MicroPort

Evolution®

MEDIAL-PIVOT KNEE SYSTEM

# DISTAL CUT FIRST

## *WITH E200 INSTRUMENTATION KITS*

Surgical technique

# INDICATIONS AND WARNINGS
## EVOLUTION® KNEE SYSTEM

### Indications

#### Intended Use

The EVOLUTION® Total Knee System is intended to replace a knee joint in total knee arthroplasty for reduction or relief of pain and/or improved knee function in skeletally mature patients.

#### Indications for Use

1. noninflammatory degenerative joint disease including osteoarthritis, traumatic arthritis, or avascular necrosis;
2. inflammatory degenerative joint disease including rheumatoid arthritis;
3. correction of functional deformity;
4. revision procedures where other treatments or devices have failed; and treatment of fractures that are unmanageable using other techniques.

Non-porous MicroPort total knee replacement implants are for cemented use only.

Porous coated MicroPort total knee replacement implants are for use without bone cement.

### Important

Proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training, experience, and patient condition.

Prior to use of the system, the surgeon should refer to the product package insert for additional warnings, precautions, indications, contraindications and diverse effects. Instructions for Use package inserts are also available by contacting the manufacturer. Contact information can be found on the back of this surgical technique, and the Instructions for Use package insert is available on the website listed.

Package inserts are also available at ortho.microport.com/ifus.

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# Product Information

***The Evolution® Knee System builds on the clinical history of the Advance® Knee System medial-pivot design.***

## Device Description

### FEMORAL IMPLANT

- CS/CR* options offered in eight sizes, left and right
- CS/CR* offered in cemented, NitrX™ (TiNbN) coated, and cementless options
- 145° constant radius C-curve
- Anatomic, recessed patellar groove with bone conserving preparation
- Central pegs to minimize bone removal during downsizing

### TIBIAL BASE IMPLANT

- Asymmetric for optimal bone coverage
- 8 sizes and 3 “plus” sizes
- Offered in cemented, NitrX™ (TiNbN) coated, and cementless options
- Innovative locking mechanism
  - Angled 8° in direction of the incision approach (anterior-medial direction)
  - Lower insertion loads while maintaining strong disassociation loads

### TIBIAL INSERT IMPLANT – CS

- Asymmetric to position mating femur more posterior
- 1:1 Insert-Femur Conformity on the medial side
- 1-up interchangeability with plus size insert options
- 1-down interchangeability with standard insert
- Patellar tendon relief
- 15° of permissible femoral rotation

### TIBIAL INSERT IMPLANT – CR*

- Asymmetric to position mating femur more posterior
- PCL soft tissue relief angled in the direction of PCL pull
- 1-up, 1-down tibiofemoral sizing interchangeability
- Soft tissue friendly patellar tendon relief
- 15° of permissible femoral rotation

***NOTE: CR is not available in CE marked countries***

# Surgery Preparation

## SIZE SPECIFIC COMPONENT PART NUMBERS ARE REPRESENTED WITH X'S THROUGHOUT THIS SURGICAL TECHNIQUE.

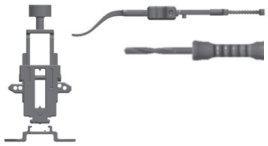
A 1.3mm (0.05") thick saw blade is recommended for resections.



*9.5mm (3/8") diameter drill (E5001002)*

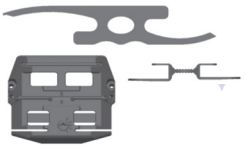
*T-handle (E5001001) and IM rod (EE5001003) with valgus module (E1101001, E1100357, E1000010)*

*Ensure proper resection guide is set at appropriate valgus angle and the bushing is rotated with the correct side designation (left or right) facing up.*



*Sizing caliper (E1100101), caliper feet (E110013X), caliper stylus (E1100112) & 3.2mm drill bit (E1000201)*

*Ensure the "Left" side is facing out for a left knee. This means the "Right" side is against the resected distal surface. For a right knee, the "Right" side is facing out.*



*4-in-1 resection guide (E12041XX) with posterior condylar gauge (E1200113) and dual reference "angel wing" gauge (E5001006)*

*Ensure the 4-in-1 resection guide is set to "0."*

*3.5mm hex screwdriver (E5001005)*

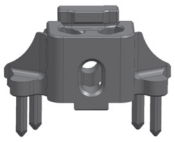
*Slaphammer (E5002001) with attached extraction boss (E5002002)*

*Femoral trial (E130XXXX), patella cap (E13050XX), femoral holder driver (E10051X3 or E10051X7), femoral finishing impactor (E10051X1) and handle (E5005001)*

*Extramedullary tibial alignment guide (E2102001), standard proximal rod (E2102002), adjustment barrel (E2102006), tibial resection crosshead (004007L or K004007R), and stylus (E2100210)*

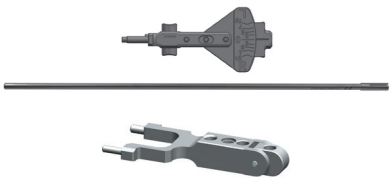
*IM guide not pictured*

*Tibial base trials (E2302XXX), trial base handle (E2001020), and anchoring pins (K0002007)*



*Keel punch tower (E2004028 or E2004128)*

*Keel punch (E2005XXX) and handle (E2000001)*



*External alignment guide with slope gauge (E5101000) and drop rod (E5101001) or External alignment guide (E5101002)*

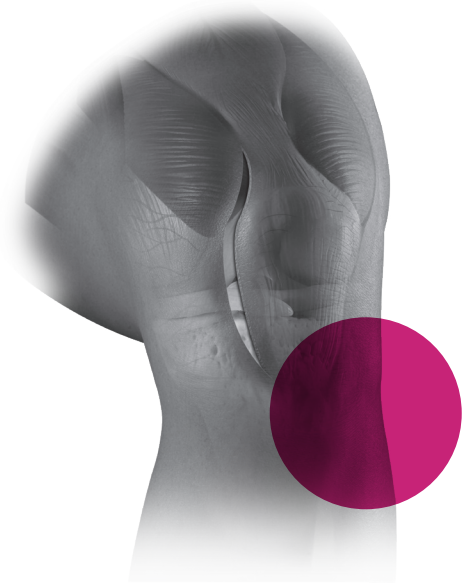
# Introduction

***E200 Instrumentation was designed to be applicable to both less-invasive and standard total knee procedures. Therefore, surgeons should employ the technique they are most comfortable with, whether that is the medial parapatellar, subvsatus, or midvastus approach.***

***With the E200 instrumentation, the preparation of the femur and the tibia can be performed independently. This choice is left to the surgeon's discretion.***

## Medial Parapatellar Approach

### Preparation – Incision – Exposure



With the knee in extension, the medial and lateral margin of the patella is marked. A straight longitudinal line is drawn through the medial one third of the patella starting from approximately 2cm from the upper patellar pole to 1cm medial of the tibial tubercle. The skin incision is performed with the knee in flexion. The subfascial dissection of the subcutaneous tissue is performed laterally in order to free the dorsal aspect of the patella. On the medial side, only limited subcutaneous dissection is performed. Careful coagulation of the subcutaneous venous system is performed at this stage.

The arthrotomy is performed starting proximally in the vastus medialis 3mm medial from the medial border of the quadriceps tendon. It is continued distally leaving a cuff of tissue on the patella to facilitate closure. The incision is carried distally to the medial side of the medial tubercle. Be careful at this stage not to violate the patellar tendon. The upper medial tibial border is exposed by subperiosteal blunt release of the medial collateral and capsular complex. In extreme varus deformity a subperiosteal deeper release can be performed using an osteotome taking care to protect the medial collateral attachment at all times. The knee is brought into full extension and a portion of the fat pad is excised. This opens the space behind the patellar tendon and relieves tension on the extensor mechanism so it can safely be mobilized during further surgery. Proximally any adhesions or scar tissue in the suprapatellar pouch are released by gentle blunt manual dissection. At this stage the thickness of the patella is measured. The knee is brought to flexion again with the patella everted. At this stage a measured patellar resection is performed freehand. Next the patella is turned back and shifted to the lateral side of the femur to decrease tension on the extensor mechanism.

### LIA infiltration – Closure

The LIA infiltration with a cocktail of long-acting local anaesthetic is performed in three steps before cementing the different components. The knee is brought to flexion and the back of the knee exposed by introducing a laminar distractor. The posterior capsule is infiltrated first. The second step involves the infiltration of the anterior and lateral structures except the subcutaneous tissue. At the end the subcutaneous tissue is infiltrated with a cocktail without adrenaline. Closure of the muscle – tendon – capsule - synovial complex is performed in flexion in one stage with a running knotless, self-anchoring resorbable suture. The subcutaneous tissue is closed with interrupted resorbable sutures. Next the skin is closed with staples.

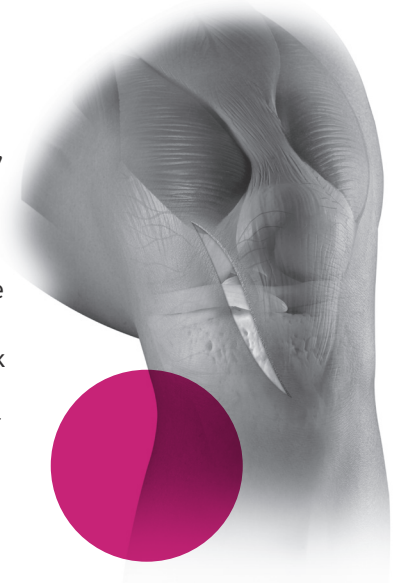
## Subvastus Approach

The skin incision generally follows the course of the traditional curvilinear medial parapatellar skin incision. It is marked out approximately 1cm medial to the edge of the patella and patellar tendon. It extends to approximately 2-3cm above the upper border of the patella and down to the medial border of the tibial tubercle.

After making the skin incision, the dissection is carried medially, raising a medial skin flap, and identifying the lower border of the vastus medialis obliques (VMO) muscle. A longitudinal capsular incision is then made at the medial edge of the patellar tendon. It extends from approximately 5mm inferior to the level of the VMO insertion into the patella to the level of the tibial tubercle. A tonsil-type clamp is placed within the joint, and the "subvastus limb" of the capsular incision is then made. The incision is carried from lateral to medial approximately 5mm below the edge of the muscle; taking care to avoid the origin of the medial collateral ligament.

