



Surgical Technique
Mobile Bearing Knee System*

*Product not available in the United States

INDICATIONS AND USAGE

The CONSENSUS[®] MBK KNEE SYSTEM is designed as a system and is only intended to be used with compatible femoral and patellar components of the CONSENSUS[®] KNEE SYSTEM. THE MBKTIBIAL COMPONENTS ARE INTENDED FOR CEMENTED USE ONLY.

The indications for use are:

- A. Primary intervention of rheumatoid arthritis, osteoarthritis, traumatic arthritis, polyarthritis, collagen disorders, and/or avascular necrosis of the femoral condyle.
- B. Post-traumatic loss of joint configuration (particularly when there is patellofemoral erosion, dysfunction, or prior patellectomy)
- C. Failed osteotomy or unicompartmental replacements.
- D. Replacement of unsatisfactory cemented or press-fit knee components when sufficient bone stock exists.
- E. The salvage of previously failed surgical attempts if the knee can be satisfactorily balanced and stabilized at the time of surgery
- F. Moderate valgus, varus, or flexion deformities

Mobile Bearing Knee

Surgical Technique

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Design Rationale

The Consensus® Mobile Bearing Knee (MBK) is designed to build upon the success of the Consensus® Total Knee System; a very successful total knee system designed to restore near normal anatomy, alignment and kinematics. The Consensus® MBK offers the enhanced properties of dual-surface articulation to potentially reduce wear and early loosening due to implant constraints. The Consensus® MBK ensures congruent contact of the femoral and tibial implants throughout the range of motion and allows axial rotation to occur at the knee. The Consensus® MBK surgical technique and instrumentation are designed to ensure bone resections are followed by equal amounts of prosthetic replacement; restoring the anatomic joint-line and proper knee kinematics (Figure 1).

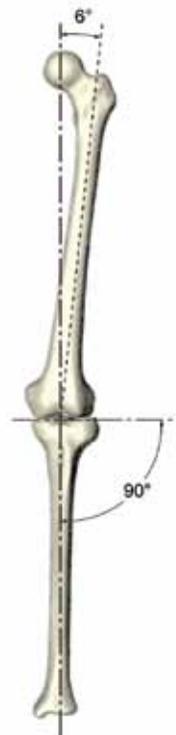


Figure 1

The Consensus® MBK utilizes the Consensus® Knee System Femoral Components (see Table 1 for size compatibility) and incorporates a reduced lateral profile, a deep patella groove and CoCr articulating surfaces for durability.

	Size Compatibility			
Tibial Insert	0	1/2	3/4	5/6
Femoral Component	1, 2, 3	1, 2, 3	2, 3, 4, 5	4, 5, 6

Table 1

The Consensus® MBK Tibial Implant is asymmetrical for optimal anatomical coverage. The Tibial Stem is offset medially to support medial loads and avoid impingement on the lateral cortex. The Tibial Stem is also positioned anteriorly and contoured to avoid impingement on the posterior cortex.

The Consensus® MBK Tibial Implant offers a highly polished tibial tray and post that reduces wear and offers a secure insert-to-femoral articulation. The Consensus® MBK uses PCL Substituting Inserts for enhanced A/P stabilization.

The Consensus® MBK utilizes the Consensus® Knee System Patellas, which are available in both an oval and round design to accommodate surgeon preferences.

Femoral and Patellar components from other manufacturers should not be used with the Consensus® MBK System.

The surgical technique for the Consensus® MBK is designed to assist surgeons in making reproducible bone resections and soft tissue balancing which ensures successful results in this dual-articulation system.

Please read the Consensus® MBK Instruction For Use supplied with the product for indications, contraindications, precautions, adverse effects and patient counseling information.

Consensus® MBK components are designed to be compatible with Consensus® Knee instrumentation.

Surgical Approach

The preferred anterior approaches to the knee are represented in Figure 2. After entering the synovium, elevating a subperiosteal flap off the medial plane of the tibia, and freeing the patellar tendon, the knee is maximally flexed. The medial capsule is released to the posteromedial corner to allow subluxation of the tibia anterior to the femur. This will allow complete visualization of the proximal tibia.

All osteophytes are removed from the distal femur to expose the true shape of the condylar surfaces. At this point, the meniscal remnants and the anterior and posterior cruciates should be removed to improve exposure and instrumentation access throughout the case. Additional ligament releases may be necessary for alignment correction or exposure.

Both standard and reduced incision approaches are complemented by our instrument systems. These lower-profile and medial-oriented instruments provide accurate resections and reproducible cuts for either technique.

The Consensus[®] MBK requires attention to soft tissue balance and flexion-extension gap equality. Incision size should never limit appropriate implant position or alignment, or soft tissue balance.

As in all total knee techniques, a primary goal is to achieve balanced flexion and extension gaps. An additional objective is to provide equal medial and lateral soft tissue balance. These goals can assure consistent contact between the mobile bearing insert and femoral component and also prevent insert dislocation or subluxation.

