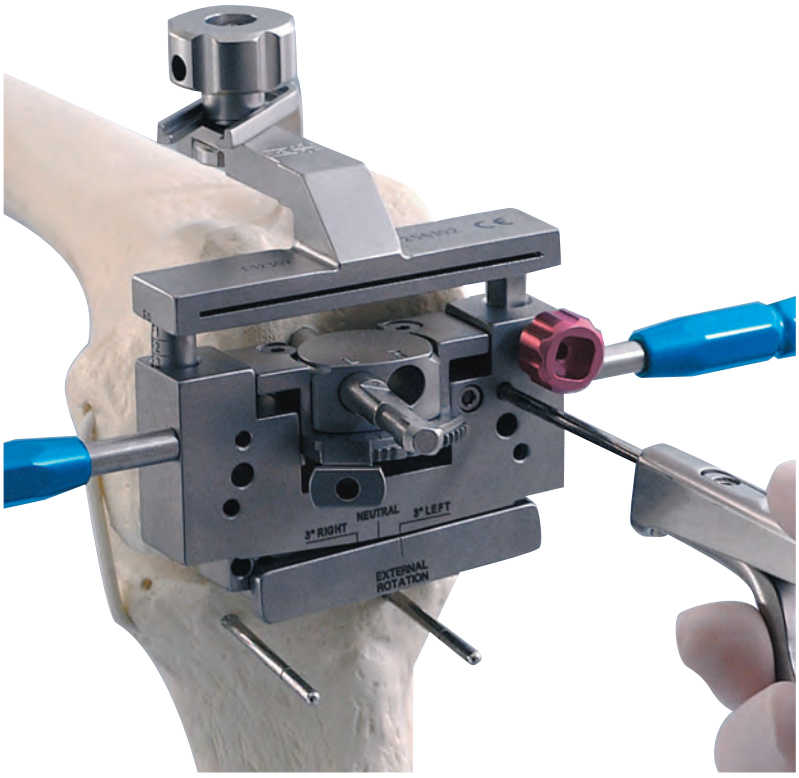
Note the nearest indicated femur size.

When in between two sizes use the larger size.



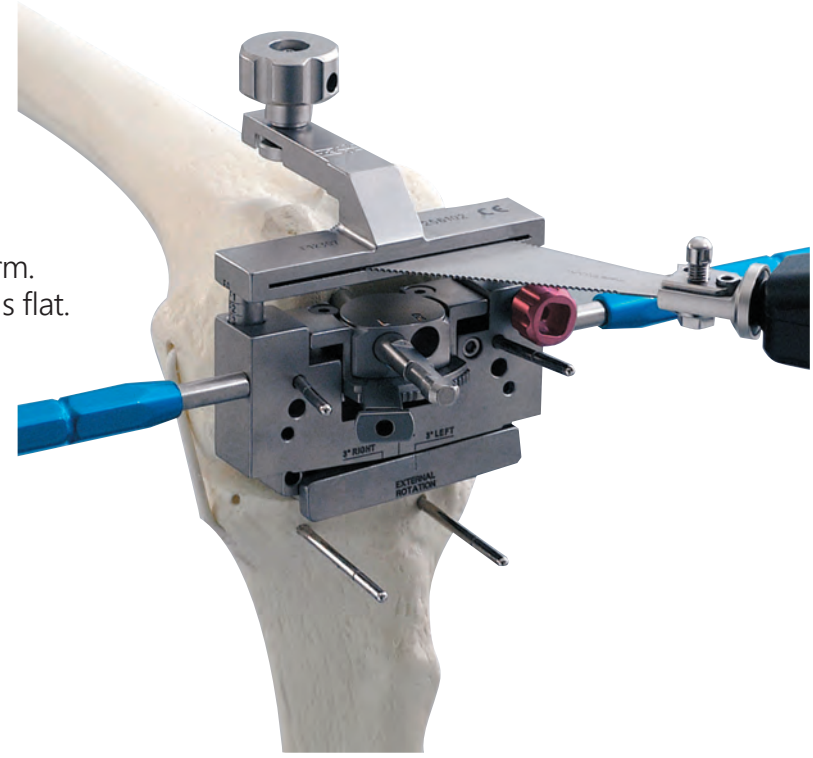
Step 17

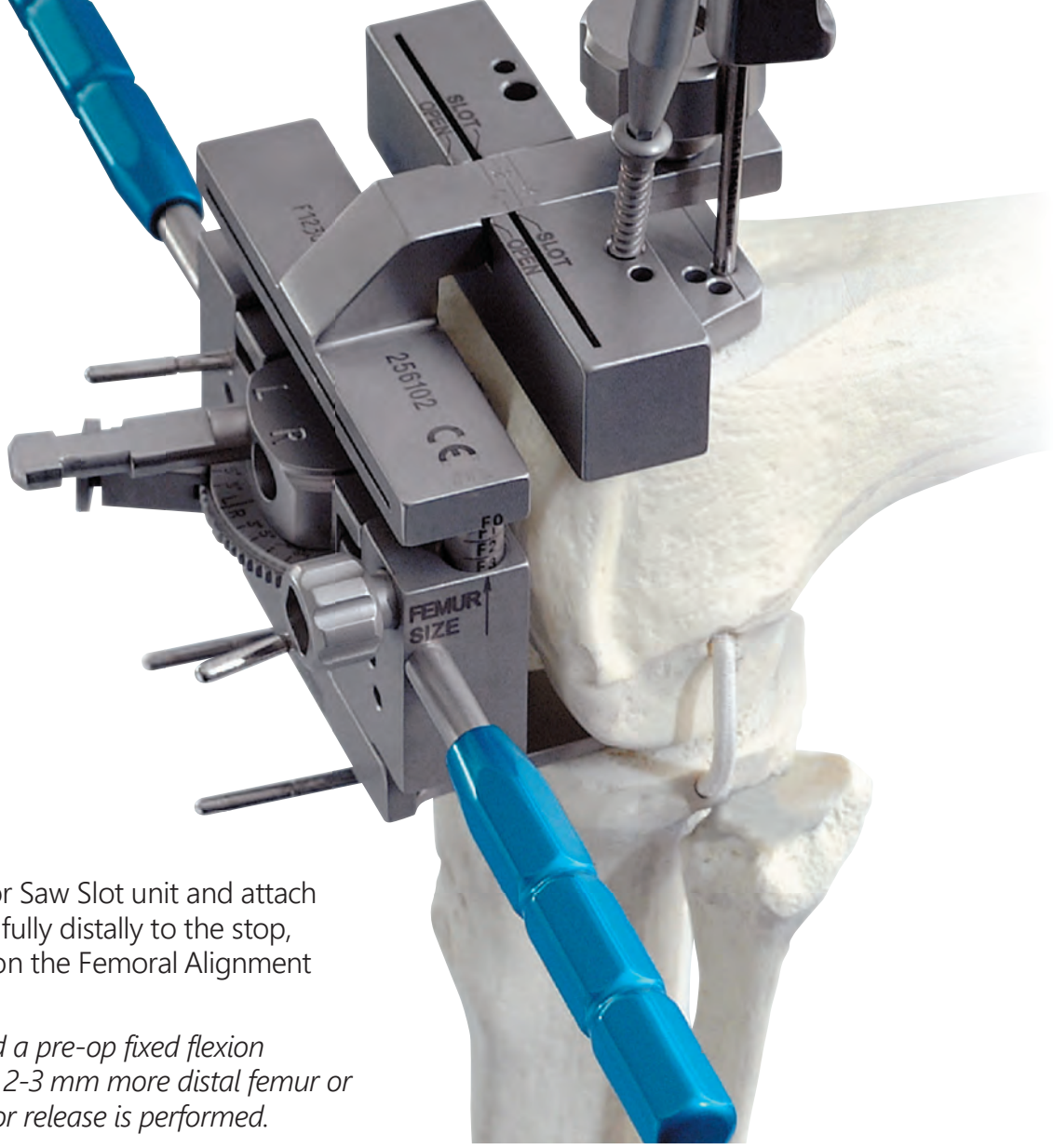
Lock the Anterior Saw Slot unit firmly into position, ensuring that the Femoral Alignment Jig is touching the distal femur, and pin in two places.



