

iBalance[®] TKA Total Knee Arthroplasty

Surgical Technique Guide



Accessing the Intramedullary Canal

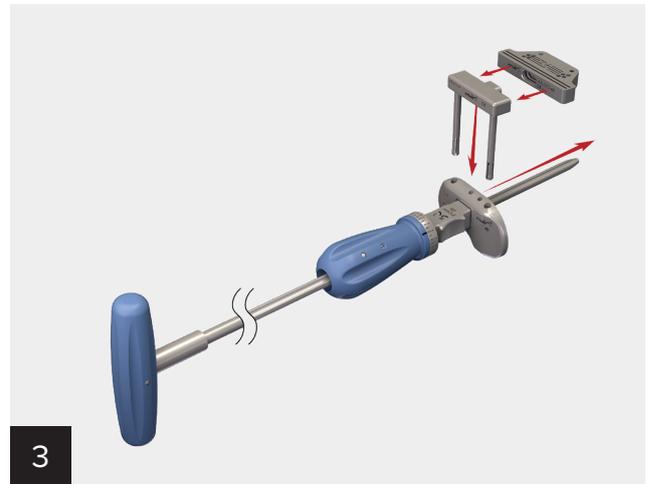


Flex the knee up to 90° and access the femoral canal using the 8 mm IM Drill. The entry point of the femoral canal is 5-10 mm anterior to the intercondylar notch. The drill has a 10 mm trailing diameter to dilate the access point. It is important to ensure the drill is aligned coaxial with the femoral canal to prevent damage to the femoral cortex and malalignment.

Setting and Placement of the Distal Femoral Alignment Guide



Set the Distal Femoral Alignment Guide to the desired valgus angle setting for the operative side. This is accomplished by twisting the blue handle until the hash mark lines up with the desired angle setting of the operative side. The typical setting is between 5° and 7°.



Assemble the Distal Femoral Cutting Block and Offset Tower, insert the Offset Tower into the Distal Femoral Alignment Guide and insert the Fluted Intramedullary Rod through the Distal Femoral Alignment Guide.



IM Drill
AR-613-41



Distal Femoral Alignment Guide
AR-613-42



Offset Tower
AR-613-43

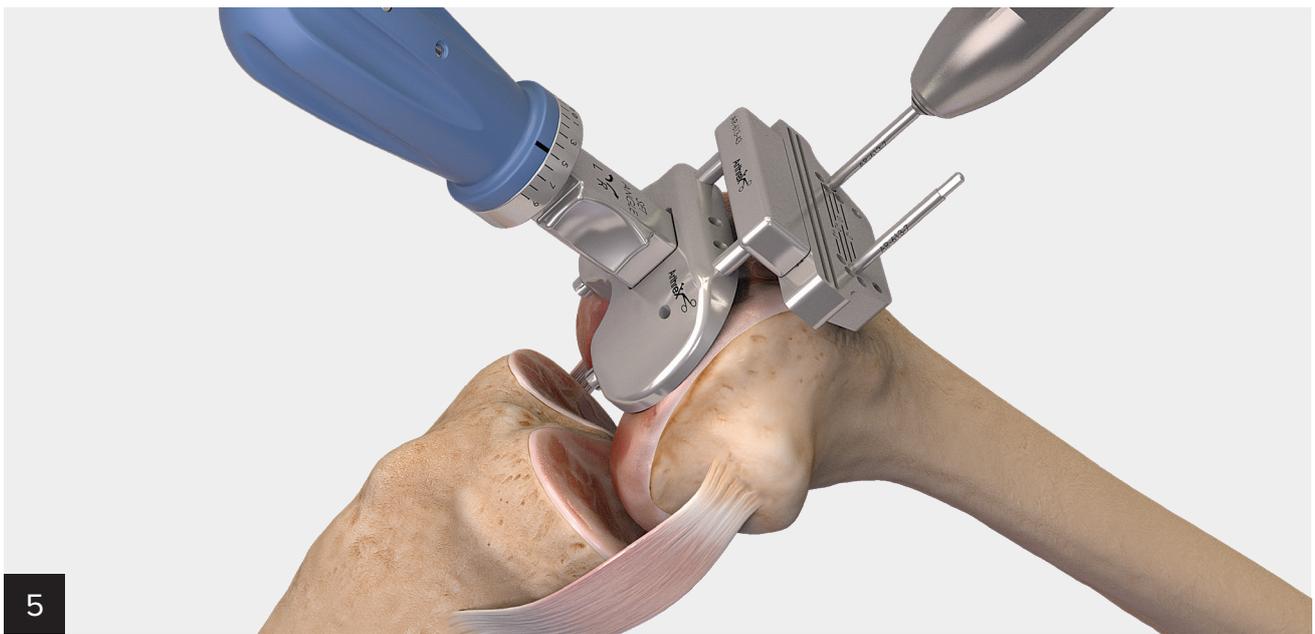


Distal Femoral Cutting Block
AR-613-44

Setting and Placement of the Distal Femoral Alignment Guide



Insert the Fluted Intramedullary Rod into the femoral canal. The Distal Femoral Alignment Guide should rest on the most prominent of the distal femoral condyles.



Using the Headless Pins, pin the cutting block into place through the holes marked "0".

