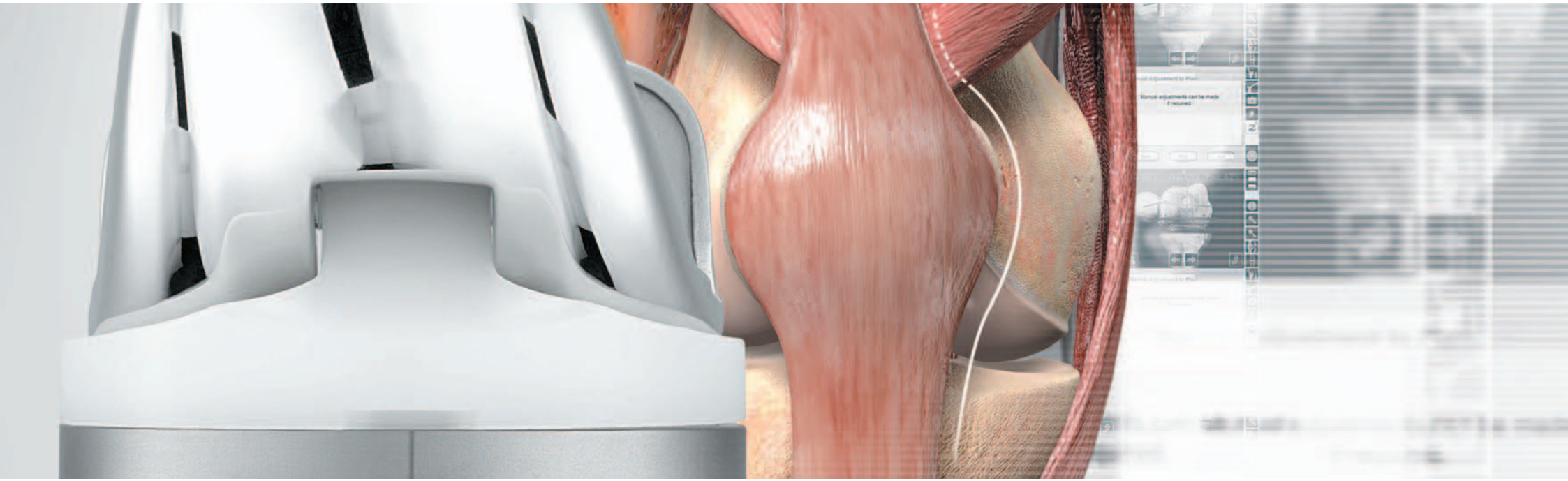
MINIMALLY INVASIVE SURGERY FOR P.F.C.® SIGMA™ AND P.F.C.® SIGMA™ RP KNEE SYSTEMS



SURGICAL TECHNIQUE


INTELLIGENT ORTHOPAEDICS™

Contents

Ci™ System Connections

Ci™ Unit Connections

Connecting the Ci™ System

All cables are connected to a panel at the rear of the Ci™ unit. All power cables and connectors are supplied with the system.

1. Power switch (on / off)

The power switch is positioned below the power socket. A green light indicates when the unit is switched on.

2. Power lead connection

The standard 3-pin power lead connects to the power socket.

3. Voltage switch

The red ‘H-shape’ switch adjusts the power supply between 110 volts and 220 volts. Make sure that the correct voltage is selected before switching on the system.

4. Earth / ground lead connection

The earth / ground socket is identified by the yellow and green colours.

The system must be earthed / grounded using the cable supplied before switching on the system.

5. Camera unit connection (tracking unit)

The orange coloured camera cable plugs into the camera unit socket (also marked in orange). The cable pins are aligned before inserting the cable. The cable is removed by pulling smoothly and slowly to avoid damaging the pins.

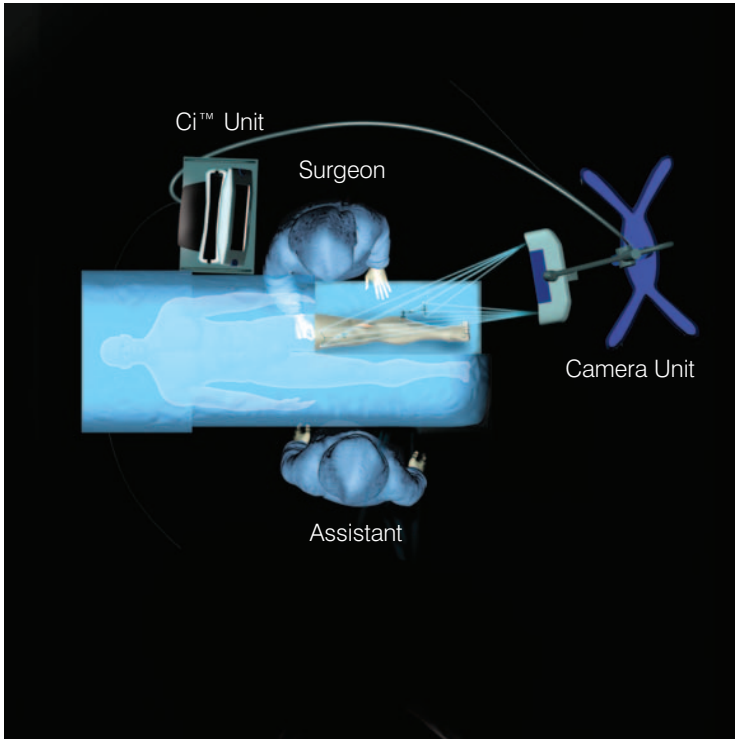
Important: The camera must be switched on at least 20 minutes prior to the start of the procedure.

Connections on the camera unit should also be checked at this stage.

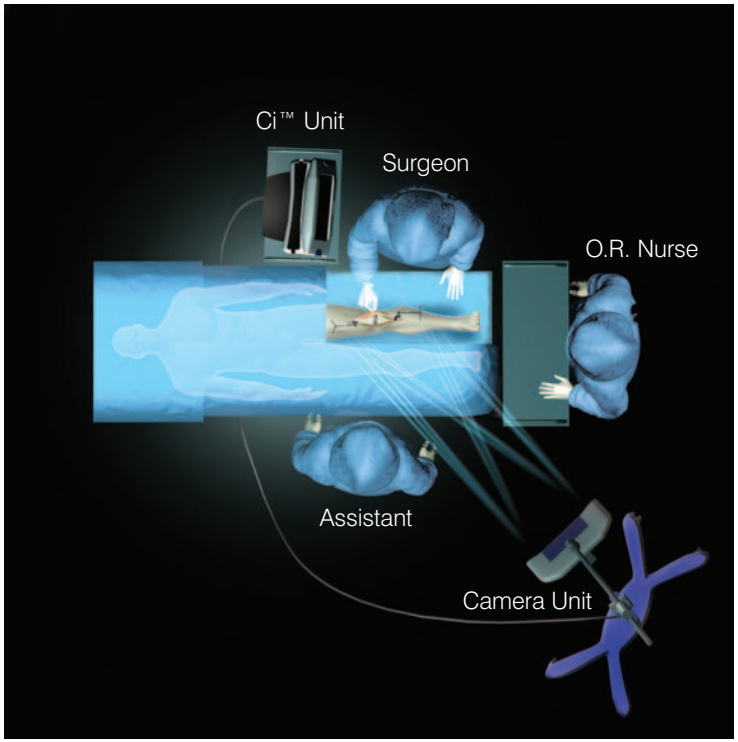
Please refer to the System User Guide (Art-No: 52543-03EN) for detailed set-up instructions.

Note: The Ci™ instrumentation should be coated with a medical grade lubricant prior to surgery.

Ci™ System Set-up



Option 1: Ci™ Camera unit at the base of the table



Option 2: Ci™ Camera unit angled

Positioning the Ci™ System in the O.R.
The Ci™ unit should be positioned so that the surgeon has a clear view of the screen. The touch-screen should be within easy reach of the surgeon or surgical assistant.

Ideally the infrared camera unit should have an uninterrupted view of the tibial and femoral marker arrays throughout a full range of motion (knee flexion, extension and pivoting of the hip joint). The camera unit should be positioned between 1.5 to 2 metres (4 to 6 feet) away from the surgical site.

The Ci™ unit must be covered using the sterile drape supplied.

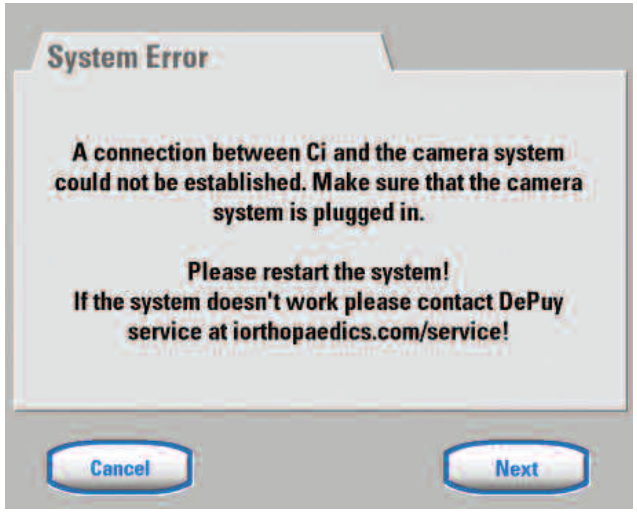
Unstable stands or tables should not be used for placement of the Ci™ unit.

Please refer to the System User Guide (Art-No: 52543-07EN) for detailed set-up instructions.

Start-up Procedure

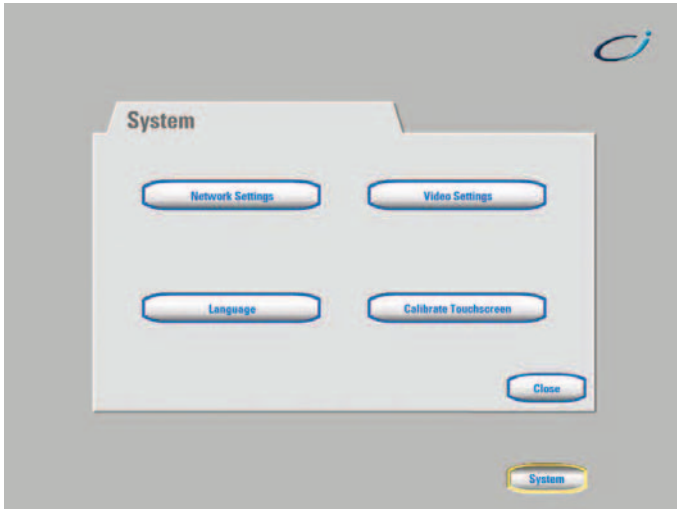
Start-up screen

Figure 1



Camera connection error screen

Figure 2



System settings for network, video, language and touchscreen

Figure 3

All cables must be fully connected before switching on the system.

Once the power supply has been switched on, the Ci™ software will automatically initialise (Figure 1).

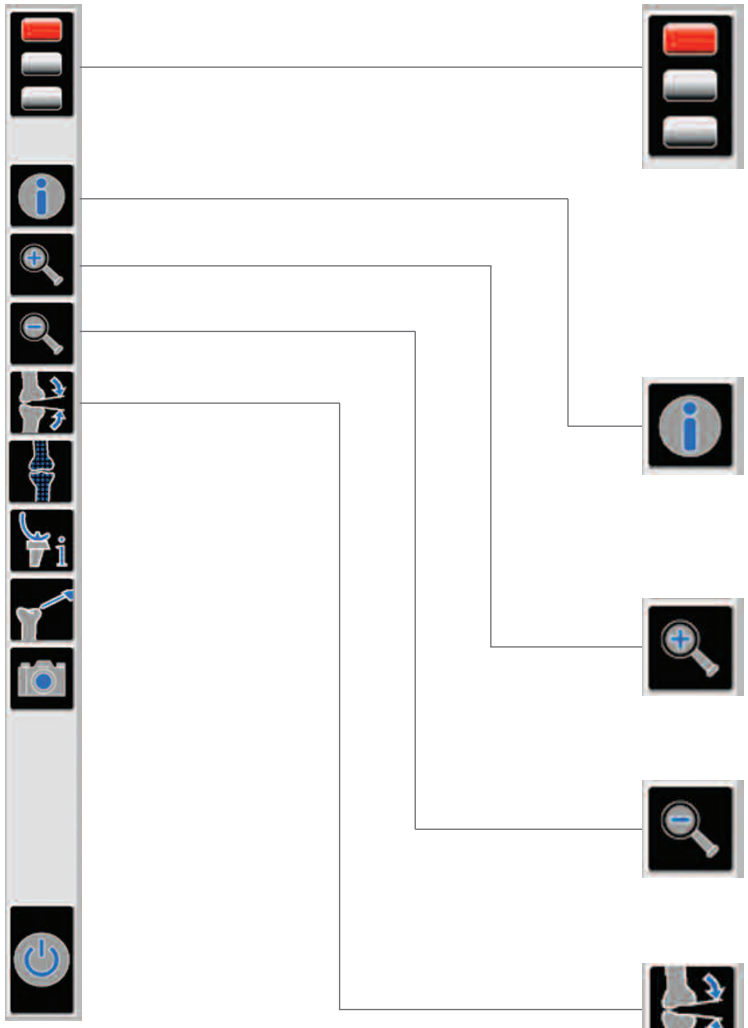
Two ‘beeps’ indicate that the camera unit is properly connected.

If the camera unit is not properly connected, no ‘beeps’ will be heard and an error message will appear asking you to restart the system (Figure 2).