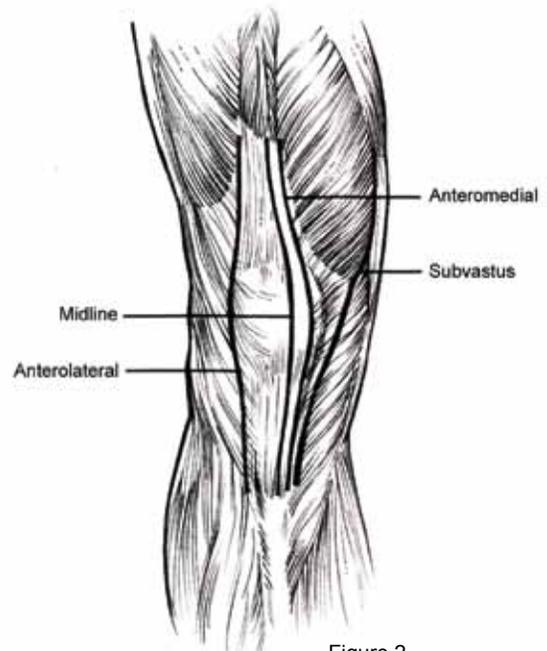


Figure 2

Tibial Preparation

The **Tibial Alignment Guide** can be used as an extramedullary or intramedullary guide. In either mode, the **Tibial Cutting Block** is preassembled to the proximal **Tibial Alignment Guide** which should be dialed to its most proximal position. The technique chosen is based on surgeon preference. Once the alignment guide is set, either extramedullary or intramedullary, then the alignment guide procedure is the same.

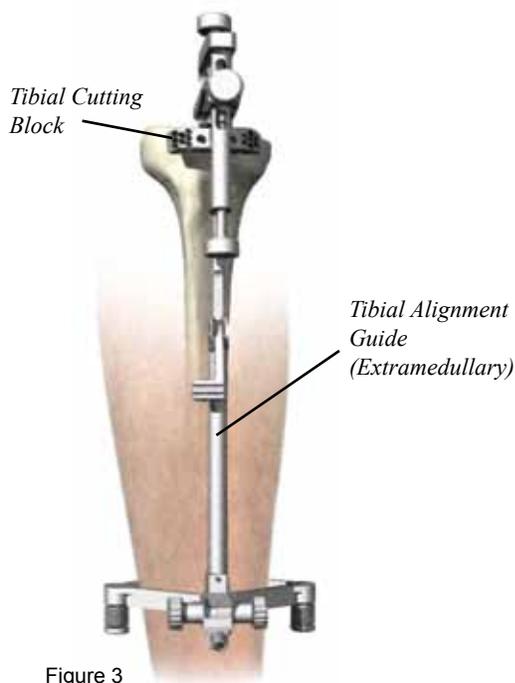


Figure 3

Extramedullary Alignment Guide

The spines of the proximal tibia can be removed with a saw to allow accurate placement of the guide. Resect the spines level with the tibial plateau making a gross cut with the saw. The posterior pin on the proximal guide is impacted into the center of the tibial plateau. The ankle cradle is then opened and allowed to engage the tibia and fibula just above the malleoli. The adjustable shaft seeks the proper length when its lever is in the up position. When the desired length is established, the shaft is locked in place by pushing the lever down.

The guide shaft is then adjusted to the interval between the tibialis anterior and exterior digitorum longus (center of the talus) at the ankle by dialing either of the knobs on the distal portion of the ankle cradle (Figure 3).

Intramedullary Alignment Guide

The intramedullary technique uses the 8mm fluted **Intramedullary Rod (I.M. Rod)** and **T-handle** passing through the proximal portion of the **Tibial Alignment Guide** (Figure 4). A reference hole is drilled with the 8mm drill bit referencing the tibial spine and between the middle and anterior one-third of the tibial plateau. It is critical that the drill hole not be placed in the center, as the **Tibial Alignment Guide** will impinge into the patellar tendon (Figure 5). The assembled **I.M. Rod** and **Tibial Alignment Guide** is then slowly introduced into the medullary canal and the assembly is positioned on the proximal tibia. The **T-handle** can be removed from the **I.M. Rod** if needed.