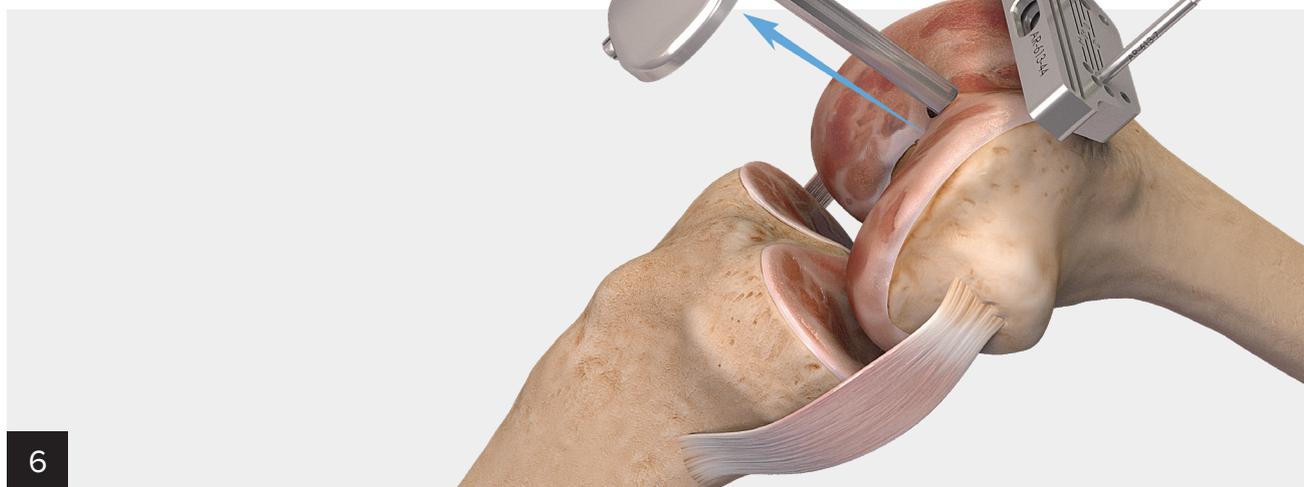


Modular T-Handle
AR-613-48



Fluted IM Rod
AR-613-45

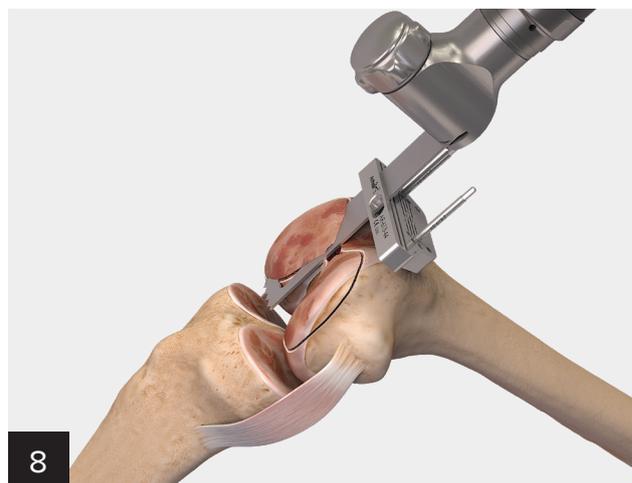
Distal Femoral Resection



Once the cutting block is pinned, remove the Intramedullary Rod and Distal Femoral Alignment Guide by pulling the assembly off the distal femur. The pinned cutting block will be retained.



The iBalance® TKA instrumentation is designed to resect 8 mm of distal femoral bone through the standard, “0” cutting slot. The resection level can be evaluated with an Angel Wing. If an adjustment is necessary, the resection can be made through the “+3” cutting slot to take off 3 mm of additional bone, or the block can be moved to the “-2” hole to take 2 mm less or to the “+2” or “+4” holes to take off 2 mm or 4 mm of additional bone.



Once the resection level is determined to be appropriate, a cross pin may be added for additional stability. Make the cut through the cutting slot using a sagittal saw blade.

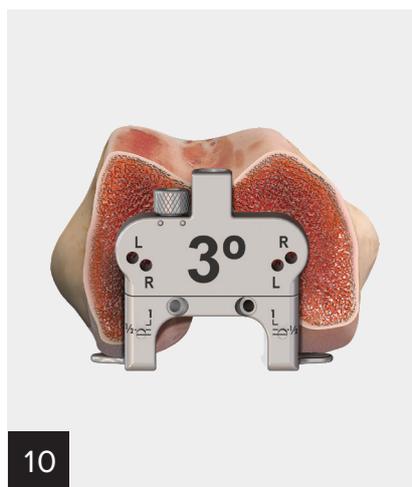
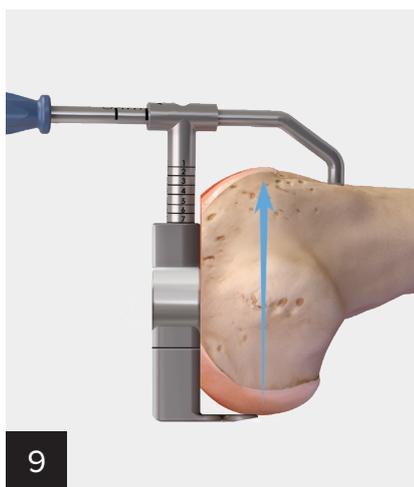


Headless Pin
AR-613-7



Angel Wing
AR-613-76

Femoral Sizing

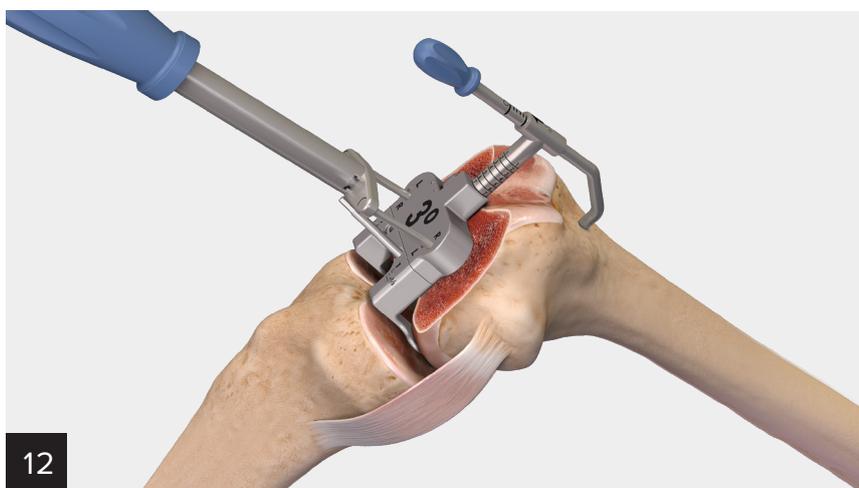


Posterior Referencing Rationale

The term “posterior referencing” describes the femur being sized from the “posterior up” with 8 mm of bone being resected from the posterior condyles, matching the posterior thickness of the iBalance® TKA femoral components.