The start-up screens allow the user to configure network and video settings if required (Figure 3).

A blank CD-R (not CD-RW) should be inserted into the Ci™ unit before draping to allow any patient data to be stored.

Ci™ System Menu Buttons



1. Status Field – red / orange / green

Green: Normal tracking mode

Yellow: Ci™ instrument not visible to camera

Red: Ci™ instrument and / or navigation array not visible to camera for more than 3 seconds

Pressing on this button brings up the camera field of view screen. This will show the position of all visible navigated instruments in the field of view.

2. Information

Provides information on the application, version number, phone 'hotline' numbers and www.iorthopaedics.com website

3. Zoom In

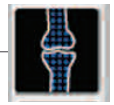
Zooms in on the morphed bone model

4. Zoom Out

Zooms out of the morphed bone model

5. Ligament Balancing

Can be used at any time after the registration procedure is complete



6. 3D Model

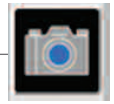
Allows the user to switch between displaying or hiding the 3D model, leaving only the ‘cloud’ of acquired points visible on screen.

7. Implant information

Provides details on the implants and sizes. This may be used to confirm the selected implants after the implant planning stage. If this option is selected before the optimisation process, the femoral implant displayed will usually be too small.

8. Verification Button

If, at any time, the reference arrays are moved or knocked out of position, you can re-verify the accuracy of the bone model using the Ci™ pointer. If the bone model is no longer accurate, the registration process will need to be repeated. (If only one array has been moved, the registration will only need to be repeated for that array). Use the next / back buttons to return to the appropriate point in the procedure.



9. Screenshot Button

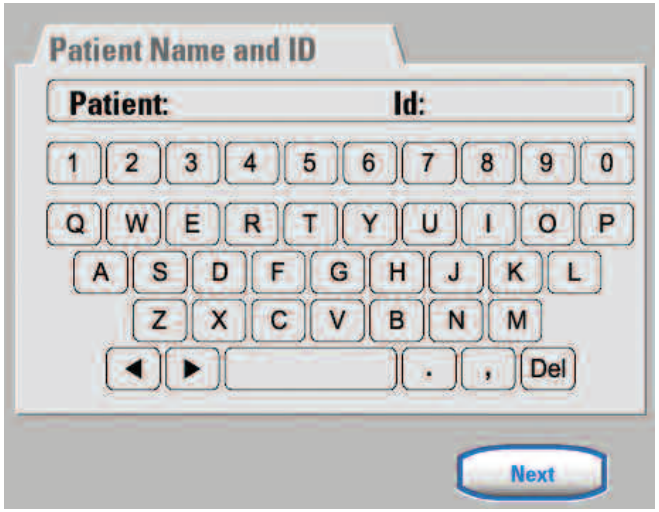
This allows the user to take manual screenshots at any stage of the procedure. Screenshots are stored within the system and can be written to a CD-R. The system will also take automatic screenshots at key stages during the procedure.

10. Close Button

This closes the application. All information can then be stored on disk before continuing with a new procedure. The patient’s name and ID are stored as an HTML file with all information gathered during the procedure.

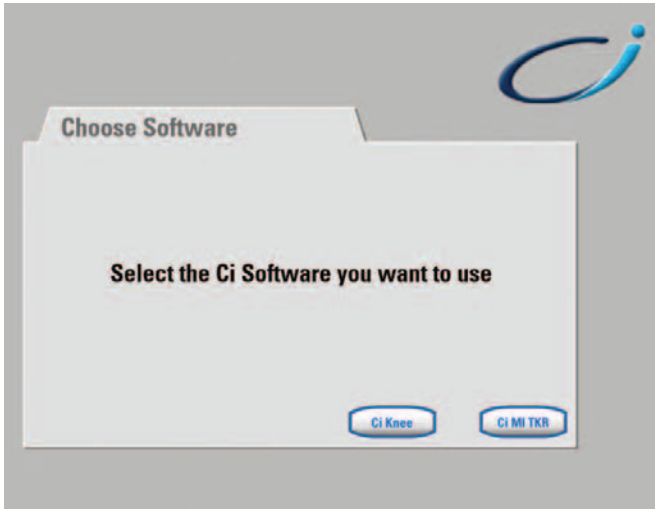
Ci™ System Procedure Set-up

On screen there are next and back buttons. In this surgical technique we use arrows to indicate movement to the next step.	Arrow Key: Press 'next' to continue Press 'back' to return to the previous step



Patient name and ID input screen

Figure 4



Ci™ 1.1 or Ci™ MITKR workflow selection

Figure 5

Implant product line selection

Figure 6

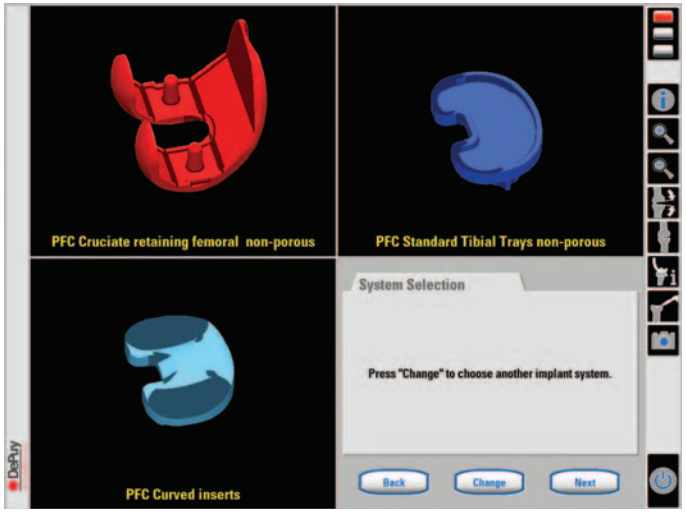
The procedure is started by entering the patient's name and ID, using the touch-screen keyboard (Figure 4). This information will appear on the screen and on each screenshot taken during the operation.

A choice of Ci™ Knee 1.1 or Ci™ MITKR software can be selected (Figure 5).

The appropriate MITKR Knee System software is selected from the choices displayed - LCS® Complete™ / P.F.C.® Sigma™ / P.F.C.® Sigma™ RP Knee Systems (Figure 6).

Navigation order selection

Figure 7



Specific implant selection

Figure 8

Affected knee selection

Figure 9

If the P.F.C.® Sigma™ product line is selected, a choice of 'tibia first' or 'optimised' navigation order options are presented (Figure 7).

The appropriate product line is selected (Figure 8). Press 'change' to alter the selections on screen.

The femoral component is selected first, followed by the tibial component and the tibial insert.

The appropriate treatment side for the surgery is selected (Figure 9).

Exposure

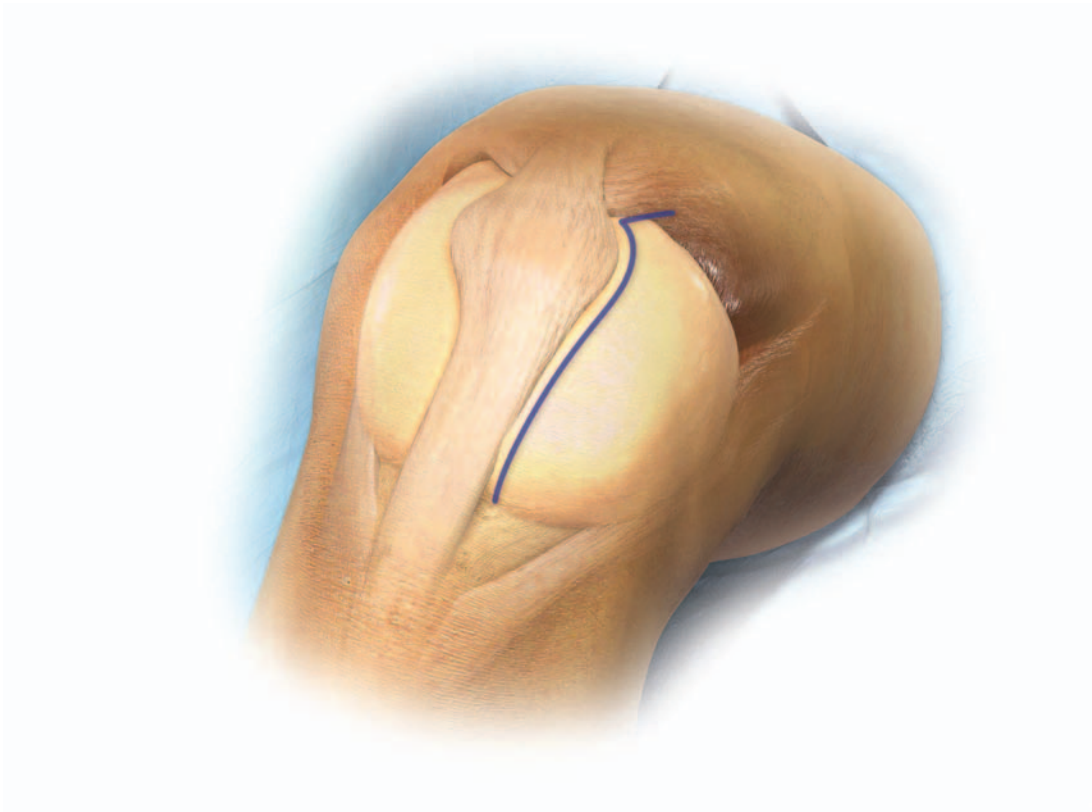


Figure 10

Mid-vastus, sub-vastus or medial peripatellar capsular exposures are performed (Figure 10).

Following exposure of the joint, the anterior fat pad is cleared from the anterior cortex. The patella pouch and the working area around the tibia and femur should also be cleared.

In order to achieve long leg alignment and joint stability, it is vital that all osteophytes are removed from the entire medial or lateral edges of the femur and tibia before registration takes place.

A retractor is used on the patella rim to draw the patella into a central position. Any significant osteophytes on the edge of the patella should also be excised.

Tibial and Femoral Array Positioning

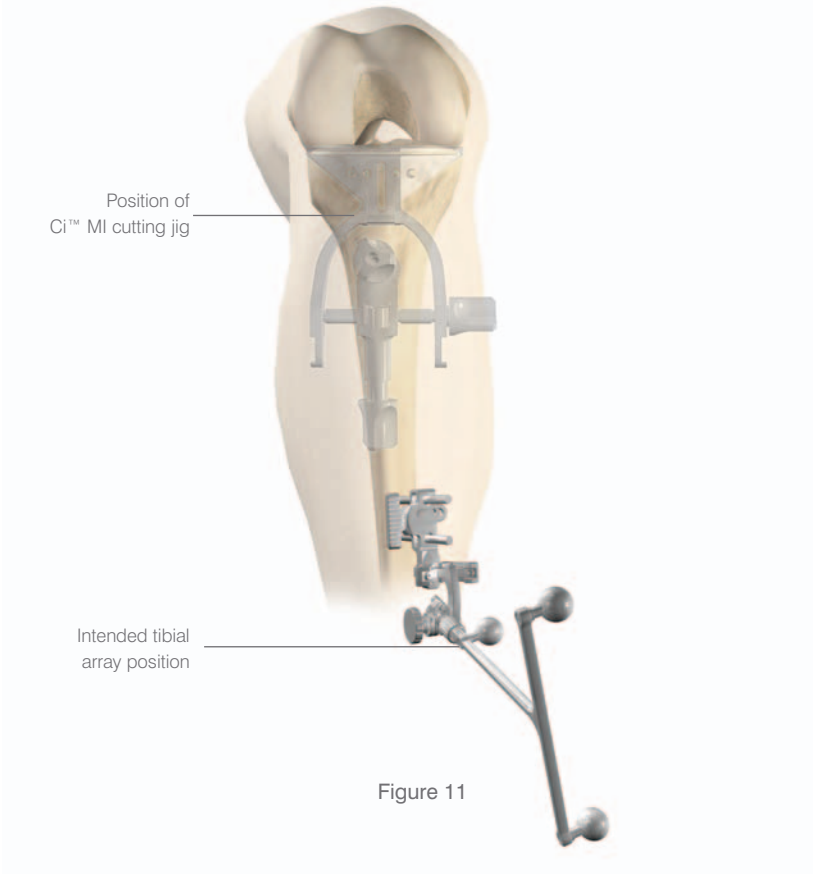


Figure 11

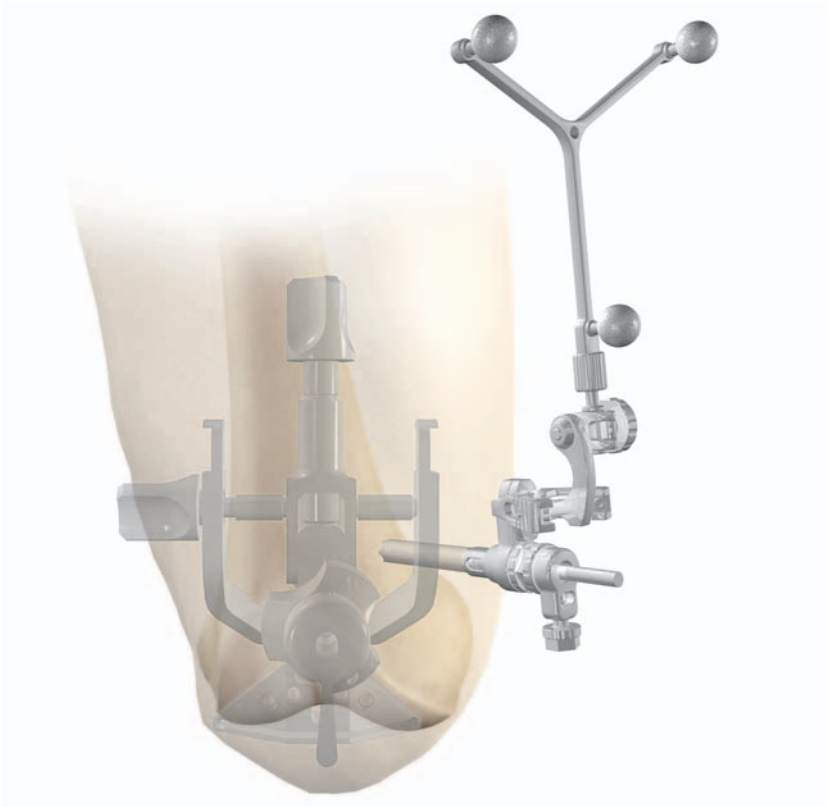


Figure 12

The arrays must be placed away from the intended positions of both the femoral and tibial instruments to avoid any contact during bone resection and drilling.