Traditional upper-medial tibial exposure is then completed with resection of one third to one half of the anterior portion of the medial meniscus. An osteotome is used to raise a superosteal flap along the upper medial tibial border; taking care to preserve the medial collateral ligament attachment. The knee is brought into full extension and a portion of the fat pad is excised. This helps to open the space behind the patellar tendon and above the tibial tubercle. Next, with the knee held in maximum extension, the VMO and entire extensor mechanism are mobilized. A finger is placed within the joint with the knee in full extension to feel the first level of constraint, which is either the remaining lateral capsule inferior to the medial most edge of the VMO or the synovial reflection. As these structures are released, the VMO begins to mobilize. The next tethers along the border of the muscle are palpated from within and above. Care is taken as the muscle is freed from soft tissues medially and proximally. This is always performed with gentle blunt manual dissection and need not be carried very far proximally. The required mobilization should not extend anywhere near Hunter's canal. A right angle retractor is placed under the skin, but above the muscle, and the Scarpa's fascia is typically palpated at this point and released to further mobilize the extensor mechanism and allow translation of the patella. With the knee in full extension, once the patella can safely be mobilized along the lateral femoral condyle, adequate VMO mobilization has been achieved.

## Midvastus Approach



Outline the superior aspect of the patella and its medial and lateral margins. In addition, mark the tibial tubercle and medial and lateral margins of the patellar tendon. With the knee extended, a transverse line is made at the superior pole of the patella. The knee is then flexed and a transverse line is drawn at the mid-lower aspect of the tibial tubercle. The skin incision runs between those two transverse lines slightly medial to the midline over the patella. Skin and subcutaneous tissue are divided, followed by the deep retinacular fascia. The arthotomy incision progresses from approximately the two o'clock position on the patella (for a left knee) to split the vastus medialis 1½ to 2cm in line with its fibers. The incision is then brought down the medial retinacular area; leaving a cuff of tissue on the patella medially to facilitate closure and improve tracking postoperatively. The incision is then carried distally to the tibial tubercle. The infrapatellar fat pad is removed as necessary for visualization. A deep MCL release is performed, and the anterior third of the medial meniscus is removed as needed for initial visualization. A "Z" retractor is placed on the proximal medial tibia to protect the MCL. At this point, any adhesions or scar tissue in the suprapatellar pouch are released to allow the patella to shift to the lateral side of the femur. A planed medial patellar facet excision is sometimes used to facilitate exposure of the distal femur.

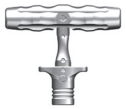
# Surgical technique



*P/N E5001002*



*P/N E5001003*



*P/N E5001001*

FIGURE 1

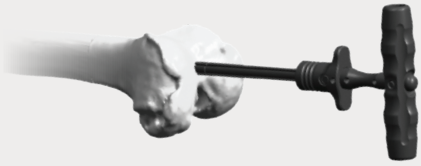


FIGURE 2

FIGURE 3

## Preparation of the Distal Femur

### Starter Hole Preparation

Initiate an opening in the femoral canal with the 9.5mm (3/8”) diameter drill (E5001002). The hole may be placed medial and anterior to the anteromedial corner of the intercondylar notch, in the center of the trochlear groove, or 1cm (0.4”) anterior to the PCL origin. **FIGURE 1**

### Alignment Rod Insertion

Insert the fluted IM reamer/rod (E5001003) into the femoral canal, being sure to irrigate and aspirate several times to reduce the chance of a fat embolus. Turn the reamer during insertion with the T-handle (E5001001). **FIGURE 2**

### *Efficiency Suggestion*

Some surgeons prefer the distal femoral alignment guide (E1101001), valgus bushing (E1100357) and resection guide (E1000010) pre-loaded on the IM rod (E5001003) before it is introduced into the femur. After insertion, the T-handle (E5001001) is maintained on the rod for faster rod removal after the resection block (E12041XX) is pinned. **FIGURE 3**

### Retractors and placement:

- Knee should be in >90° flexion
- “Z” Retractor - superior lateral on femur to lift skin out of way of distal resection guide
- “Z” Retractor - medial on femoral condyle or tibia to protect collateral ligament

***IMPORTANT NOTE: All Evolution® femoral resection slots are designed for use with a .050" (1.3mm) thick saw blade. Wide 1" (25.4mm) saw blades are recommended for the distal resection.***

## Distal Femoral Resection Guide Insertion

The distal femoral resection guide has 10mm and 14mm resection slots as well as shift holes to allow for other resection depths. Load the distal resection guide onto the distal femoral alignment guide (E1101001) and lock them together by pushing the locking button from left to right. **A IN FIGURE 4** "LOCK" text will be visible.

Insert the distal femoral alignment guide (E1101001) onto the valgus bushing (E1100357). **B IN FIGURE 4**

The valgus bushing (E1100357) has both a "Left" and "Right" side, and has three slots which allow 3°, 5°, or 7° of valgus. Ensure the "Left" side of the bushing is facing up for a left knee, and the "Right" side is facing up for a right knee.

Slide the valgus bushing (E1100357) down the IM rod (E5001003) toward the T-handle (E5001001) connection. Insert the fully assembled IM rod into the intramedullary canal until the valgus bushing (E1100357) rests against the unresected prominent distal condyle. **FIGURE 5**

***NOTE: Although rotation is not critical at this step, the distal femoral alignment guide (E1101001) features two lines which may be aligned with the epicondyles. A IN FIGURE 5***

Lock the valgus bushing (E1100357) to the IM rod (E5001003) by turning the knob until it is tight. **B IN FIGURE 5**

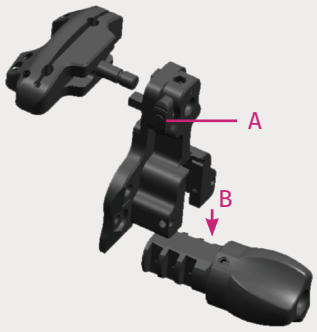



FIGURE 4

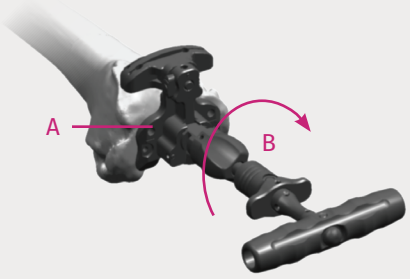



FIGURE 5


*P/N E1000010*


*P/N E1000012*


*P/N E1000114*


*P/N E1101001*


*P/N E1100357*

## Retractors and placement:

- Knee should be in >90° flexion
- "Z" Retractor – Posterior lateral on femur
- Bent Hohmann – Antero-lateral on femoral cortex

FIGURE 6

## Distal Femoral Resection

Pin the distal resection guide (E1000XXX) to the anterior cortex with two headless pins through the “STD” holes (the most proximal holes on the guide). Additional fixation pins may be added through the divergent holes.

***NOTE: If the pins are left too proud, they may impinge on the saw and prevent full saw penetration.***

***NOTE: In the absence of a divergent pin, a kocher can be clipped to the pin to provide stability.***

Push the locking button to detach the resection block and remove the IM Rod (E5001003), distal femoral alignment guide (E1101001), and valgus bushing (E1100357). **FIGURE 6**

Perform the distal femoral resection with the saw. After the resection, remove the pins and the distal resection guide (E1000XXX).

## Extramedullary Tibial Preparation

***IMPORTANT NOTE: The Evolution® tibial resection guides are designed for use with a 1.3mm (0.05") thick saw blade.***

## Extramedullary Tibial Guide Assembly

Assemble the extramedullary tibial resection guide by erecting the distal tower portion of the ankle clamp (E2102001) **FIGURE 7** and inserting either the standard proximal rod (E2102002) or the spiked proximal rod (E2102013) with the adjustment barrel (E2102006) into the distal tower.

Attach the appropriate tibial resection guide (K004007R for "right", K004007L for "left") to the proximal rod using the adjustment barrel (E2102006) **FIGURE 8**.

***NOTE: A short proximal rod (E2102005) is also available.***

## Extramedullary Tibial Guide Positioning and Adjustments

Position the ankle clamp of the extramedullary (EM) tibial resection guide (E2102001) against the lower leg just proximal to the malleoli. **FIGURE 8.**

Position the tibial resection guide (K004007X) close to the tibia by sliding the distal tower toward the shaft of the tibia. Position the tibial resection guide (K004007X) slot a few millimeters below the lowest articular surface by first unlocking the adjustment barrel (E2102006) by pressing the unlock button down, positioning the tibial resection guide slot, and releasing the lock button. Fine tune adjustments to resection depth will be made following varus/valgus and posterior slope adjustments. **FIGURE 8.**

To adjust the varus/valgus alignment of the EM tibial resection guide (E2102001), loosen the large distal knob **(B IN FIGURE 8)**, if necessary, and then use the left-right adjustment feature on the ankle clamp to match the tibial mechanical axis **A IN FIGURE 8**. Tighten the large distal knob to secure its position **B IN FIGURE 8**.

To adjust the posterior slope of the EM tibial resection guide (E2102001), loosen the ankle screw of the right side of the ankle clamp and pull the distal end of the guide towards or away from the ankle to the desired posterior slope angle **C IN FIGURE 8**.

FIGURE 7

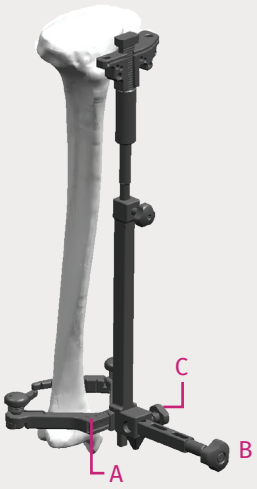
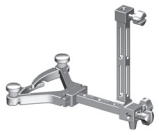



FIGURE 8



P/N E2102001



P/N E2102002

P/N E2102005

P/N E2102006

P/N E2102013

P/N K004007L

P/N K004007R

P/N E2100210

P/N E5001006

FIGURE 9

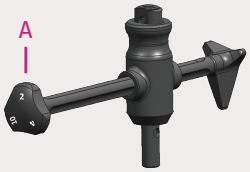



FIGURE 10

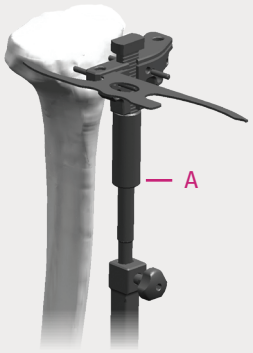



FIGURE 11

***NOTE: To obtain the standard 3° posterior slope, adjust the EM tibial resection guide (E2102001) parallel to the tibial mechanical axis. For an anatomically sloped resection, place the dual reference gauge (E5001006) or a saw blade in the cutting slot and adjust the long axis of the EM guide until the cutting slot angle matches the anatomic slope of the tibia.***

***NOTE: If the spiked proximal rod (E2102013) is used, place the longer (posterior) spike into the center of the proximal tibia, adjust the internal-external rotation of the guide, then drive both spikes into the tibia with a mallet FIGURE 9.***

To adjust the resection depth, set the adjustable resection stylus (E2100210) to the desired resection depth (the number in the upright position - 2, 4, or 10mm - represents the resection depth) by turning the adjustment knob **A IN FIGURE 10**. Insert the adjustable resection stylus (E2100210) into one of the holes (medial or lateral) on the tibial resection guide (K004007X). Spin the adjustment barrel (E2102006) to fine tune the resection height until the adjustable resection stylus is seated on the lowest portion of the tibial condyle to indicate the desired resection depth **A IN FIGURE 11**.