Step 18

Optionally, remove the Anterior Feeler Arm. Cut the anterior femur and check that it is flat.





Step 19

Remove the Anterior Saw Slot unit and attach the Distal Block, set fully distally to the stop, before replacing it on the Femoral Alignment Jig.

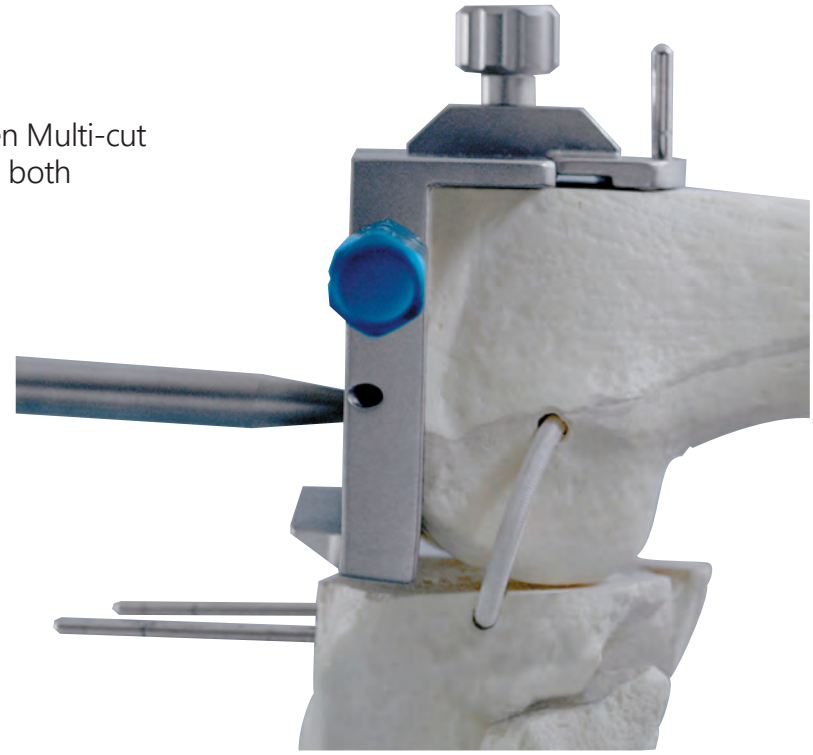
Note: If the knee had a pre-op fixed flexion deformity, either cut 2-3 mm more distal femur or ensure a full posterior release is performed.

Step 20

Remove the IM Rod and Anterior Saw Slot unit Pins. Release the locking screws to remove all but the Distal Block. Add screws and additional pins to ensure that the Distal Block is firm and in full contact with the bone. Cut the distal femur and check that it is flat.

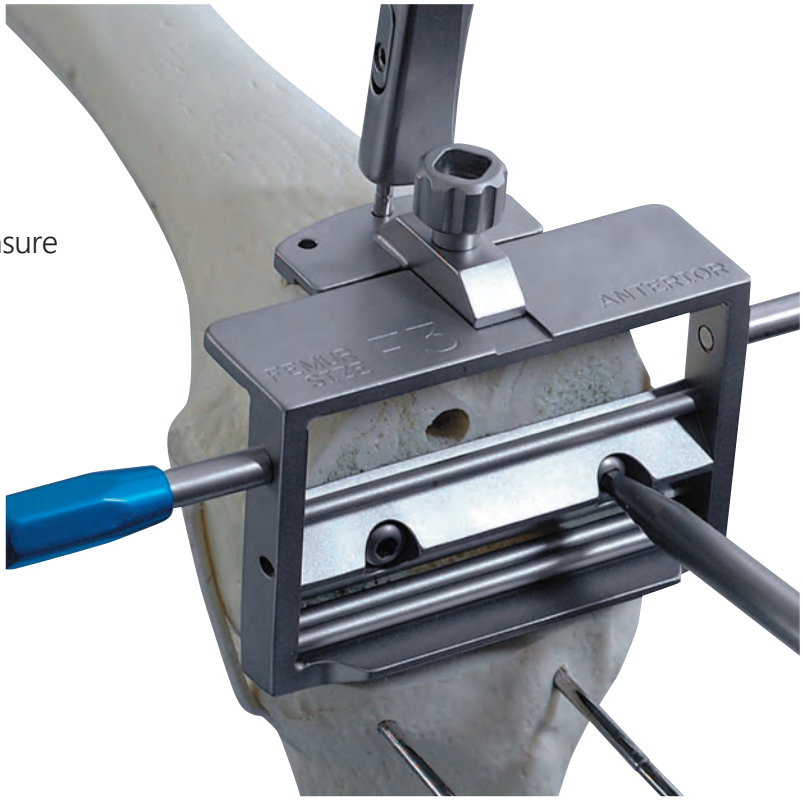
Step 21

Remove the Distal Block. Place the chosen Multi-cut Block with its anterior plate sitting flat on both surfaces; trim the bone if it does not.



Step 22

Fix with two short screws and pins and ensure that it has not moved.



Step 23

Cut the posterior femur.
Cut the chamfers at this stage only if confident of the flexion and extension spaces being equal.

Step 24

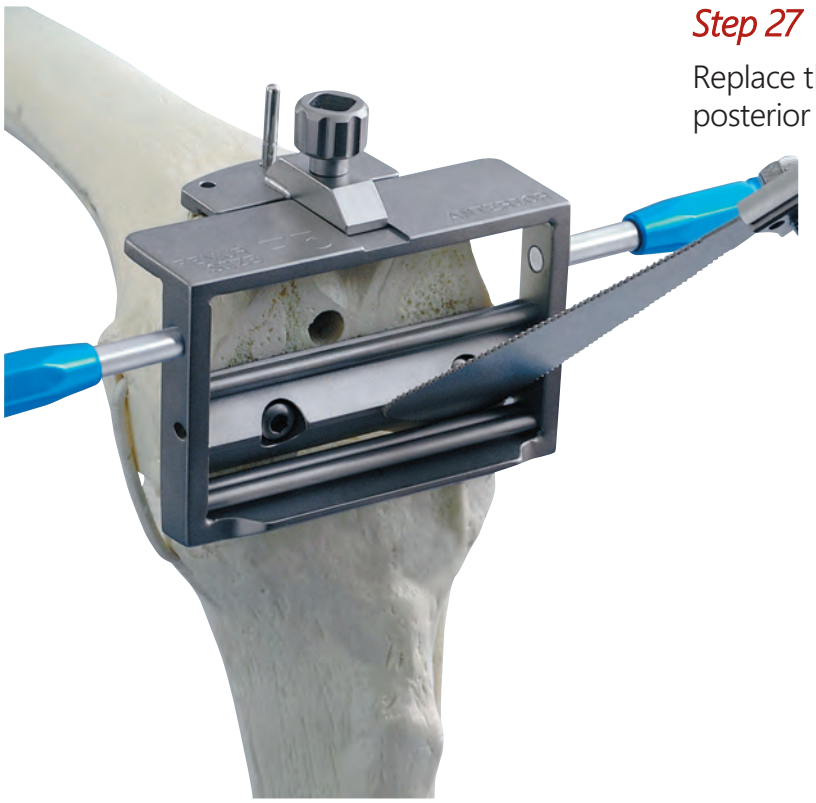
With the knee in flexion at 90°, fit the Magic Spacer and tension gently to only just fit. Turn the top knob of the Magic Spacer to find the flexion space shown in the centre of the window. If the indicated space is less than 10.5 mm, take further cuts from the tibia and repeat this step until it is achieved. The measurement indicated in the window is the correct tibia thickness to use and should not be changed.