Note: The position of the reference arrays must not be moved during the operation as this will lead to inaccurate information being displayed.

Positioning of the cutting jig

The Ci™ MI cutting jig is held in an approximate position on the tibia before marking the pin positions. Care should be taken to position the array clear of the jig and any navigated instruments (Figure 11).

Positioning of the femoral array

The femoral array should be positioned away from the intended incision and should not influence soft tissue and ligament movement in extension and flexion (Figure 12).

Tibial Array Fixation

Figure 13

A fixation pin template is positioned on the tibia. Two marks are made through the template to identify the pin positions (Figure 13).

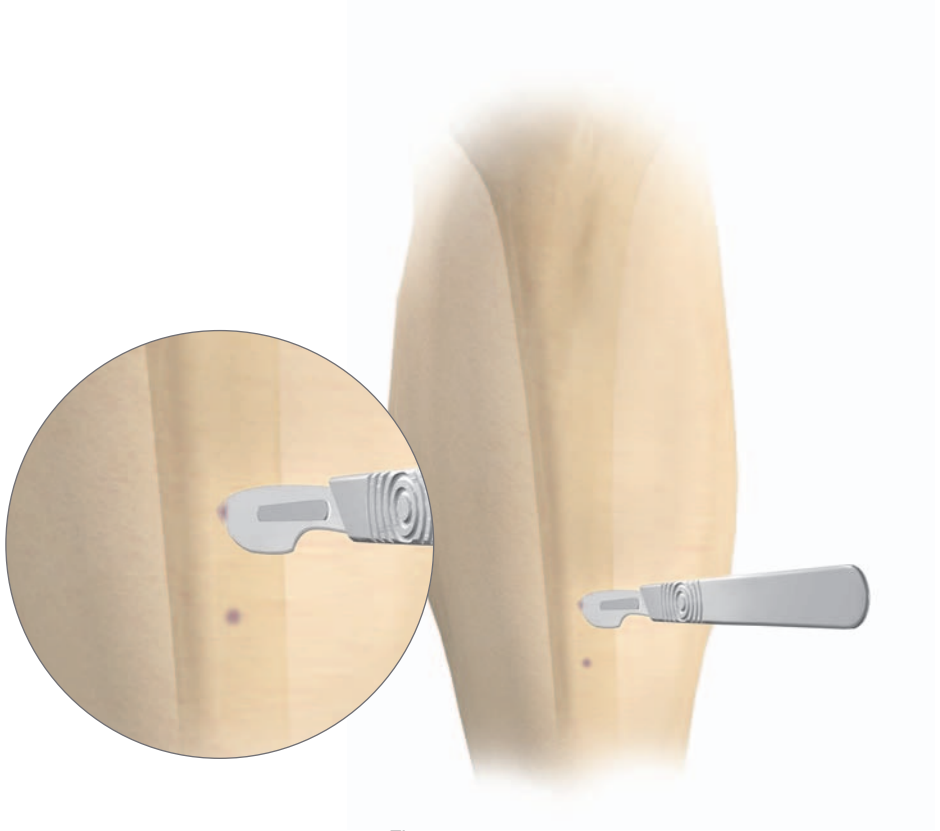


Figure 14

A stab incision is made through the soft tissue using a scalpel (Figure 14).

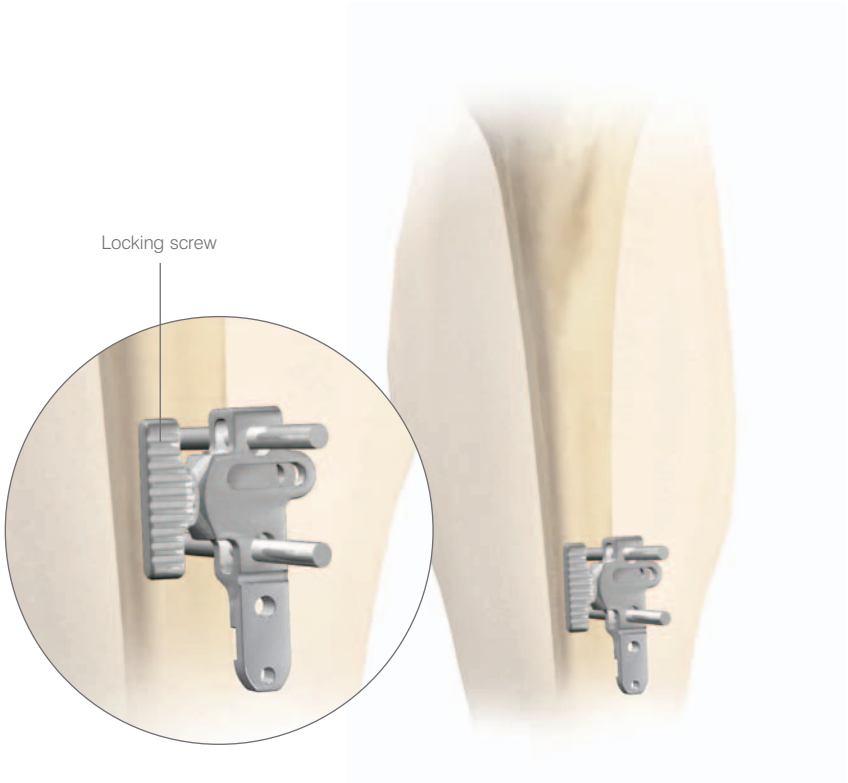


Figure 15

The two pins are fixed unicortically into the tibia. A sheath is used on the pins to avoid any disruption to the soft tissue. The array block is placed on the pins and secured in place with the locking screw (Figure 15).

Figure 16

The quick release array is secured to the block. Final positioning and tightening of the array is made using the adjustment screw (Figure 16).

