

Distal Cut First Sizing and A/P Resection Guide

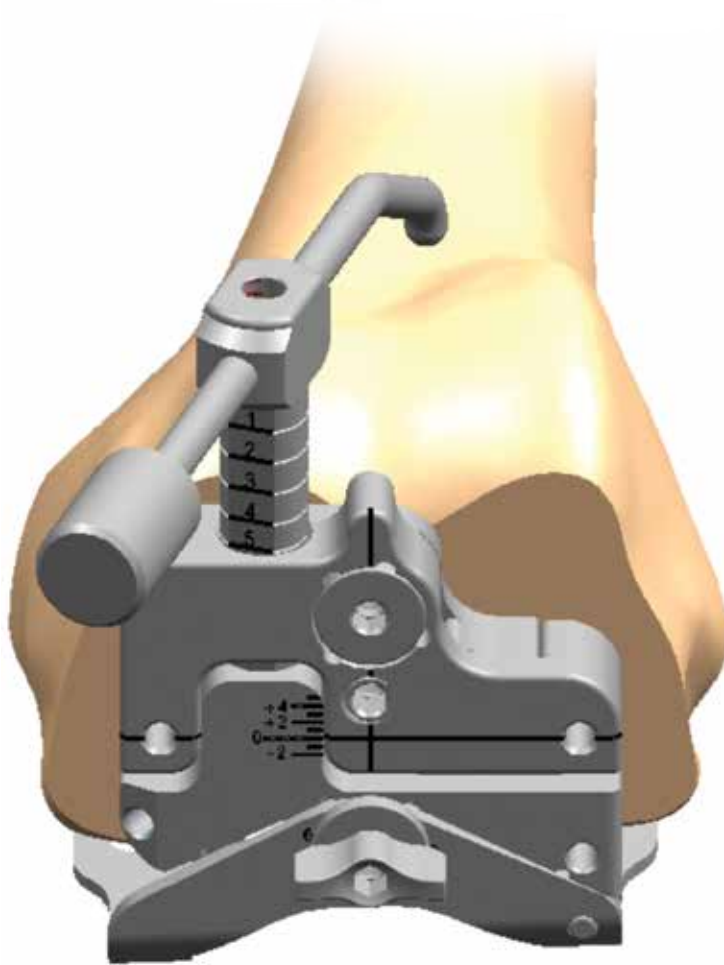


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Nota Bene

The technique description herein is made available to the healthcare professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient.

Introduction

This technique addendum is intended to be a reference for sizing and shifting the 4-in-1 femoral cutting guide. Due to differing femoral anatomy, this may be needed when the planned resections do not remove enough bone or remove too much bone at the surgeon's discretion. The resection check should always be used in the anterior cutting slot of the 4-in-1 block to determine resection level, as it is important to make any shift decisions prior to making any bone resections. When making the resections, it is important to start with the anterior resection first as it leaves the most options for shifting the block after the resection has been made.

Instruments

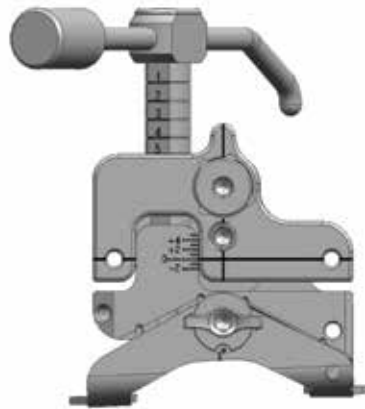
4-in-1 Cut Block

Used to make the anterior, posterior and chamfer resections matching the implant.



Variable sizing guide

Used to determine size, set external rotation and Anterior/Posterior position of the 4-in-1 cutting block.



