

NexGen[®] CR-Flex Fixed Bearing Knee

Surgical Technique



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Introduction

The NexGen CR-Flex Fixed Bearing Knee is a cruciate retaining prosthesis designed to safely accommodate greater range of motion for cultural, recreational, or work activities that require deep flexion.

The development of the CR-Flex Fixed Bearing Knee is the result of an analysis of the normal knee prosthesis as it undergoes deep flexion beyond 120 degrees. Multiple design features are incorporated to accommodate high flexion activities. For example, the interaction of the posterior condyles on the bearing was carefully tested. As a result, efforts were made to optimize the contact area as the posterior condyles roll back to flexion angles of up to 155 degrees (Figure 1). This was addressed by thickening the posterior condyles, thereby extending the condylar radius in the sagittal plane.

The posterior distal radius of the lateral condyle was extended slightly more than that of the medial condyle to further enhance natural anteroposterior rollback. Optimization of internal and external rotation at high-flexion range of motion was achieved by modifying the medial surface of the lateral condyle. The height of the posterolateral condyle was decreased to reduce the tightness of the lateral retinacular ligament in high flexion.

The tibial bearing was also considered in the design. In deep flexion, the extensor mechanism experiences a high level of stress as the soft tissues are stretched and pulled tightly against the anterior tibia and distal femur. A larger, deeper anterior cutout on the bearing was designed to help avoid impingement (Figure 2).

This cutout accommodates the extensor mechanism in deep flexion.

These features are designed to accommodate high-flexion activities. When combined with the proper surgical technique and rehabilitation regimen, this device provides increased capability for patients who have both the flexibility and desire to increase their flexion range. Some patient factors, however, may limit the potential for high flexion. The CR-Flex is not contraindicated for these patients. Even patients who do not have the potential for high flexion may benefit from the NexGen CR design features that are incorporated into the CR-Flex Knee.

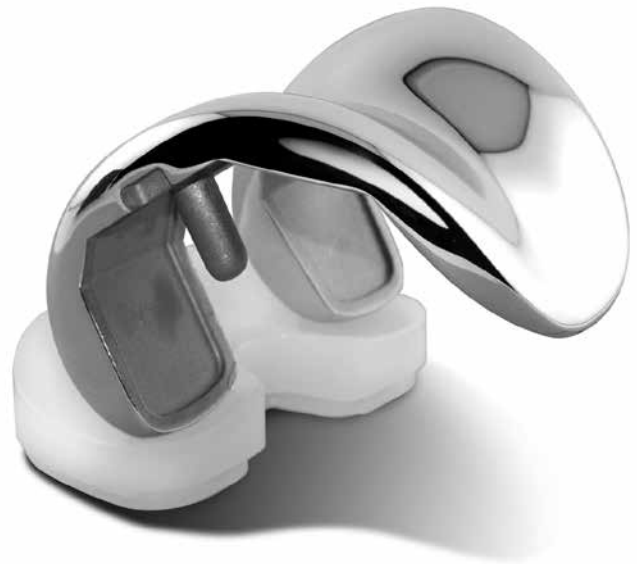


Figure 1

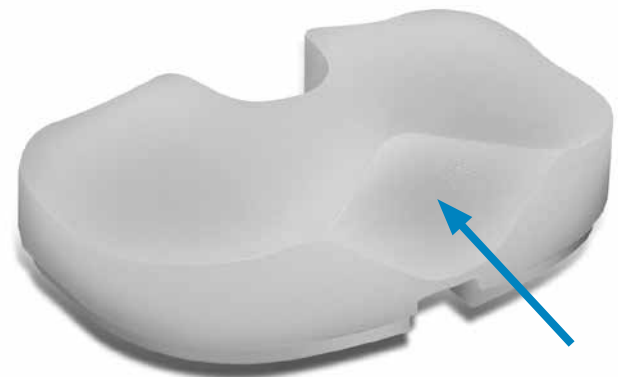


Figure 2

Preoperative Conditioning

A common view among orthopaedic surgeons is that certain patients have greater potential for achieving higher flexion after knee replacement. Patients with good flexion preoperatively tend to get better motion postoperatively. To optimize use of the high-flexion design elements of the CR-Flex Knee, the following criteria should be considered.

1. The patient should have a need and desire to perform deep-flexion activities. This need may be dictated by cultural or social customs where practices such as frequent kneeling for prayer, sitting “cross-legged,” and squatting are common. Also, activities specific to daily living, leisure and recreation, or job performance may require high-flexion capability.
2. The patient should be capable of reaching 110 degrees of flexion preoperatively with a reasonable probability of achieving a range of 125 degrees postoperatively.
3. The patient should have stable and functional collateral ligaments. In patients with severe deformity, consider the patient’s expectation for achieving high flexion.
4. It may also be important to consider the length of time the patient has not performed high-flexion activities.

Keep in mind that the CR-Flex Fixed Bearing Knee is designed to accommodate high flexion, and not create high flexion.

To help prepare the patient for surgery, it is helpful for the patient to perform mobility exercises to prepare the muscles for the postoperative rehabilitation protocol.

Preoperative Planning

Use the template overlay (available through your Zimmer representative) to help determine the angle between the anatomic axis and the mechanical axis of the femur. This angle should be reproduced intraoperatively.

Use the various templates to approximate the appropriate component sizes. The final sizes must be determined intraoperatively; therefore, larger and smaller sizes should be available during surgery.

The CR-Flex Knee Components can be implanted using any of the NexGen Knee Instrument Systems. These include:

- Multi-Reference[®] 4-in-1 Femoral Instrumentation System inclusive of Mini and MIS instrumentation
- MICRO-MILL[®] Instrumentation System (Milling or 5-in-1 Saw Blade Options)
- Intramedullary Instrumentation System

If the Multi-Reference 4-in-1 Femoral Instrumentation System is used, the posterior referencing technique will help provide a consistent flexion gap. Regardless of the instrumentation system used, the flexion and extension gaps should be equalized to help ensure knee stability.