There are two posterior referencing Femoral Sizers in the iBalance TKA instrumentation—a fixed external-rotation 3° Femoral Sizer and an axis-matching Femoral Sizer, which allows for matching the transepicondylar axis, setting external rotation of the femoral component from 0°-7°.

Place the chosen posterior referencing Femoral Sizer on the resected distal femur and ensure that it is sitting flush. In order to ensure correct A/P sizing of the femoral component, the posterior feet of the sizer must rest on the tangent point of the posterior femoral condyles. Once the sizer is positioned correctly relative to the posterior aspect of the femur, a fixation pin may be placed to provisionally fix the sizer to the femur while the A/P size is determined. Place the Femoral Sizing Stylus on the trochlear region and determine the femoral size on the sizing scale.



Note: To size the femur appropriately, the tip of the stylus should sit in the deep sulcus of the anterior cortex at the point where the saw blade will exit. This point can be approximated using the graduated scale on the shaft of the stylus.

Once the A/P size of the femur is determined, if using the fixed 3° sizer, punch the holes that correspond to the operative limb, either left or right, with the Dual-Spiked Punch. If using the axis-matching Femoral Sizer, set the external rotation by dialing the adjustment knob with the included Hex Driver and punch the holes.

Note: If the femur is measured as in-between two femoral component sizes, refer to instructions on page 5 on how to proceed.



Dual-Spiked Punch
AR-613-65

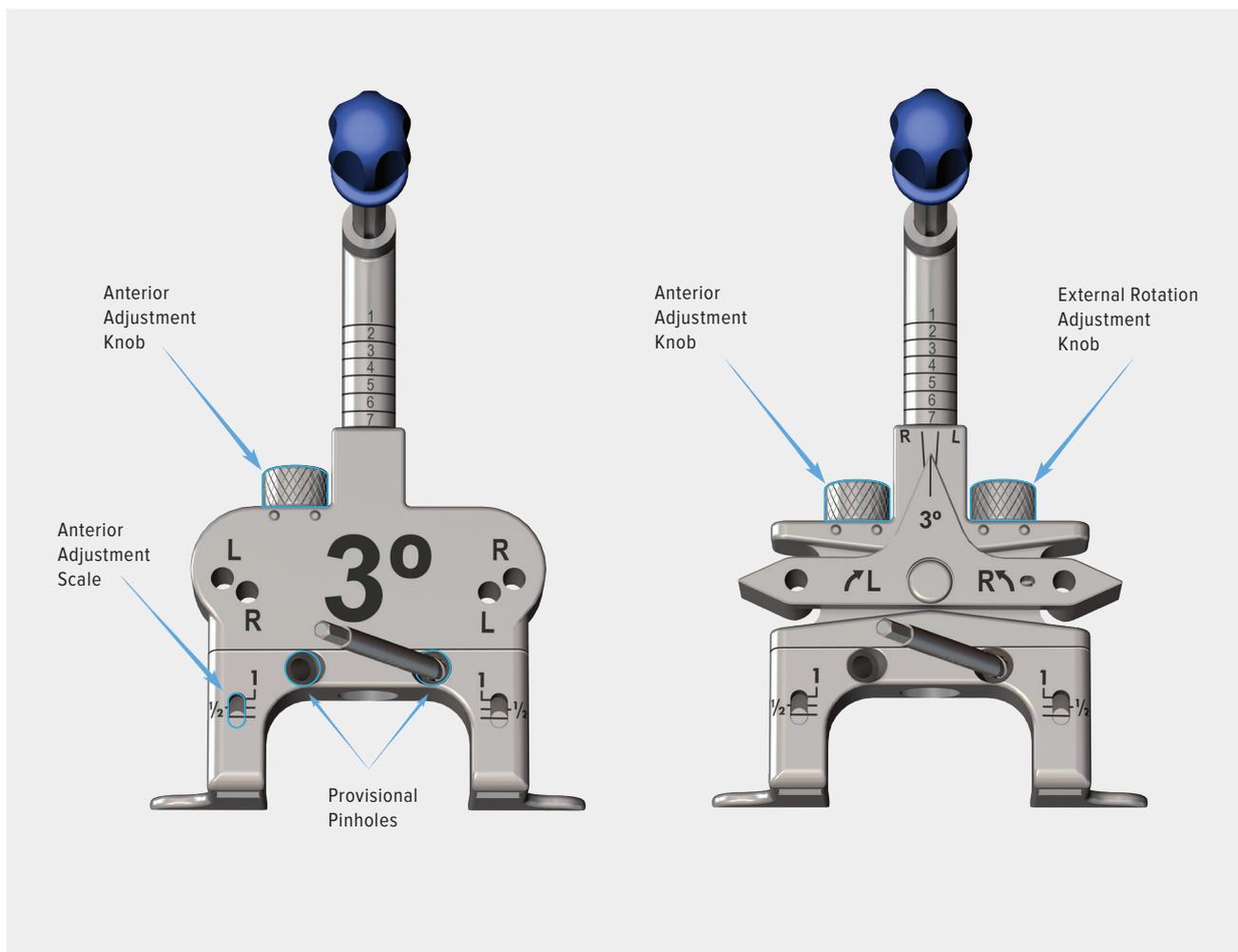


Hex Driver
AR-605-8



Femoral Sizing Stylus
AR-613-24

Femoral Sizing



Note: If the Femoral Sizer indicates the size is in between two femoral component sizes, there are three choices on how to proceed:

1. **Choose the larger size of the two.** Choosing to upsize will decrease the amount of anterior bone that will be resected and could lead to overstuffing of the patella.
2. **Choose the smaller size of the two.** Choosing to downsize will increase the amount of anterior bone being resected and could lead to notching of the anterior femoral cortex.
3. **Choose the smaller size of the two and split the difference.** It is also possible to “split the difference” by choosing the smaller femoral size and shifting its position a half size (1.3 mm) anterior. This option will increase the amount of bone resected from the posterior condyles by 1.3 mm and decrease the amount of bone resected from the anterior cortex by 1.3 mm. The anterior adjustment is made by dialing the adjustment knob with the included Hex Driver.