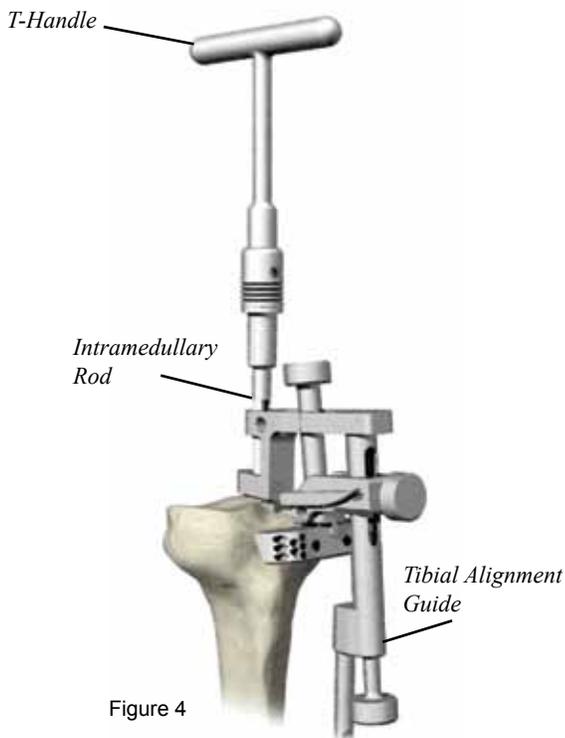


Figure 4

After placement of the **Tibial Alignment Guide** by either extramedullary or intramedullary methods, the tibial alignment guide technique then continues the same for each.

Tibial Alignment Guide Technique

Rotation

Position the alignment guide just medial of the tibial tuberosity and impact the stabilizing pins.

Note: For the intramedullary technique, the alignment guide can be rotated as desired.

Posterior Slope

The **Stylus** “pin” is placed into the hole on the superior surface of the **Cutting Block** that corresponds with the least defective side. The tip of the **Stylus** marked “slope” references the posterior slope of the tibial plateau. The thumb screw marked “slope” is then adjusted until the foot of the **Stylus** is parallel to the proximal tibial plateau. It is easiest to dial down from an elevated position superior to the tibia replicating slope (Figure 6). Under most circumstances this should be approximately 7° posterior slope.

Level of Resection

The **Stylus** is then picked up and rotated 180° so that the end marked “depth” is positioned over the least involved, or most normal non-deficient, portion of the tibial plateau. The **Stylus** is then lowered by turning the thumbscrew marked “depth” until the **Stylus** tip contacts the tibia (Figure 7). This will adjust the block for a 10mm resection which corresponds to the thinnest baseplate/insert combination. Caution should be noted, as the **Stylus** is flexible at the block connection. Be sure to confirm the **Stylus** is in its neutral position when adjusting the resection level. Holes are provided in the **Cutting Block** so that adjustments can be made by moving it up or down in 2mm increments if the surgeon feels there is too much or too little being resected.

The **Cutting Block** is affixed to the proximal tibia by filling the “0” marked holes with smooth fixation pins. The **Stylus** may be left in place to confirm accurate **Cutting Block** placement. The **Cutting**

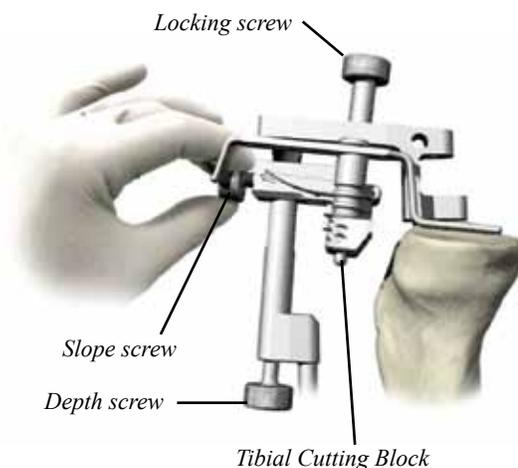
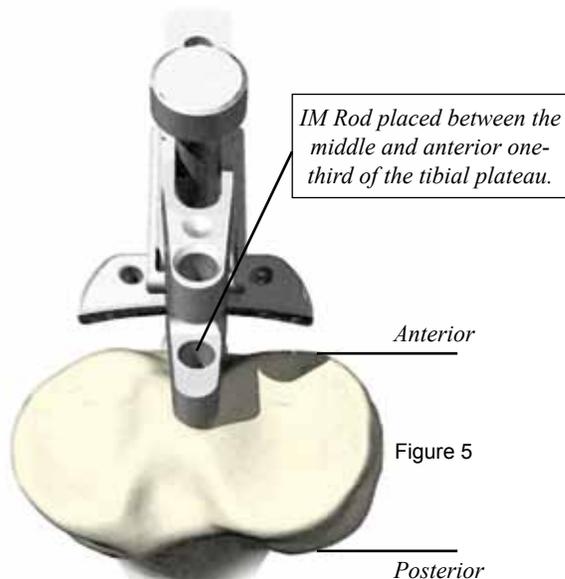