***NOTE: The adjustable resection stylus (E2100210) is generally set to resect 2mm from the most deficient side and/or 10mm from the most unaffected side.***

## Proximal Tibial Resection

Pin the tibial resection guide (K004007X) to the proximal tibia through the “STD” holes using headless pins. Check the tibial resection depth by inserting the dual reference gauge (E5001006) into the cutting slot of the tibial resection guide (K004007X) **FIGURE 11**.

Make the proximal tibia resection with or without the EM alignment guide attached using a saw and remove the cut bone. The use of a divergent pin or a kocher on the headless pin in place is recommended to prevent the resection block from vibrating off the pins during resection.

## Tibial Resection Alignment Checks

Varus/valgus angulation can be checked to the ankle using the external alignment guide (E5101002) **FIGURE 12** or the external alignment guide with slope gauge (E5101000). **FIGURE 13** If using the external alignment guide with slope gauge (E5101000), slope can be approximated by aligning the alignment rod (E5101001) parallel to the shaft of the tibia. **FIGURE 14**

Once the resection guide is detached from the EM guide, it can be moved distally 2mm if headless pins are used. The top surface of the resection guide can also be used to resect the tibia and is 4mm proximal to the distal surface of the captured slot. Use of a divergent pin is recommended to prevent the resection block from vibrating off the pins during resections. In the absence of a divergent pin, a kocher can be clipped to the pin to provide stability.

To fold the distal tower of the ankle clamp (E2102001), fully loosen the large distal knob. Hold the left – right adjustment portion to the ankle clamp, slide the distal tower toward the large knob, and fold the distal tower. **FIGURE 15**

**FIGURE 12**

**FIGURE 13**

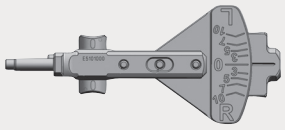


**FIGURE 14**

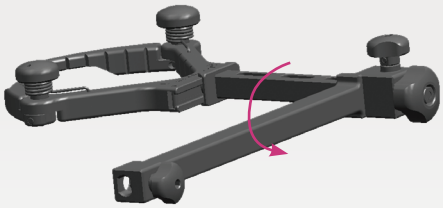


**FIGURE 15**

*P/N E5101002*

*P/N E5101000*

*P/N E5101001*


*P/N E2201002*


*P/N E2201020*

FIGURE 16

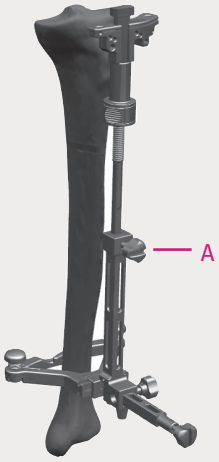



FIGURE 17

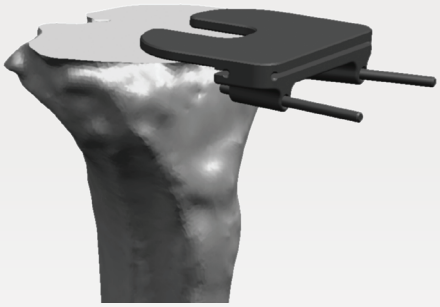


FIGURE 18

***IMPORTANT NOTE: The spiked proximal rod (E2102013) must be removed prior to making the tibial resection. The spike proximal rod (E2102013) is removed using the slaphammer (E5002001) and the extraction boss (E5002002) FIGURE 16.***

***NOTE: The EM alignment guide may be removed for proximal tibial resection. To remove the alignment guide, spin the adjustment barrel (E2102006) to release the tibial resection guide (K004007X), loosen the knob at the top of the distal tower A IN FIGURE 17, and raise the proximal rod up to pull out from the crosshead (K004007X). Remove the proximal rod (E2102002) and the ankle clamp (E2102001).***

Remove the pins, the tibial resection guide (K004007X), and the EM alignment guide (E2102001) if not already removed.

***NOTE: If a deeper proximal tibial resection is needed, the divergent pin can be removed and the tibial resection guide can be shifted 2mm distally.***

## Optional Proximal Tibial 2mm Recut

***IMPORTANT NOTE: the holes are convergent and do not correlate to the holes on the proximal tibial resection guides. This 2mm recut guide cannot be used for the distal femoral resection recut.***

To position the 2mm recut guide (E2201020), place the wings on the resected surface with the resection slot touching the anterior edge of the resected surface. Check resection depth and orientation. Pin the guide while applying downward pressure on the surface to prevent it from raising up during pinning. **FIGURE 18** Make 2mm proximal tibial recut.

## Intramedullary Tibial Resection

***Efficiency Suggestion: Some surgeons prefer the tibial crosshead (E220100R or E220100L) and IM alignment guide (E2101012) to be pre-loaded on the IM rod (E5001003) before it is introduced into the tibial canal. After insertion, the T-handle (E5001001) is maintained on the IM rod (E5001003) for easier rod removal.***

The 3/8" (9.5mm) drill bit (E5001002) is used to penetrate the proximal tibia just posterior to the tibial ACL attachment. Insert the fluted IM reamer/rod (E5001003) into the tibial canal, constantly turning the T-handle (E5001001). **FIGURE 19**

Irrigate and aspirate several times to reduce the chance of a fat embolus. The IM rod (E5001003) with assembled IM guide (E2101012) should be inserted to at least the mid isthmus. Turn the gold anterior lock knob to secure the guide to the IM reamer/rod. Use the varus/valgus screw to set the desired varus/valgus angle with the 3.5mm hex driver (E5001005). **A IN FIGURE 19** Set the posterior slope using the posterior slope adjustment knob. **B IN FIGURE 19** The crosshead is neutral and does not contribute any additional slope to the resection.

*P/N E2101012*

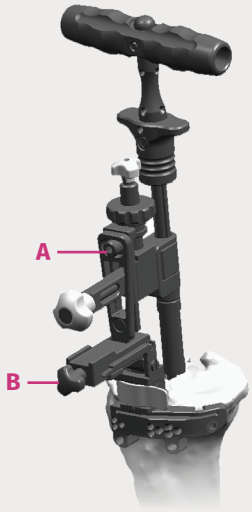



**FIGURE 19**

P/N E2100210


P/N E220100R


P/N E220100L

P/N E5101000

P/N E5101001

P/N E5101002

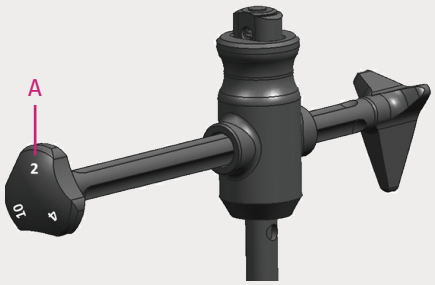



FIGURE 20

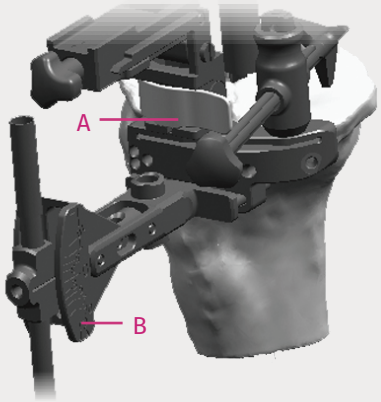



FIGURE 21

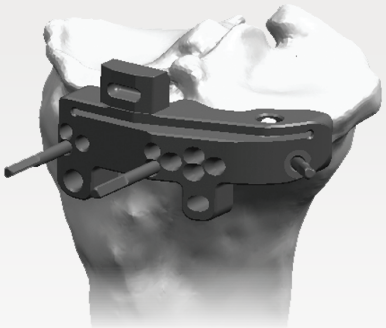


FIGURE 22

Place the tibial stylus (E2100210) into the medial hole on the resection guide (E220100R or E220100L) to set the desired level of tibial resection. Turn the tibial stylus (E2100210) knob to set the desired level of resection. The number in the upright position represents the resection depth. **A IN FIGURE 20**

Generally the stylus is set to resect 2mm from the most deficient side and/or 10mm from the most prominent. Pin the resection guide (E220100X) to the proximal tibia through the "STD" holes. Using the release lever, release the resection guide (E220100X) from the intramedullary alignment guide (E2101012). **A IN FIGURE 21** The rest of the alignment guide assembly will remain connected to the IM rod (E5001003) and can be removed all at once by pulling up on the T-handle (E5001001).

Varus/valgus angulation can be checked to the ankle using the external alignment guide with slope gauge (E5101000) or alignment guide (E5101002) and alignment rod (E5101001). With the alignment rod (E5101001) parallel to the tibia, posterior slope can be measured. **B IN FIGURE 21**

Ensure the tibial resection guide (E220100X) is adjacent to the tibia and place a divergent pin. **FIGURE 22**

*Refer to Figure 23 for breakdown of IM Guide and for detail of the resection guide.*