3° Femoral Sizer
AR-623-61



0-7° Femoral Sizer
AR-623-63

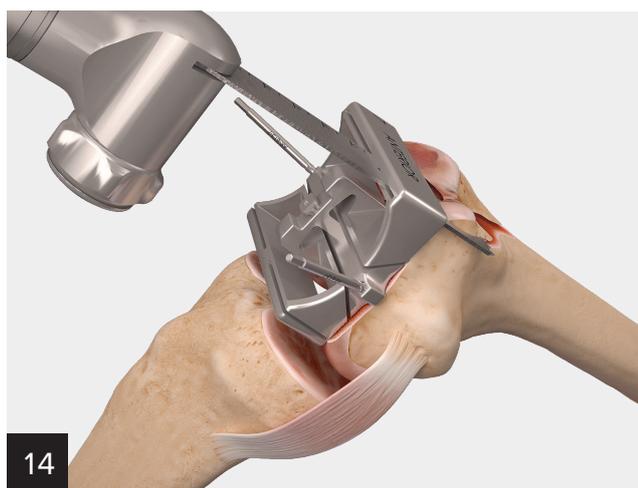


Hex Driver
AR-605-8

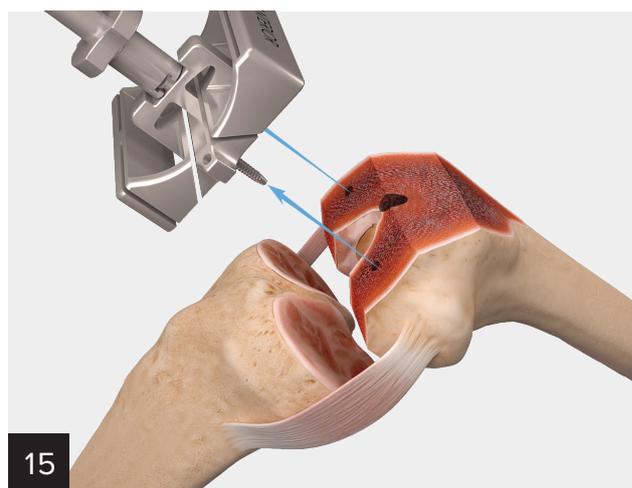
Femoral Preparation



Place the four-in-one Femoral Cutting Block that matches the measured size on the distal femur, inserting the pegs on the block into the two holes that were created in the last step. Take care to position the block with the side marked “Anterior” oriented with the anterior femur. Once the block is fully seated, if necessary, use the Angel Wing to predict the amount of bone to be resected.



Pin the block in place with threaded pins to secure it if necessary. Make the anterior, posterior and both chamfer cuts through the cutting slots on the block using a 1.27 mm sagittal saw.



Once the resection is complete, if pins were used to secure the block, remove the pins. Remove the block from the femur by attaching the Slap Hammer to the attachment point on the face of the block.



Femoral Cutting Block
AR-623-51-60



Angel Wing
AR-613-76



Slap Hammer
AR-613-99

Posterior Stabilized Notch Preparation



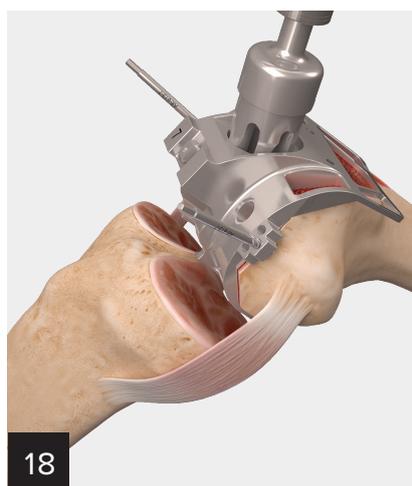
16

If a posterior stabilized total knee is being performed, the next step is to prepare the notch to accept the PS femoral implant. Choose the Femoral Notch Prep Guide that matches the size of the femoral component chosen and impact it onto the femur, making sure that the block is sitting flush against the planar resections made in the last step.



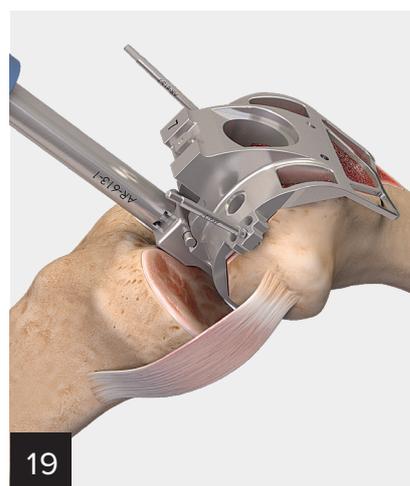
17

The anterior portion of the guide is marked to represent the trochlear region of both a left and right femoral component. Use this as a reference to ensure proper medial/lateral positioning of the guide, as this will drive the final position of the femoral implant.



18

Once the guide is properly positioned, pin it into place. Use the Femoral Notch Reamer to prepare the notch by placing it into the capture on the block and reaming the femur until the depth stop on the reamer sits flush on the guide.



19

Impact the Posterior Notch Chisel fully into the slot on the block to finish the notch prep.



Femoral Notch Prep Guide
AR-613-102 – 108



Femoral Notch Reamer
AR-603-73



Posterior Notch Chisel
AR-613-69

Posterior Stabilized Notch Preparation



There is an option to drill the femoral lugs at this point in the technique or wait until the femoral trial is placed and drill them through the trial. Once the notch has been punched, remove the pins holding the Femoral Notch Prep Guide in place and use the Slap Hammer to remove the notch prep guide from the femur.

Tibial Preparation

The iBalance® TKA instruments include options for resecting the tibia using **extramedullary** or **intramedullary** guidance.

Extramedullary

Assemble the extramedullary tibial guide as shown.