Femoral Array Fixation

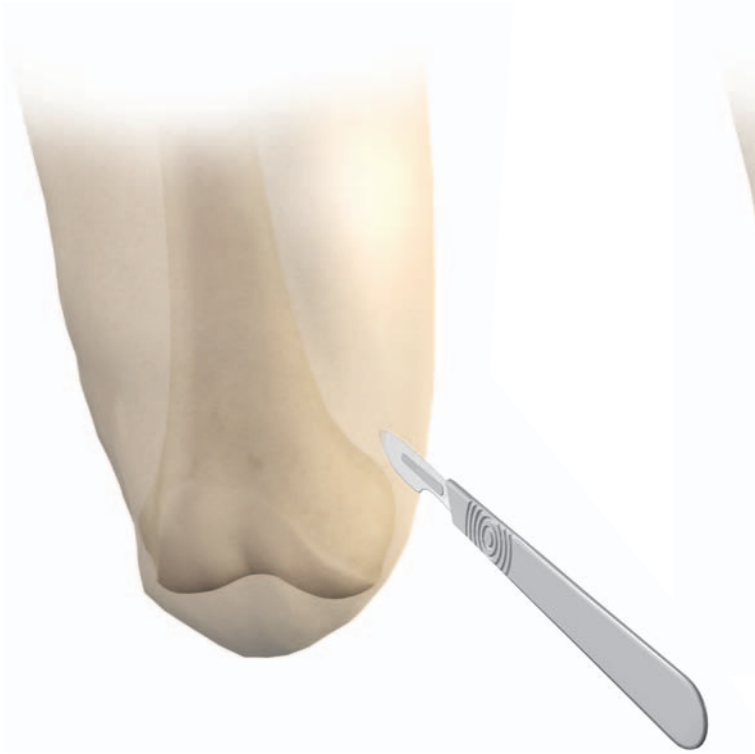


Figure 17

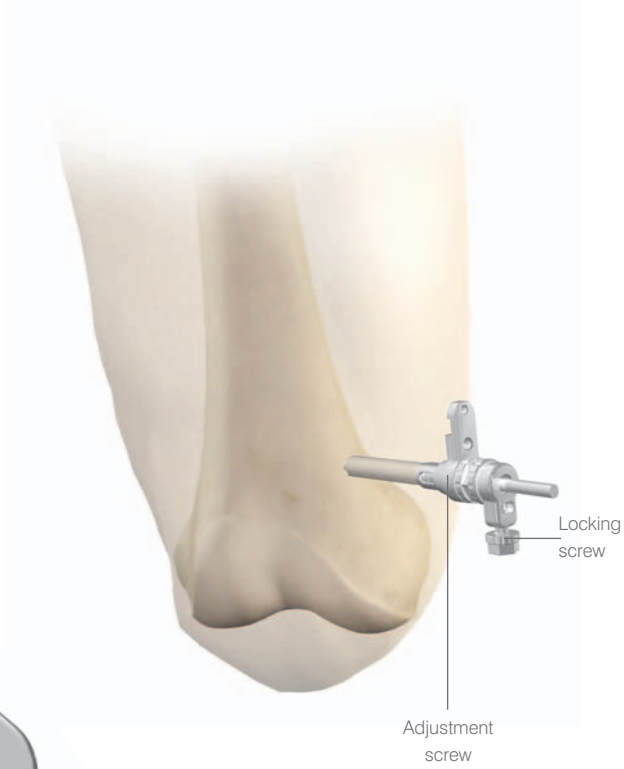


Figure 18

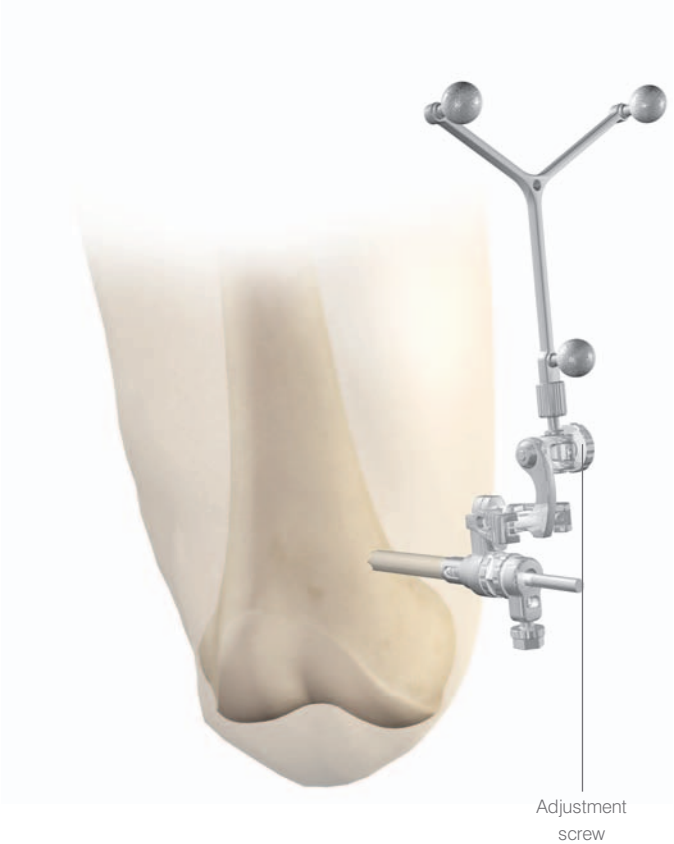


Figure 19

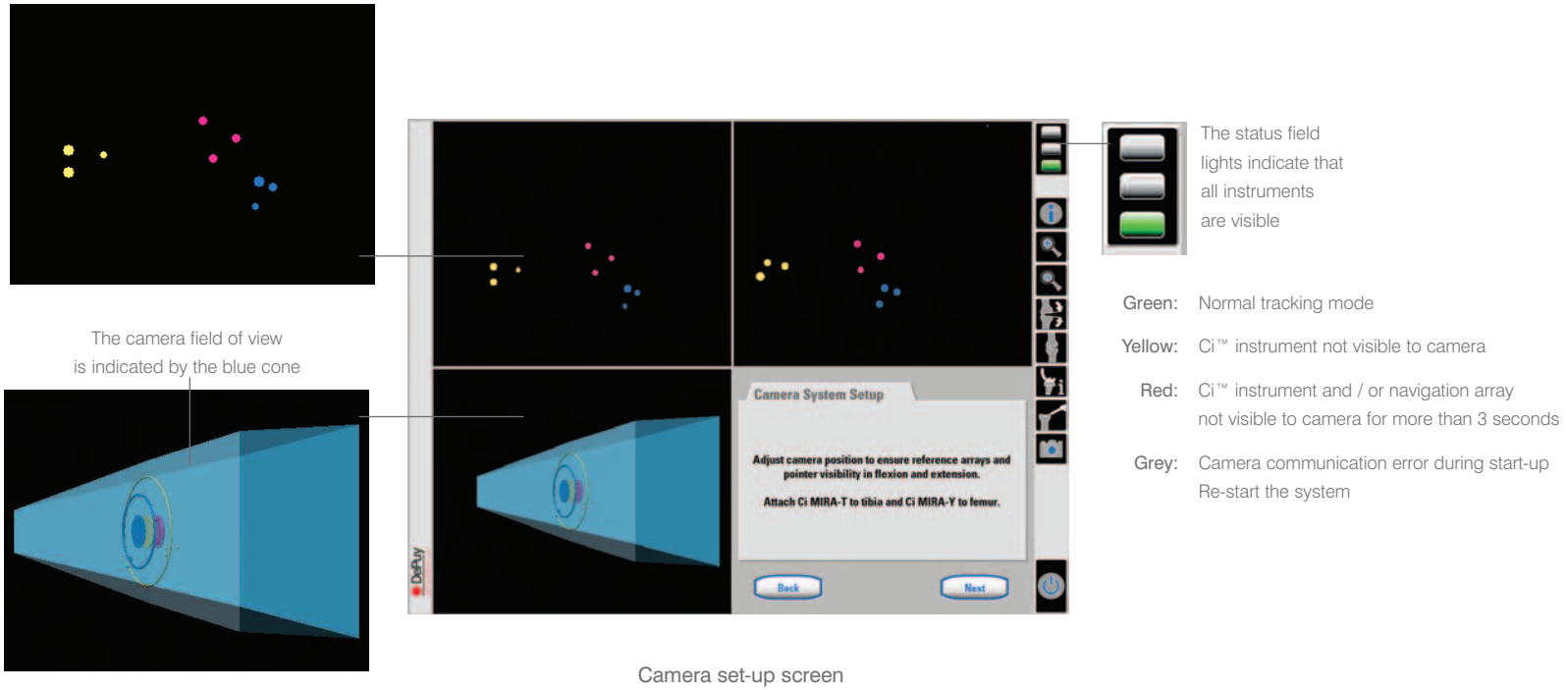
The Schantz screw position is marked on the femur and a stab incision is made through the soft tissue using a scalpel (Figure 17).

A single Schantz screw is drilled into the femur bicortically. A sheath is used on the screw to avoid any disruption to the soft tissue. The array sleeve is placed on the screw and pushed down until the spikes engage cortical bone.

The sleeve is secured using the locking and adjustment screws and tightened using the wrench (Figure 18).

The quick release array is secured to the block. Final positioning and tightening of the array is made using the array adjustment screw (Figure 19).

Camera Alignment



Camera set-up screen

Figure 20

The camera alignment window highlights movement of the reference arrays and instruments. These are displayed as different coloured dots and circles on-screen (Figure 20).

Coloured dots represent the positions of the femoral and tibial reference arrays, and the Ci™ pointer.

The circles show the position of the instruments in relation to the camera unit's field of view.

The status field lights indicate the visibility of the arrays and instruments.

The camera displays can be accessed at any time during the procedure by touching the status field lights.

Patellar Resection

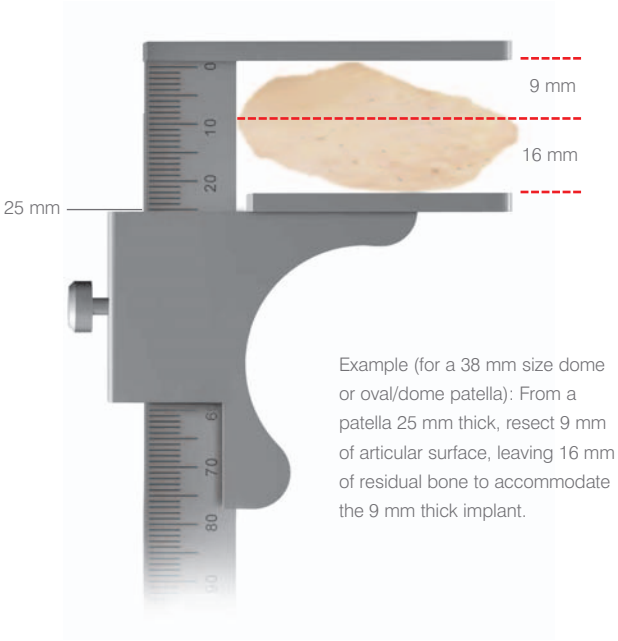
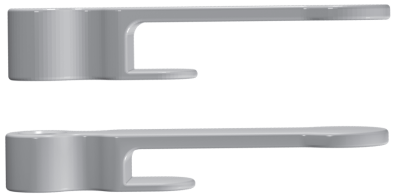


Figure 21



Patella stylus

Figure 22

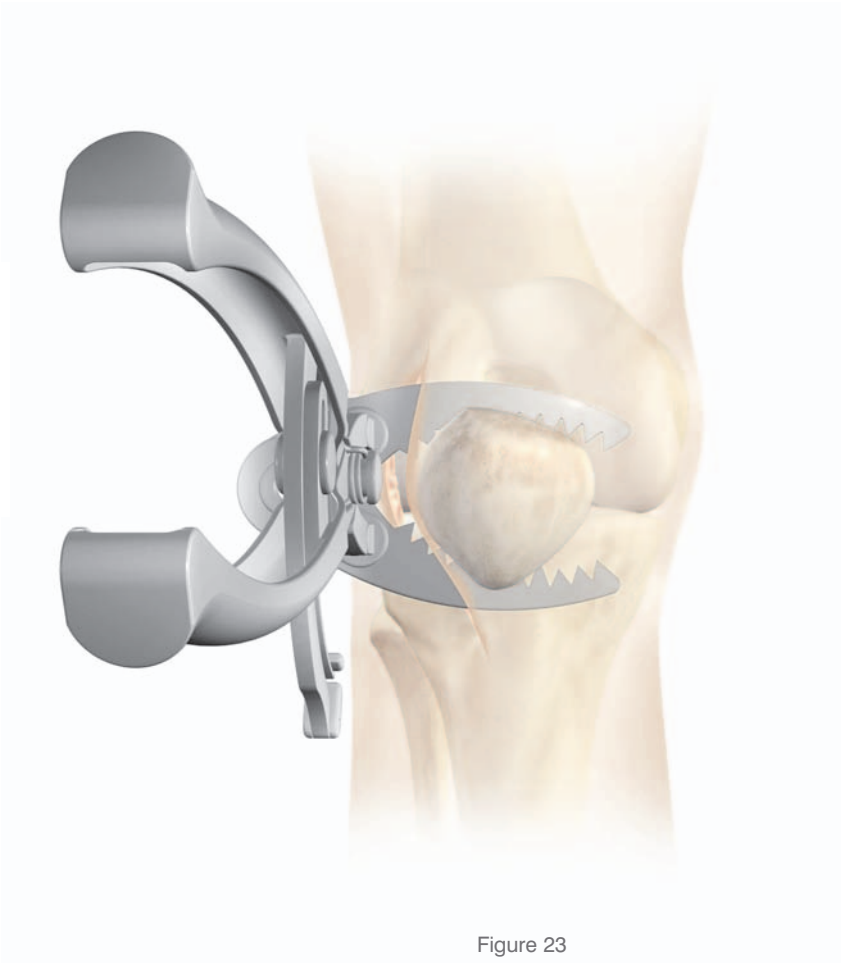


Figure 23

The patella is everted to an angle of approximately 40 - 60 degrees.
The synovial tissue and retinaculum are released from the periphery of the patella down to the plane of the quadriceps tendon.

The thickness of the patella is measured and the level of bone resection calculated (Figure 21). The thickness of the resurfaced patella should be the same as the natural patella. The minimum residual dimension should be no less then 12 mm.

A patella stylus is selected that matches the depth of the patella to be resected (Figure 22). The leg is placed in extension with the patella cutting guide positioned with the stylus against the posterior cortex of the patella with the serrated jaws at the superior and inferior margins of the articular surface (Figure 23).

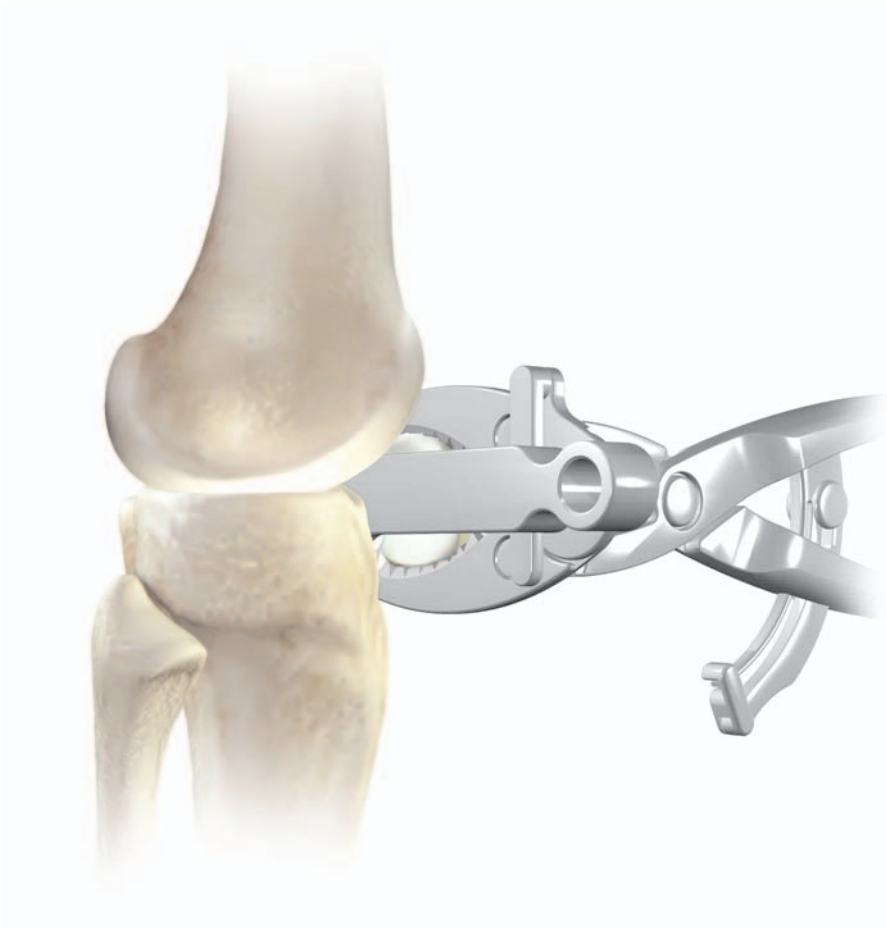


Figure 24

The jaws should be closed to firmly engage the patella (Figure 24).

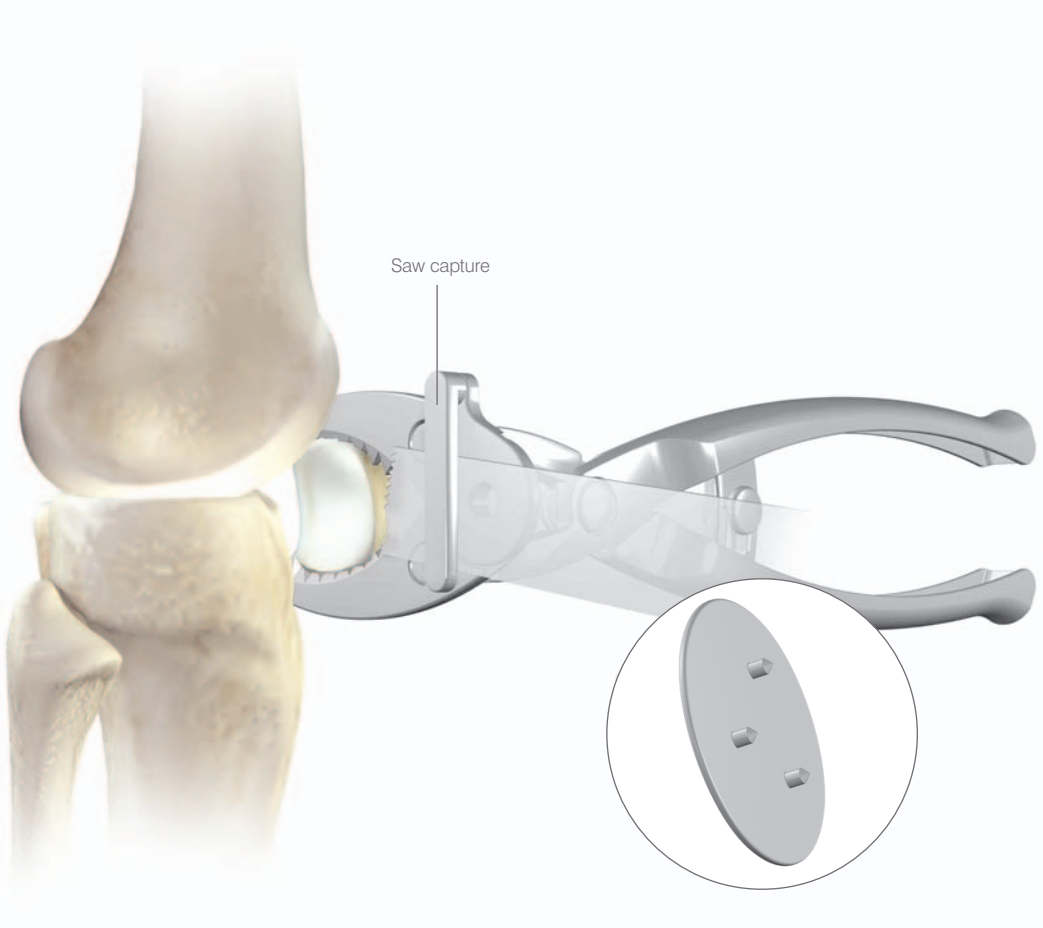


Figure 25

The stylus is removed and the resection performed using an oscillating saw with a 1.47 mm blade, through the saw capture and flush to the cutting surface (Figure 25).