Step 25

With the knee in extension, fit and tension the Magic Spacer. Check the alignment with the Magic Spacer Leg Alignment Rod. Stability should be achieved with the correct alignment and may necessitate a soft tissue release on the tight side in order to obtain this. If the space set in extension does not match the tibia thickness already set in flexion, either cut more or pack out the distal femur. This is indicated by the direction and amount of variance shown in the window.

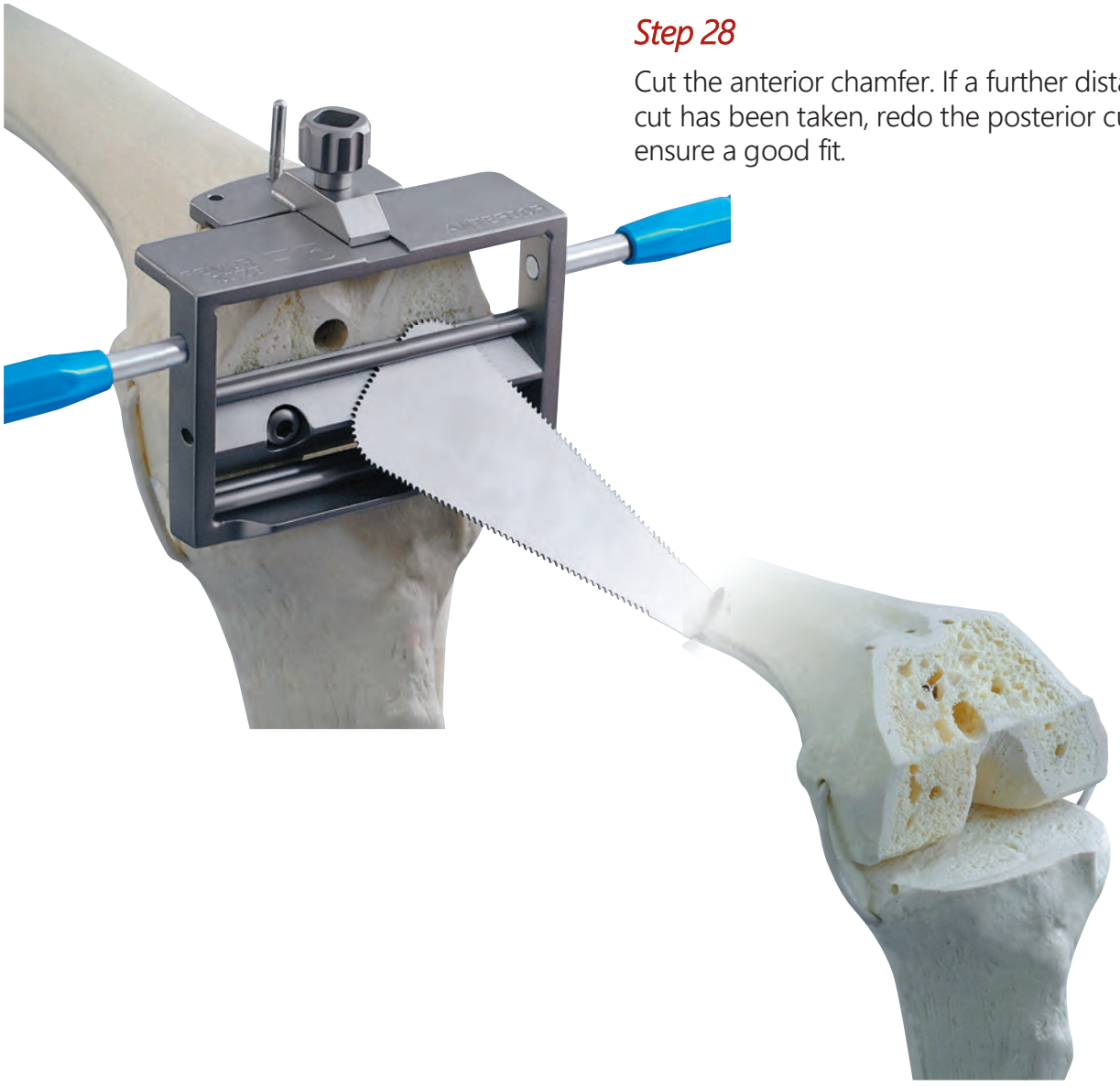
Step 26

If the distal femur requires further resection, replace the Distal Block on another pair of pinholes to remove another 2 mm, and use a screw pin to secure. Cut and then use the Magic Spacer to recheck the flexion, then extension space. It should indicate the same tibia thickness in flexion and extension and the knee should be stable in both.



Step 27

Replace the Multi-cut Block and make the posterior chamfer cut.



Step 28

Cut the anterior chamfer. If a further distal femur cut has been taken, redo the posterior cut to ensure a good fit.

Step 29

Choose the appropriate Tibial Guide that fits the tibia without overhang. This will be the size used and does not need to match the femur size.

Step 30

Fit the correct side and chosen thickness Tibial Trial Insert.

Step 31

Using the Femoral Impactor, place the appropriate Femoral Trial. Check the fit and position.

Step 32

Test for extension and flexion with the patella reduced. The knee should be stable and have only limited laxity in flexion. The Tibial Trial should find its best fit position on the tibia as a meniscal trial, the Tibial Guide should then be pinned in place through the lugs either side of the centre.

Using a diathermy, make location marks on the femur both medially and laterally of the Femoral Trial. These marks will be used to ensure correct positioning of the pegged Femoral Drill Guide.

Step 33

Pegged Femur

Drill peg holes to full depth using the drill marked 'Femur Peg'.

Note: Do not drill the peg holes if using a Stemmed Femur

Step 34

The Femoral Trial and Tibial Trial Insert are now removed. The Tibial Stem Drill Guide is placed and locked onto the Tibial Guide together with the chosen size Tibial Peg Drill Guide.

Step 35

Drill to full depth the central hole in the Tibial Guide with the appropriate length Tibial Stem Drill. Leave the Stem Drill in place to drill the two peg holes to full depth. Ensure the Tibial Guide remains flat on the tibia.

Step 36

Stemmed Femur

Fit the appropriate side and size Femoral Drill Guide in alignment with the location marks. Check that it fits and pin in place. This operation will fix the medial-lateral position of the Femoral Component.

Step 37

Drill the stem hole to full depth using the drill marked 'Femur Stem'.

Remove the drill, pins and Femoral Drill Guide, then in a similar way to Step 31 on page 19, use the femoral impactor to position the appropriate Stemmed Femoral Trial.

Trim patella osteophytes and perform a trial reduction with the femur and tibia trials to assess whether patella replacement and/or a soft tissue release is required.

The patella should be completely stable without the need for stay sutures or finger support.