Figure 6



Figure 7



Figure 8

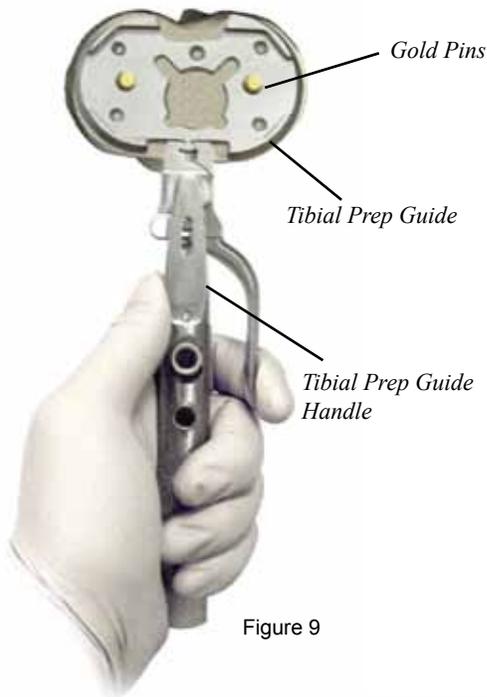


Figure 9

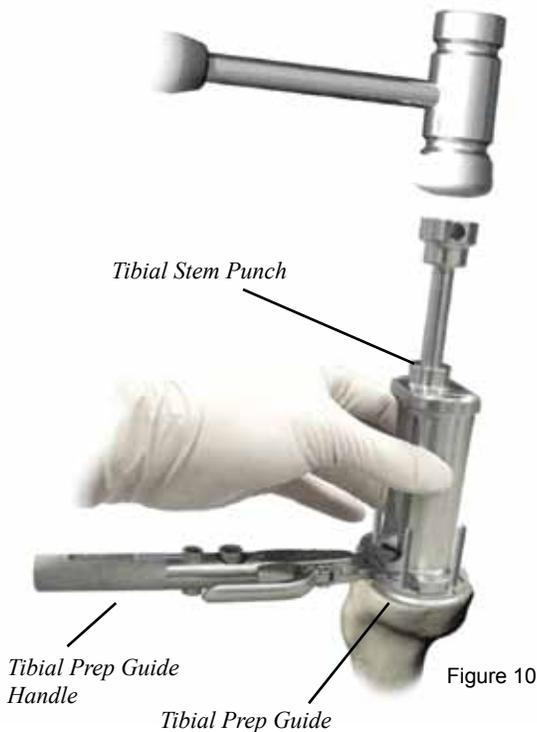


Figure 10

Block is released using the top thumb screw and the **Tibial Alignment Guide** is removed with the **Slap Hammer/Extractor**.

Alignment can be checked by attaching the **Alignment Tower** to the saw guide. The **Alignment Rod** is then inserted in the stationary or pivoting hole of the tower. The tip of the rod should lie over the center of the talus to ensure a perpendicular cut. If necessary, the **Varus/Valgus Saw Guide** may be used to adjust the alignment (plus or minus 2°). A **Saw Capture** is attached to the **Cutting Block** and the proximal tibia is resected (Figure 8).

Once a satisfactory cut is achieved, the **Cutting Block** is removed leaving one or both pins in place as a rotational guide. At this point, the osteophytes from the posterior femur should be removed with a curved osteotome.

Sizing of the Proximal Tibia

The mobile bearing, dual-articulation design allows the surgeon to focus on coverage of the tibial plateau, with rotational flexibility provided by the mobile insert.

Tibial Prep Guides are used to size the tibia (Figure 9). They also serve as a guide for the **Tibial Stem Punch**.

The **Tibial Prep Guide Handle** is assembled to the **Tibial Prep Guide**. The guides are then fitted to the tibial plateau until the appropriate size is determined. Rotational positioning is accomplished by aligning the **Prep Guide Handle** for optimal coverage so that there is no overhang. Once the desired position is obtained, the guide is fixed with two gold headed fixation pins. The **Alignment Rod** is used to verify axial alignment and is inserted through the **Tibial Prep Guide Handle**. The four peripheral peg holes are then drilled with the 3.2mm drill bit.

The appropriate size **Tibial Stem Punch** is selected and positioned over the stabilizing pins. The punch is then fully impacted with a mallet (Figure 10) and removed using the **Slap Hammer/Extractor**.

The **Tibial Prep Guide** can be removed prior to femoral preparation

Femoral Preparation

Distal Femoral Resection

An 8mm hole is made in line with the femoral shaft and medial edge of the intercondylar notch (Figure 11). The **T-handle** is attached to the (8mm) **I.M. Rod**. The **I.M. Rod** is then inserted through the **Femoral Alignment Guide**, which is assembled with the **Distal Femoral Cutting Block** (Figure 12). Prior to bone insertion, the **Femoral Alignment Guide** should be configured for a right or left knee by pulling and rotating the center “knob” to the left or right position. Both cannulated stabilizing screws should be fully retracted. The **I.M. Rod** is then inserted into the femoral canal until the guide contacts the distal femur. Should one of the condyles have a defect, the appropriate stabilizing screw can be adjusted to compensate for the lost cartilage and stabilize the instrument. The **T-Handle** can be removed to allow better access for installing fixation pins or screws.