Ankle Clamp
AR-623-33



Tibial Cutting Block
AR-623-94L



Tibial Preparation

21

Place the guide on the lower leg and adjust the overall working length of the guide and the varus/valgus position to match the long axis of the tibia, with the distal aspect of the guide aiming in between the 2nd and 3rd metatarsals. Set the slope to either neutral–3° of posterior slope, if a PS knee is being performed, or to match the patient’s native slope, if a CR knee is being performed.



Working Length



Varus/Valgus



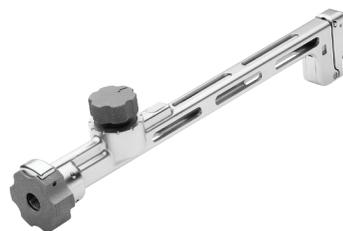
Alignment with the long axis
of the tibia



Posterior Slope

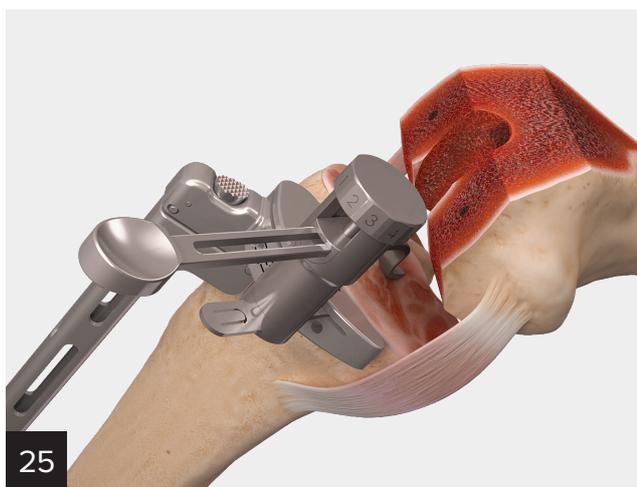


Short Distal Body
AR-623-31

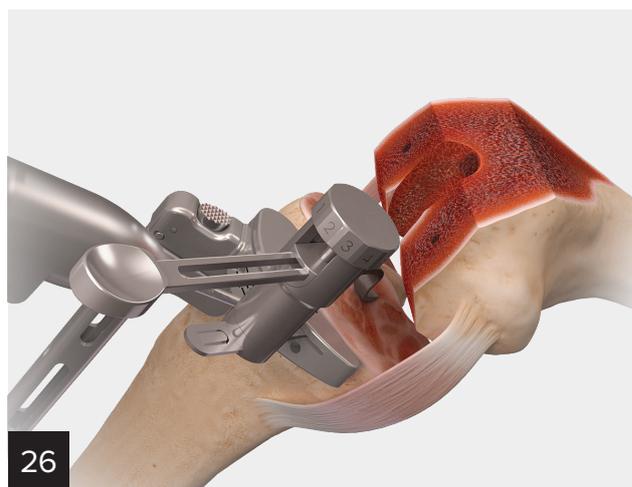


Proximal Body
AR-623-30

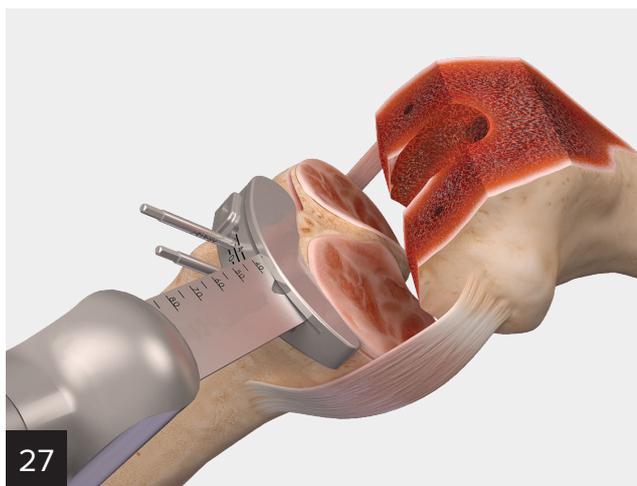
Tibial Preparation



Use the Tibial Stylus to determine the depth of tibial resection by dialing in the desired resection depth (0 mm - 10 mm). Place the stylus on the respective tibial plateau and drop the cutting block down until the tip of the stylus makes contact with the bone.

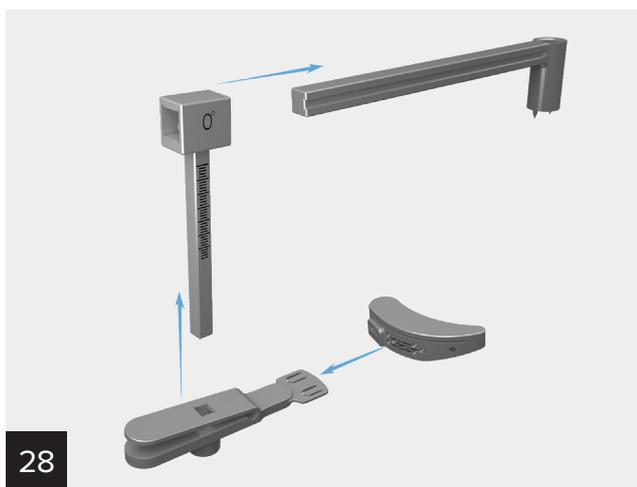


Pin the Tibial Cutting Block in place in the "0" holes.



Make the tibial resection using a sagittal saw blade. If additional bone resection is required, the block can be moved into the "2" or "4" sets of holes to remove an additional 2 mm or 4 mm of bone from the initial resection level.

Tibial Preparation



28

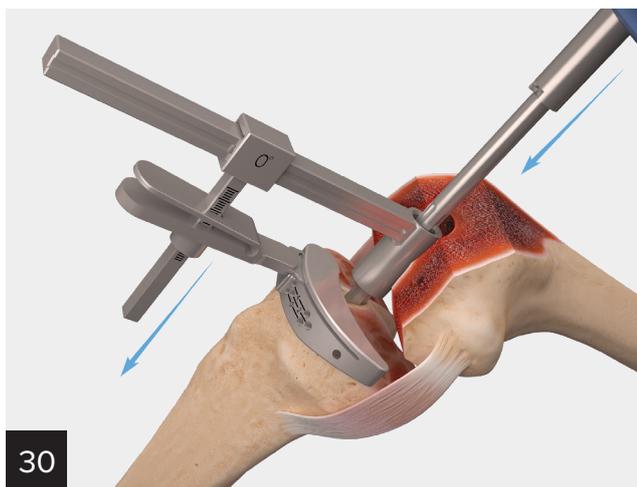
Intramedullary

Assemble the Intramedullary Guide as shown. There are 0°, 3° and 5° posterior slope options.