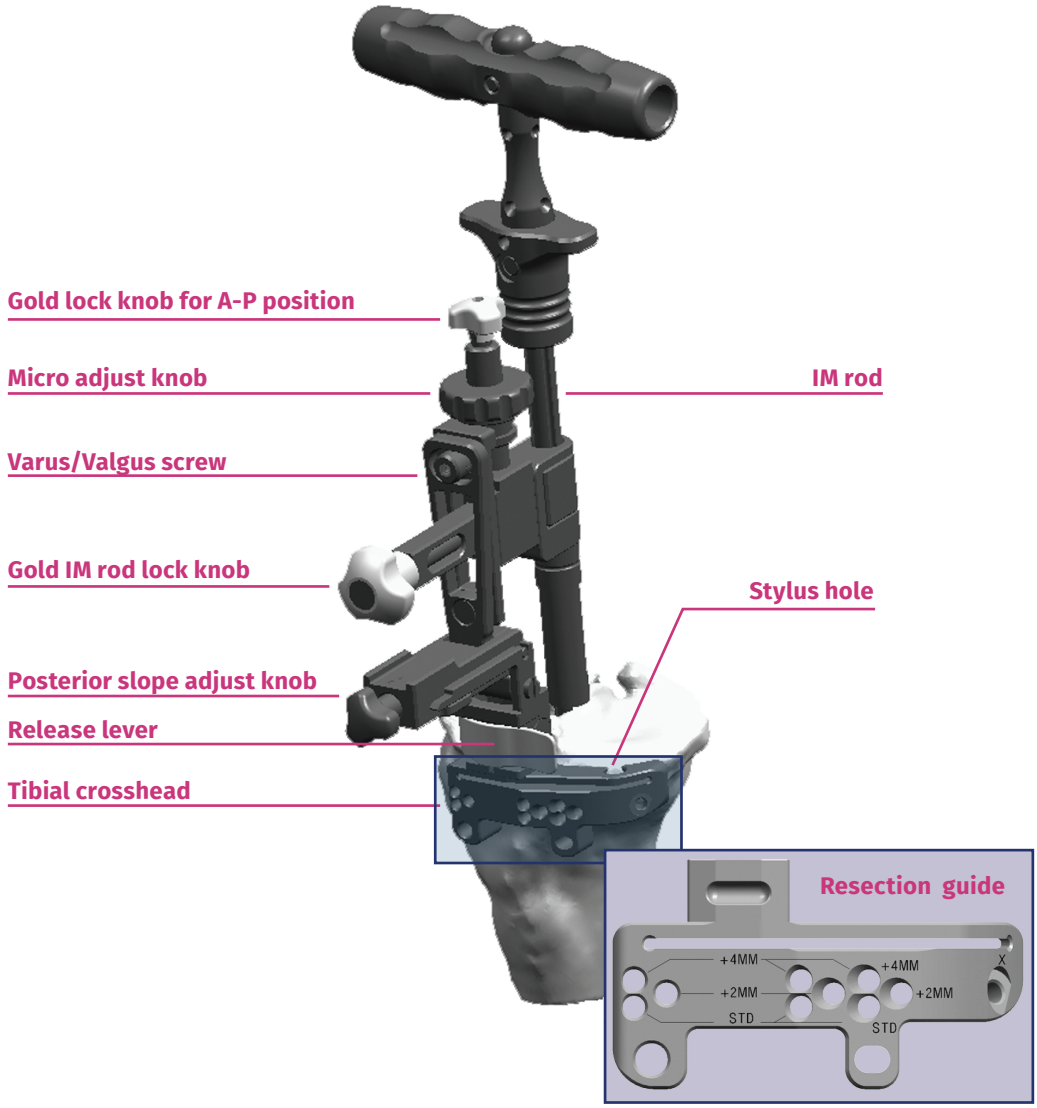



FIGURE 23

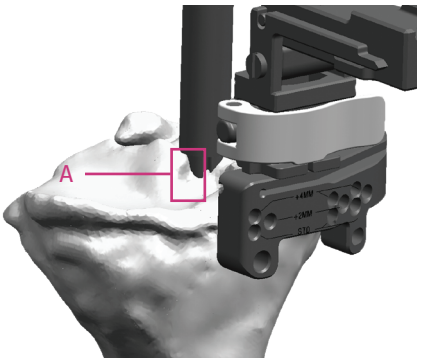



FIGURE 24

***NOTE: Lubrication of the crosshead connection cam hinge is particularly important to maintenance of the mechanism. Regular lubrication with surgical-grade lubricant intended for heat sterilized medical instruments per the MicroPort cleaning and handling instructions should be part of the routine instrument maintenance. A IN FIGURE 24***


*P/N E50010XX*

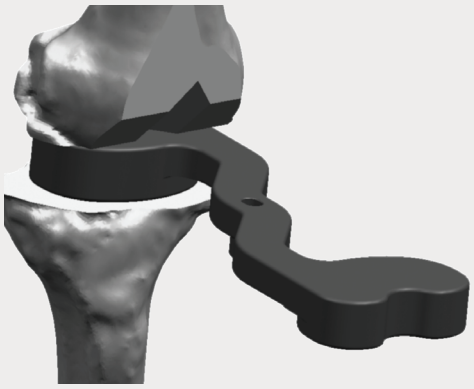


FIGURE 25

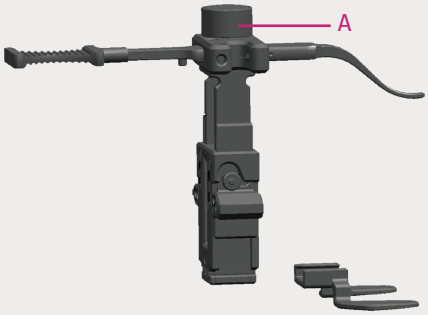
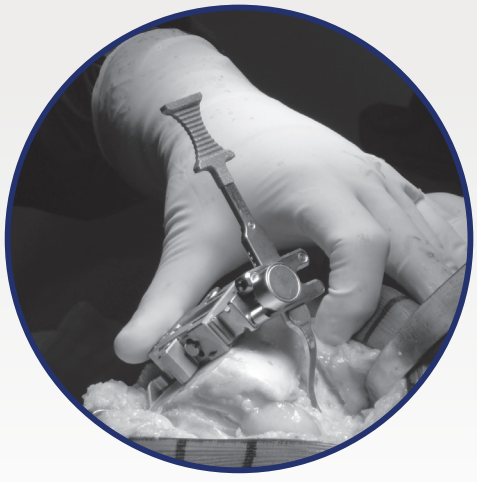



FIGURE 26



## Extension Gap Measurement

***IMPORTANT NOTE: The extension gap can be assessed following the distal femoral and proximal tibial resections. The anterior-posterior femoral resections do not have to be completed prior to the extension gap measurement but may be completed if desired.***

Place the leg into extension. Insert the 10mm extension block (E50010XX) into the space between the distal femoral resection and the proximal tibial resection. **FIGURE 25** If the 10mm spacer block (E50010XX) is too thick additional distal femoral resection or proximal tibial resection may be required to achieve full extension, depending on the corresponding flexion gap measurement.

If the 10mm spacer block is not thick enough for appropriate tension, insert progressively thicker spacer blocks in extension until the appropriate tension is obtained.

***NOTE: The thickness of the femoral condyles, tibial base, and the tibial insert are built into the spacer block thicknesses.***

## Femoral Sizing and Rotation

### Placement of Sizing Caliper

***NOTE: The caliper must be set for the appropriate knee. For example: If used on a right knee, the "Right" marking must be facing the observer and the "Left" marking should be against the bone. To set the caliper for the opposite knee, remove the posterior feet, rotate the caliper and reinsert the feet. FIGURE 26***

### Retractors and placement:

- Knee should be in >90° flexion
- "Z" Retractor – Posterior lateral on femur
- Bent Hohmann – Antero-lateral on femoral cortex

Place the sizing caliper (E1100101) flush against the resected distal femur. Adjust the sizer so the posterior feet (E110013X) rest against the posterior condyles. The stylus (E1100112) should be pushed proximally into the femoral sizing caliper (E1100101) until it clicks. Each click represents one femoral size. The stylus should be pushed until the number of clicks equals the suspected femoral size (femoral size is presumed based on preoperative templating). **FIGURE 27** The stylus (E1100112) size markings are read through the hole in the stylus body. **A IN FIGURE 26**

Ensure the caliper (E1100101) rests flat on the distal surface. **FIGURE 28** The tip of the stylus (E1100112) should touch the most prominent aspect of the anterior cortex just proximal to the lateral anterior condyle. The femoral size is read through the windows in the anterior face of the sizing caliper (E1100101). Sizes are represented by shaded areas.

## Prepare 4-in-1 Block Holes

The 4-in-1 resection block (E12041XX) preparation holes are drilled through the 3° holes with the 3.2mm (1/8”) drill bit (E1000201) **FIGURE 28**, which features a shoulder at the correct depth. **A IN FIGURE 28**

***NOTE: The preparation of the holes will set 3° of external rotation relative to the posterior condylar axis.***

***IMPORTANT NOTE: In a severe varus or valgus knee, the posterior condylar axis may not be a reliable reference for femoral rotation. Instead, rotation may be set visually by referencing the A/P axis or epicondyles. If rotation must be set visually, the caliper (E1100101) features a central window with crosshairs. With the sizing caliper (E1100101) resting on the distal resection, the crosshair may be aligned with the A/P axis or the epicondyles. FIGURE 29 Once aligned, the peg holes are drilled through the 0° holes.***

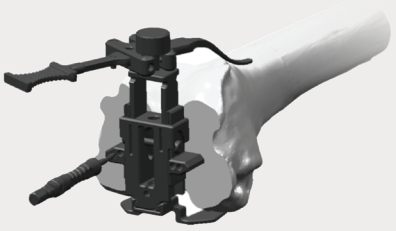


FIGURE 27

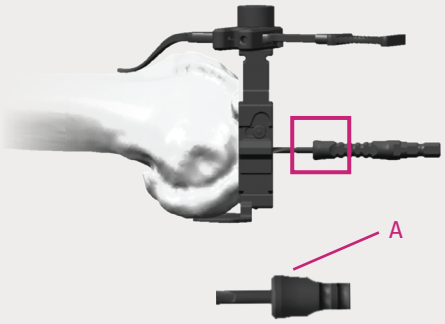
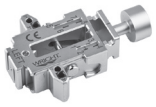



FIGURE 28


FIGURE 29



*P/N E1100101*

*P/N E110013X*

*P/N E1100112*

*P/N E1000201*

*P/N E12041XX*

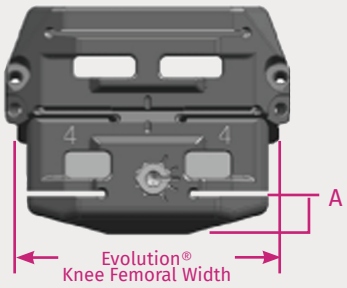



FIGURE 30

## Anterior and Posterior Resections

***NOTE: Take care to protect the collateral ligaments during resections.***

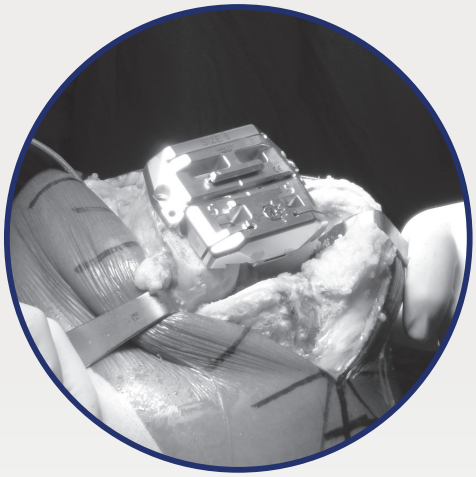
***IMPORTANT NOTE: Make sure the 4-in-1 femoral resection block (E12041XX) is set to zero at the beginning of the case.***

## AP Femoral Block Placement

Select the 4-in-1 femoral resection block (E12041XX) corresponding to the size indicated by the femoral sizing caliper (E1100101). Place the pegs on the back of the femoral resection block (E12041XX) into the holes drilled through the sizing caliper (E1100101).