Figure 26

A patella wafer is hand placed on the resected surface (Figure 26).

Registration Methods

Figure 27

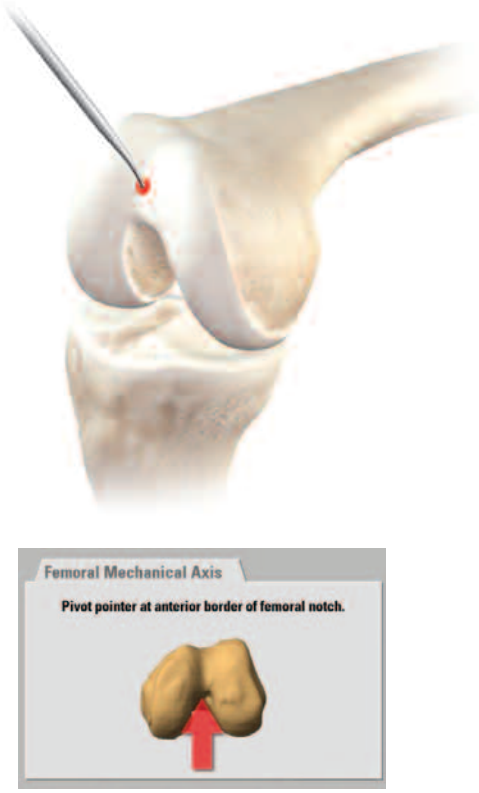


Figure 28

Pivoting

Pivoting involves rotating the femur in a loose arc until a sufficient number of points have been acquired. The software uses this information to determine the rotational centre of the femoral head which is the most proximal point of the mechanical axis (Figure 27).

Single landmark acquisition

Key single landmarks are registered by touching the appropriate bone structure (or soft tissue covering the bone structure) with the tip of the Ci™ pointer. On the monitor, a single arrow indicates where the point is to be acquired (Figure 28).

The following points are acquired in this way:

- Malleolus (medial and lateral)
- Mechanical axes (proximal tibia and distal femur)
- Proximal tibial contour (medial, lateral, anterior and posterior)
- Epicondyles (medial and lateral)
- Femoral anterior cortex resection level

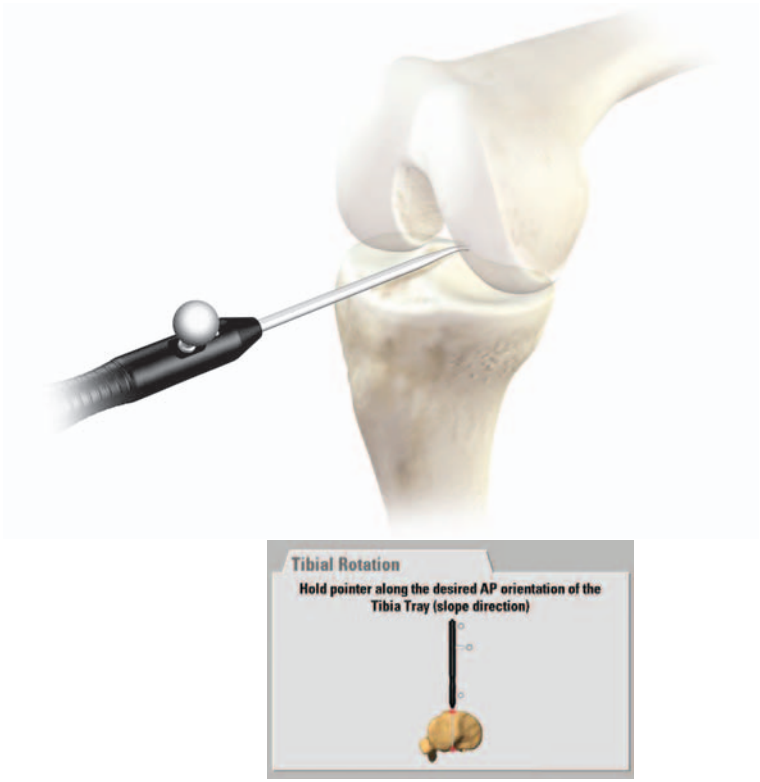


Figure 29

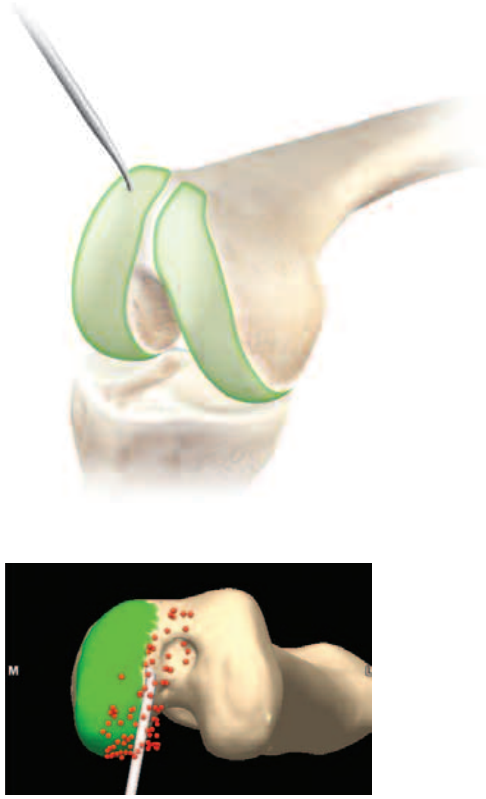


Figure 30

Acquiring directions

Some axes and directions are acquired by holding the Ci™ pointer absolutely still in a specific alignment (Figure 29). The following directions are acquired in this way:

- Tibial rotation
- Whiteside's line

Multiple landmark acquisition

Multiple landmark acquisition registers bone areas. The points acquired are used to calculate resection levels and morph the 3D bone model. Points are acquired by sliding the Ci™ pointer tip along the bone structure (Figure 30).

Points are only acquired which are at least 1.5 mm from the previous five points. Dots indicating the registered areas appear on the image of the bone with progress shown on the progress bar. The following points are acquired in this way:

- Tibial plateau (medial and lateral)
- Condyles (medial and lateral)
- Anterior cortex (tibia and femur)

Ci™ Pointer Tips

Figure 31

Figure 32

1. To acquire points accurately, it is helpful to hold the tip of the Ci™ pointer with one hand while pivoting the Ci™ pointer with the other. This will ensure that all of the points are registered on the bone, not away from the patient (Figure 31).

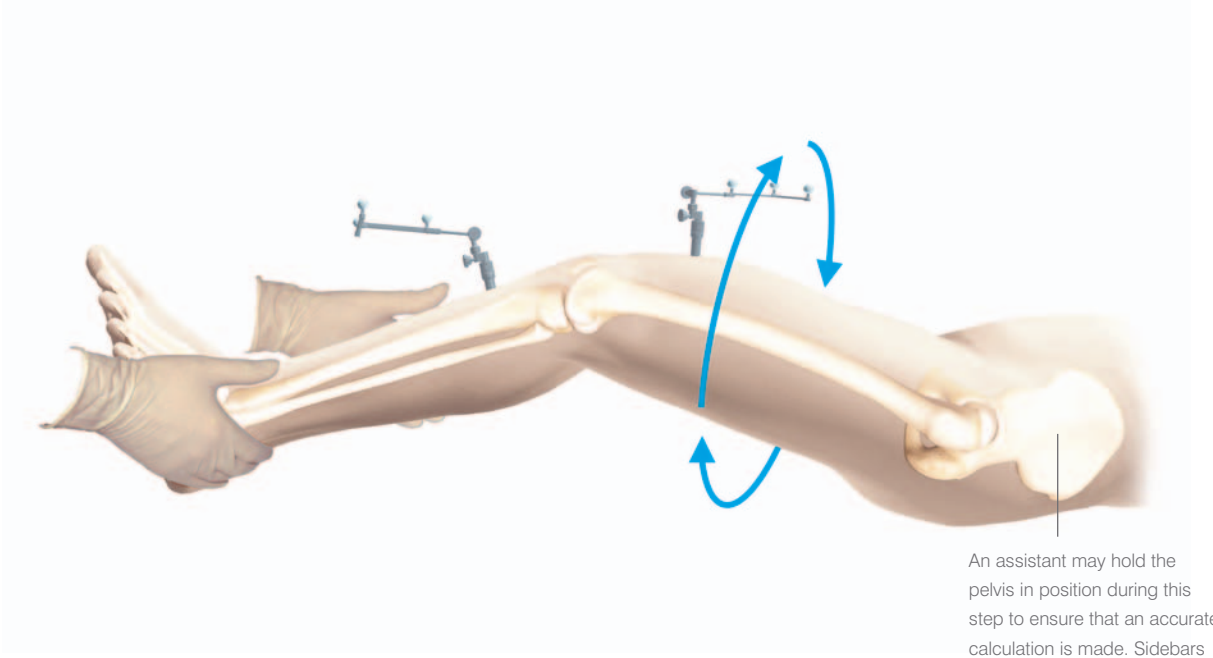
2. To avoid acquiring unnecessary points before the Ci™ pointer is positioned, it may be helpful to cover one of the marker spheres with a hand. This will effectively ‘eliminate’ the Ci™ pointer from the camera’s field of view (Figure 32).

3. Make sure all three marker spheres on the Ci™ pointer are directed towards the camera unit when acquiring a point.

4. When a point has been successfully acquired, the system will sound an audible ‘beep’. This removes the need to refer to the screen as each point is acquired. If the camera cannot see the Ci™ pointer, a deep sounding ‘beep’ will be heard.

5. If at any stage during the procedure the marker spheres become contaminated with blood or tissue, they may be gently cleaned using lint-free cloth.

Calculating the Femoral Head Centre



An assistant may hold the pelvis in position during this step to ensure that an accurate calculation is made. Sidebars on the OR table may inhibit the registration process.

Figure 33

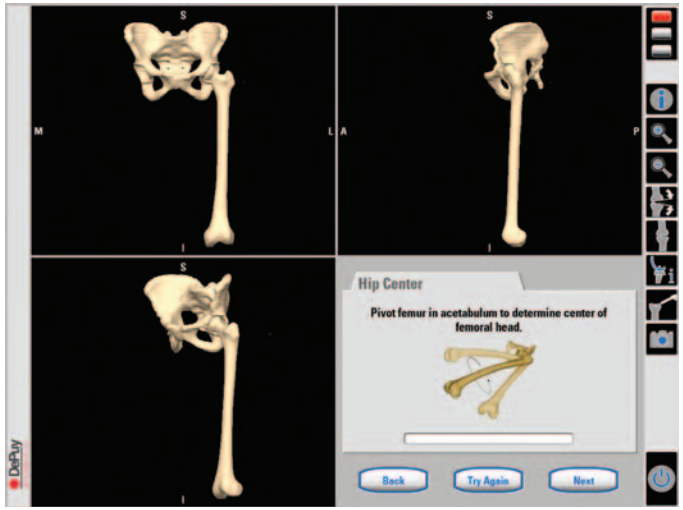


Figure 34

Calculating the rotational centre of the femoral head defines the proximal point of the mechanical axis. It is important to make sure that the patient's pelvis is not moved excessively during registration as this will lead to miscalculation by the system.

The femur is pivoted using circular motions (Figure 33). The system calculates a series of points to determine the rotational centre and will automatically proceed when the rotational centre has been accurately calculated (Figure 34).

Pivoting will restart automatically if the error is more than 3 mm.

After the fourth attempt (and if the error is between 3 mm and 5 mm) the error value is displayed on screen. The surgeon has the option to accept the error or try again.

If an error of 4 mm or 5 mm is accepted, the mechanical axis will deviate by more than 0.5 degrees.