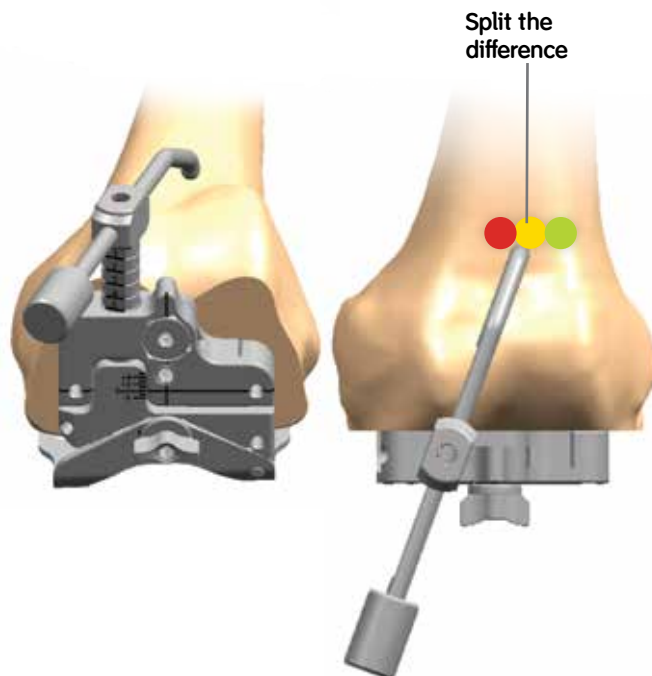
Downsizing drill guide

Used to shift the holes for the 4-in-1 cutting block 2mm in either the anterior or posterior directions.



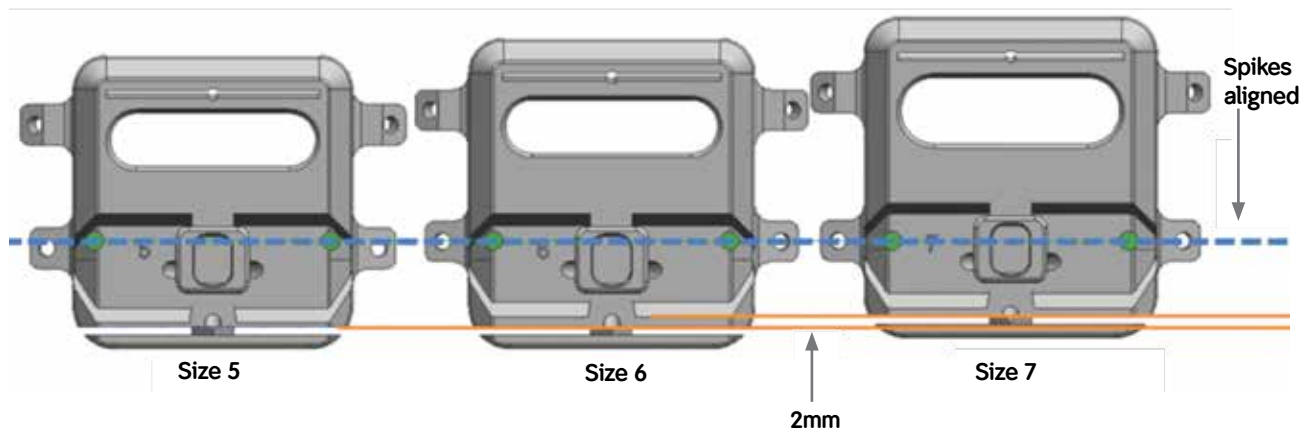
Sizing the femur

For most accurate sizing, find a balance between the lateral cortex and mid sulcus on the anterior femur. Splitting the difference has been found to determine the most accurate sizing.



A/P resection dimensions

As the 4-in-1 cutting blocks change in size, the anterior resection changes accordingly but the posterior resection stays the same. *The exception to this rule is the 2mm larger posterior resection with the size 7 and 8, 4-in-1 blocks.* This is done in order to accommodate the larger posterior condyle thickness on these implants (11.5mm vs. 9.5mm).