***NOTE: The femoral resection blocks (E12041XX) may be used to double-check the femoral size. The width of the resection block (E12041XX) on the step just posterior to the level of the pinholes represents the width of the femoral component. The distance from the top of the posterior slot to the central bottom portion of the guide represents the thickness of the posterior condyles of the implant. A IN FIGURE 30***

***NOTE: If the femoral size is found to be between sizes, the bigger size should be utilized, since this choice will not jeopardize the option of downsizing, if necessary.***



## Retractors and placement:

- Curved single-prong Hohmann – Superior-lateral on femoral cortex
- “Z” Retractor – Posterior lateral on femur
- “Z” Retractor – Posterior medial on femur to protect medial collateral ligament

## AP Femoral Block Adjustment

To ensure appropriate posterior condyle resection, place the posterior condylar gauge (E1200113) into the posterior slot of the resection block. **FIGURE 31**

***NOTE: The inside of the gauge equals the thickness of the implant posterior condyles (10mm for sizes 1-4; 11mm for sizes 5-8). The thickness of the outside of the gauge equals approximately 2mm more (12mm for sizes 1-4; 13mm for sizes 5-8). It is recommended to remove 2mm more bone than the implant thickness from the medial side during the posterior resection.***

To ensure appropriate anterior resection and to check for notching, place the dual reference gauge ("angel wing", E5001006) in the anterior cut slot.

If it appears too much or too little of the posterior condyles are being removed or that there will be anterior notching, the 4-in-1 femoral resection block (E12041XX) may be adjusted up to 2mm (.08") anterior or posterior with the 3.5mm hex head screwdriver (E5001005). Place the screwdriver (E5001005) into the adjustment dial and push the dial inward, then turn the dial in increments of 1mm. **FIGURE 32**

If rotation of the femoral resection block (E12041XX) must be adjusted, utilize the 2° re-drill guide (E1100002). Remove the femoral resection block (E12041XX) and insert the re-drill guide (E1100002) into the peg holes. Re-drill the holes in the desired rotation and reinsert the femoral resection block (E12041XX). **FIGURE 33**

FIGURE 31

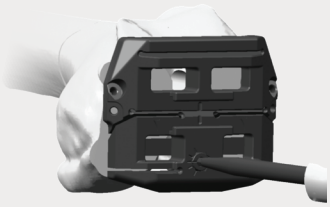


FIGURE 32

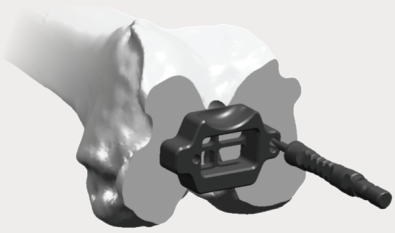


FIGURE 33

*P/N E1200113*

*P/N E5001006*

*P/N E5001005*

*P/N E1100002*

*P/N E5002001*

*P/N E5002002*

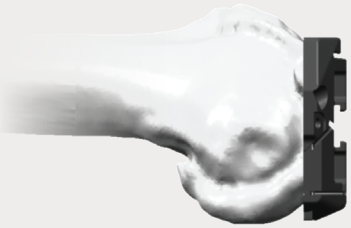


FIGURE 34

FIGURE 35

FIGURE 36

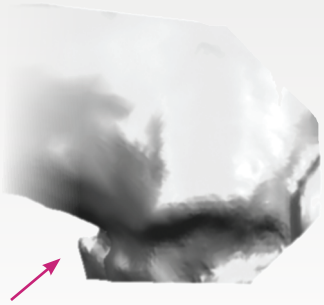



FIGURE 37

## AP Femoral Resections

Ensure the resection block (E12041XX) rests flat on the distal surface. **FIGURE 34** Stabilize the block (E12041XX) against the bone using four 3.2mm (1/8”) diameter pins on the medial and lateral sides of the block (E12041XX). **FIGURE 35** If two pins are preferred, place one pin low and the other high contralaterally.

Resect the anterior and posterior femur. The resections are performed in the following recommended order: 1) anterior cut, 2) posterior cuts, 3) posterior chamfer cuts, and finally 4) anterior chamfer cut.

***NOTE: A narrow saw blade, must be used for the chamfer resections.***

After the resections have been made, the pins are removed and the femoral resection block (E12041XX) is removed with the slaphammer (E5002001) and the extraction boss (E5002002). **FIGURE 36**

***NOTE: Care should be taken to remove posterior condylar osteophytes to avoid impingment with the posterior portion of the tibial component. FIGURE 37***

## Extension and Flexion Gap Measurements and Adjustments

***NOTE: The extension gap may be measured after the distal femoral resection and proximal tibial resection. The anterior and posterior femoral resections do not have to be completed, but are recommended to be completed for final gap assessment in relation to the flexion gap. The flexion gap is measured after the distal femoral resection, the posterior femoral resections, and the proximal tibial resection.***

Reasses the Extension Gap measurement by following the technique described on **page 17**. **FIGURE 38**

To assess the Flexion Gap measurement, flex the knee to 90° and insert the 10mm flexion block (E50010XX) into the space between the posterior femoral resection and proximal tibial resection. **FIGURE 39** If the 10mm spacer block (E50010XX) is too tight in flexion, an additional tibial resection or a smaller femoral size may be needed depending on the corresponding extension measurement.

Insert progressively thicker spacer blocks until appropriate tension is obtained.

Ensure that the extension and flexion measurements are equivalent. If they are not equivalent, refer to **TABLE 1** to determine the correction needed.

***NOTE: The ball-in-socket design accommodates for slight laxity in flexion.***

***NOTE: The thickness of the femoral condyles, tibial base, and the tibial insert are built into the spacer block thicknesses.***

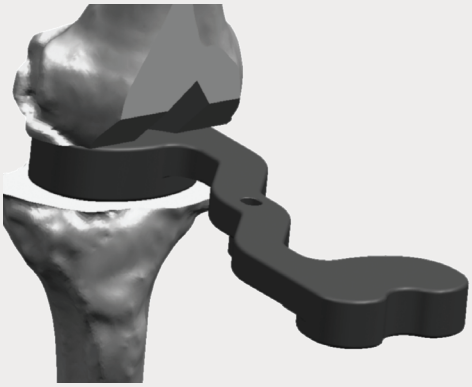


**FIGURE 38**

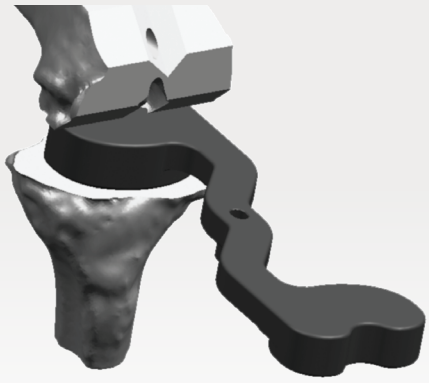


**FIGURE 39**


***P/N E50010XX***

**TABLE 1**

| FLEXION \ EXTENSION | TIGHT | OK | LOOSE |
|---|---|---|---|
| TIGHT | Downsize poly insert<br>Cut more tibia | Cut more posterior condyle (Resulting in smaller femoral component) | Cut more posterior condyle (Resulting in smaller femoral component) |
| OK | Recut distal femur | No adjustment necessary | Cut more posterior slope and use thicker poly |
| LOOSE | Recut distal femur and use thicker poly (If necessary) | Change may not be necessary. Ball-in-socket design accommodates for slight laxity in flexion<br>If necessary, recut distal femur and use thicker poly | Change may not be necessary. Ball-in-socket design accommodates for slight laxity in flexion<br>Use thicker poly |

*P/N E10051X3*

*P/N E130XXXX*

*P/N E5005001*


FIGURE 40

## Trochlear Groove Resection and Femoral Trial Placement (Sizes 3-8)

### Femoral Trial Placement

Assemble the holder driver (E10051X3 or E10051X7) to the modular impaction handle (E5005001). **FIGURE 41**

Loosen the knob on the femoral holder driver (E10051X3) to retract the impactor pad housing to expose the intracondylar hook **A IN FIGURE 40** Place the intercondylar hook of the femoral holder driver (E10051X3) on the appropriate size femoral trial (E130XXXX) as shown. Use the knob to tighten the holder driver (E10051X3) to the femoral trial (E130XXXX). **FIGURE 41** Seat the femoral trial against the femoral bone. **FIGURE 42**

***NOTE: Many surgeons lateralize the femoral component to reproduce the natural Q-angle.***

FIGURE 41

## Femoral Trochlear Groove Preparation

Loosen the knob of the femoral holder / driver (E10051X3) and slide the femoral holder / driver out of the femoral trial (E130XXXX).

Detach the femoral holder / driver (E10051X3) from the modular impaction handle (E5005001). Attach the femoral finishing impactor (E10051X1) to the modular impaction handle (E5005001).