The minimum thickness of patella required to accommodate each patella implant is as follows:

20 - 13.5 mm,

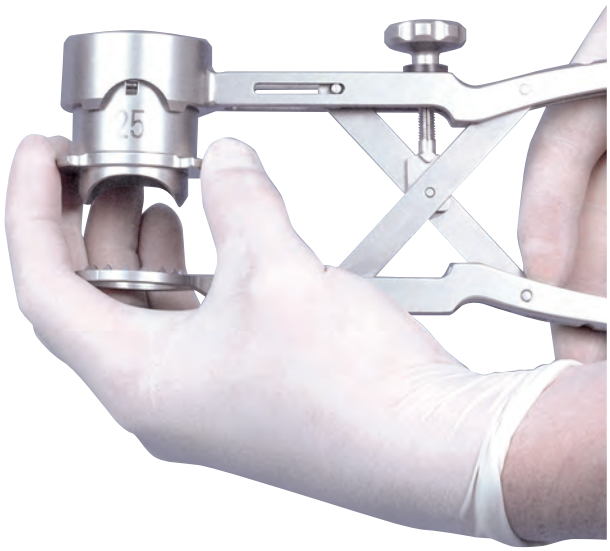
25 - 14.5 mm

30 - 16.5 mm.

Step 38

Prepare Patella Clamp

Select one of three patella diameters (20, 25 or 30 mm), open the Patella Clamp fully and insert the corresponding Patella Insert into the underside of the tube. Turn the Insert until it engages and sits flush against the underside of the tube.

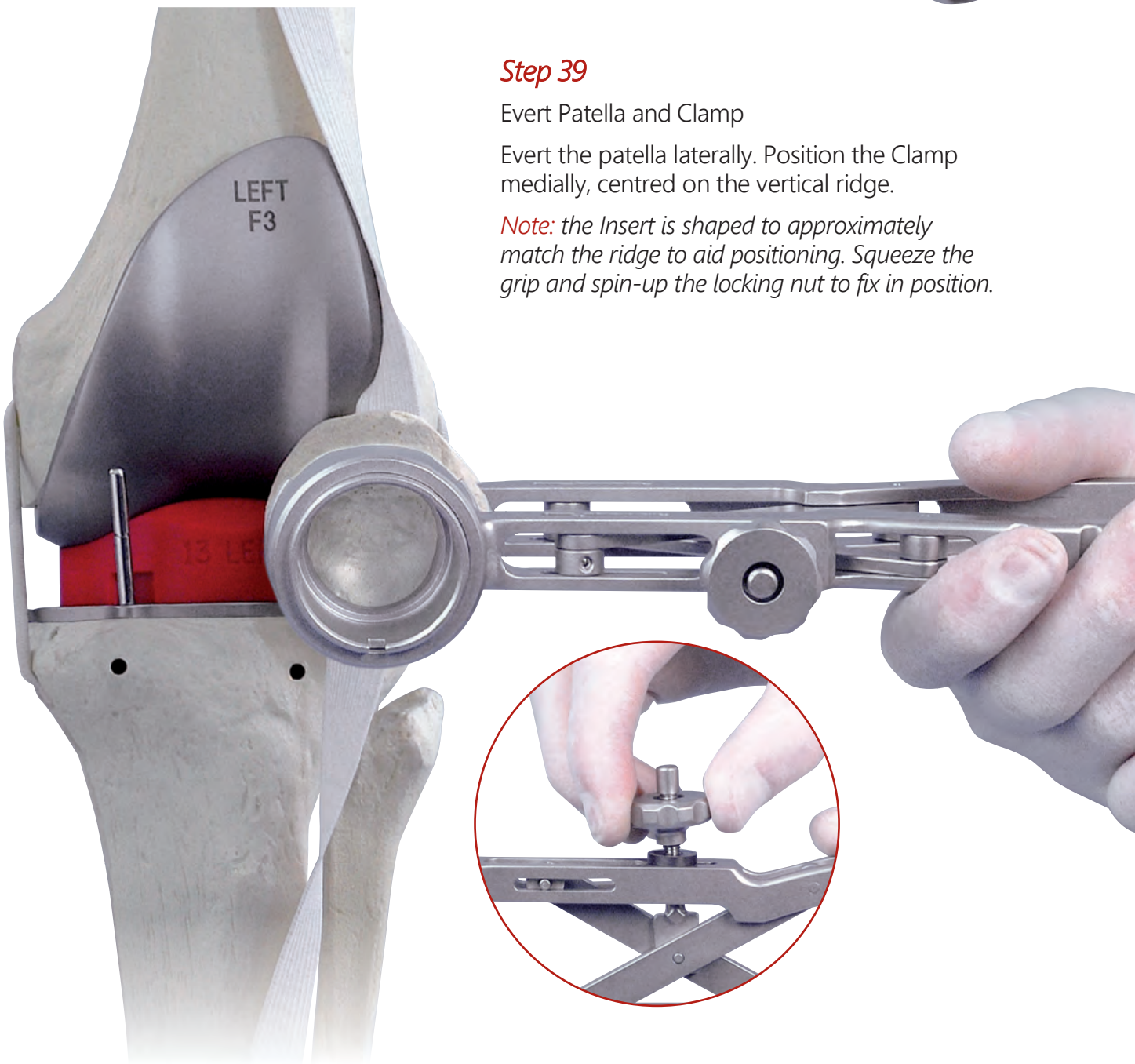


Step 39

Evert Patella and Clamp

Evert the patella laterally. Position the Clamp medially, centred on the vertical ridge.

Note: the Insert is shaped to approximately match the ridge to aid positioning. Squeeze the grip and spin-up the locking nut to fix in position.



Step 40

Insert Drill Guide

Insert the Drill Guide and rotate until the anti-rotation pin engages and the collar sits flush with the top of the Insert.

Note: The Drill Guide provides a depth stop for the 10.5 mm Peg Drill, referencing the patella surface therefore it is vital that it is inserted correctly.

Step 41

Drill Central Hole

Insert the 10.5 mm Peg Drill in the Drill Guide and drill to the depth stop, holding the Clamp firmly at all times. Remove the Drill Guide and clear the central hole of all bone debris.

Note: the bottom of the drilled hole will act as a depth stop for the counterbore cutters, therefore it is important to remove all debris.

Step 42

Prepare Counterbore (Hole Cutter)

Select the corresponding size of Hole Cutter and advance until the central peg bottoms in the pre-drilled hole.

Note: the counterbore is prepared in two steps to ease cutting effort and reduce heat build-up with hard sclerotic bone.

With softer bone this step can be omitted, jumping straight to step 43.

Step 43

Prepare Counterbore (Milling Cutter)

Select the corresponding size of Milling Cutter and advance until the central peg bottoms in the pre-drilled hole.

Step 44

Insert Patella Trial

Remove the Patella Clamp and insert the corresponding size of Patella Trial. Check that the articulating surface of the trial is level with or slightly proud of the bone surface.

Note: *if the trial is excessively proud, re-clamp the patella making sure the tube is centred over the counter bored hole. Freehand drill the central hole a little deeper. Deepen the counter bore with the Milling Cutter until the central peg bottoms in the deepened hole.*

Re-insert the Patella Trial.

Step 45

Trial Reduction

Perform a full trial reduction with the femur and tibia trials. If necessary trim the patella bone further to match the femur articulation. The patella should be completely stable without the need for stay sutures or finger support.

Note: *Remove all trial components. Recesses for forceps are provided to aid removal of the Patella Trials.*

Step 46

Ensure all implants are of the correct side and size as the trials. The colour of the Tibial Component and Tibial Insert labels should be the same. Prepare the Tibial Assembly Clamp by depressing the button and flipping open the top section.