Rotational alignment is determined by adjusting the posterior portion of the **Femoral Alignment Guide** so that it is parallel to the posterior femoral condyles. The rotation is then locked in place by drilling through either of the cannulated stabilizing screws with a 3.2mm drill bit and filling it with a like-size smooth pin (Figure 13). Alignment (6° valgus) can be confirmed with the **Alignment Tower and Rod** which should point through the center of the femoral head. Minor varus/valgus adjustments can be made by adjusting the stabilizing screws.

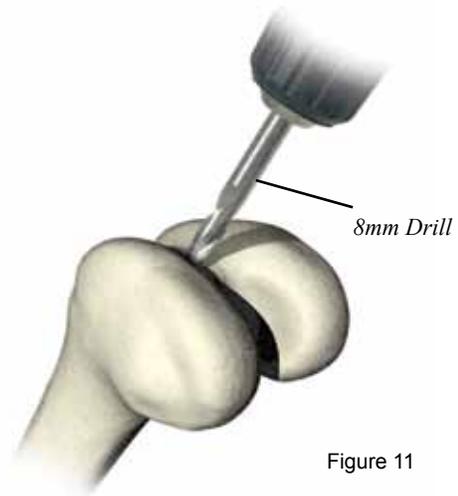


Figure 11

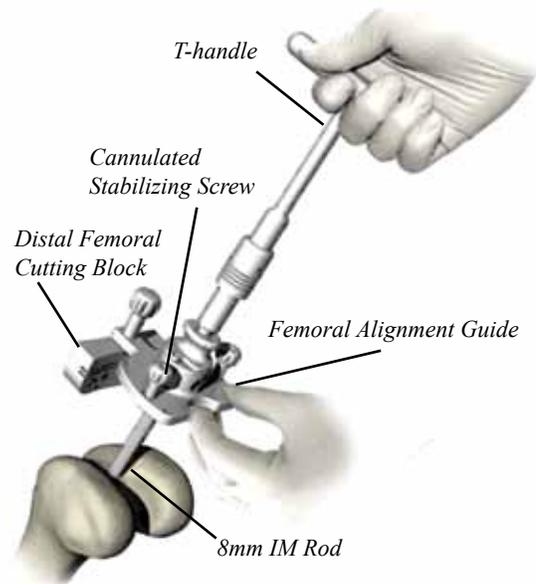


Figure 12

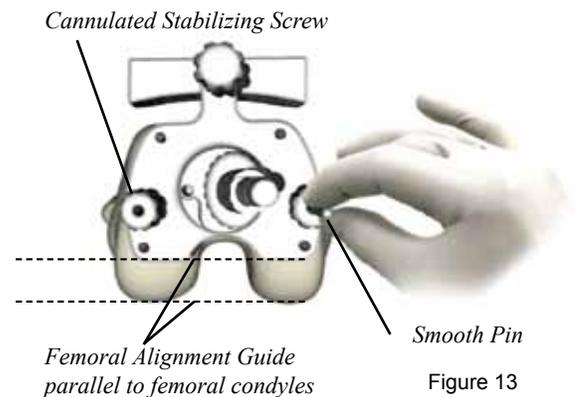


Figure 13

Figure 14



The **Distal Femoral Cutting Block** is affixed to the distal femur by drilling through the “0” marked holes and filling them with smooth pins. This will position the **Cutting Block** to make a 10mm resection which is the distal thickness of the femoral component (Figure 14 and 15).

All cutting blocks require a saw blade thickness of either 1.27mm or 1.37mm depending on the amount of clearance desired. Thermal injury to the bone can be controlled by using new blades and intermittently irrigating the saw blade when making bone cuts. With the **Cutting Block** affixed to the distal femur, the **Femoral Alignment Guide** is removed by releasing the thumb screw from the **Cutting Block**. An additional 3mm can be resected from the distal femur using the additional slot. The amount of bone resected can also be adjusted by moving the saw guide either proximally or distally in the holes provided for this purpose. These options for increased resection can help with the correction of flexion-contractions and assist in flexion-extension discrepancies. As a general guide, the sawblade should just contact or barely resect the femoral sulcus (Figure 16).