Impact the femoral trial (E130XXXX) to be flush with with the bone using the femoral finishing impactor. **FIGURE 42**

Resect the trochlear bone using the V-shaped flat on the CS/CR* femoral trial as a guide. **FIGURE 43**

Prepare the final peg holes for the implant by drilling the distal holes on the femoral trial with the 4.8mm (3/16”) drill bit (E1000301). The bit features a collar at the correct depth. **FIGURE 44**

***NOTE: Femoral trial pins (E1051022) may also be used to prepare for the pegs on the final implant.*** **FIGURE 45**

***CAUTION: Be careful not to plunge the saw blade past the intended V-shaped trochlear groove resection. This can possibly lead to stress risers on the distal femur and periprosthetic fractures of the bone.***

***NOTE: CR is not available in CE marked countries***

FIGURE 42

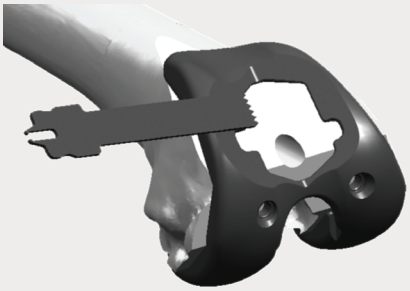


FIGURE 43

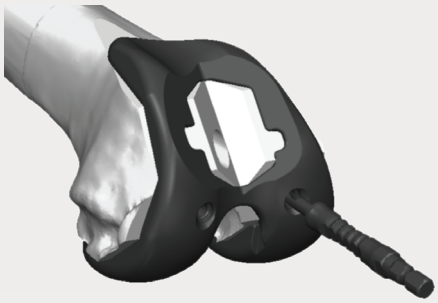


FIGURE 44

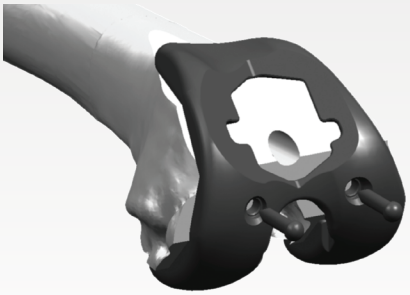


FIGURE 45

*P/N E1005101X1*

*P/N E1000301*

*P/N E1051022*

*P/N E120100X*

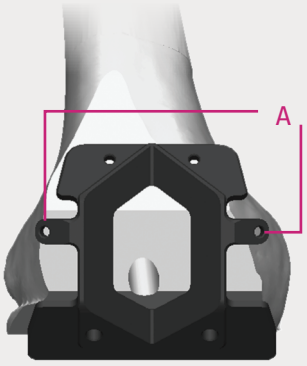



FIGURE 46

## Trochlear Groove Resection and Femoral Trial Placement (Sizes 1-2)

***IMPORTANT NOTE: The trochlear groove resection for sizes 3-8 CS/ CR femoral components is made through the femoral trial and is performed after the tibial bone has been prepared.***

Select the trochlear groove resection guide (E120100X) corresponding to the size indicated by the sizing caliper (E1100101). **FIGURE 46** Place the guide (E120100X) along the lateral edge of the femur to reproduce the natural Q-angle. Pin the guide using two collared pins. **A IN FIGURE 46** Resect the trochlear groove by using a 12.7mm (1/2”) sawblade on the angled surface and along the sides of the central portion of the guide (E120100X).

***NOTE: The width of the distal aspect of the guide (E120100X) is the same M/L width as the femoral implant, and the lateral proximal edge represents the lateral edge of the implant and dictates the final implant location.***

***NOTE: The peg holes for the implant are prepared during the femoral trialing step. If the extension/flexion balance has not been properly achieved at this stage, and a femoral re-cut is necessary, the femoral resection block cannot be re-mounted onto the femur due to the 3.2mm (1/8”) pegs on the back of the blocks once the 4.8mm (3/16”) peg holes have been drilled.***

Place the femoral trial onto the femoral bone as decribed in the Trochlear Groove Resection and Femoral Trial Placement (Sizes 3-8) section.

## Tibial Sizing and Tibial Trial Placement

The Evolution® Knee System allows 1-up, 1-down interchangeability. (See **page 27** for interchangeability information.)

## Tibial Trial Sizing

Assemble the appropriate trial tibial base (E2302XXX) to the trial base handle (E2001020) and place it against the resected proximal tibial surface. The alignment rod (E5101001) can be inserted through the handle (E2001020) to check alignment to the ankle. **A IN FIGURE 47** Align the trial tibial base (E2302XXX) (generally to the medial one-third of the tibial tubercle). The trial tibial base (E2302XXX) may be pinned to the tibia using short headed anchoring pins (E2001020) through the holes with vertical lines. **B IN FIGURE 47**

## Trial Reduction and Range of Motion

Place the appropriate size CS/CR* femoral trial patella cap (E13050XX) on the femoral trial (E1301XXX). **FIGURE 48**

Insert the trial tibial insert (E3XXXXXX) of the appropriate hand, size and thickness onto the trial base (E2302XXX). **FIGURE 49** To achieve an insert trial with a thickness of more than 14mm, snap the trial insert spacers (E340XXXX) into the 14mm insert trial to make 17mm, 20mm, and 24mm increments. **FIGURE 50**

***NOTE: CR is not available in CE marked countries***

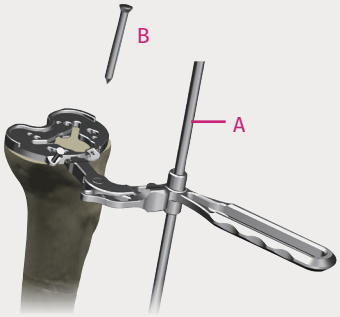



FIGURE 47

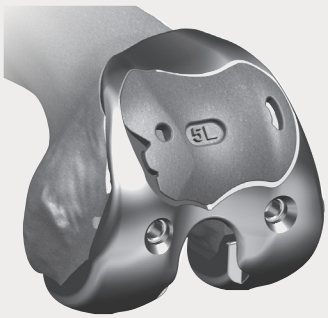



FIGURE 48

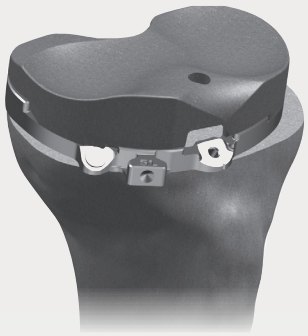


FIGURE 49

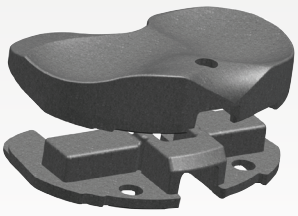


FIGURE 50

P/N E2302XXX

P/N E2001020

P/N E2001020


P/N E13050XX

P/N E3XXXXXX

P/N E340XXXX

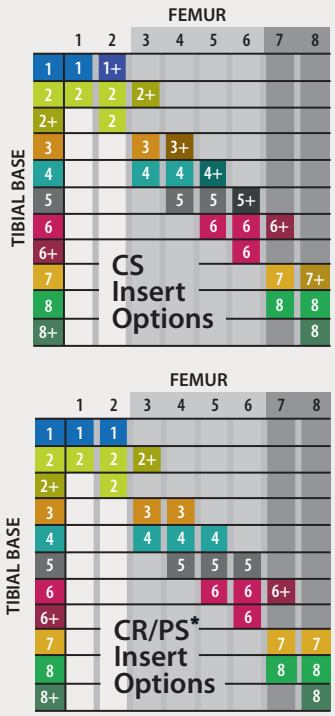



FIGURE 51

***IMPORTANT NOTE: The Evolution® system allows for 1 size mismatch between the femur and tibia for all styles. Refer to FIGURE 51 for size interchangeability and see the implant specification charts at the end of this surgical technique for a more detailed look at the options available for use. Be aware of the size 2+ and 6+ tibial bases – these are required for the articular surface groupings built into this system.***

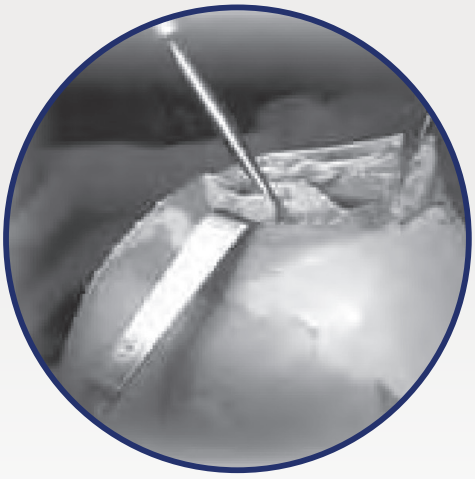
***NOTE: When assembling the tibial insert trial (E3XXXXXX), slightly angle the insert trial with some posterior slope during insertion to clear the anterior lip of the trial base (E2302XXX).***

***NOTE: Trial inserts (E3XXXXXX) may be assembled in conjunction with the final tibia base implant (ETPKNXXX) to allow the surgeon to continue to trial after final implantation of the femur and the tibia.***

If the patella has been resurfaced, place the selected trial patella (KPTRTPXX) in place and complete the trial reduction. With the trial implants in place, perform an evaluation of the full range of motion to determine the final implant position.

Once final implant position is decided, the lines on the anterior portion of the trial tibial base (E2302XXX) can be used for marking the tibia to aid with alignment of the tibial base component during final implantation.

***NOTE: CR/PS is not available in CE marked countries**



## Retractors and placement:

- Knee should be placed in 90° of flexion.
- Curved Single Prong Hohmann – on lateral tibia to cover patella and protect soft tissues
- “Z” Retractor – on medial tibia to expose tibia and protect the medial collateral ligament
- Cobb Elevator – subluxes tibia forward

## Tibial Keel Preparation

After the trial reduction is complete, remove the insert trial (E3XXXXXX) and the femoral trial (E130XXXX) along with any femoral trial pins with the slaphammer (E5002001) by sliding the extraction boss (E5002002) into the slot between the femoral condyles. **FIGURE 52** During removal, keep one hand on the femoral trial (E130XXXX) to control its extraction. Leave the tibial base trial (E2302XXX) in the position with the lines of the tibial base trial matching the recently marked lines on the tibia. If not already pinned, pin the tibial base trial using short headed anchoring pins to the tibia.

Align the four spikes on the keel punch tower (E2004XXX) with the corresponding holes on the trial tibial base (E2302XXX) and impact the keel punch guide with a mallet until the keel punch guide (E2005XXX) is seated on the surface of the trial tibial base (E2303XXX). **FIGURE 53**

In the event of hard tibial bone, before punching, prepare the entry hole for the tibial keel using the 15mm (1/2”) cemented or cement free reamer. **FIGURE 54** Reference **TABLE 2** for the appropriate reamer, reamer line, and keel punch for the various size tibial base trials.