Surgical Technique



Figure 3

Surgical technique is an important factor to consider when attempting to maximize range of motion in total knee arthroplasty (TKA). Close attention must be paid to balancing the flexion and extension gaps, removing posterior osteophytes, posterior capsule tension, reproducing the joint line, and accurate sizing of the femoral component.

Altering the joint line can cause patellofemoral issues and limit the degree of flexion. An elevated joint line, for example, can cause tibiofemoral tightness in flexion thus restricting flexion and causing excessive rollback. It is possible that the joint line may be moved proximally if a preoperative flexion contracture is corrected by distal femoral resection. Movement of the joint line can be minimized by performing a posterior capsular release to correct flexion contractures.

The femur, tibia, and patella are prepared independently, and can be cut in any sequence using the principle of measured resection (removing enough bone to allow replacement by the prosthesis).

Incision and Exposure

The medial parapatellar approach is recommended for the CR-Flex knee. With the patient in the supine position and the knee slightly flexed, make a straight midline incision. Begin the incision in the medial quadriceps tendon above the superior pole of the patella. Extend it distally to below the level of the tibial tubercle (Figure 3). The subvastus technique can also be used for the high-flexion CR knee.

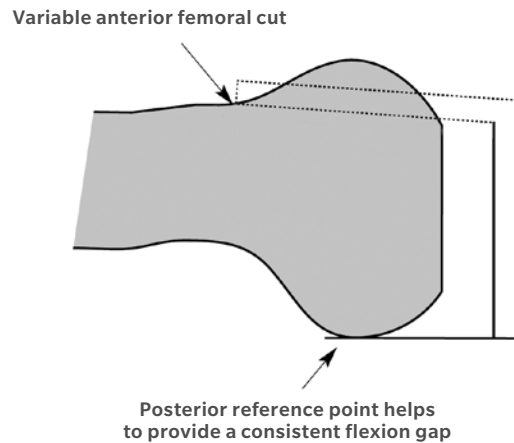


Figure 4

Femoral Preparation

Prepare the femur using the selected instrument system. Then proceed to “Posterior Condyle Recut” in this technique to remove the additional bone required for the CR-Flex femoral component.

When sizing the femoral component, it is preferable to select the closest size. However, depending on the situation, selecting the closest size could mean either upsizing or downsizing.

Using the selected instrumentation system, and following the appropriate technique for that system, prepare the femur. **If a size B femoral component is chosen, do not drill the distal femoral post holes at this time.** Size B femoral components have smaller pegs. The holes should be drilled using the size A/B femoral peg drill and the standard flex cut guide.

Using a posterior referencing technique will help ensure an appropriate flexion gap. The resected portion of the medial femoral condyle should be at least 9 mm, while the resected portion of the lateral femoral condyle will be dictated by the degree of femoral component rotation. With posterior referencing, it may be necessary to upsize the femur to avoid notching the anterior cortex. If the distal femur was resected in three degrees of flexion, notching of the anterior femur is less likely to occur. This option can be helpful when in between femoral sizes, especially when using a posterior referencing technique. If an anterior referencing technique is used, be aware of the amount of posterior condylar resection, since the variable cut is now posterior. Avoid resection greater than 10 mm from the posterior medial condyle (Figure 4).

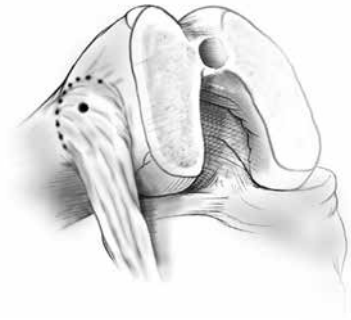


Figure 5



Figure 6



Figure 7

Determine External Rotation

Posterior referencing instrumentation systems like the Multi-Reference 4-in-1 Instruments are designed to help balance the flexion and extension gaps with the initial bone cuts. **The critical goal is to create a rectangular and symmetrical flexion gap between the femur and tibia.**

It is necessary to externally rotate the femoral component in order to create a symmetrical flexion gap. Depending on the preoperative alignment of the knee, external rotation can be set by referencing either the posterior condyles or the transepicondylar axis.

Referencing the Posterior Condyles

The posterior condyles can be used for a knee that is in varus or neutral alignment without posterior condyle bone loss. When referencing from the posterior condyles, the femoral component should be externally rotated three degrees. When the A/P sizing/rotation guide is placed on the femur, both feet of the guide should be contacting the posterior condyles.

Referencing the Transepicondylar Axis

The transepicondylar axis provides a reproducible method of setting femoral rotation for all knees, and is appropriate method for knees in valgus alignment. The anteroposterior axis of the femur provides an additional rotational landmark when using the transepicondylar axis.

To identify the lateral epicondyle, dissect away the patellofemoral ligament. The lateral epicondyle is a discrete point at the center of the lateral collateral ligament attachment.

To identify the medial epicondyle, remove the synovium from the medial collateral ligament attachment to the femur. The medial collateral ligament has a broad attachment to the medial epicondyle forming an approximate semicircle (Figure 5). Choose the center of the attachment. Mark these two points with methylene blue (Figure 6). Then, draw a line between the two epicondyles on the resected surfaces of the distal femur (Figure 7). This line represents the transepicondylar axis.