Step 47

Insert the Tibial Component with the posterior part nearest the button. Insert the Tibial Insert by placing the posterior feet underneath the posterior undercuts of the Tibial Component and pushing firmly downwards and in a posterior direction.

Step 48

Flip over and latch the top section. Screw the plunger down to meet the Tibial Insert using the rapid turning handle.

Step 49

Retract this handle and using a secure handgrip, continue turning the screw plunger until the Tibial Insert is fully seated. Check the anterior section and if there is a gap between the components, tighten the handle to a greater extent.

Remove the assembled Tibial components by slackening off the screw plunger, depressing the button and flipping the top section as before. The Tibial Assembly is now ready for implantation.

Step 50

Clean the resected bone surfaces with a bone brush or pressurised lavage. Use suction to remove the debris and liquid.

Dry thoroughly.

Step 51

Place bone cement on the tibia bone, ideally low viscosity cement applied with a syringe.

The Tibial Plugs may be used to prevent cement seeping into the stem and peg holes.

Insert the Tibial Assembly.

Step 52

Impact carefully using the Tibial Impactor. Remove the excess cement fully and carefully.

Step 53

Place cement on the Femoral Component and push firmly onto the femur in deep flexion.

Step 54

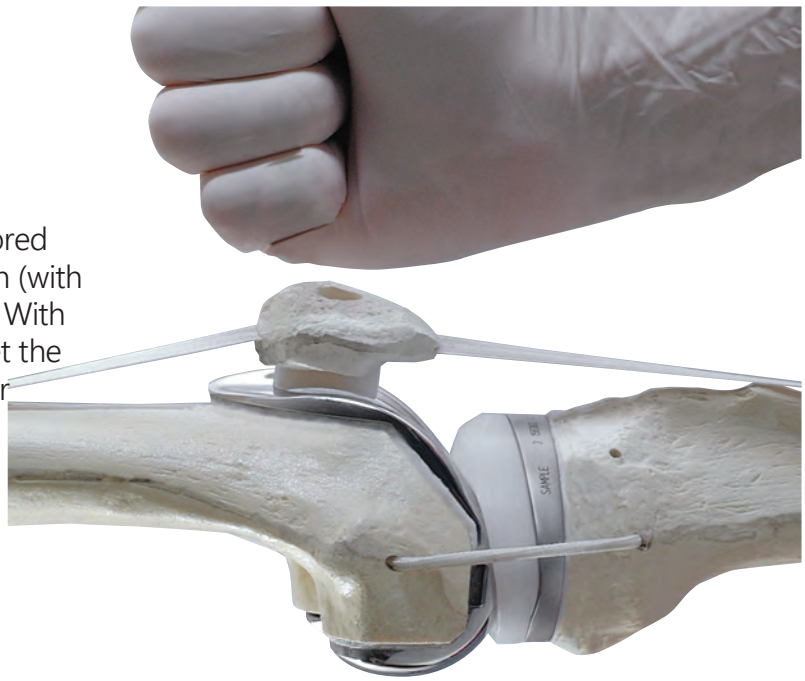
Carefully extend the knee a little way and fully impact the component into place.

Extend the knee carefully to fully seat the component in the cement. Flex to about 90 degrees and remove all excess cement fully and carefully.

Step 55

Insert Patella Implant

Place the Patella Implant in the counterbored hole, in approximately the correct rotation (with the notch in line with the patella tendon). With the patella reduced, strike with a fist to set the rotational position in relation to the femur articulation.