LEGION® TKS A/P box dimensions

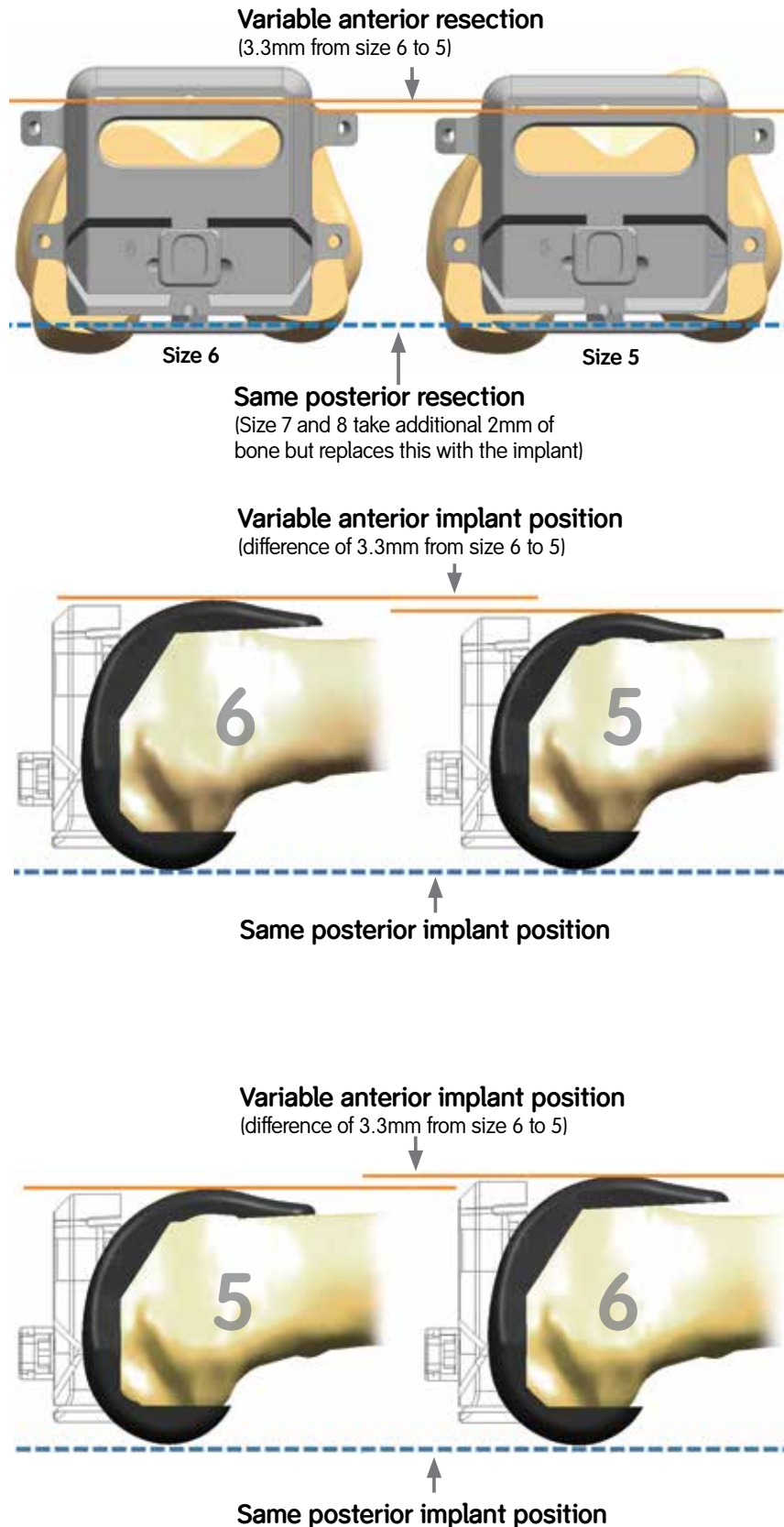
Size	2	3N	3	4N	4	5N	5	6N	6	7	8
AP Box (mm)	34.3	38.1	38.1	41.7	41.7	45.0	45.0	48.3	48.3	50.3	54.9

Downsizing or upsizing the 4-in-1 Cutting Block while maintaining same flexion gap

Occasionally it may be determined that a smaller or larger sized femoral component would be more adequate than the one planned with the variable sizing guide.

To downsize the femur put the next size smaller 4-in-1 cutting block into the same holes that were originally planned. The 4-in-1 block dimensions vary anteriorly and not posteriorly so this will result in additional anterior resection. All of the bone is removed anteriorly in order to avoid over stuffing the joint although this increases the risk of notching. If there is a risk of notching the femur with all of the bone removed anteriorly, follow the techniques described in the following section for **shifting the 4-in-1 Cutting Block**.