Figure 8

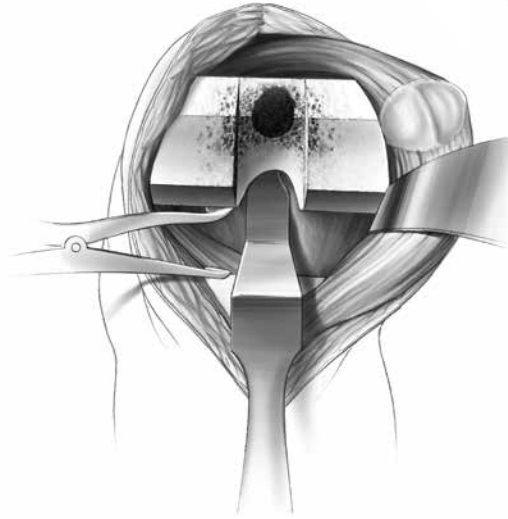


Figure 9

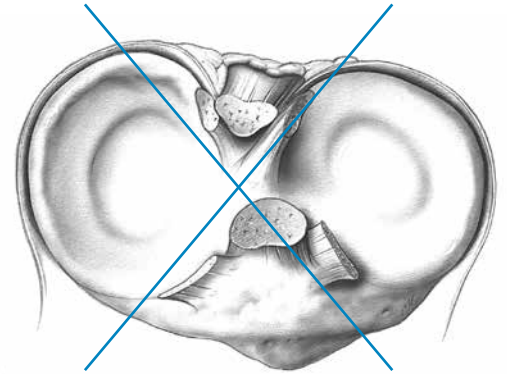


Figure 10

Determine External Rotation (cont.)

When establishing the mediolateral position of the femoral component, it is recommended to lateralize the component to help improve patellar tracking. Avoid positioning the component where it overhangs the bone as this may restrict flexion.

With the knee in flexion, remove posterior osteophytes with a 3/4-inch curve-on-flat osteotome (Figure 8). Use a laminar spreader and the posterior femoral retractor to improve exposure (Figure 9).

Tibial Preparation

Using the selected instrumentation system, and following the appropriate technique for that system, establish the tibial cutting platform and resect the proximal tibia. Using a .050in/1.27 mm saw blade and an oscillating saw to cut the proximal tibia taking care not to resect the cruciate island. A reciprocating saw can be used to aid in resecting around the cruciate island (Figure 10).



Figure 11

Posterior Condyle Recut

🔑 **Technique Tip:** This step can be performed after cutting the tibia to allow easy access to the popliteal fossa and facilitate osteophyte removal.

To accommodate the thickened posterior condyle of the CR-Flex femoral component, a posterior condyle recut must be made. Insert the posterior femoral retractor to help protect the neurovascular structures. Select the standard flex cut guide that matches the size of the last cutting guide used for the femur. Position the guide so it is flush with the cut bone surfaces (Figure 11) and is aligned with the trochlear recess. If the femoral post holes have been drilled previously, screw the cut guide modular pegs into the guide to aid in positioning.

When positioning the standard flex cut guide, ensure that the guide goes on straight to prevent the guide from sitting in flexion. Check to ensure that the cut guide does not impinge on bone or soft tissue either anteriorly or posteriorly. Protect the medial collateral ligament and the posterior cruciate ligament.



Figure 12



Figure 13

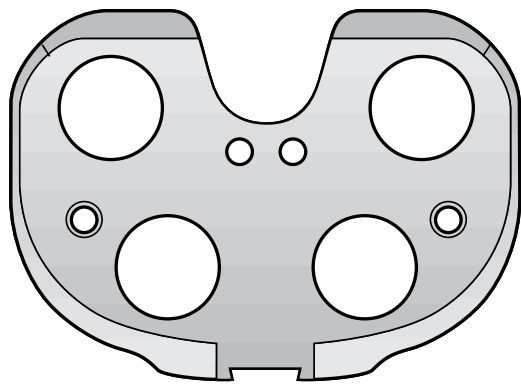
Posterior Condyle Recut (cont.)

Cut the posterior condyles through the posterior cutting slot of the cut guide using an oscillating saw with a .050in/1.27 mm blade (Figure 12). This cut will remove approximately 2 mm from the posterior condyles. If post holes have not been drilled, this instrument can be used to drill for the femoral post holes.

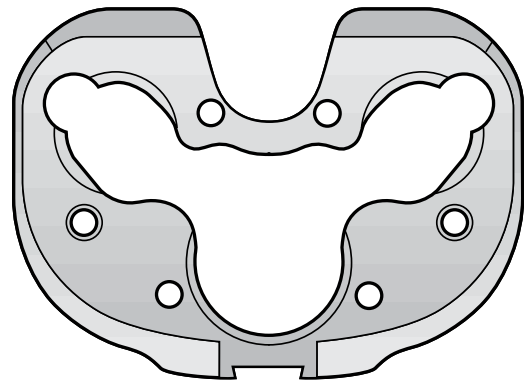
Note: For size B femoral components, you must use the cut guide to drill the size A/B femoral post holes with the A/B femoral peg drill (Figure 13).

Check to ensure that there is no bone left beyond the feet of the cut guide. The length of the posterior condyle of the cut guide represents the length of the medial posterior condyles of the femoral implant.

With all femoral and tibial bone cuts completed, it is easy to visualize the posterior condyles and popliteal recess. This allows removal of loose bodies and any posterior osteophytes. Use a laminar spreader or the posterior femoral retractor to improve exposure. An elevator can be used to release any adhesions and then the posterior osteophytes removed with an osteotome. Remove all fragments of bone, loose bodies and osteophytes.



Pegged Tibial Sizing Plate



Stemmed Tibial Sizing Plate

Figure 14

Finish the Tibia

Select the proper style of tibial sizing plate (for either stemmed or pegged tibias) and the plate size that provides the desired tibial coverage (Figure 14). Base the selection first on achieving good mediolateral coverage, and then on anteroposterior coverage. Be sure to rotationally position the plate correctly. This position usually leaves some bone exposed on the posterior medial tibia when the plate lines up with the posterior lateral cortex.

ⓘ Technique Tip: Consider biasing the plate posteriorly to help ensure femoral support during high flexion and to minimize potential impingement.

