Design Rationale
Overview

VISIONAIRE® patient matched cutting blocks use the patient’s MRI and X-Ray to determine accurate alignment cuts and implant placement for each patient. However, the surgeon’s input on each patient is critical. The surgeon has the ability to make adjustments as he/she sees fit to address the patient’s specific anatomy, making this process not only patient specific, but surgeon specific as well.

Varus/Valgus Alignment

Femur
Using the patient’s full-leg standing A/P X-Ray, varus/valgus alignment is set to the mechanical axis by measuring the angle between the mechanical axis of the femur (center of the femoral head to the femoral sulcus) and the femoral shaft axis (Figure 1).

Tibia
Using the patient’s full-leg standing A/P X-Ray, varus/valgus alignment is set to be perpendicular to the mechanical axis which is measured from the eminence to the center of the distal tibial shaft.

Note: By using the patient’s full-leg A/P X-Ray, measurements made based on the patient’s anatomy can be used to correct the patient’s preoperative varus or valgus deformity (eg, severe tibial bow or severe varus/valgus of the femur).
**External Rotation**

**Femur**
LEGION™ PRIMARY/JOURNEY™ BCS – aligned to the A/P axis due to the fact that the MRI clearly shows A/P axis. The trans-epicondylar axis and the posterior condyles can be used as secondary reference points.

GENESIS™ II – aligned to the posterior condyles. A/P axis and the trans-epicondylar axis can be used as secondary reference points.

**Notes:** The distal pin holes of the femoral block align with the pin holes on the 4-in-1 A/P cutting blocks, therefore, setting the appropriate rotational alignment.

The vertical etching on the anterior surface of the femoral cutting block aligns with the A/P axis to show rotational alignment.

The horizontal etching on the distal surface of the femoral block is parallel with the trans-epicondylar axis and the width also represents the ML width of the suggested implant size.

**Tibia**
Aligned to the medial one-third of the tibial tubercle.

**Notes:** The proximal pin holes on the tibial cutting block match the pin holes on the tibial trial and can be used to set the rotation.

The anterior etching on the tibial cutting block marks the medial one-third of the tubercle. This can be used to show rotation, and line up a drop rod for checking varus/valgus and slope.
**Flexion**

**Femur**
Flexion and A/P placement is set to avoid femoral notching and or “air balling” unless otherwise requested by the surgeon. The distal cut is set to be perpendicular to the shaft axis of the distal femur in the sagittal plane replicating what would be achieved when using an intramedullary rod.

**Tibial Flexion/Posterior Slope**
The default proximal tibial cut is designed with 3° posterior slope. All Smith & Nephew tibial implants are designed with the baseplate at 3° of posterior slope in relation to the stem. Smith & Nephew tibial inserts have 3-4° of slope built in as well to give a total of 6-7° of posterior slope built into the implant. The surgeon may request more or less slope, but it is only advised to do so when using a cruciate retaining implant system.

**Distal Femoral Resection**

**JOURNEY® BCS**
Resection depth is based on sulcus referencing by setting the distal cut 1.5mm (saw blade width) into the sulcus. An additional 2mm can be designed into the blocks preoperatively at the surgeon's request.
LEGION® PRIMARY/GENESIS® II
Resection depth is measured 9.5mm from the least effected condyle. An additional 2mm can be designed into the blocks preoperatively at the surgeon's request.

For all three implant systems, the anterior holes on the femoral cutting block are identical to the hole pattern on the standard distal femoral cutting blocks in order to remove additional bone intraoperatively. Refer to standard catalog numbers below.

71441118 – GII MIS Distal Femoral Cutting Block
74012233 – JOURNEY® BCS MIS Distal Femoral Cutting Block

Proximal Tibial Resection

JOURNEY® BCS
Standard tibial resection is 12mm off the least effected side (approximately 8mm for valgus deformity) for a 9mm insert. A thicker insert will require a larger resection depth.

LEGION PRIMARY/GENESIS II
Standard tibial resection is 9mm off the least effected side (approximately 5mm for valgus deformity) for a 9mm insert. A thicker insert will require a larger resection depth.

For all three implant systems, the anterior holes on the tibial cutting block are identical to the hole pattern on the standard proximal tibial cutting blocks in order to remove additional bone intraoperatively. Refer to standard catalog numbers below.

71441136 – GII MIS Tibial Cutting Block – Left
71441137 – GII MIS Tibial Cutting Block – Right
74018411 – JOURNEY BCS MIS Tibial Cutting Block – Left
74017411 – JOURNEY BCS MIS Tibial Cutting Block – Right
Implant Sizing
Femoral sizing is based on A/P dimensions due to the fact that all Smith & Nephew systems were designed and sized based on A/P dimensions.

Tibial sizing is based on plateau coverage.

Upsize/Downsize Protocol
If, based on the MRI data, the implant size is between two sizes, the size determined is based on the surgeon preference.

Other Design Notes
Cartilage and osteophytes are included in all designs, however, the meniscus must be removed.

Also, due to the 2mm slices obtained from the MRI scan, osteophytes smaller than 2mm may not be built into the design. Should any small osteophytes cause the blocks not to fit accurately, they must be removed before making any cuts.