Femoral Mechanical Axis

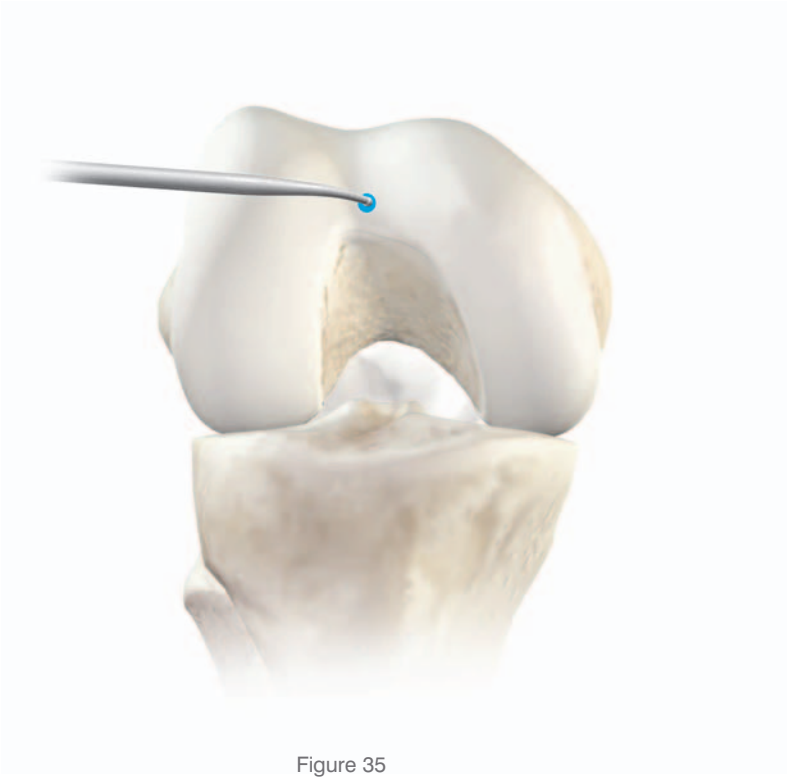


Figure 35

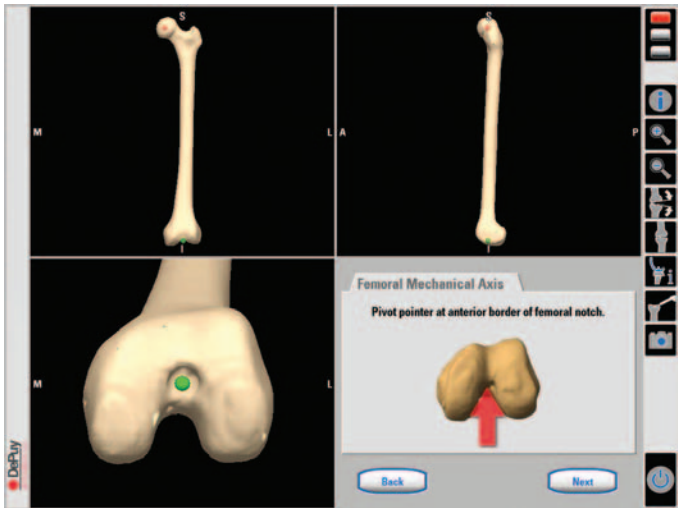
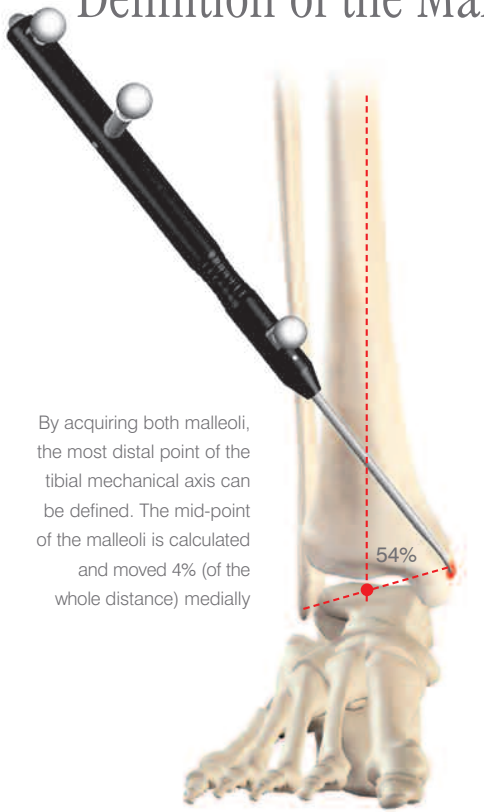


Figure 36

The Ci™ pointer should be placed slightly medial to the anterior aspect of the femoral notch point (as indicated on screen) (Figures 35 & 36).

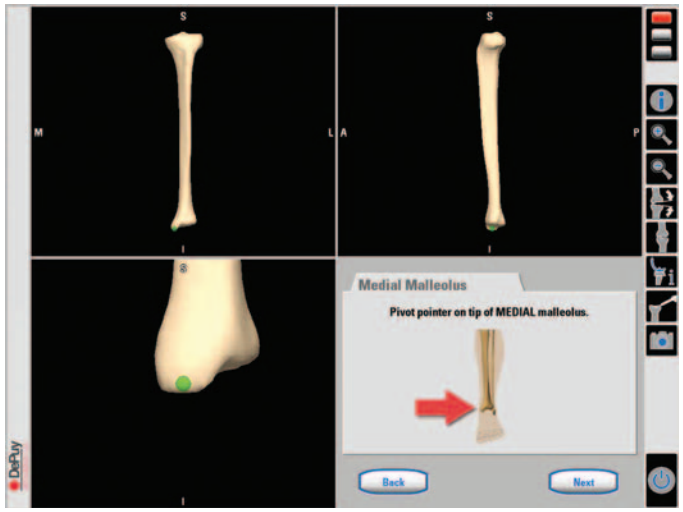
Do not use the femoral canal entry point as a guide for acquiring the point. The acquisition of this point completes the femoral mechanical axis.

Definition of the Malleoli



By acquiring both malleoli, the most distal point of the tibial mechanical axis can be defined. The mid-point of the malleoli is calculated and moved 4% (of the whole distance) medially

Figure 37



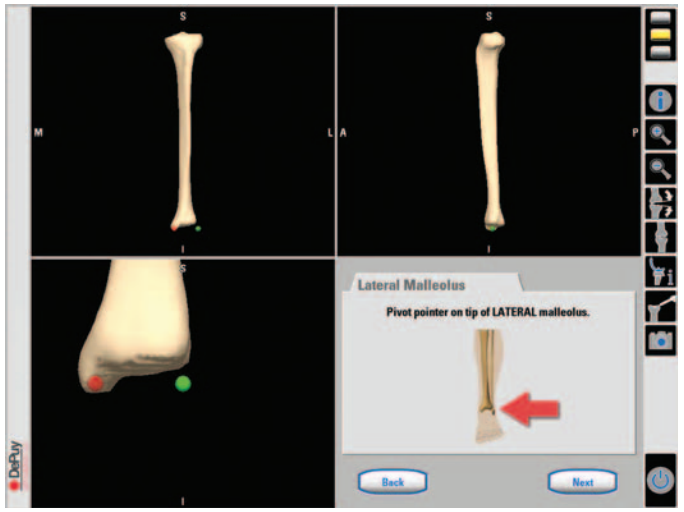


Figure 38

The medial and lateral malleoli are defined using the Ci™ pointer.

The malleoli can usually be located by hand before acquiring the points. It is important that draping or bandaging is reduced to a minimum to enable the malleoli to be located.

Place the tip of the Ci™ pointer on the medial malleolus and pivot the Ci™ pointer (Figure 37). It is important not to move the tip of the Ci™ pointer from the bone. Once the system has registered the medial malleolus, the lateral malleolus can be registered in the same way (Figure 38).

Acquiring the malleoli defines the distal point of the mechanical axis.

All single registration points for anatomic landmarks are acquired in the same way.

It is important that these points are acquired as accurately as possible.

Definition of the Tibial Mechanical Axis

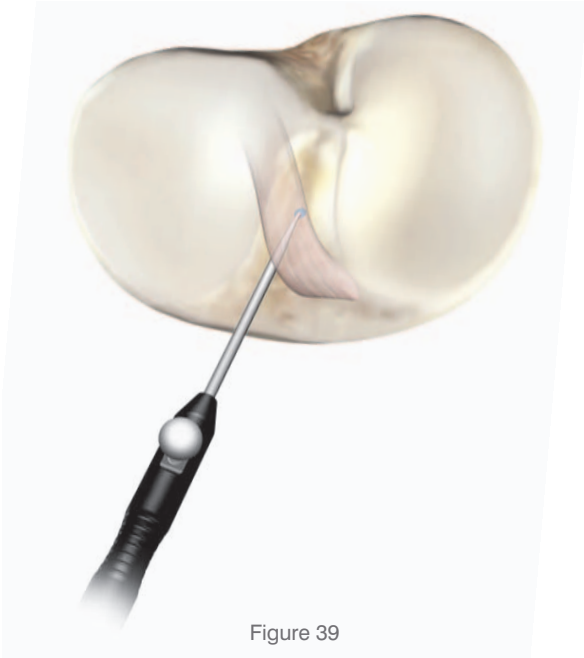


Figure 39

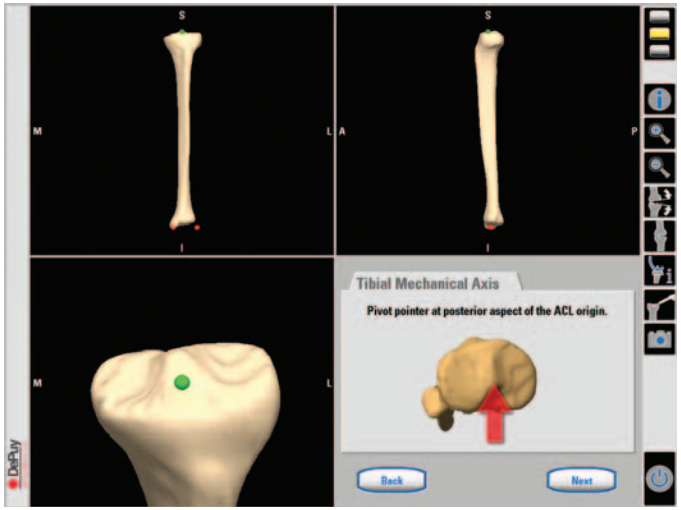


Figure 40

The final point on the mechanical axis is defined by acquiring the posterior aspect of the ACL tibial insertion point (Figure 39). This is indicated by the arrow on screen (Figure 40).

It is important that the point acquired defines the mechanical axis, and not the tibial eminence.

The definition of the mechanical axis is the basis for all further calculations and should be acquired as accurately as possible. Final implant position will be referenced to the mechanical axis.

Tibial Sizing

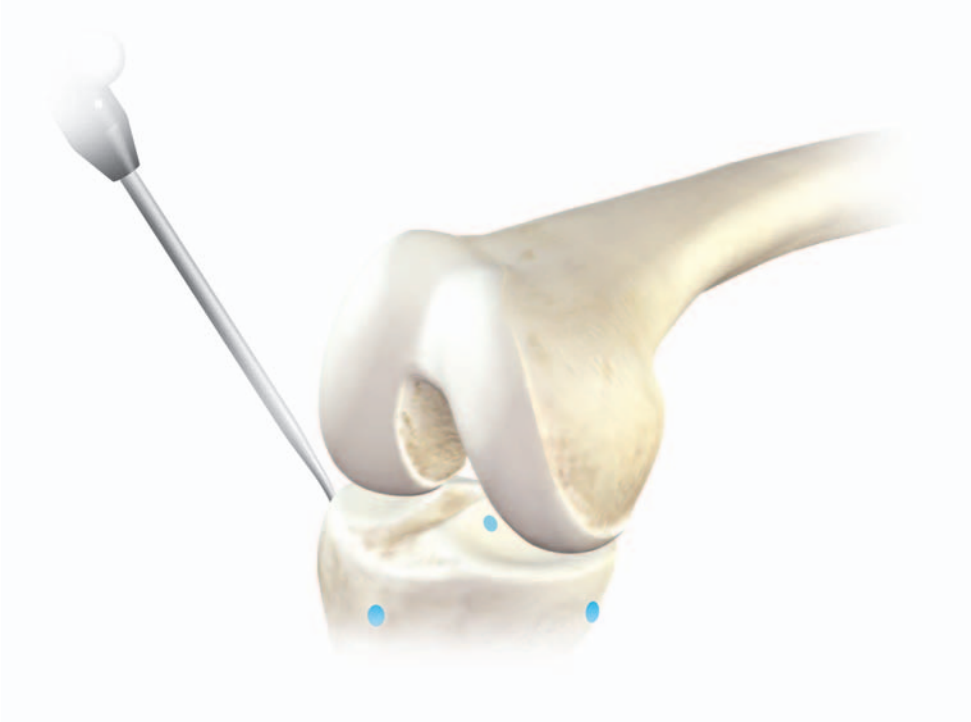


Figure 41

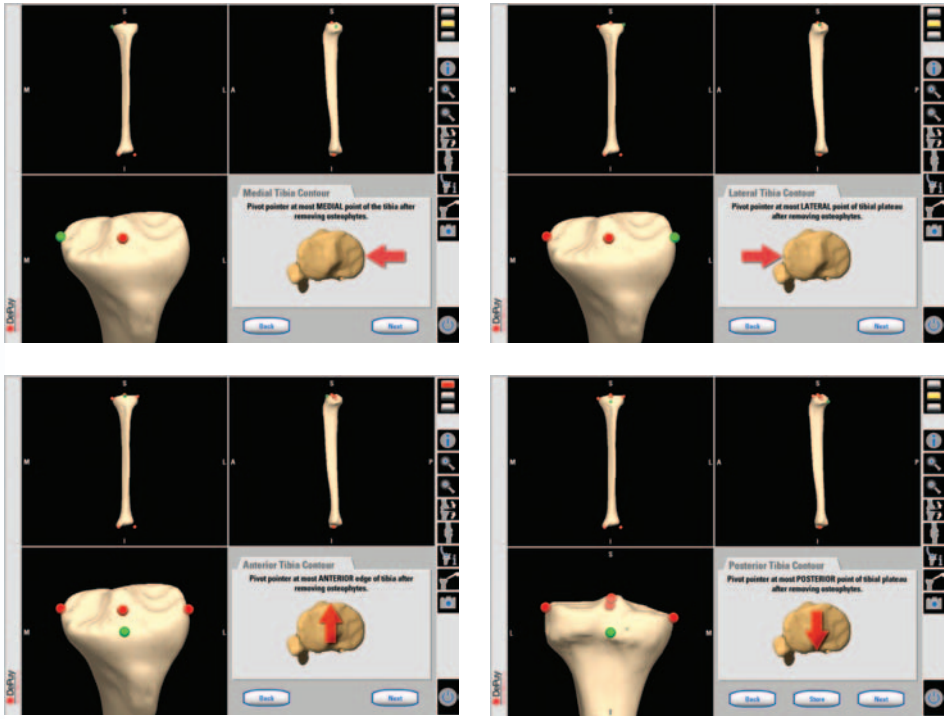


Figure 42

After removal of any osteophytes, the most medial and lateral points of the proximal tibia are acquired using the Ci™ pointer (for implant sizing). These are followed by the most anterior and posterior points (for implant positioning) (Figures 41 & 42).