To upsize the femur put the next size larger 4-in-1 cutting block into the same holes that were originally planned. The 4-in-1 block dimensions vary anteriorly and not posteriorly so this will result in less anterior resection. If there is a risk of over stuffing the joint, some bone still needs to be removed anteriorly, or if the anterior cut has already been made, follow the techniques described in the following section for **shifting the 4-in-1 Cutting Block**.



Shifting the 4-in-1 Cutting Block

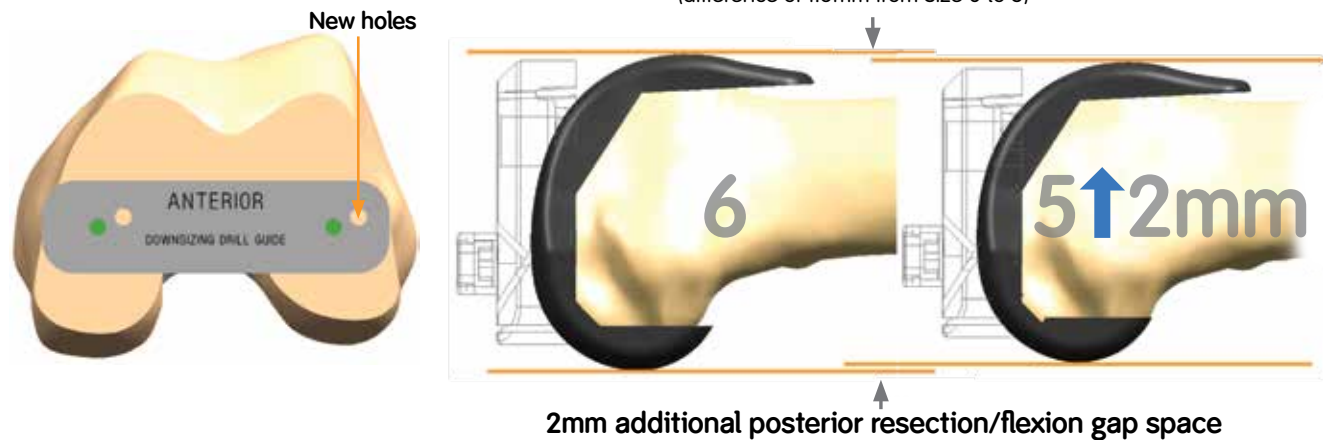
Shifting the 4-in-1 cutting block is at the surgeon's discretion according to how much more or less anterior resection needs to be made. Shifting the 4-in-1 block is mandatory when downsizing from a 7 to a 6 if the posterior resections have already been made.

More anterior resection

If more anterior resection is desired there are two ways to accomplish this, each having a different result on the flexion gap space.