***Note: Sizes 1 and 2 tibial baseplates utilize a separate reamer included with those size baseplate trials.***

***NOTE: Make sure cemented or cement free reamers, towers, and keels all match.***

FIGURE 52

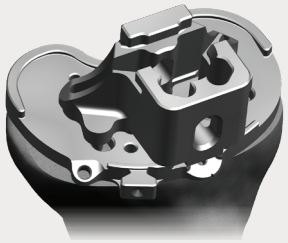


FIGURE 53

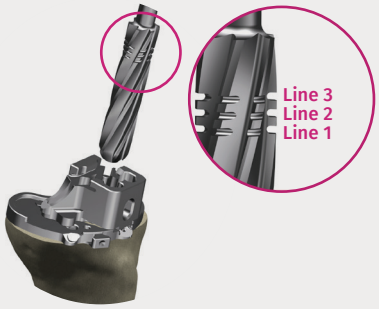



FIGURE 54

**TABLE 2**

| Tibial Base Trial | Reamer | Keel Punch |
|---|---|---|
| Size 2+ | Line 1 | Size 2+/3/4 |
| Size 3 | Line 1 | Size 2+/3/4 |
| Size 4 | Line 1 | Size 2+/3/4 |
| Size 5 | Line 2 | Size 5/6 |
| Size 6 | Line 2 | Size 5/6 |
| Size 6+ | Line 3 | Size 6+/7/8/8+ |
| Size 7 | Line 3 | Size 6+/7/8/8+ |
| Size 8 | Line 3 | Size 6+/7/8/8+ |
| Size 8+ | Line 3 | Size 6+/7/8/8+ |

*CEMENTED P/N E2004028*
*CEMENT-FREE P/N E2004128*

*CEMENTED P/N E2001238*

*CEMENT-FREE P/N E2001138*

*P/N E2005XXX*

*P/N E2000001*

**FIGURE 55** **FIGURE 56**

**FIGURE 57**

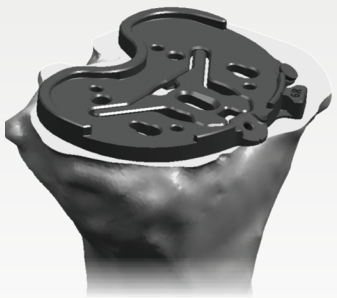


**FIGURE 58**

Assemble the appropriate size keel punch (E2005XXX) to the keel punch handle (E2000001) by pulling back on the trigger mechanism of the handle (E2000001) and inserting it into the opening on the keel punch (E2005XXX). **FIGURE 55** The keel punch handle (E2000001) is impacted with a mallet until fully seated and the bottom edge of the handle (E2000001) aligns with the top of the keel punch tower (E2004XXX). **FIGURE 56**

The handle (E2000001) is released from the punch (E2005XXX) by pulling back on the handle's trigger mechanism. The keel punch tower (E2004XXX) is removed with the slaphammer (E5002001) and the extraction boss (E5002002) **FIGURE 57**, leaving the trial tibial base (E2302XXX) and keel punch (E2005XXX). **FIGURE 58**

After final trial reduction and range of motion assessments, remove the tibial base.

## Patella Preparation

***NOTE: Patella preparation is only necessary if the surgeon chooses to resurface the patella at their surgical discretion. Ensure the patellar preparation is perfomed prior to the final trialing and range of motion.***

## Patellar Resection

Choose the appropriate patella resection depth stylus. Attach the resection depth gauge to the top of the resection guide (E4202000). **A IN FIGURE 59** Position the resection guide (E4202000) jaws parallel to the articular margin and securely clamp the guide to the bone; ensuring the gauge is contacting the apex of the articular surface. **FIGURE 60** Remove the resection depth gauge (E420200X) and make the patellar resection.

***NOTE: The 6mm (E4202002) and 8mm (E4202001) resection depth gauges come standard in the patella kit.***

## Patellar Peg Preparation and Trialing

Attach the single peg (K0031109) or tri-peg (K0031104) drill guide to the patellar clamp (K0031103). **A IN FIGURE 61**

***NOTE: The drill guides have grooves on their surfaces indicating the patellar diameter options.***

Prepare the peg hole(s) by drilling through the drill guides using the single peg (E4001015) or tri-peg (E4001035) drill.

Place the single peg (KPTRXXXX) or tri-peg patella (KPTRTPXX) trials onto the prepared patella for trialing.

***NOTE: The single peg and tri-peg patella components have the same peg position between sizes and can be easily changed during trial reduction.***


FIGURE 59

FIGURE 60

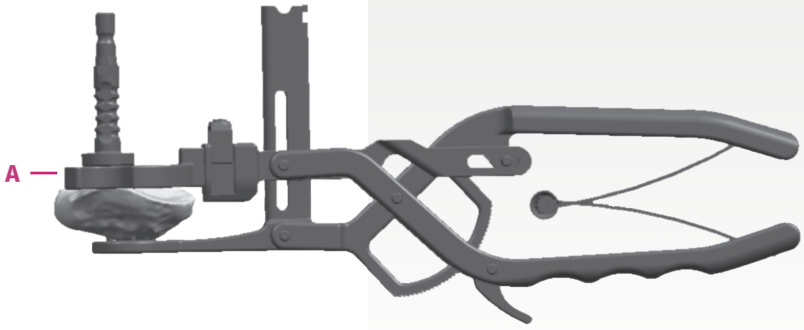



FIGURE 61

*6MM P/N E4202002*

*8MM P/N E4202001*

*P/N E4202000*

*P/N K0031109*

*P/N K0031104*

*P/N K0031103*

*P/N E4001015*

*P/N E4001035*

*P/N E2001021*

FIGURE 62

## Final Implant and Insert Implantation

***NOTE: The recommended order for implantation is left to the discretion of the orthopaedic surgeon.***

## Tibial Baseplate Implantation

The tibial bone bed is cleaned and bone cement, if using a cemented baseplate, is prepared and introduced according to the standard recommendations. The tibial holder driver (E2001021) may be used to seat the final implant. **FIGURE 62** To engage the tibial holder driver (E2001021), depress and engage the locking mechanism with the front of tibial base implant. Assemble the tibial finishing impactor (E20051X1) to the module impaction handle (E5005001). Impact the tibial baseplate implant with a mallet until fully seated in the bone. **FIGURE 62** Remove excess cement if used.

If implanting a cementless tibia, once the proper size tibial baseplate and keel implants are chosen, align the key and groove on the tibial baseplate taper and keel, respectively, and impact the keel onto the tibial baseplate implant Morse taper. Apply three strong blows with a metal mallet directly on the metal tip of the stem.

***CAUTION: The assembly should be performed on a rigid back table and, most effectively, over a supporting structure for the table such as a corner to avoid any flex of the table during assembly. "Metal on metal" contact is a necessity. Ensure that no additional material (e.g. towels, 4 x 4's, etc.) is placed between the mallet and the stem extension tip.***

## Femoral Component Implantation

The femoral bone bed is cleaned and bone cement, if using a cemented femoral component, is prepared and introduced according to standard recommendations. Assemble the femoral holder driver (E1005103) to the modular impaction handle (E5005001). Use the femoral holder driver assembly to initially position and impact the final femoral component (porous: EFSRPXXX or nonporous: EFSRNXXX). Assemble the femoral finishing impactor (E1005101) to the modular impaction handle (E5005001) and perform final impaction of the femoral component. **FIGURE 63** Remove excess cement, if used.

***IMPORTANT NOTE: Final impaction must be completed with the femoral finishing impactor.***

***CAUTION: Use porous coated femoral components only when there is no need for cement. Use nonporous coated femoral components only when there is need for cement.***

## Patellar Component Implantation

The patellar bone bed is cleaned and bone cement, if using a cemented patella, is prepared and introduced according to the standard recommendations.
Place the patellar component in line with the peg preparation. Hold the patellar implant in place while the cement cures using the parallel patellar clamp (K0031103) and implant seater (E4001008). **FIGURE 64**

FIGURE 63

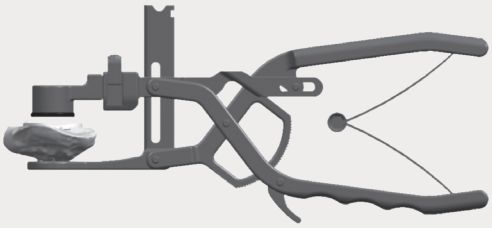


FIGURE 64

*P/N E4001008*

*P/N E20051X1*

*P/N E30051X1*

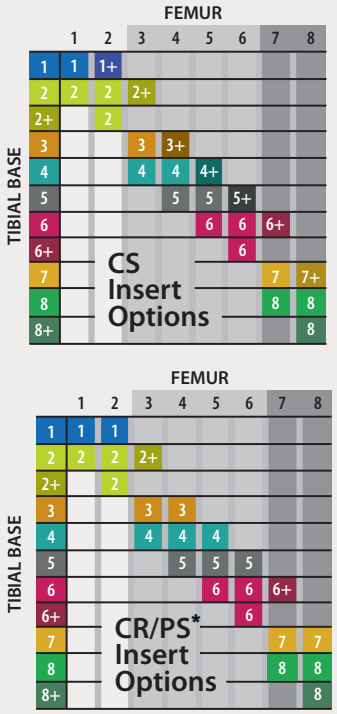



FIGURE 65

## Tibial Insert Implantation / Seating

***IMPORTANT NOTE: Ensure the posterior and peripheral captures of the tibial base implant are completely clear of soft tissue and bone. If these captures are not clear, the tibial insert will not be able to seat. The tips of the dual reference gauge (E5001006, "angel wing") are contoured to fit in the lock detail to help clear debris.***

Once the cement has cured, the appropriate Evolution® tibial insert may be locked into place. Initial seating is accomplished by pushing the insert as far posterior as possible with hand pressure, paying special attention to engage the central dovetail and the posterior captures of the tibial base.

Refer to **FIGURE 65** for the appropriate insert size based on tibial and femoral size.

The 45° insert impactor (E30051X1) may be utilized by placing the impactor tip in the anterior slot of the tibial insert at slightly greater than a 45° angle to the tibial base. **FIGURE 66** Keeping the impactor tip in the slot, decrease the angle of the impactor handle until the tip is felt to impinge within the slot, approximately 45°. While maintaining the 45° angle relative to the tibial base, apply several strong mallet blows directing the insert posteriorly. After the anterior edge of the insert has been pushed past the anterior capture of the tibial base, it will automatically drop behind the anterior capture and the insert face will be flush against the surface of the tibial base.

***NOTE: CR/PS are not available in CE marked countries**

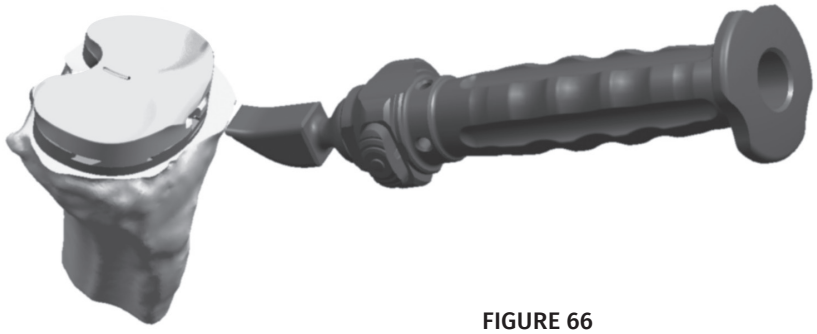


FIGURE 66

## Explant Information

***IMPORTANT NOTE: If the removal of the implant is required due to revision or failure of the device, the surgeon should contact the manufacturer using the contact information located on the back cover of this surgical technique to receive instructions for returning the explanted device to the manufacturer for investigation.***

## Insert replacement

A narrow osteotome may be inserted into the anterior region of the insert to facilitate removal. A hemostat may be used to remove the insert once it is no longer locked to the tibial base. Care must be taken not to scratch or mar any component that is not intended to be removed.