Figure 15

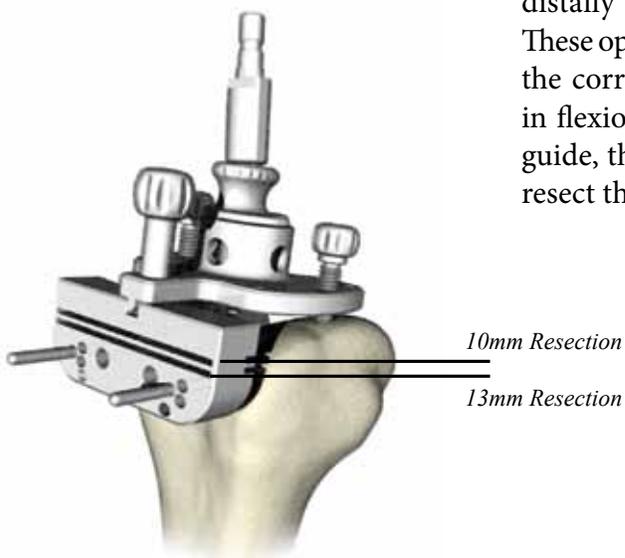


Figure 16

Femoral Sizing/Rotational Alignment

There are two types of **Femoral Drill Guides**: Standard and 2mm Anterior Shift. Each **Drill Guide** can be used in a neutral or 3° external rotation configuration (Note: The 3° external rotation configuration is left and right specific). This provides more anatomic patellar tracking and aids in preventing patellar subluxation and tracking problems later. The selected **Drill Guide** is placed into the **Femoral Sizer** (Figure 17).

With the knee maximally flexed, the **Femoral Drill Guide/Sizer** is centered in the M/L plane on the distal femur with the posterior feet referencing the posterior condyles. This position can be checked by making sure that the intercondylar notch aligns with the notch on the **Femoral Sizer**. The two captured stabilizing pins are then impacted. (If one of the condyles is defective, impact the stabilizing pin on the unaffected side and rotate the Femoral Sizer to compensate for lost cartilage. The second stabilizing pin can then be impacted.)

The sliding stylus along with the size markings on the **Femoral Drill Guide** are used to determine the correct **Femoral Component size**.

The two distal femoral holes are then drilled with the **Distal Femoral Drill** (Figure 18).

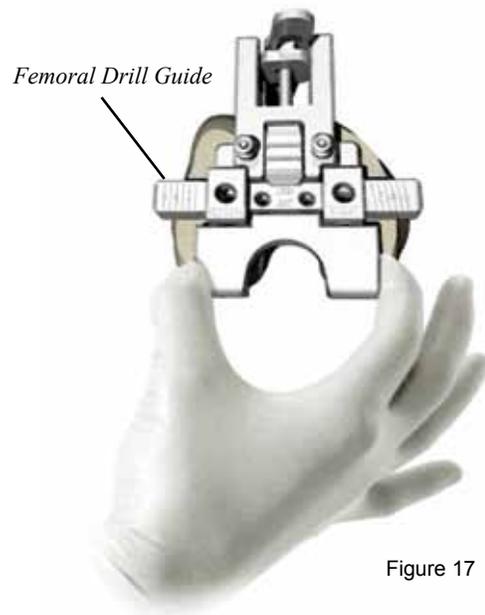


Figure 17

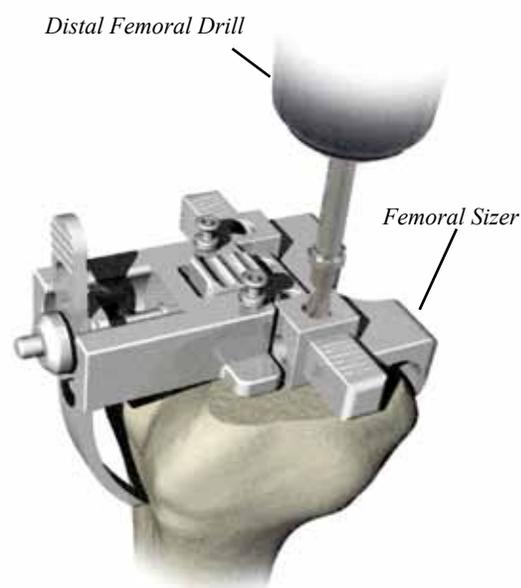
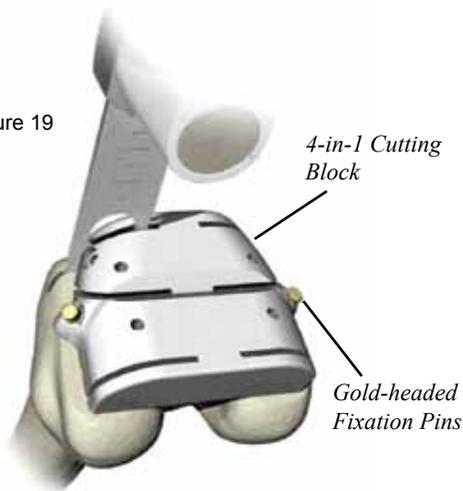