The articular surface provisional has an alphanumeric code. Compare the letters on the selected articular surface provisional to the letter on the selected femoral provisional. One of the letters on the articular surface provisional must match the letter on the femoral provisional. If the articular surface provisional does not match the femoral provisional, adjust the size of the articular surface provisional to yield a match. Then compare the range of numbers on the articular surface provisional to the number on the tibial sizing plate. The number on the sizing plate must be within the range on the articular surface provisional. If the articular surface provisional does not match the tibial sizing plate, adjust the size of the sizing plate to yield a match (See sizing chart on page 15).

The tibia can be finished prior to trial reduction if the implant position will be chosen based on anatomic landmarks. Alternatively, the provisionals, in combination with the sizing plate, can be used to perform a trial range of motion to aid in tibial location.

If the tibial position will be based on anatomic landmarks, position the sizing plate rotationally by referencing the line that defines the tibial A/P axis, from the PCL to the junction of the medial and mid-third of the tibial tubercle.

If the tibial position will be based on a trial reduction, prepare the patella. Then perform a trial reduction and balance all ligaments (prepare the patella).

Pin the plate in place and drill for the appropriate pegged or stemmed component. If a stemmed component will be implanted, broach the tibia.

ⓘ Note: The stemmed plate must be used with a 17 mm or 20 mm Net-Shape molded or Prolong[®] Highly Crosslinked Polyethylene bearing. (See technique on page 16)

ⓘ Note: The A/P wedge sizing plate can be used as a tibial provisional by attaching the stem base adaptor (00-5987-006-00) to the appropriate sizing plate and attaching the appropriate stem extension to the stem base adaptor.

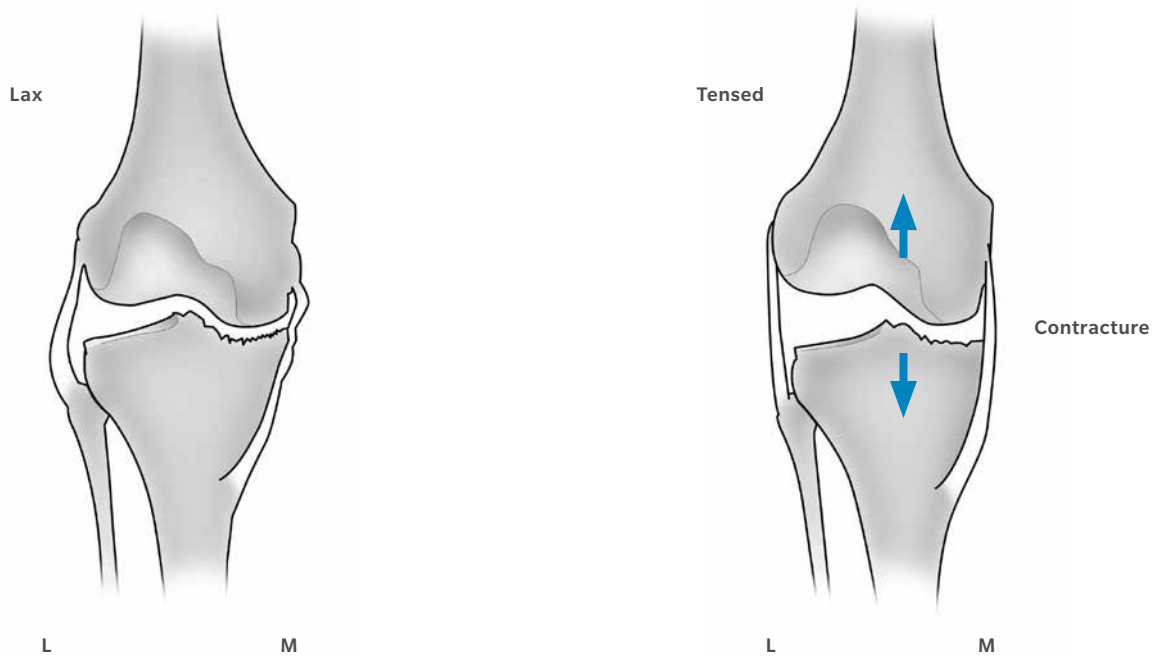


Figure 15

Prepare the Patella

The patella can be prepared for resurfacing using a number of techniques. With any technique, it is important to measure the patellar thickness before preparation and be very careful not to increase the thickness of the patellar construct. This will artificially tighten the extensor mechanism, leading to lateral releases and limited flexion. It is also important to bias the placement of the symmetric patellar component medially so that the central thick dome will be located medially in line with the anatomic central ridge.

Balance Soft Tissues

The objective of this procedure should be to distribute contact stresses across the artificial joint as symmetrically as possible with the knee in an anatomic position. This requires the creation of equal and symmetrical flexion and extension gaps. Varus or valgus deformities should be corrected before flexion contractures. All of these releases are performed after the bone cuts are completed.

Varus Releases

To correct most fixed varus deformities (Figure 15), progressively release the tight medial structures until the medial and lateral spaces are equal in flexion and extension. The extent of the release can be monitored by inserting progressively thicker trials within the tibiofemoral joint and judging balance by evaluating the tension of the joint. To facilitate the release, excise all osteophytes from the medial femur and tibia. These osteophytes “tent” the medial capsule and ligamentous structures, and their removal can produce a correction before beginning the soft tissue release.

To release the tight medial structures, elevate a subperiosteal sleeve of soft tissue from the proximal medial tibia in a stepped fashion. Begin with the superficial medial collateral ligament. Perform this release with a periosteal elevator. Continue the subperiosteal release distally on the anteromedial surface of the tibia for up to 8 cm-10 cm.