The points should be registered at the expected resection level. This will help to avoid oversizing the tibial component.

Note: Failure to remove osteophytes at this stage may lead to oversizing the implant (during implant planning).

Tibial A/P Direction

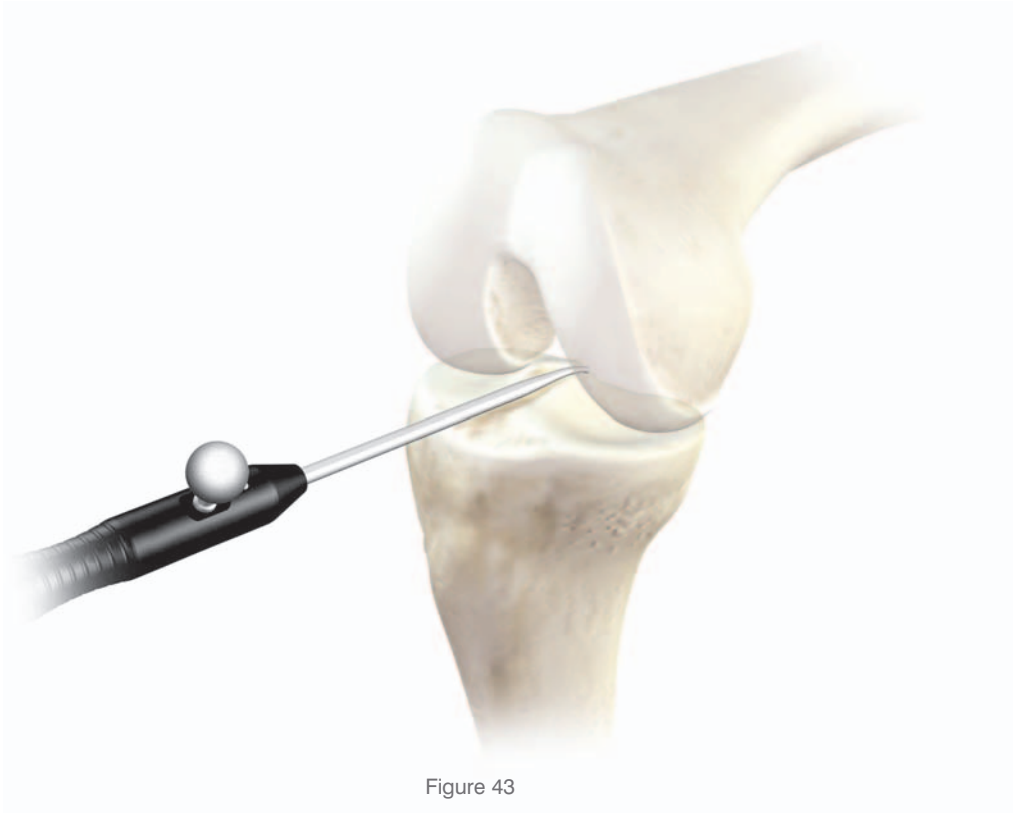


Figure 43

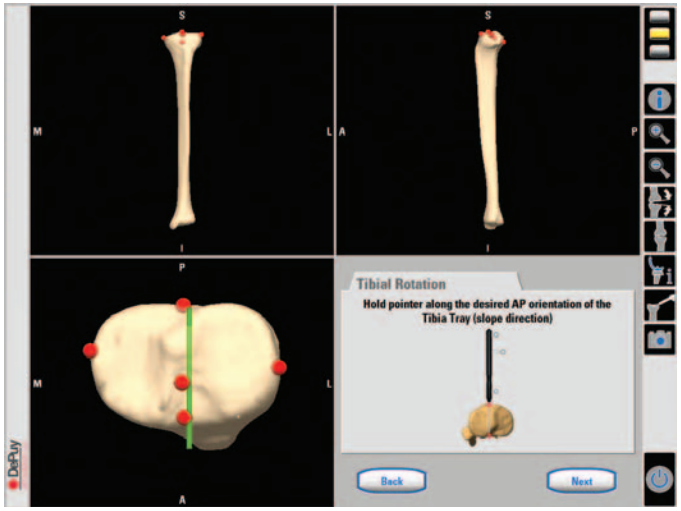


Figure 44

The Ci™ pointer is placed on the tibia to acquire the A/P direction only (Figure 43). If access to the centre of the tibia is limited, the Ci™ pointer can be placed to one side. Accurate acquisition of the A/P direction will help to avoid a compound slope.

The Ci™ pointer is held in place for 2 seconds to allow the system to calculate the A/P direction (Figure 44).

Tibial Modelling

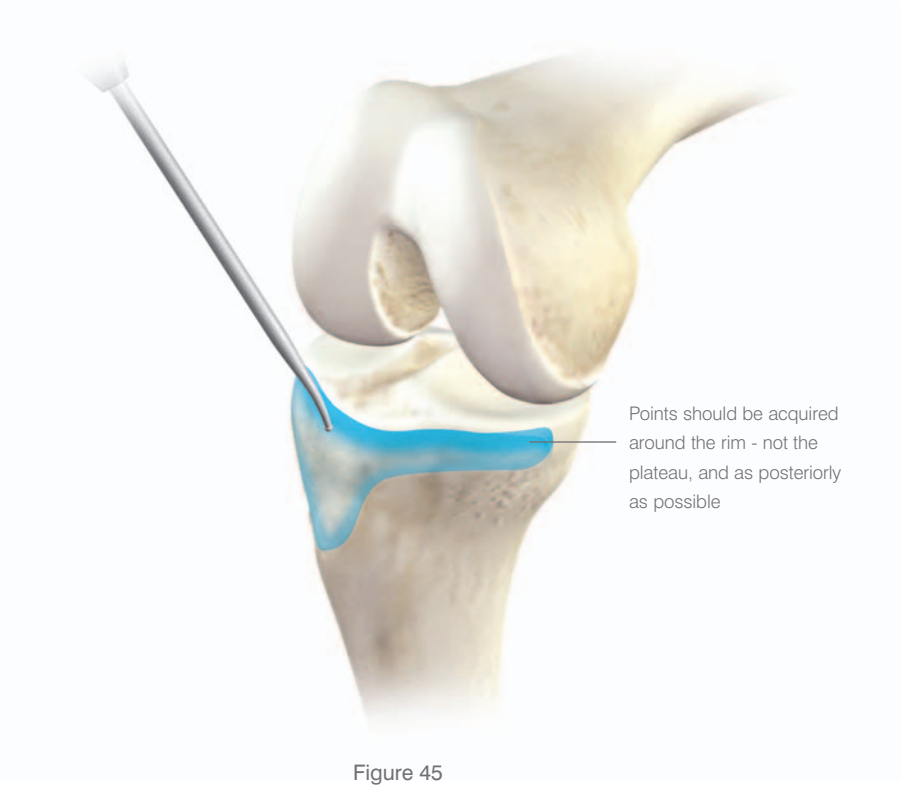


Figure 45

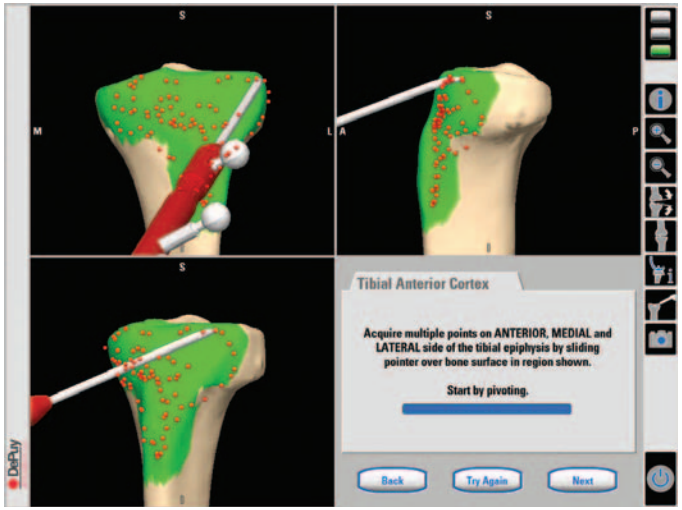


Figure 46

A fixed number of points along the anterior and medial / lateral tibia are acquired using the Ci™ pointer. These points are used to further define the bone model (Figure 45).

The Ci™ pointer is placed on the tibia and pivoted to begin the procedure. A 'beep' will indicate when to begin moving the Ci™ pointer (Figure 46).

The tip of the Ci™ pointer should 'paint' the exposed surface of the tibia making sure it does not leave the surface of the bone. Points should be acquired mainly around the rim and extend as posteriorly as possible. Points further down the tibia are less important, but will add shape to the model. The system will indicate when enough points have been acquired.

Tibial Plateau Modelling

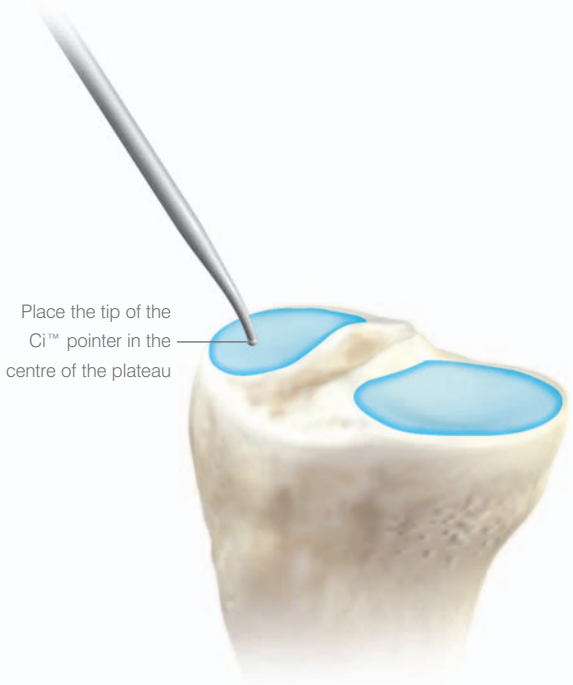
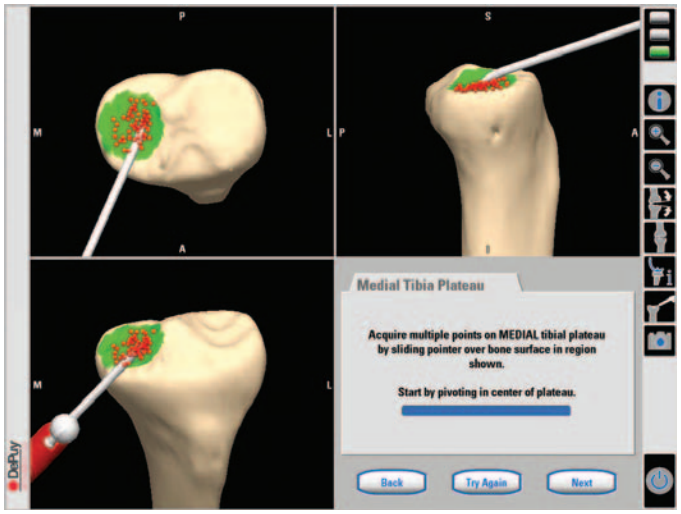


Figure 47



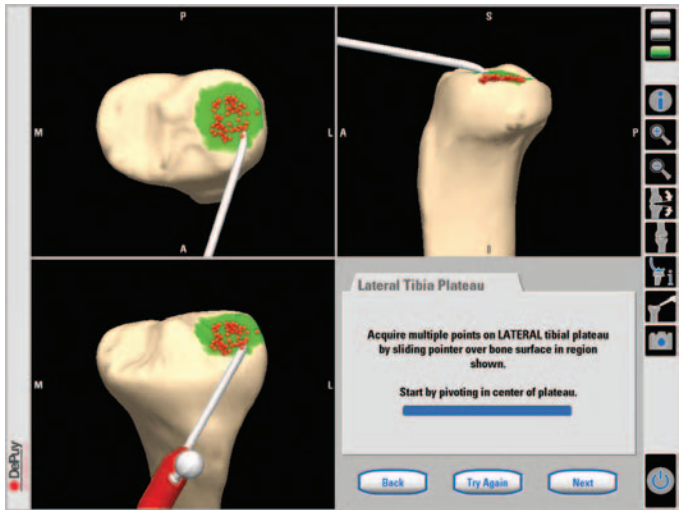


Figure 48

The Ci™ pointer should be placed in the centre of the medial tibial plateau. Laminar spreaders can be used to open the joint to allow greater access to the tibial plateau. The tip of the Ci™ pointer is moved in a circular motion across the surface of the plateau (Figure 47).

It may be helpful to apply varus or valgus stress to the knee joint to allow greater access to the tibial plateau.

The system will automatically proceed to the lateral plateau, which is registered in an identical manner to that of the medial plateau (Figure 48).