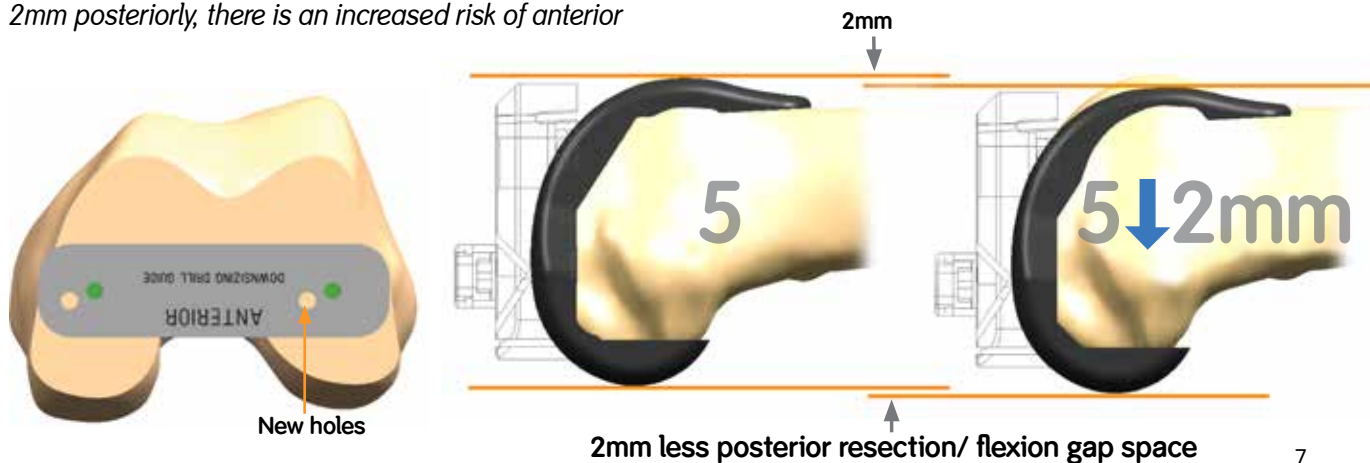
Increased flexion gap space

Use the downsizing drill guide to shift holes 2mm anteriorly and use the next smaller size 4-in-1 cutting block. The anterior resection will vary by size and 2mm of additional bone will be taken off posteriorly.



Decreased flexion gap space

Use the downsizing drill guide with lettering facing upside down in order to shift holes 2mm posteriorly and use the same size 4-in-1 cutting block. This will result in 2mm more anterior resection and 2mm less posterior resection. *By shifting the same size block 2mm posteriorly, there is an increased risk of anterior*

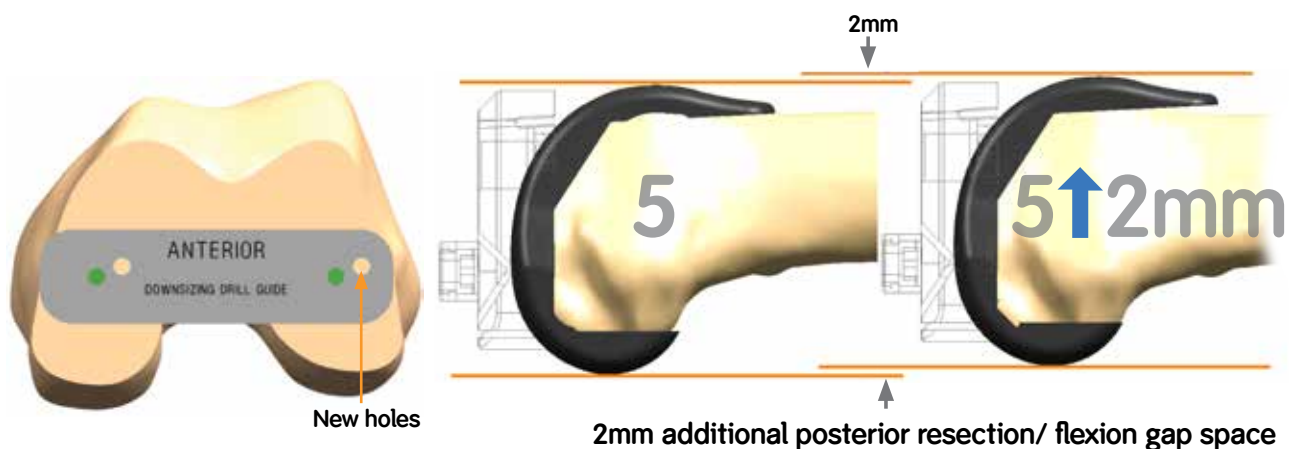


Less anterior resection

**** Not possible if anterior cut has already been made.* If less anterior resection is desired there are two ways to accomplish this, each having a different result on the flexion gap space.