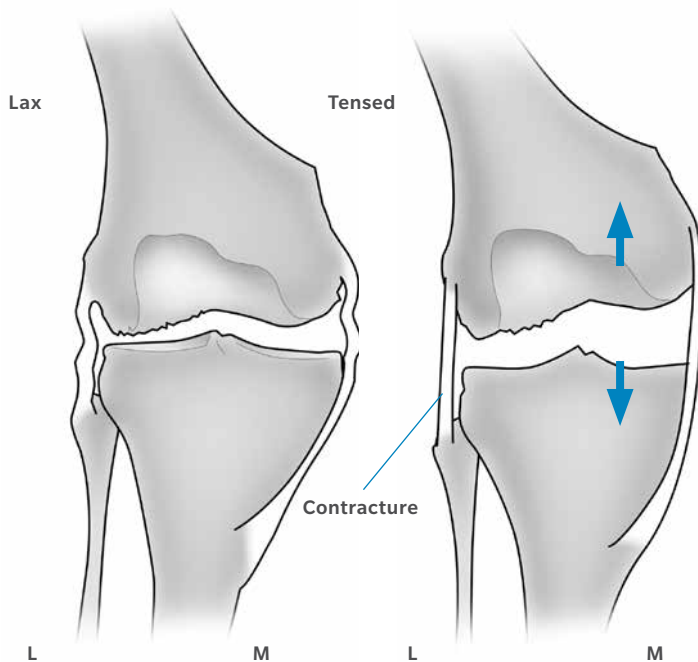


Figure 16

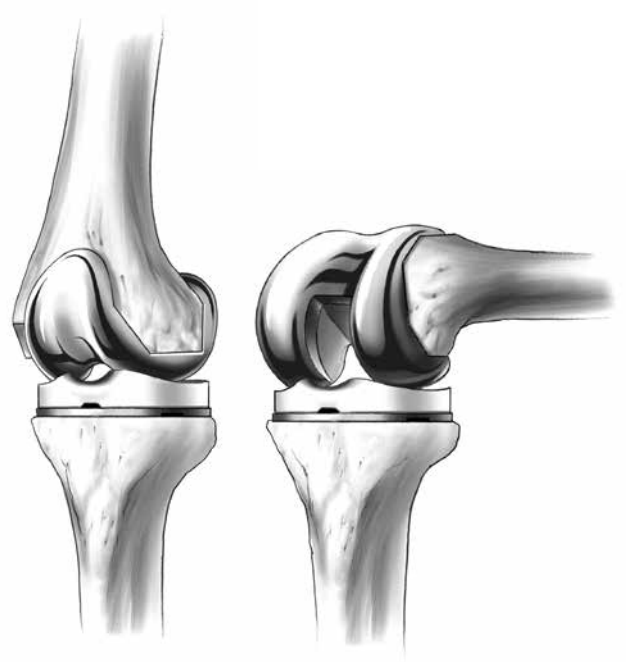


Figure 17

Varus Releases (cont.)

This should be sufficient for most deformities. For more severe deformities, continue subperiosteal stripping posteriorly and distally. Release of the insertion of the semimembranosus muscle from the posteromedial tibia, or the pesanserinus tendons, is occasionally necessary. Rarely, the posterior cruciate ligament must also be released. During large releases, be careful to avoid creating a larger flexion gap medially than laterally. When varus misalignment is present with a flexion contracture, it may be necessary to release the posterior capsule. This should be done after correction of the varus deformity.

Valgus Releases

In knees that have a fixed valgus deformity (Figure 16), sequential releases can usually correct this abnormality. In making the bone cuts, it is important to recognize the frequently hypoplastic lateral femoral condyle and avoid internal rotation of the femoral component. With the trial implants in position, evaluate the tightness of the lateral compartment in flexion and extension. If the knee is excessively tight in extension and appropriate in flexion, selectively loosen the iliotibial band with multiple punctures above the joint line using a #11 or #15 knife blade.

If the knee is excessively tight in flexion and appropriately tight in extension, subperiosteal release of the lateral collateral ligament and possibly the popliteus off the lateral femoral condyle will correct this problem. If the knee is too tight laterally in flexion and extension, start with the lateral collateral ligament and advance sequentially through the popliteus and iliotibial band. After each release of a lateral structure, repeat the trial reduction with progressively thicker tibial bearings. When tibiofemoral stability in flexion and extension has been achieved with equal tension in the medial and lateral compartments, evaluate patellofemoral tracking. Make appropriate adjustments in the extensor mechanism to allow the patella to track centrally.

Trial Reduction

Place the femoral provisional, the tibial plate provisional, the articular surface provisional, and the patellar provisional (if needed) onto the prepared bone surfaces. With all the provisional components in place, perform a complete range of motion (Figure 17).

Observe patellar tracking and tilt.