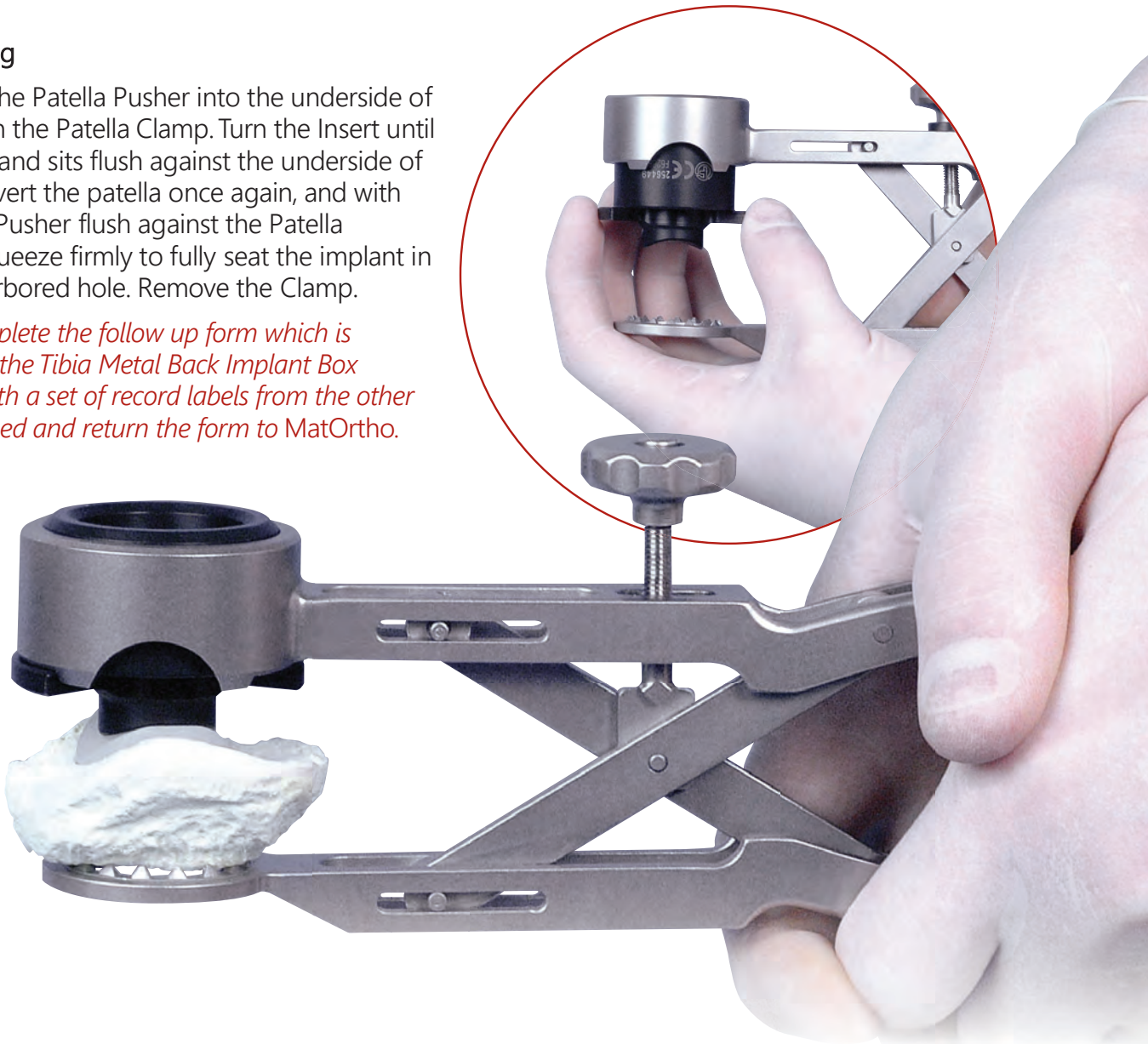


Step 56

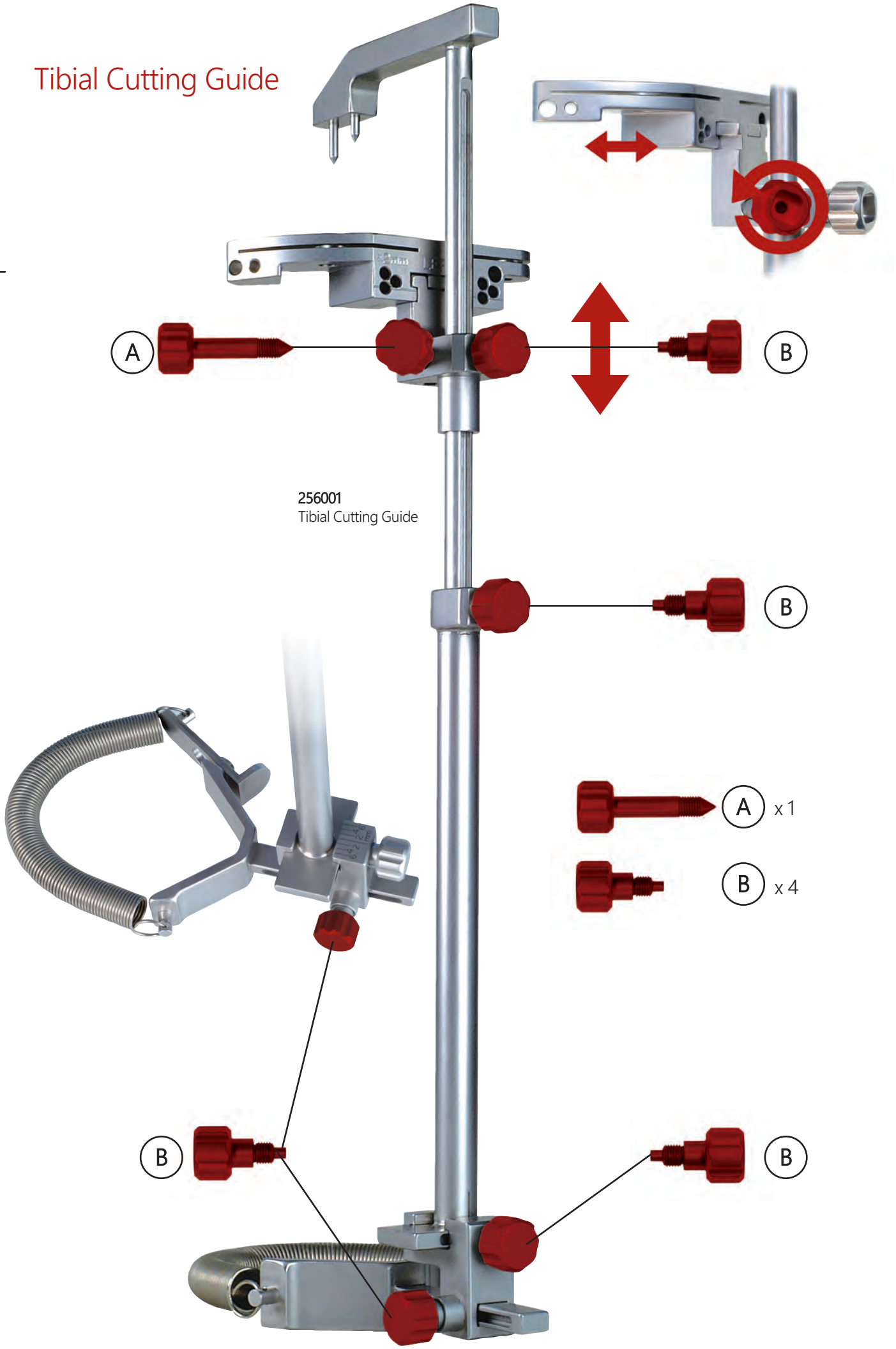
Final Seating

Assemble the Patella Pusher into the underside of the tube on the Patella Clamp. Turn the Insert until it engages and sits flush against the underside of the tube. Evert the patella once again, and with the plastic Pusher flush against the Patella Implant, squeeze firmly to fully seat the implant in the counterbored hole. Remove the Clamp.

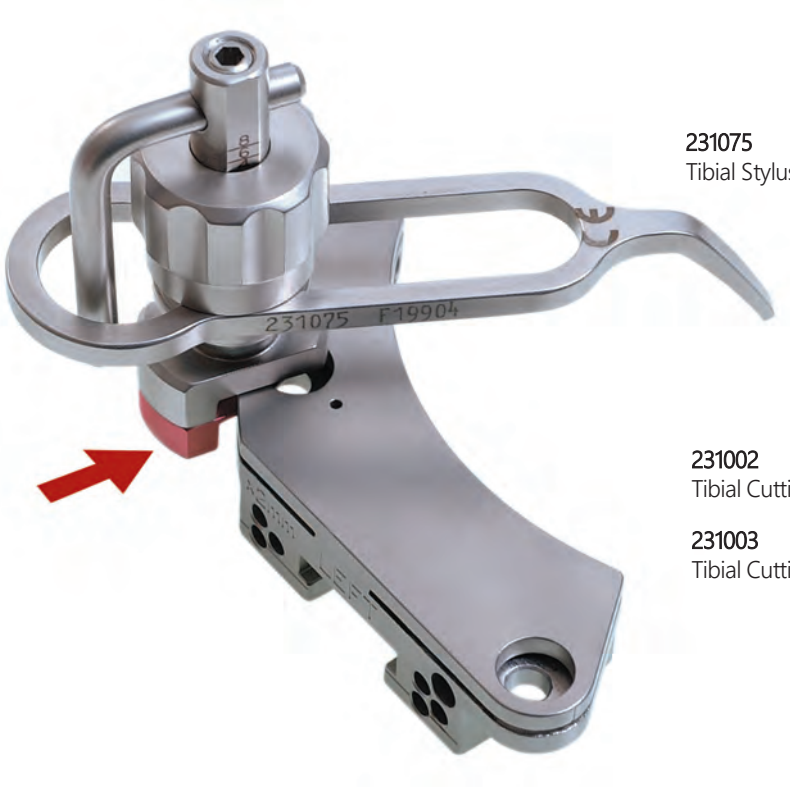
Please complete the follow up form which is included in the Tibia Metal Back Implant Box together with a set of record labels from the other implants used and return the form to MatOrtho.