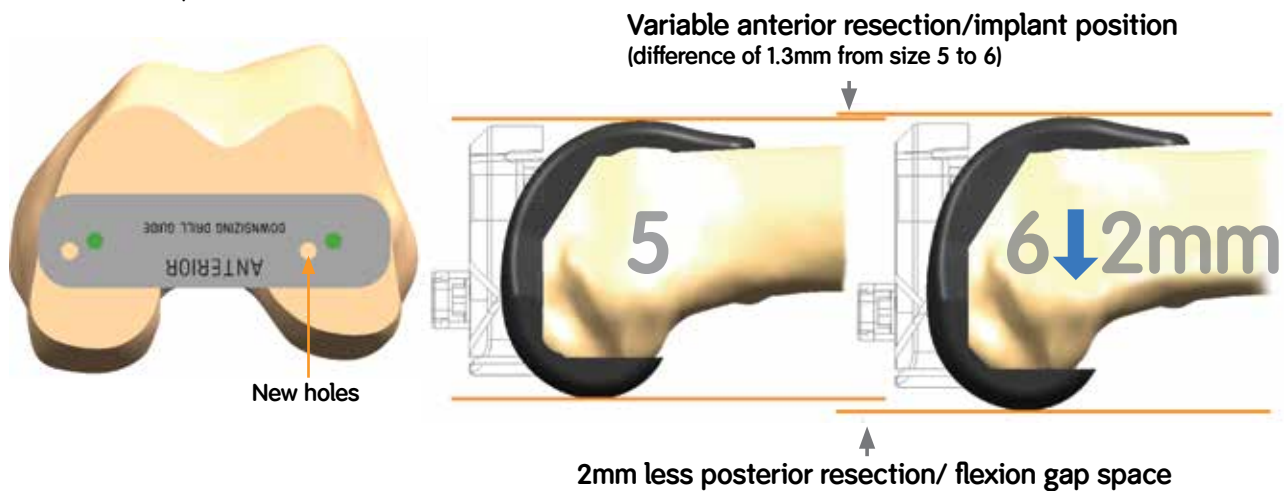
Increased flexion gap space

Use the downsizing drill guide to shift holes 2mm anterior and use the same size 4-in-1 cutting block. This will result in 2mm less anterior resection and 2mm more posterior resection.



Decreased flexion gap space

Use downsizing shim with lettering facing upside down in order to shift holes 2mm posteriorly and use the next larger size 4-in-1 cut block. This will result in an anterior resection that varies by size and 2mm less posterior resection.

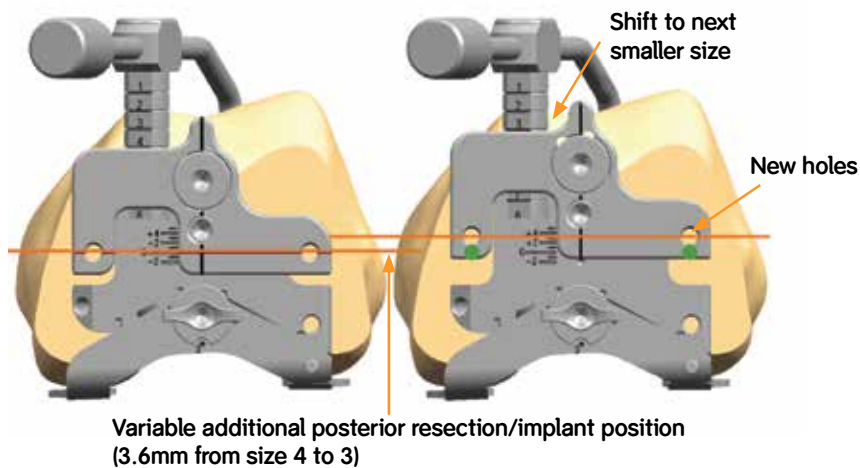


Same anterior resection

If the anterior resection is adequate but a different posterior resection is desired there are two ways to accomplish this, each having a different result on the flexion gap space.