Figure 18

Femoral Resections

Figure 19

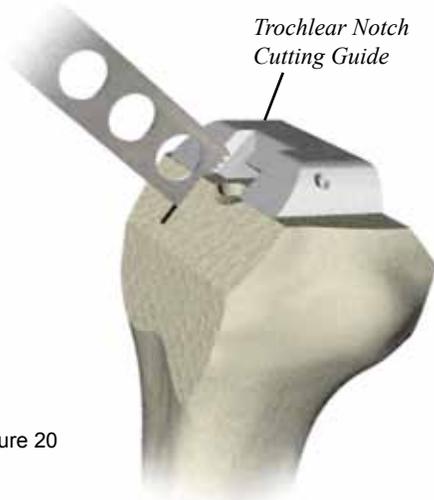


The **4-in-1 Cutting Block** is impacted in place and secured using the gold-headed fixation pins. The femoral resection check guide is then placed parallel to the **4-in-1 Cutting Block** to verify the femur will not be notched. If it appears this will notch the femur, the surgeon needs to move the block 2mm anterior and drill again or move to the next size block. The anterior, posterior, anterior chamfer and posterior chamfer resections are then made (Figure 19). Handles can be screwed into the blocks if needed for additional stability. When making the posterior cuts, retractors should be positioned to protect the collateral ligaments.

The gold pins are then removed using the **Slap Hammer/Extractor**.

At this point the posterior osteophytes and loose bodies may be removed by lifting up the femur through the intramedullary hole previously placed or utilizing laminar spreaders.

Figure 20



The trochlear notch is prepared using the **Trochlear Notch Cutting Guide**. With the properly sized guide placed in the holes on the distal femur, a 1" saw blade can be used to resect the trochlear notch on the anterior femur (Figure 20). (If the bone is soft enough, the blunt end of the Chisel and a mallet may be used to create the recessed chamfer by compressing the bone).

Patellar Preparation

The patella thickness is measured with the **Patellar Caliper** to provide a baseline dimension prior to the osteotomy.

A free-hand patella resection can be made or the **Patellar Osteotomy Guide** can be positioned vertically in the coronal plane with the jaws at the osteochondral juncture medially and laterally. The stylus is positioned over the apex of the patella. The resection is made through the saw capture (Figure 21).

The **Patellar Drill Guide** is placed over the cut surface to determine the appropriate size **Patellar Component** (Figure 22).

The **Patellar Component** drill holes are drilled with the **Patellar Stop Drill Bit** (Figure 23). The **Patellar Trial** is then fully seated for trial reduction.



Figure 21

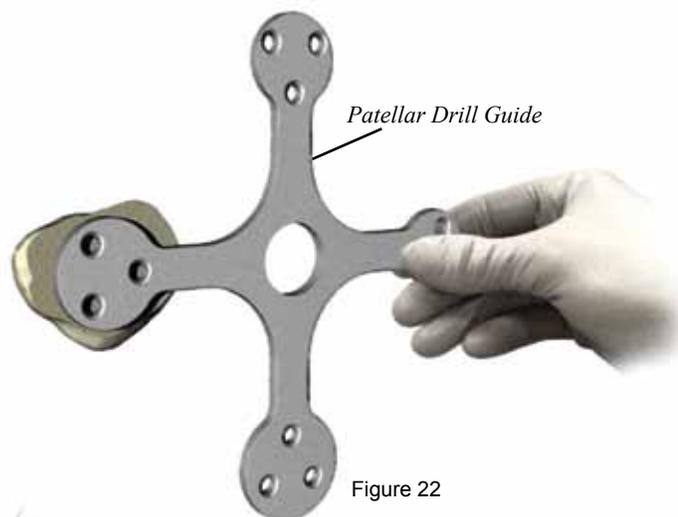


Figure 22



Figure 23

MBK Tibial Trial
Baseplate



Figure 24

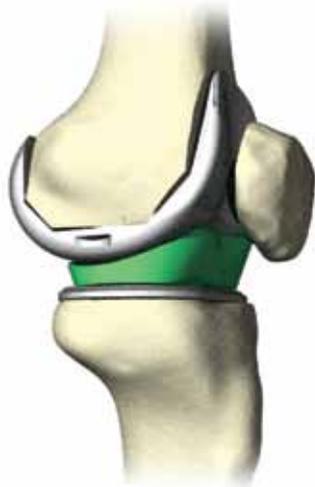


Figure 25

Patellar Clamp



Figure 26

Trial Reduction

A trial reduction is performed to assess soft tissue balancing, patellar tracking and range of motion. The appropriate MBK **Tibial Baseplate Trial** is inserted and impacted into the prepared proximal tibia using the **Femoral/Tibial Impactor** (Figure 24). The appropriate size **Femoral Trial** is positioned on the femur using the **Femoral/Tibial Impactor**.

The MBK **Tibial Insert PCL Trial** can then be inserted. The surgeon should confirm correct A/P orientation and R/L side. The knee is then extended and overall alignment checked (Figure 25). The surgeon can assess the proper thickness of the **Tibial Insert Trial**. Ligament balance is then checked. There must be equal laxity medially and laterally to assure even wear and proper kinematics.

The **Femoral Trial, Patellar Trial, Tibial Baseplate Trial and Tibial Insert Trial** components are then removed with the Slap Hammer/Extractor.