Tibial Cutting Guide



256001
Tibial Cutting Guide

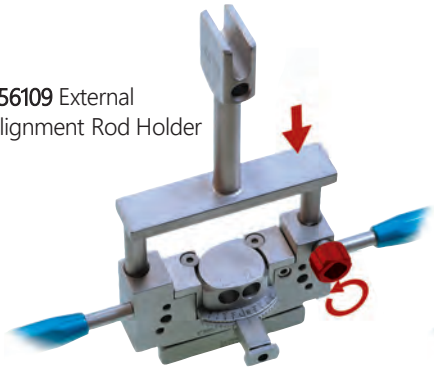


231075
Tibial Stylus

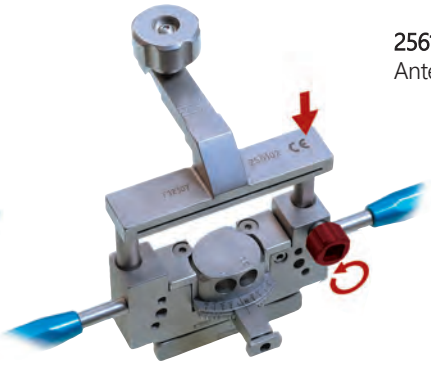
231002
Tibial Cutting Block Right

231003
Tibial Cutting Block Left

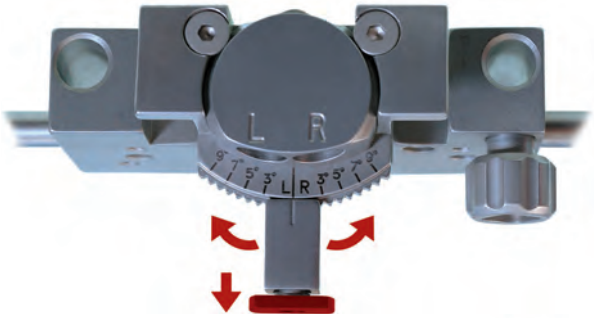
Femoral Alignment Jig

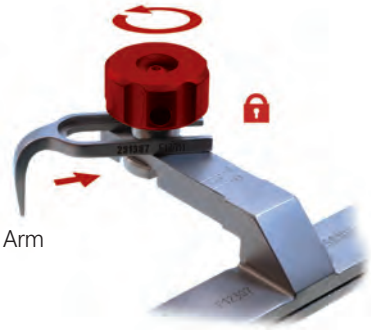


256109 External
Alignment Rod Holder

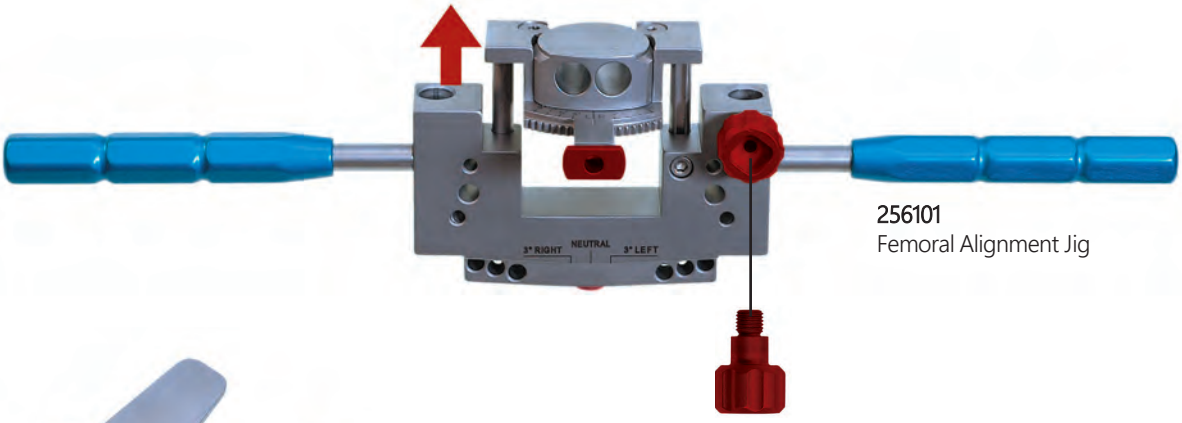


256102
Anterior Saw Slot

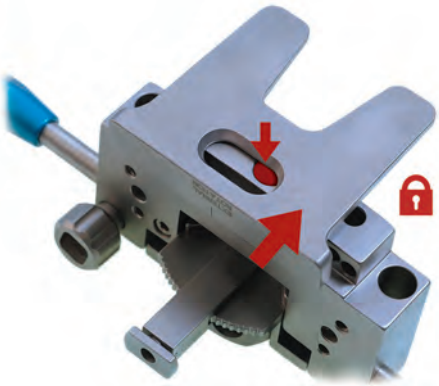


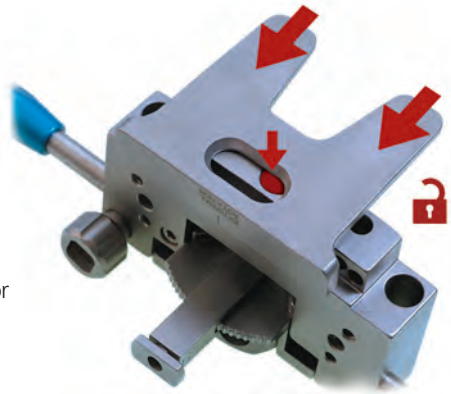


231387
Anterior Feeler Arm



256101
Femoral Alignment Jig





231104 Posterior
Footplate

231002
Tibial Cutting Block - Right

231003
Tibial Cutting Block - Left

231071
Tibial Re-Cutting Guide 0 Degree

231072
Tibial Re-Cutting Guide 2 Degree

231316
IM Awl

231075
Tibial Stylus

231302
Power Screw Pin Driver

231315
Knob Tightener

231311
Pins 50 mm (x6)

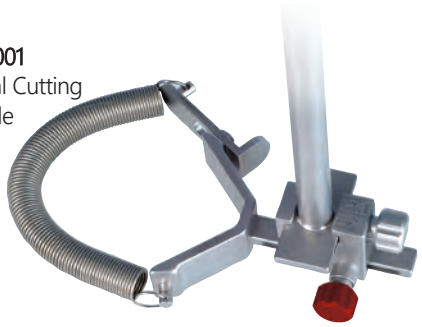
231313
Pins 70 mm (x6)