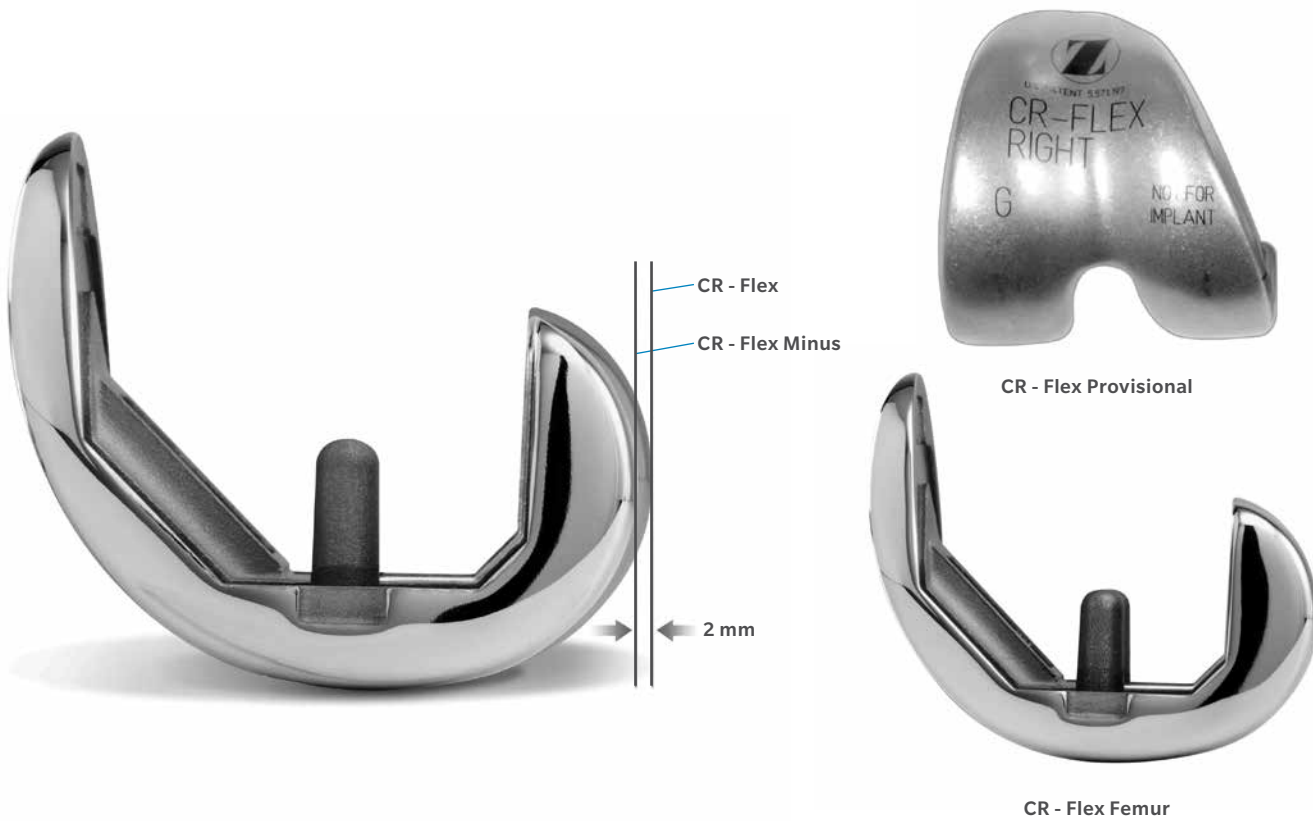


Figure 18

Trial Reduction (cont.)

If the knee is tight in flexion and acceptable in extension, the surgeon has the option of using a minus size femoral component to balance the flexion and extension gaps. The minus sizes have a 2 mm reduction in the outer A/P dimension of the femoral component.

No additional femoral cuts need to be made. The regular size provisional is switched out for the minus size and complete range of motion is performed again (Figure 18).



| | | Extension | | |
|---------|-------|-----------|----|-------|
| | | Tight | OK | Loose |
| Flexion | Tight | 1 | 2 | 3 |
| | OK | 4 | 5 | 6 |
| | Loose | 7 | 8 | 9 |

Figure 19

Balance Flexion and Extension Gaps

After varus or valgus deformities are corrected, the flexion and extension gaps must be balanced or adjusted to be equal. This may be facilitated by using the minus size femoral components available with the NexGen CR-Flex Fixed Bearing Knee System. These implants fit the same box cut but the outer A/P dimension is approximately 2 mm smaller posteriorly than the standard size. These additional implant options allow the surgeon to balance the gaps when the knee is too tight in flexion and correct in extension. With the trial femoral component in place, insert progressively thicker tibial bearings. When the knee is stable in flexion, extend the knee. A symmetrical and balanced extension gap should be created. This is occasionally difficult as it may require elevation or lowering of the joint line. The patella helps determine the appropriate position of the joint line.

It is important to remember that adjustments to the femoral side of the arthroplasty can affect the knee in either flexion or extension, while any change to the tibia affects both flexion and extension. The following matrix (Figure 19) suggests the nine situations that can occur during a trial reduction in a total knee arthroplasty.

1. If a knee is too tight in both flexion and extension, reducing the height of the tibial bearing may be sufficient to balance the construct.
2. If the knee is tight in flexion but acceptable in extension, two options exist. One option is to use a minus size femoral component. This creates more space in flexion. The second option is to release the PCL either by island osteotomy or ligament release, both of which lengthen the ligament.
3. If the joint is loose in extension and tight in flexion one option is to use a smaller or minus size femoral component possibly with a thicker polyethylene component.
4. If the joint is acceptable in flexion but tight in extension, several options exist. One is to release the posterior capsule from the femur. Another alternative is to resect more distal femoral bone. This moves the femoral component proximally on the femur at the expense of elevating the joint line.
5. If both components are acceptable, no further modification is necessary.

| | | Femoral Size | | | | | |
|----------------------|----------|--|-----------|---|-----------|---|-----------|
| | | B | C,C- | D,D- | E,E- | F,F- | G,G- |
| M/L (mm) | | 58 | 60 | 64 | 68 | 72 | 76.5 |
| A/P (mm) | | 48.5 | 53.5/51.5 | 57.5/55.5 | 61.5/59.5 | 65.5/63.5 | 70.5/68.5 |
| A/P Box (mm) | | 36 | 38 | 42 | 46 | 50 | 54 |
| Bearing Spacing (mm) | | 36 | 44 | | | | |
| Tibial Size | 1,2 | P | SP | SP | SP | SP | SP |
| | 3,4 | SY | Y | Y | Y | Y | Y |
| | 5/6 | SG | G | G | G | G | G |
| | 7,8,9,10 | | B | B | B | B | B |
| Patella Size | | Micro 26 mm 5972-61-26 29 mm 5972-61-29 32 mm 5972-61-32 35 mm 5972-61-35 | | Standard 26 mm 5972-65-26 29 mm 5972-65-29 32 mm 5972-65-32 | | Standard 35 mm 5972-65-35 38 mm 5972-65-38 41 mm 5972-65-41 | |

Color Key
 P = Purple
 Y = Yellow
 G = Green
 B = Blue
 SP= Striped Blue
 SY= Striped Yellow
 SG= Striped Green

Figure 20

Balance Flexion and Extension Gaps (cont.)