Cemented Component Implantation

Prior to cement application, additional small holes may be placed in sclerotic or cancellous bone surfaces to aid in intrusion of cement and interdigitation.

Patella

The **Patellar Component** is implanted first. The cut surface is thoroughly cleansed with pulsatile lavage. Cement is applied to the surface and the component is pressed into position using the **Patellar Clamp and Inserter** (Figure 26). All extruded cement is removed and attention turned to the tibia.

Tibia

The tibia is subluxed anteriorly with retractors posteriorly to the tibia. The tibial plateau is then thoroughly cleansed with pulsating lavage. Cement is applied to the tibial surface and forced into the trabecular bone with digital pressure or gun injection to attain 3-5mm penetration. The MBK **Tibial Baseplate Component** is then pressed into place and fully seated using the **Femoral/Tibial Impactor** (Figure 27). Prior to hardening, excess cement is removed.

The MBK **Tibial Insert Component** is then snapped onto the MBK **Tibial Baseplate** post (Figure 28). The surgeon should confirm correct A/P orientation and R/L side.

Femur

The femur is cleaned thoroughly with pulsating lavage. Cement is applied to the resected surfaces and forced into trabecular bone with digital pressure or gun injection. The **Femoral Component** is positioned and fully seated into place using the **Femoral/Tibial Impactor** (Figure 29). Prior to hardening, excess cement is removed.

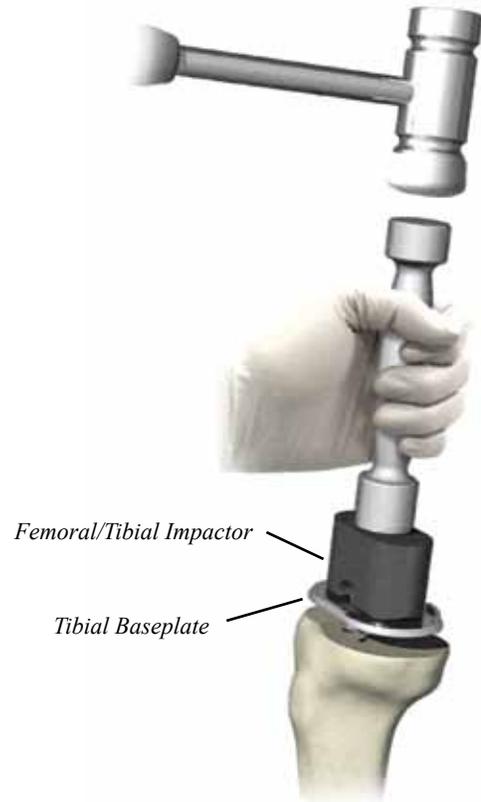


Figure 27

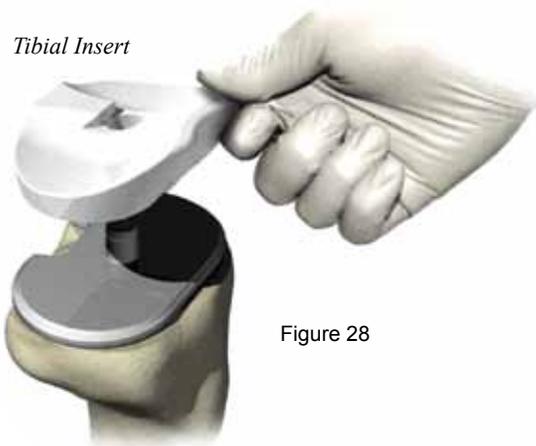


Figure 28

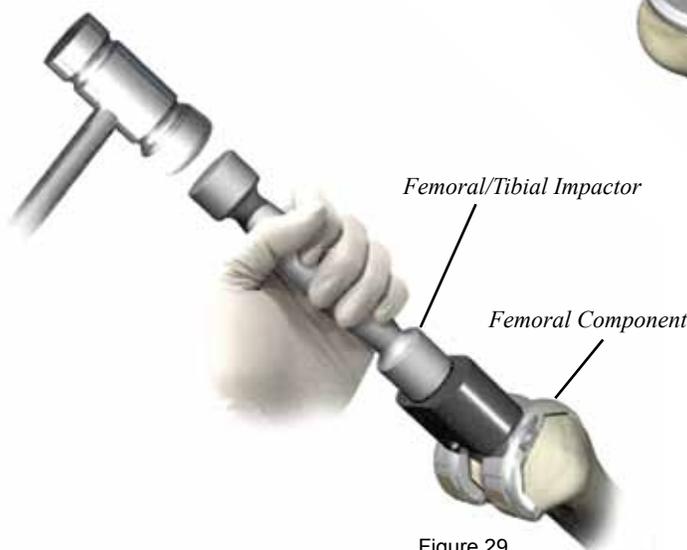


Figure 29



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