Increased flexion gap space

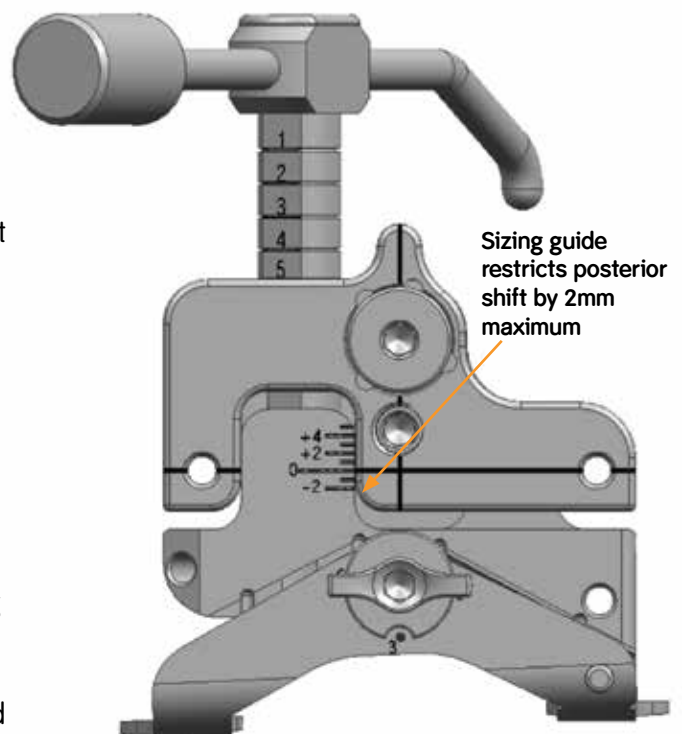
Place the variable sizing guide back on the femur and shift to the next smaller size. Re-drill the holes and use the corresponding size 4-in-1 cutting block. This will result in more posterior resection, however, the thickness will vary by size. For example, shifting from a size 4 to a size 3 will result in the guide shifting 3.6mm anteriorly to the smaller size based on the AP box difference (41.7mm for size 4 vs. 38.1mm for size 3).



Decreased flexion gap space

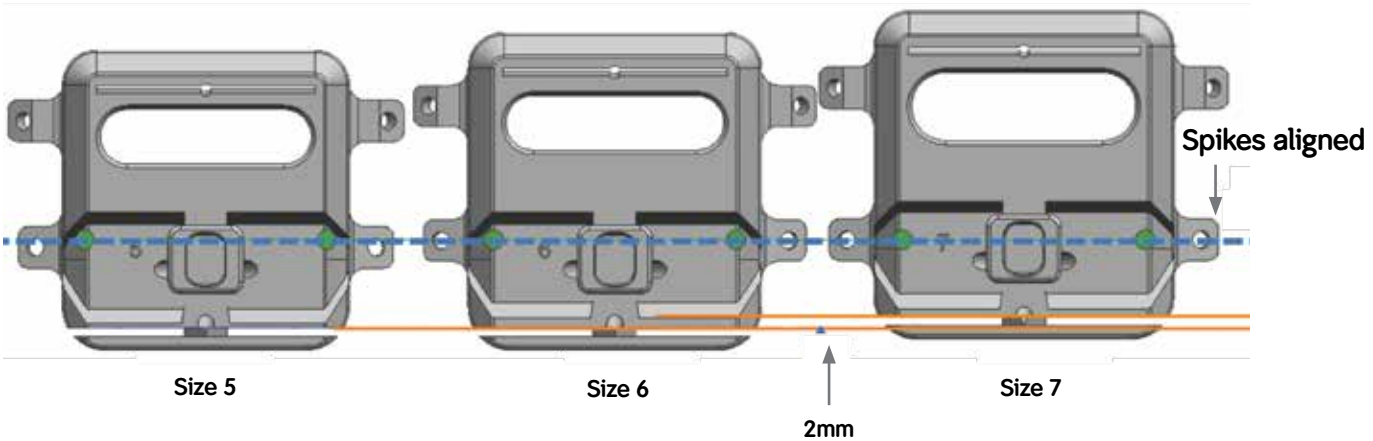
*** Not possible if anterior cut has already been made.

It is not possible to achieve this if the anterior cut has already been made. This is because in order to decrease the flexion gap space in this scenario, the anterior resection must shift to accommodate the same or next larger size. The sizing guide restricts the amount of posterior shift by 2mm maximum. For example, shifting from a size 4 to a size 5 requires that the holes be shifted by 3.3mm to maintain the anterior resection due to the difference in AP box sizes (45.0mm for size 5 vs. 41.7mm for size 4). This will decrease the flexion gap of the size 5 by 2mm while shifting the anterior resection anteriorly by the 1.3mm difference. The purpose of this is to safeguard against femoral notching when performing this shift and upsize maneuver. If a decreased flexion gap space is desired, the downsizing drill guide should be used as previously described in the **"Decreased Flexion Gap Space"** sections which will result in an anterior resection that varies by size and 2mm less posterior resection.