- If the joint is acceptable in flexion and loose in extension, consider downsizing the femoral component to a minus size. If the femoral component cannot be downsized, cement the femoral component distal of the bone cut. This augmentation with cement distally fills the extension space when used with a thinner tibial articulating surface.
- If the joint is loose in flexion and tight in extension, a larger femoral component may suffice. A second option is a thicker tibial bearing with a more proximal femoral position. A third option is a thicker tibial component combined with a posterior release.
- If the joint is loose in flexion and acceptable in extension, increasing the femoral size may equalize the gaps. Alternatively, moving the femoral component proximally and applying a thicker tibial bearing will equalize the gaps. Another option is to fill the flexion gap with the appropriate poly and perform a posterior release to increase the extension gap.
- If a joint is symmetrically loose in both flexion and extension, a thicker tibial bearing will usually solve both problems.

In situations where two options exist to help solve the soft tissue mismatch, the position of the patella or the joint line help the surgeon decide which option to select.

- Note:** after applying one of these solutions, perform another trial reduction. This will identify any new problem or a variation of the initial problem that now may exist.

Implantation and Bearing Assembly

After the implants have been chosen, make one last check to ensure that the femoral, tibial base plate, and tibial bearing components match. The femoral letter must match one of the letters on the bearing carton as indicated by the interchangeability chart (Figure 20).

CR-Flex porous coated femoral components may be used cemented or uncemented (biologic fixation). All other femoral components are indicated for cemented use only. Insert the appropriate size femoral components. Ensure components remain stable and do not rotate during cement cure. Then use the bearing inserter to attach the appropriate tibial bearing onto the plate.

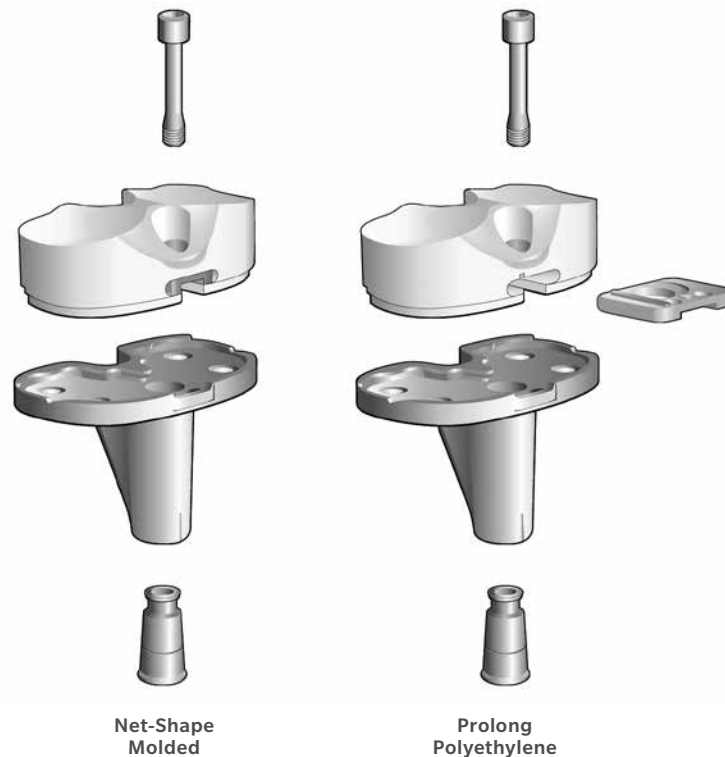


Figure 21

Balance Flexion and Extension Gaps (cont.)

Techniques for 17 mm and 20 mm Bearing Assembly

A secondary locking screw is required for the 17 mm and 20 mm bearing components when used with CR-Flex components. **Therefore, stemmed tibial plates with either a stem extension or taper plug must be used with these thicker components (Figure 21). This assists in lift off resistance at higher flexion positions.**

ⓘ **Note:** The pegged plate **cannot** be used with the 17 or 20 mm net-shape molded or Prolong polyethylene bearing.

With the Prolong Highly Crosslinked Polyethylene bearing option, the locking insert and screw are packaged separately from the bearing component in the same box. Prior to inserting the bearing, the metal locking insert must first be inserted into the anterior slot of the bearing. The rail should be aligned with the space in the slot.

There is an arrow on the superior side of the locking clip that indicates the correct direction for insertion. The purpose of the rail is to prevent the insert from being assembled incorrectly. The metal insert should glide easily into the slot. The insert is properly seated when a click is heard. For the molded bearing, the metal locking insert is preassembled into the bearing.

A taper plug also can be used with the 10 mm to 14 mm bearing components. If you plan to use a 14 mm component or the flexion and extension gaps are not balanced, consider using the taper plug in case, during final trial reduction, it would be necessary to use a 17 mm or 20 mm component. Then, if the bearing should ever require revision with a 17 mm or 20 mm thick component, the taper plug is already in place and revision of the tibial plate component may not be necessary.

Balance Flexion and Extension Gaps (cont.)

For Back Table Assembly:

1. Assemble the stem extension or taper plug onto the tibial plate by striking it with a mallet once for the stem extension or several times for the taper plug to allow the ring on the taper to deform.
2. Place the tibial plate onto the holding fixture which is an integral part of the instrument case.
3. Use the bearing Inserter to insert the bearing onto the tibial plate.
4. With the bearing in place, insert the secondary locking screw (packaged with the bearing).
5. Use the LCCK Deflection Beam Torque Wrench with the 4.5 mm hex driver bit attached to torque the screw to 95 in.- lbs. Alternatively, if using a stem extension, use the tibial plate wrench to assist when torquing the screw. **Do not over or under torque.**

For *in vivo* Assembly:

If preferred, the 17 mm or 20 mm bearing can be inserted after the tibial plate has been implanted.