29

Access the tibial canal with the IM Drill, taking care to aim centrally down into the medullary canal of the tibia.



30

The Tibial Cutting Block is attached to the IM Alignment Guide. Load the assembled IM Alignment Guide onto the IM rod and insert it into the tibia.



31

Set the depth of resection using the Tibial Stylus, dialing in the desired amount of resection (0 mm-10 mm).



IM Drill
AR-613-41

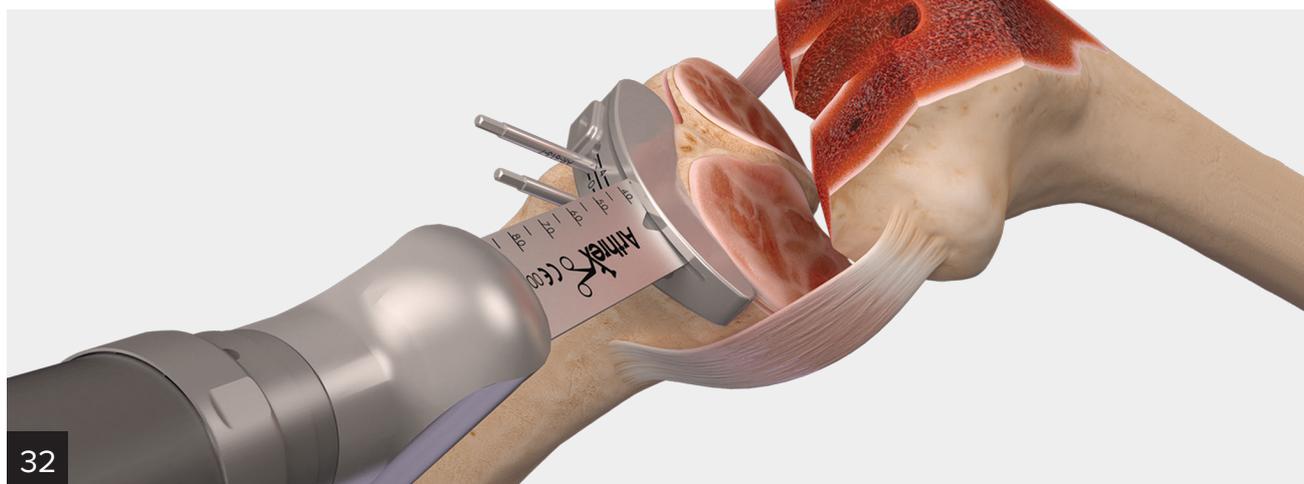


IM Alignment Guide
AR-613-10



IM Tibial Adapter
AR-613-11

Tibial Preparation



32

Pin the block, remove the IM Rod from the tibia and disassemble the IM Tibial Guide from the Tibial Cutting Block. Resect the tibia using a sagittal saw.

Gap Analysis Using Spacer Blocks



33a



33b

The soft tissue balance of the knee in flexion and extension can be evaluated using the Spacer Blocks. Each Spacer Block represents the overall implant thickness of the construct using the polyethylene thickness noted on the respective Spacer Block.



Quick Connect Handle
AR-613-8



Spacer Block
AR-613-33 – 38



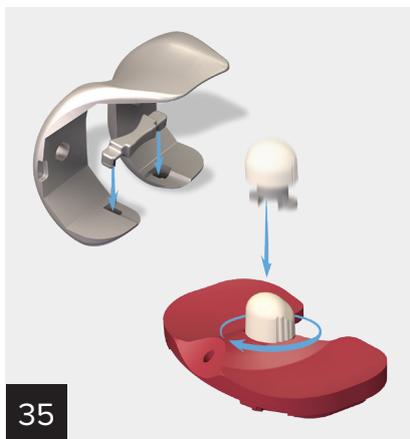
Femoral Trial
AR-613-1L and 1R – 10L and 10R

Trialing

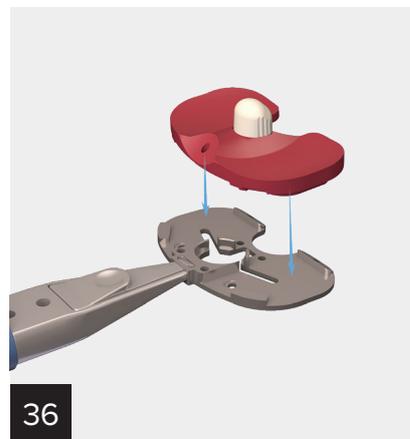
After the tibial resection is made and any soft tissue balancing of the knee is accomplished, a trial step may be performed to assess proper fit of the components and balancing of the knee.



34
Insert and impact the chosen femoral trial first.



35
If a PS knee is being implanted, assemble the PS Modular Crossbar to the femoral trial and the trial bearing post to the Tibial Bearing Trial.



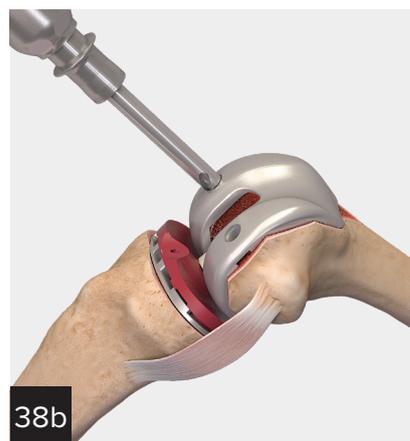
36
Attach the Tibial Baseplate Trial to the handle and assemble the chosen Tibial Bearing Trial.