Special consideration for sizes 6 and 7

If both the anterior and posterior cuts have already been made and then it is then determined necessary to change sizes, special consideration must be given if moving between sizes 6 and 7 due to the 2mm difference in posterior cut.



Shifting from size 7 to size 6

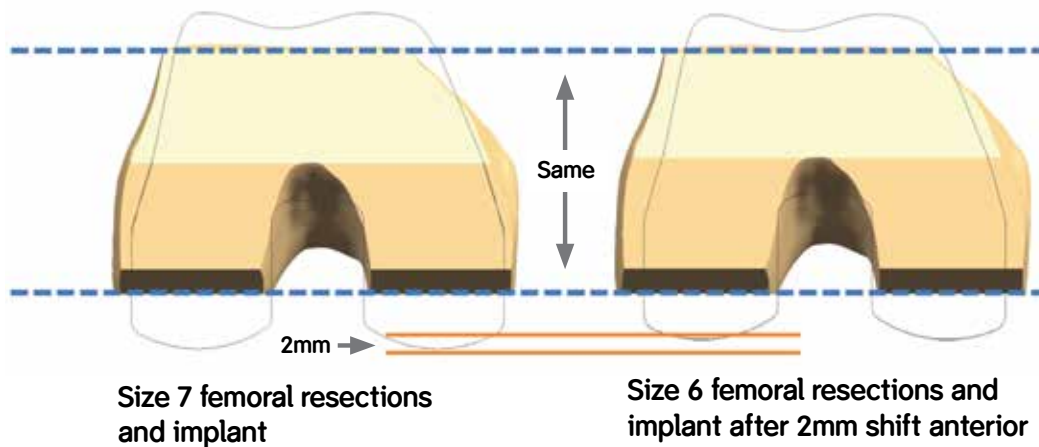
The reason for shifting down from a size 7 to a size 6 after bone resections are the following: overstuffing of the patellofemoral joint and/or a tight flexion gap during range of motion trialing. For both situations, the downsizing shim must be used.

To maintain flexion gap (flexion balanced but patellofemoral joint is tight)

Unfortunately, the surgeon must make a decision between increasing the flexion gap by 2mm to address the patellofemoral joint or maintaining the flexion gap and accepting the patellofemoral joint tightness. The reason for this decision is that with the posterior resection already made for the size 7, it is impossible to downsize to a size 6 without adding posterior augments to make up for the additional posterior bone removal previously made with the size 7 to maintain the flexion gap. If the patellofemoral joint is a higher priority than the flexion gap, follow the next step **To increase flexion gap space by 2mm.**

To increase flexion gap space by 2mm

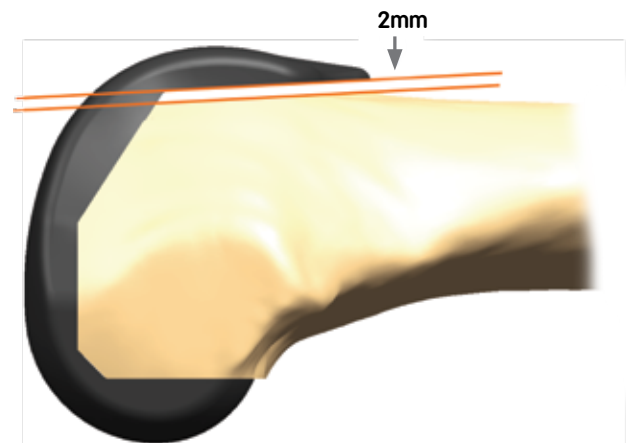
Use the downsizing shim to shift holes 2mm anterior and use the size 6 4-in-1 cut block. This will result in an equivalent posterior resection and an increase in the flexion gap by 2mm due to posterior condyles of the size 6 being 2mm less than the previous size 7. This will also result in the same anterior resection due to the fact that the A/P dimensions of these sizes differ by 2mm.



Size 7 resections (Orange) with size 6 resections (Blue) without 2mm anterior shift

Shifting from size 6 to size 7

It is not recommended to upsize from a size 6 to a size 7 if all femoral resections have been made as this will leave a gap or multiple gaps between the implant to bone mating surfaces. This could place additional stress on the cement mantle.



Size 7 implant on size 6 femoral resections with anterior flange gap

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