## Femur, tibia, and patella components

To remove the components, small osteotomes, power saws, or other surgical instruments may be used to disrupt the bone-cement interface and bone ingrowth into porous coating. Once the components have been removed, rongeurs or small osteotomes as well as other surgical instruments may be used to remove the remaining cement.

# Addendum

*P/N E1005212*
*OR E1005102*

*P/N E2005102*
*OR E2005212*

*P/N E1005104*
*OR E1005114*

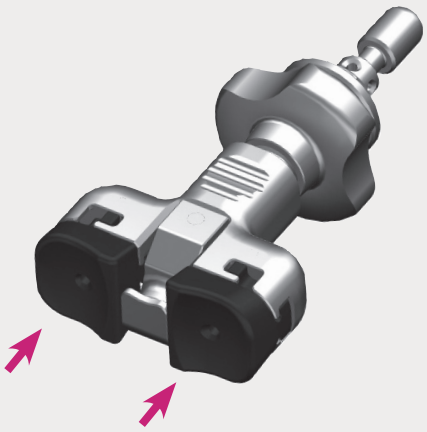


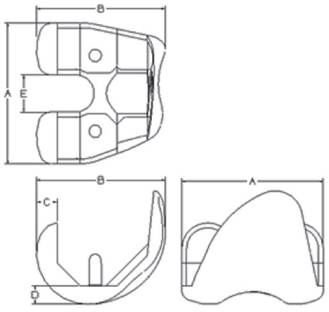
FIGURE 67

## Replaceable Plastic Impaction Surfaces

The femoral finishing impactor (E10051X1), tibial finishing impactor (E20051X1), and femoral holder driver (E10051X3) have replaceable plastic impaction surfaces. All can be disassembled by inserting a pin in each hole in the impaction surface and depressing the locking mechanism. **FIGURE 67** Slide each impactor pad to the side and pull up to remove.

***NOTE: these replaceable plastic impaction surfaces are not compatible with E10051X1, E20051X1, and E10051X3.***

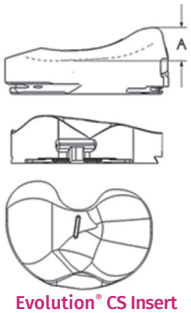
# Implant dimensions



**Evolution®**
MP CS/CR* Femoral Components
EFSRN(X)P(L/R)
EFSRP(X)P(L/R)

| Size | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | 59 | 51 | 10 | 9 | 16 |
| 2 | 61 | 54 | 10 | 9 | 16 |
| 3 | 64 | 57 | 10 | 9 | 18 |
| 4 | 66 | 60 | 10 | 9 | 18 |
| 5 | 70 | 64 | 11 | 9 | 18 |
| 6 | 73 | 68 | 11 | 9 | 18 |
| 7 | 77 | 72 | 11 | 9 | 20 |
| 8 | 80 | 76 | 11 | 9 | 20 |

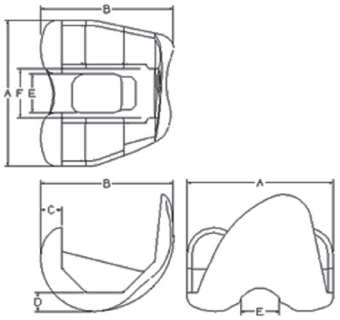
Dimensions are in mm



**Evolution® CS Insert**
(Available Thicknesses 10, 12, 14, 17, 20, 24mm)
EIS(X)S(T)(L/R)
EIS(X)P(T)(L/R)

| CS | A |
|---|---|
| 1 | 11 |
| 1+ | 11 |
| 2 | 11 |
| 2+ | 11 |
| 3 | 11 |
| 3+ | 11 |
| 4 | 11 |
| 4+ | 11 |
| 5 | 11 |
| 5+ | 11 |
| 6 | 11 |
| 6+ | 11 |
| 7 | 11 |
| 7+ | 11 |
| 8 | 11 |

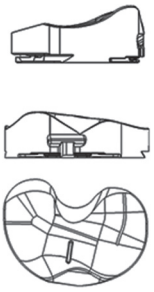
Dimensions are in mm



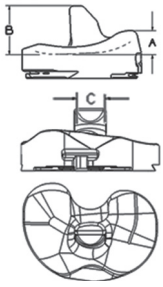
**Evolution®**
MP PS* Femoral Components
EFPSN(X)P(L/R)

| Size | A | B | C | D | E | (Ps Only) F |
|---|---|---|---|---|---|---|
| 1 | 59 | 51 | 10 | 9 | 16 | 20 |
| 2 | 61 | 54 | 10 | 9 | 16 | 20 |
| 3 | 64 | 57 | 10 | 9 | 18 | 22 |
| 4 | 66 | 60 | 10 | 9 | 18 | 22 |
| 5 | 70 | 64 | 11 | 9 | 18 | 22 |
| 6 | 73 | 68 | 11 | 9 | 18 | 22 |
| 7 | 77 | 72 | 11 | 9 | 20 | 25 |
| 8 | 80 | 76 | 11 | 9 | 20 | 25 |

Dimensions are in mm



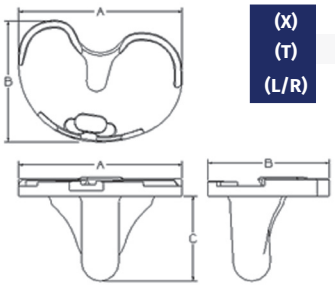
**Evolution® CR* Insert**
Available Thicknesses
10, 12, 14, 17mm
EIC(X)S(T)(L/R)
EIC(X)P(T)(L/R)



**Evolution® PS* Insert**
Available Thicknesses
10, 12, 14, 17, 20, 24mm
EIP(X)S(T)(L/R)
EIP(X)P(T)(L/R)

| CR/PS | A | B | (Ps Only) C |
|---|---|---|---|
| 1 | 9 | 19 | 14 |
| 2 | 9 | 19 | 14 |
| 2+ | 9 | 20 | 16 |
| 3 | 9 | 20 | 16 |
| 4 | 9 | 20 | 16 |
| 5 | 9 | 21 | 16 |
| 6 | 10 | 22 | 16 |
| 6+ | 10 | 23 | 19 |
| 7 | 10 | 23 | 19 |
| 8 | 11 | 24 | 19 |

Dimensions are in mm

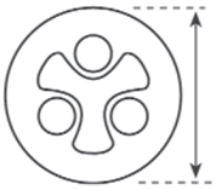


| | |
|---|---|
| (X) | Size |
| (T) | Thickness |
| (L/R) | Left/Right |

**Evolution®**
MP Tibial Base Components
ETPKN(X)S(L/R)
ETPKN(X)P(L/R)
ETAKN(X)S(L/R)
ETAKN(X)P(L/R)

| Size | A | B | C |
|---|---|---|---|
| 1 | 54 | 40 | 31 |
| 2 | 58 | 43 | 31 |
| 2+ | 62 | 46 | 34 |
| 3 | 62 | 46 | 34 |
| 4 | 66 | 49 | 34 |
| 5 | 70 | 52 | 38 |
| 6 | 74 | 55 | 38 |
| 6+ | 78 | 58 | 41 |
| 7 | 78 | 58 | 41 |
| 8 | 82 | 61 | 41 |
| 8+ | 86 | 64 | 41 |

Dimensions are in mm



**Advance®**
Patella Components
KPONTP(X)
KPON(X)(SP/TP)

| Size (Diameter) | Single peg | Tripeg | Thickness (mm) |
|---|---|---|---|
| 25 | • | n/a | 7 or 9 |
| 26 | n/a | • | 8 |
| 28 | • | n/a | 7 or 9 |
| 29 | n/a | • | 8 |
| 32 | • | • | 8 |
| 35 | • | • | 8 |
| 38 | • | • | 10 |
| 41 | • | • | 11 |

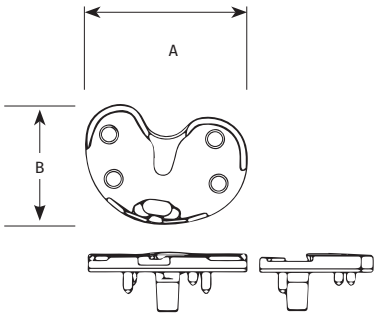
Dimensions are in mm

***NOTE: CR/PS are not available in CE marked countries**

# Implant dimensions

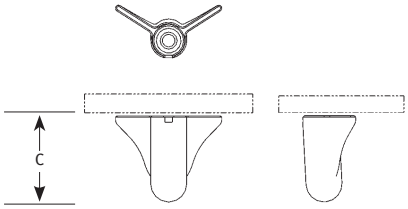
***NOTE: CR/PS are not available in CE marked countries**

| | |
|---|---|
| (X) | Size |
| (T) | Thickness |
| (L/R) | Left/Right |



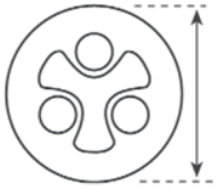

**EVOLUTION® BIOFOAM® TIBIAL BASE SCREWLESS**
ETPLB(X)S(L/R)
ETPLB(X)P(L/R)

| Size | A | B |
|---|---|---|
| 2+ | 62 | 46 |
| 3 | 62 | 46 |
| 4 | 66 | 49 |
| 5 | 70 | 52 |
| 6 | 74 | 55 |
| 6+ | 78 | 58 |
| 7 | 78 | 58 |
| 8 | 82 | 61 |




**EVOLUTION® BIOFOAM® PRESS_FIT KEEL**
Primary Keel - 15mm

| Impant | C |
|---|---|
| ETPK1534 | 34 |
| ETPK1556 | 38 |
| ETPK1578 | 41 |



**PATELLA COMPONENTS**
KPONTP(X)
KPON(X)(SP/TP)

| Size | Single Peg | Tripeg | Thickness (mm) |
|---|---|---|---|
| 25 | - | n/a | 7 or 9 |
| 26 | n/a | - | 8 |
| 28 | - | n/a | 7 or 9 |
| 29 | n/a | - | 8 |
| 32 | - | - | 8 |
| 35 | - | - | 8 |
| 38 | - | - | 10 |
| 41 | - | - | 11 |

**COMPATIBILITY CHART**

| Tibial Base | Modular Keels | | |
|---|---|---|---|
| | ETPK1534 | ETPK1556 | ETPK1578 |
| 2+ | x | | |
| 3 | x | | |
| 4 | x | | |
| 5 | x | x | |
| 6 | x | x | |
| 6+ | x | x | |
| 7 | x | x | x |
| 8 | x | x | x |

## Notes

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Arlington, TN USA 38002
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