37
Insert the tibial assembly into the knee and assess the stability of the knee and the fit of the implants.



38a
If doing a CR knee or, if the drilling was not completed during the notch prep step (see page 7), drill the lugholes through the holes on the femoral trial using the 8 mm Femoral Peg Drill.



PS Modular Crossbar
AR-613-74



Femoral Peg Drill
AR-613-70

Final Tibial Sizing and Keel Prep



39 The tibial components in the iBalance® TKA system are compatible 2 sizes up and 2 sizes down in relation to the chosen femoral component.



40 Once proper coverage of the tibial implant has been verified, place the Tibial Baseplate Trial on the tibia and position it in the desired rotational orientation. Pin the baseplate in place with 1" Double Headed Pins.

Gap Analysis Using Spacer Blocks



41 Assemble the Modular Keel Punch that corresponds to the chosen tibial baseplate size to the Universal Handle and punch the tibia.

Note: An optional Tibial Post Drill is included in the set as well, if needed to predrill the tibia in cases with sclerotic tibial bone. The punch should be impacted until fully seated.



42 The Universal Handle can be removed, and the Modular Keel Punch retained in the tibia to simulate a keeled tibial implant. To accomplish this, with the keel punch fully seated, slide the Universal Handle anteriorly. The Modular Keel Punch will be retained in the tibial baseplate.

If a keeled trial is not required, the modular Tibial Keel Punch and Universal Handle should be removed by disimpacting the handle and removing the keel punch and handle as one piece.



Patella Calipers
AR-602-48

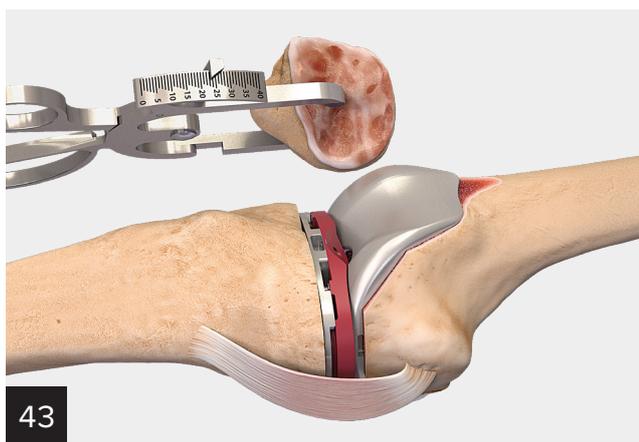


Universal Handle
AR-613-1



Double Headed Pin
AR-603-7

Patellar Preparation



43

The patellar thickness is evaluated using the Patella Calipers. The iBalance® patellar implants vary in thickness based on the diameter as shown in the chart.

iBalance Patellar Implants

Size	Thickness
27 mm	8 mm
30 mm	8 mm
34 mm	9 mm
37 mm	10 mm
40 mm	10 mm



44

Prepare the patella by resecting the articular surface of the patella using a sagittal saw. The amount of patellar bone that is resected should be approximately the same as the thickness of the patellar implant to avoid over stuffing of the patellofemoral joint. Once the patellar bone has been resected, use the Patella Calipers to measure the amount of residual patella and calculate the amount of bone resected.



45

Place the Patellar Drill Guide that matches the chosen implant diameter on the resected patella and drill the peg holes with the Patellar Peg Drill.



46

Place the selected Patellar Trial onto the patella to evaluate coverage.



Patellar Drill Guides
AR-602-44 – 49



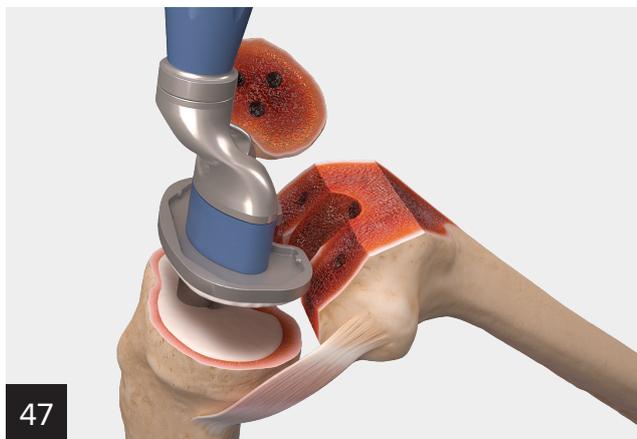
Multi-Use Patella Tool
AR-613-93



Patella Trials
AR-603-77, -79, -81, -83, -84

Implantation

After all of the trial components are removed, standard pulse lavage procedures should be carried out to clean the bony surfaces of the knee.



The Tibial Component is implanted first. Coat the backside of the implant, the exposed tibial bone surface and, if desired, the metaphyseal region of the tibia prepared with the keel punch, with a thin coat of methyl methacrylate bone cement. Seat the implant using the Tibial Impactor.



The Femoral Component is implanted next. Coat the backside of the implant and the exposed femoral bone with a thin layer of bone cement and impact the femoral component into place using the Femoral Impactor.

Gap Analysis Using Spacer Blocks



A tibial insert trial is placed into the Tibial Component, the knee is reduced and brought into full extension, while the bone cement cures.



The patellar component is implanted. Apply a thin layer of bone cement to the bone side of the patellar component and the exposed patellar bone. Attach the patellar cement clamp to the Multi-Use Patella Tool and compress the patella for secure adhesion of the component.