1. Assemble the stem extension or taper plug onto the tibial plate by striking it several times with a mallet to allow the ring on the taper to deform.
2. Implant the tibial plate. If bone cement is being used, wait for the cement to completely cure before inserting the bearing.
3. Select the tibial plate wrench that matches the size of the implant to be assembled. Place the end of the wrench over the tibial plate. Ensure that the wrench is in line with the base of the tibial plate.
4. Place the locking screw through the hole in the bearing.
5. Use the LCCK Deflection Beam Torque Wrench attached to the 4.5 mm hex driver bit to torque the screw to 95 in.-lbs.

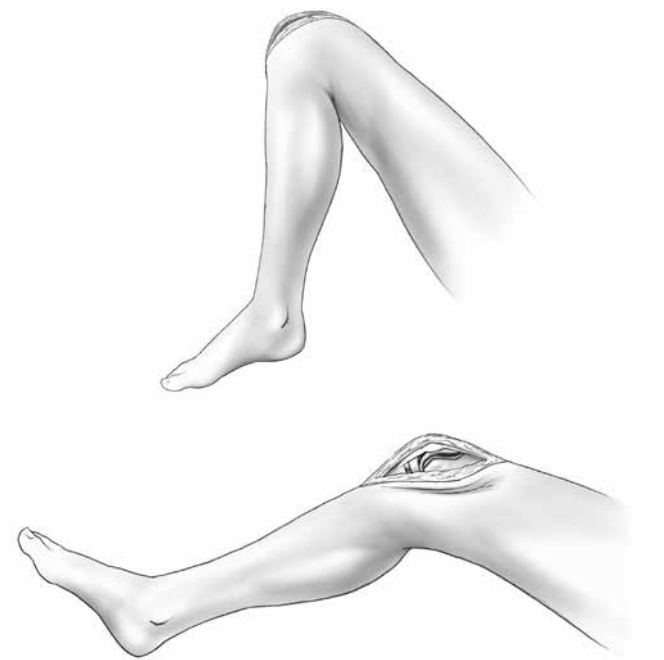


Figure 22

Closure

Freely irrigate the wound with the solution of choice. Close the knee and perform a drop and dangle test to predict the range of motion for the patient (Figure 22).

Rehabilitation Protocol

For cemented components, an equally important factor in gaining or maintaining high flexion after successful total knee arthroplasty is early and/or aggressive rehabilitation of the patient. Many of the standard rehabilitation protocols used in most hospitals today are aimed at restoring knee motion and function between 90 and 110 degrees, which is sufficient for the TKA patient to get into or out of a chair or a car. Those patients undergoing TKA who are able and willing to flex and wish to maintain preoperative flexibility may be better off with early and/or relatively more aggressive rehabilitation exercises.

For uncemented components, the patient must be limited in activity to avoid extreme positions that place strain on the knee during the first 12 weeks postoperative.

Appendix

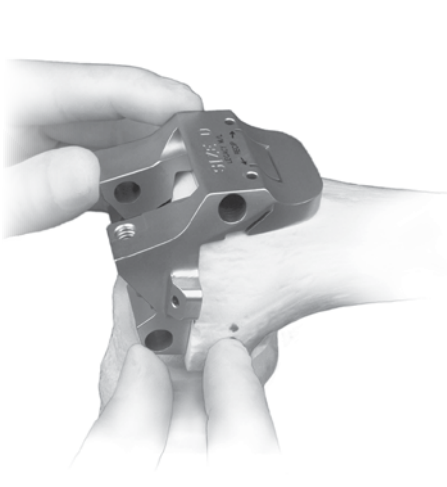


Figure 23

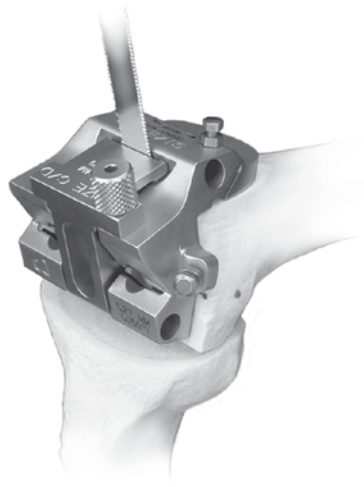


Figure 24

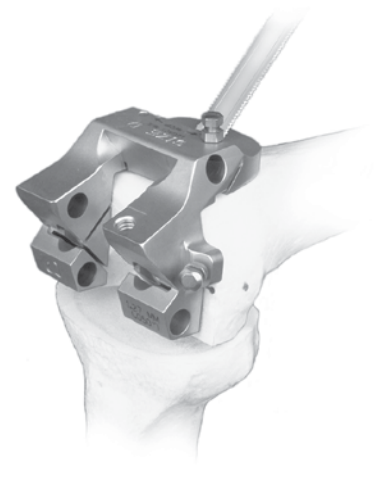


Figure 25

Crossover Techniques

(When crossing over to a high-flexion posterior stabilized design)

Note: When crossing to a posterior stabilized design after the posterior recut is made, the LPS-Flex components must be used as opposed to the standard LPS components. The only additional bone cut which needs to be made is the PS notch cut. It can be accomplished with the following technique.

Crossover Technique with the EPI Notch/ Chamfer Guide

Select the EPI notch/chamfer guide that is the same size as the A/P cutting guide used in the previous step. Place the EPI notch/chamfer guide flush with the anterior and distal surfaces of the femur (Figure 23).

Position the guide mediolaterally, using the anterior portion of the guide to replicate the location for the anterior lateral flange of the femoral component. This is important because it dictates the mediolateral positioning of the femoral component. Also, the width of the guide equals the distal width of the Legacy® LPS and LPS-Flex femoral component (pin the anterior flange first to stabilize the M/L position). Finish the box cut by cutting the base of the intercondylar notch with a reciprocating or narrow oscillating saw blade (Figure 24).

Use a reciprocating saw blade or narrow oscillating blade to first cut the base of the trochlear recess (Figure 25). Cut the sides of the trochlear recess through the slot with a reciprocating saw blade.

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