231317
Screw Pins 25 mm Long (x4)

231318
Screw Pins 45 mm Long (x4)

231340
Screw Pins Block

256001
Tibial Cutting Guide



231110
External Alignment Rod (2 Parts)

231301
Screw Pin Driver

231304
Pin Inserter/
Extractor

231107
IM Rod

231108
IM Rod Handle
(x2)

231106
IM Drill

231303
Jacobs / Hudson Adaptor

256132
Pin Drill

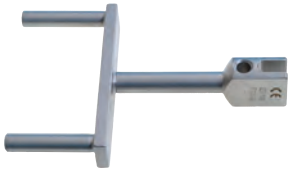
231387
Anterior Feeler Arm

231104 Posterior Footplate

256102
Anterior Saw Slot

231127
Multi-cut Block Top Plate

256105
Distal Block



256109
External Alignment Rod Holder

256133 Femoral Sizer {0-5}

256101
Femoral Alignment Jig

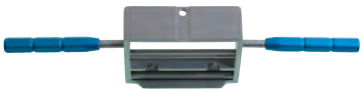
256120
Multi-cut Block Size 0

256121
Multi-cut Block Size 1

256122
Multi-cut Block Size 2

256123
Multi-cut Block Size 3

256124
Multi-cut Block Size 4



256125
Multi-cut Block Size 5

256160
Femoral Trial Left Size 0

256170
Femoral Trial Right Size 0

256161
Femoral Trial Left Size 1

256171
Femoral Trial Right Size 1

256162
Femoral Trial Left Size 2

256172
Femoral Trial Right Size 2

256163
Femoral Trial Left Size 3

256173
Femoral Trial Right Size 3

256164
Femoral Trial Left Size 4

256174
Femoral Trial Right Size 4

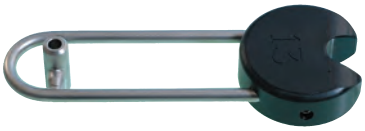
256165
Femoral Trial Left Size 5

256175
Femoral Trial Right Size 5

256136
Femoral Peg Drill

256320
Spacer 8 mm
Not available in the USA

256321
Spacer 10.5 mm



256322
Spacer 13 mm

256323
Spacer 15.5 mm

256324
Spacer 18 mm

256137
Femoral Impactor

231005
Extractor Hook

231132
Impaction Handle (x2)

256009
Tibial Impactor

256131 Femoral Introducer
Extractor

256331
Magic Spacer Leg
Alignment Rod

231133
Slide Hammer

256330
Magic Spacer

256031
Tibial Insert Trial Left 8 mm
Not available in the USA

256041
Tibial Insert Trial Right 8 mm
Not available in the USA

256032
Tibial Insert Trial Left 10.5 mm

256042
Tibial Insert Trial Right 10.5 mm

256033
Tibial Insert Trial Left 13 mm

256043
Tibial Insert Trial Right 13 mm

256034
Tibial Insert Trial Left 15.5 mm

256044
Tibial Insert Trial Right 15.5 mm

256035
Tibial Insert Trial Left 18 mm

256045
Tibial Insert Trial Right 18 mm

256021
Tibial Peg Drill Guide Size T1

256022
Tibial Peg Drill Guide Size T2

256023
Tibial Peg Drill Guide Size T3

256024
Tibial Peg Drill Guide Size T4

256025
Tibial Peg Drill Guide Size T5

256335
Tibial Assembly Clamp

256011
Tibial Guide Size T1

256012
Tibial Guide Size T2

256013
Tibial Guide Size T3

256014
Tibial Guide Size T4

256015
Tibial Guide Size T5

256005
Tibial Stem Drill 50 mm

256006
Tibial Stem Drill 80 mm

256007
Tibial Peg Drill

256010
Tibial Stem Drill Guide

256002
Tibial Plug (Large)

256003
Tibial Plug (Small) x2

256430
Patella Peg Drill

256431
Patella Ring Cutter 20 mm

256432
Patella Ring Cutter 25 mm

256435
Patella Ring Cutter 30 mm

256433
Patella Mill Cutter 20 mm

256434
Patella Mill Cutter 25 mm

256436
Patella Mill Cutter 30 mm

256451
Patella Clamp Insert 20 mm

256452
Patella Clamp Insert 25 mm

256453
Patella Clamp Insert 30 mm

256447
Patella Peg Drill Guide

256449
Patella Pusher

256531
Patella Trial 20 mm

256532
Patella Trial 25 mm

256233
Patella Trial 30 mm

256445
AP Patella Clamp

Additional Instruments for Stemmed Femurs

256140
Femoral Drill Guide Size 0 Left

256150
Femoral Drill Guide Size 0 Right

256141
Femoral Drill Guide Size 1 Left

256151
Femoral Drill Guide Size 1 Right

256142
Femoral Drill Guide Size 2 Left

256152
Femoral Drill Guide Size 2 Right

256143
Femoral Drill Guide Size 3 Left

256153
Femoral Drill Guide Size 3 Right

256144
Femoral Drill Guide Size 4 Left

256154
Femoral Drill Guide Size 4 Right

256145
Femoral Drill Guide Size 5 Left

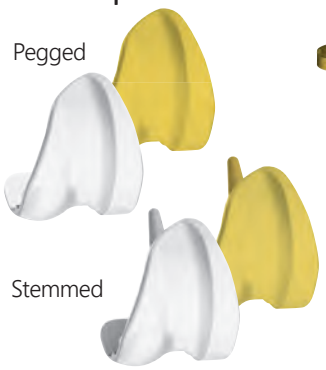
256155
Femoral Drill Guide Size 5 Right

256134 Femoral
Stem Drill

Femoral Component

Pegged

Stemmed



Tibial Component

Tibial Insert*

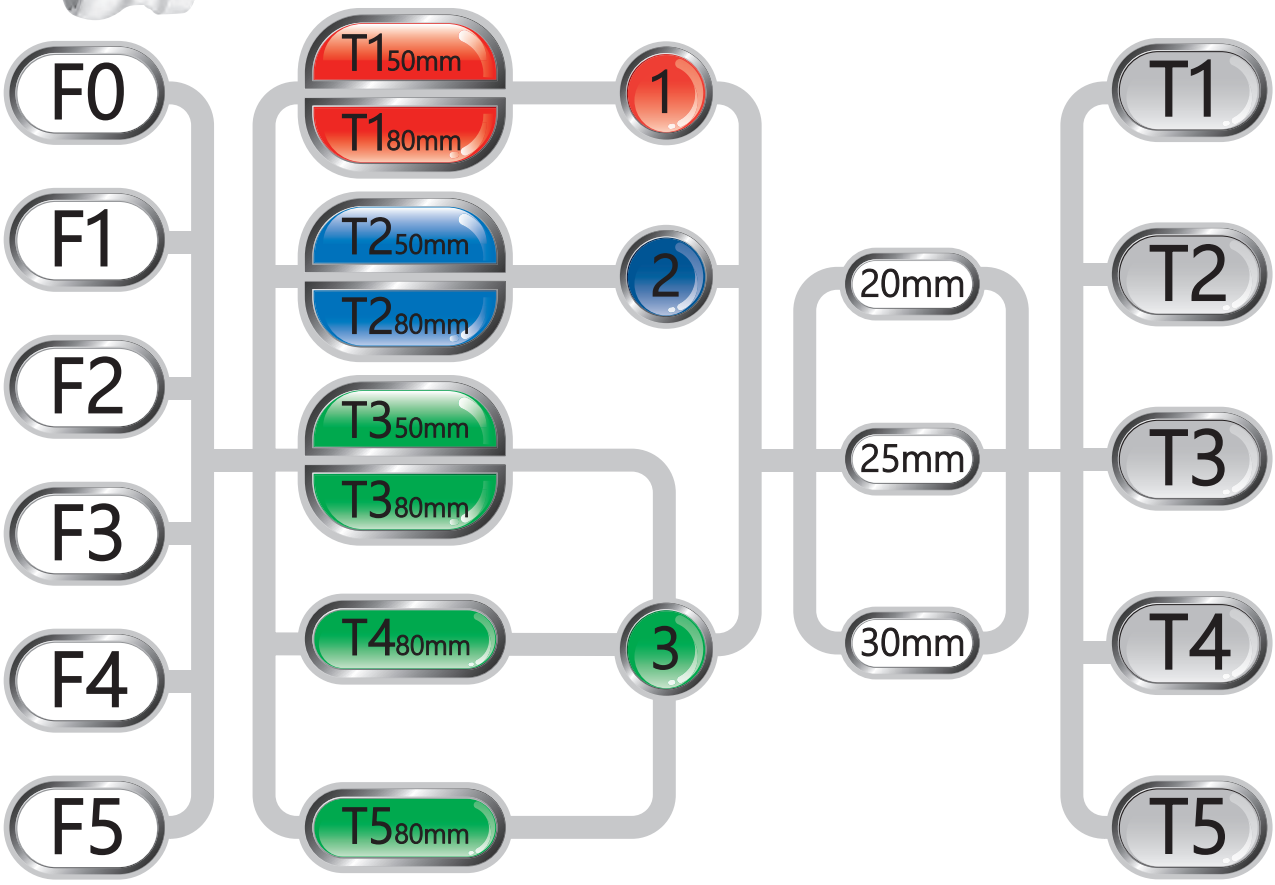
Size
8* | 10.5 | 13.0 |15.5 |18.0

*Not available in the USA.

Patella Button

All-Poly Tibia

Size
10.5 | 13.0 |15.5 |18.0



Notes

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CE 0088 FDA K020214 TGA Health Safety Regulation ARTG209657 ARTG209896 ARTG210017 ARTG210093 ARTG210094 ARTG210345 ARTG210346

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