Tibial Impactor
AR-623-36



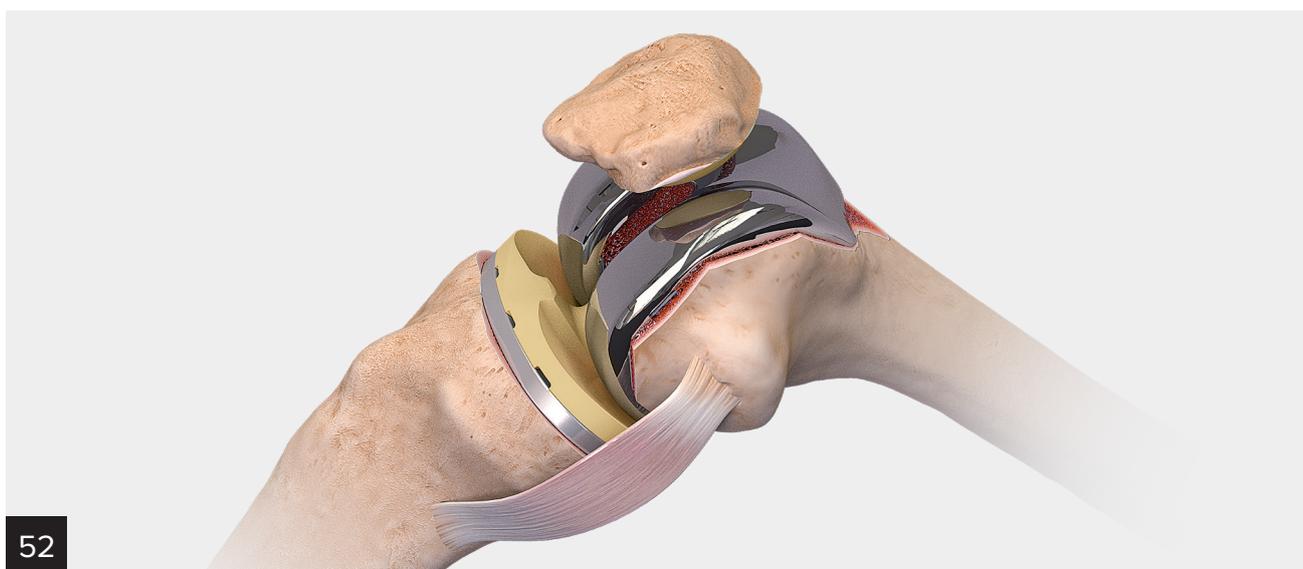
Patella O-Ring Cement Clamp Attachment
AR-613-95



Locking Femoral Impactor
AR-613-49

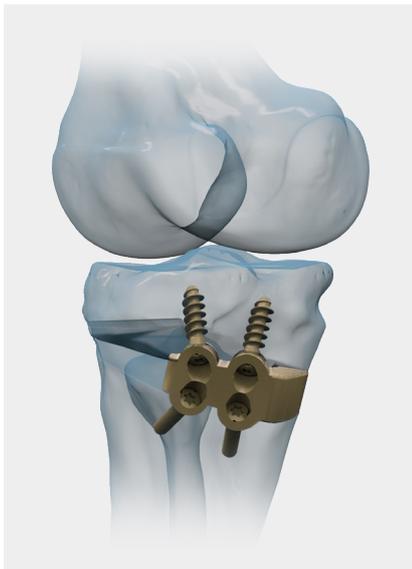


Once the bone cement has hardened, cycle the knee through the range-of-motion and evaluate the joint tension and balance. Choose the thickness of the polyethylene insert based on the fit of the trials.

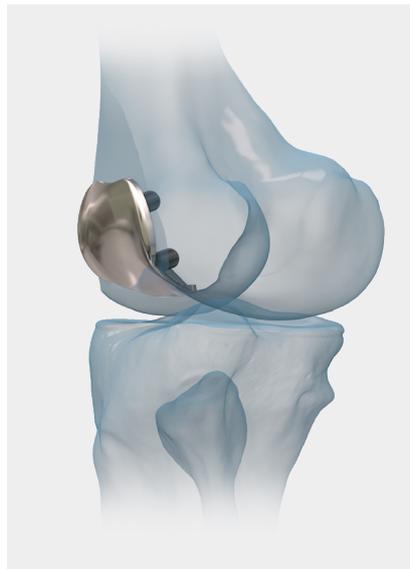


Once the final insert thickness is chosen, the final polyethylene tibial insert is implanted. Place the insert into the Tibial Baseplate, engaging the posterior aspect of the baseplate first. The anterior aspect of the insert is then snapped into place.

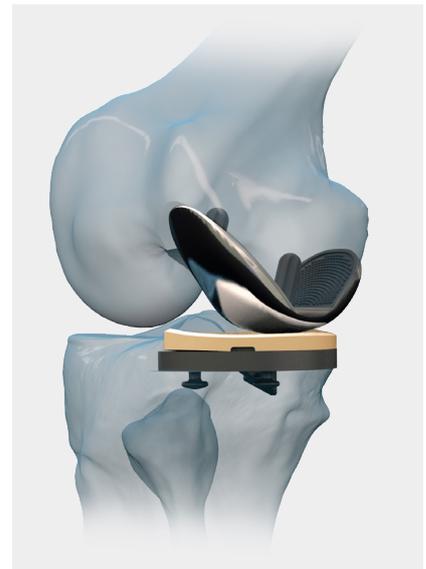
Other Systems in the iBalance Family



High Tibial Opening
Wedge Osteotomy



Patellofemoral Joint Arthroplasty



Unicondylar Knee Arthroplasty

Literature available for the iBalance Family

Product Description	Item Number
iBalance HTO System Brochure	LB1-0124-EN
iBalance HTO System Surgical Instrument Assembly Guide	LB1-0122-EN
iBalance HTO System Surgical Technique	LT1-0122-EN
iBalance UKA System Brochure	LB1-00054-EN
iBalance UKA System Surgical Technique	LT1-00017-EN
iBalance UKA with Concomitant GraftLink Surgical Technique	LT1-0003-EN
iBalance PFJ System Brochure	LB1-0162-EN
iBalance PFJ System Surgical Technique	LT1-0162-EN
iBalance TKA System Brochure	LB1-0007-EN
iBalance TKA Stems and Augments Surgical Technique	LT1-00022-EN
iBalance TKA Flexion/Extension Gap Balancing Chart	LR1-0007-EN
iBalance TKA Implant Sizing Compatibility Matrix Chart	LR1-0017-EN
iBalance TKA Technical Monograph	LR1-0018-EN
A Patient's Guide to Partial Knee Resurfacing Brochure	LB1-00030-EN
A Patient's Guide to Total Knee Resurfacing	LB1-00018-EN

For more references, go to www.arthrex.com.



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