Tibial Model Calculation and Verification

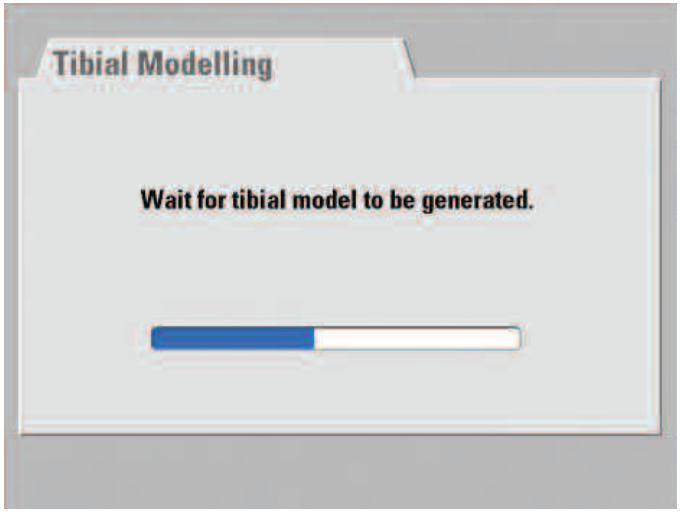
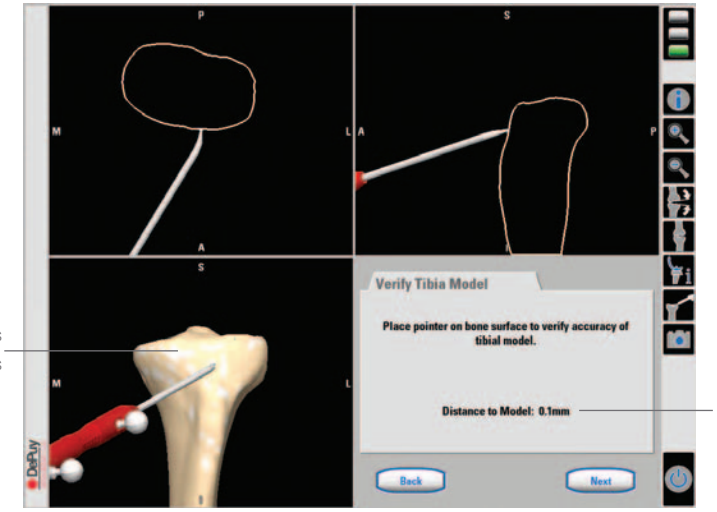


Figure 49



The white areas represent acquired points

The deviation from the tip of the Ci™ pointer to the bone is represented in mm

Figure 50

Following registration, the system adapts the tibial model (Figure 49).

- White areas are parts of the model with deviations no greater than 2 mm from the points acquired during registration.
- Brown areas are parts of the model where no points have been acquired.

The accuracy of the model is checked by holding the Ci™ pointer to the tibia. The exact deviation from the tip of the Ci™ pointer to the model is displayed on the screen. The maximum acceptable deviation is less than 1 mm. Acquired points will normally show a deviation of less than 1 mm. Verification of the model will only be accurate in white areas where points have been acquired (Figure 50).

Note: Implant sizing is based on acquired points only. The accuracy of the model should be checked on the areas responsible for implant sizing and position (medial and lateral boundary, medial and lateral plateau).

Pre-operative Leg Alignment

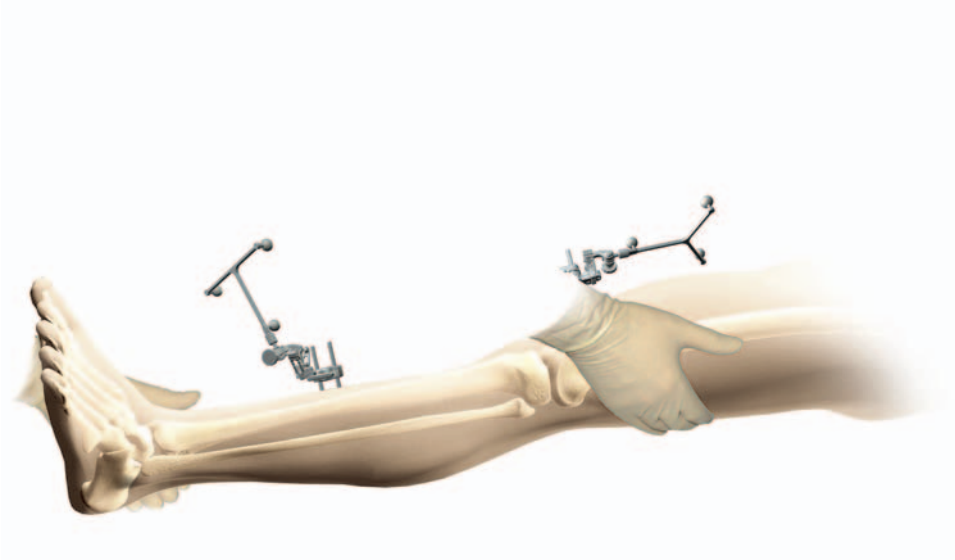


Figure 51

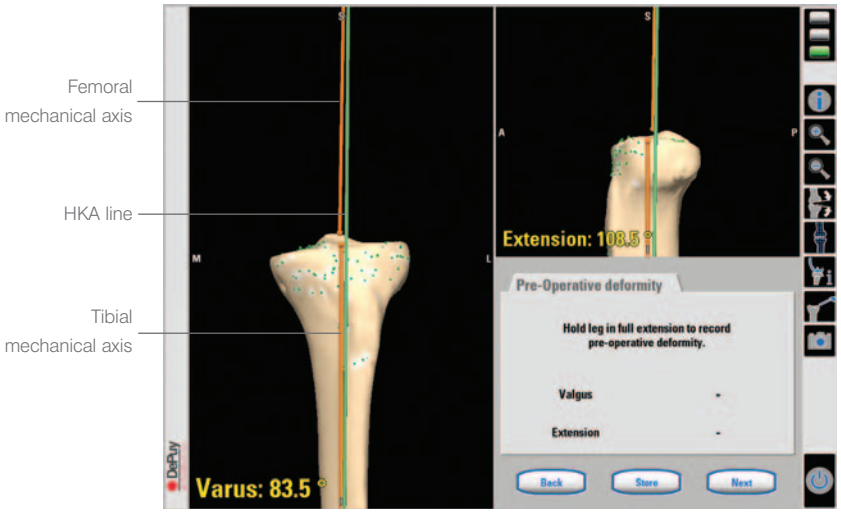


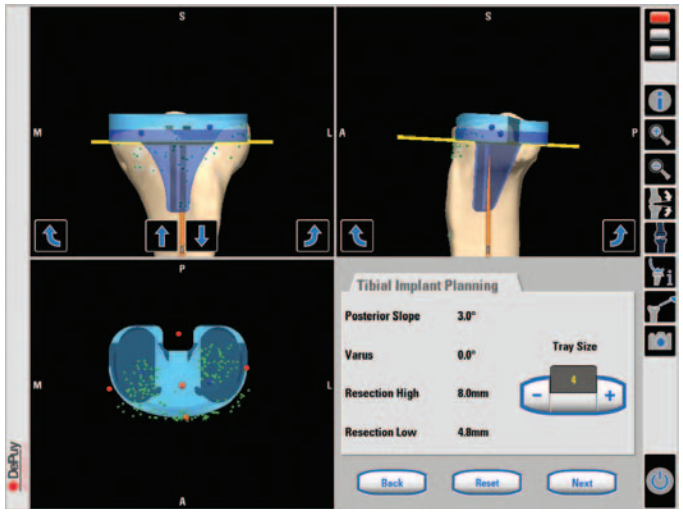
Figure 52

It is important to register the knee joint in extension. The leg is held in clinical extension for 2 seconds to register the patient's pre-operative condition prior to the procedure (Figure 51).

- The orange lines on screen represent the tibial and femoral mechanical axes.
- The green line represents the hip / knee / ankle (HKA) line.

This step allows a comparison to be made between the initial and final alignments at the end of the procedure (Figure 52).

Tibial Implant Planning



Tibial implant planning screen

Figure 53

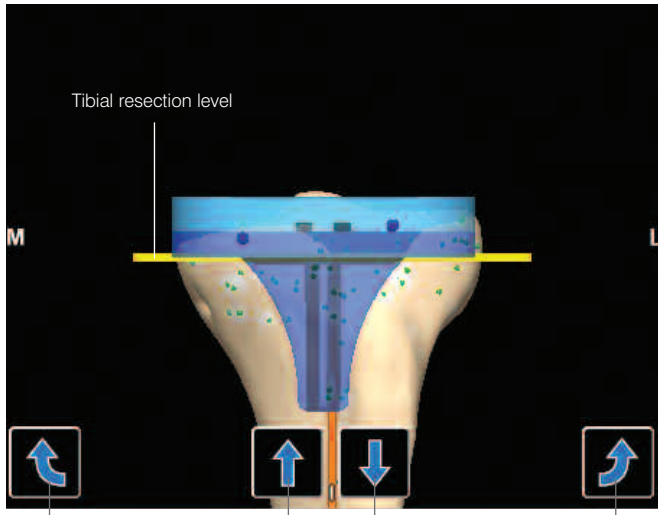


Figure 54

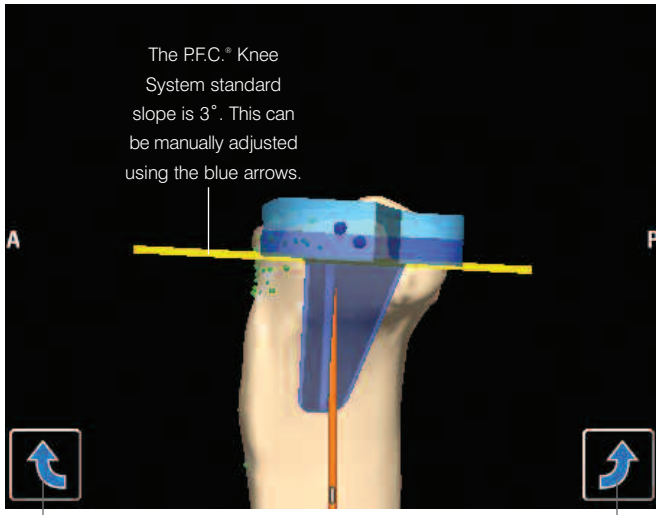


Figure 55

Initial planning and alignment of the implant position is automatically calculated during the registration procedure. The system will select the thinnest implant available based on the points acquired.

Fine tune functions allow the user to reposition the implant as required. Tibial slope, varus / valgus and resection level can be adjusted on screen at this stage (Figures 53, 54 & 55).

Button Functions

Blue arrows – allow repositioning of the tibial component.

Yellow line – tibial resection level.

The image can be enlarged on screen using the zoom function on the menu bar.

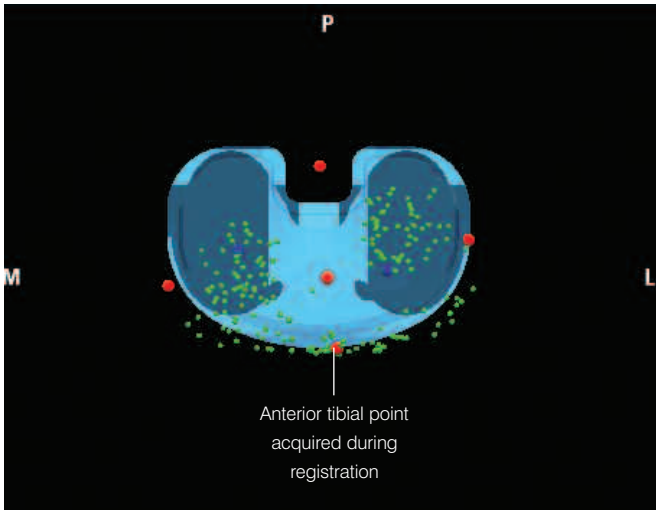


Figure 56

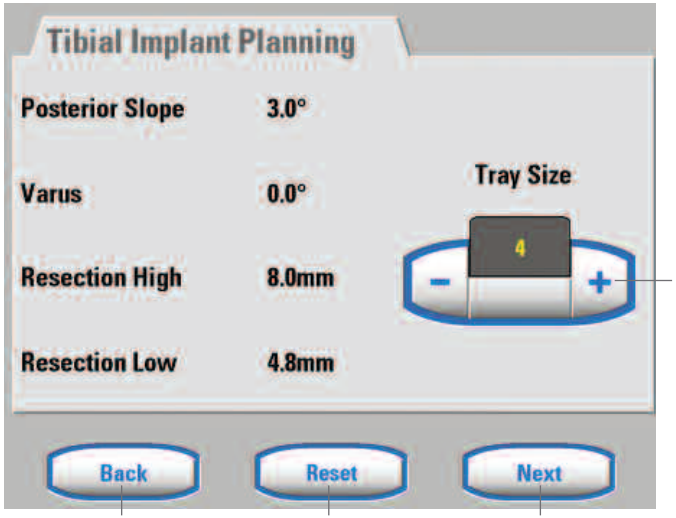


Figure 57

The A/P position of the implant is aligned to the tibial anterior point determined during registration (Figure 56).

The following information is displayed in the bottom right hand side of the screen (Figure 57):

Posterior slope – (in degrees).

Resection high - indicates the distance of the deepest point on the higher plateau from the resection level (in mm).

Resection low - indicates the distance of the deepest point on the lower plateau from the resection level (in mm).

Varus / valgus – (in degrees).

Tibial Resection

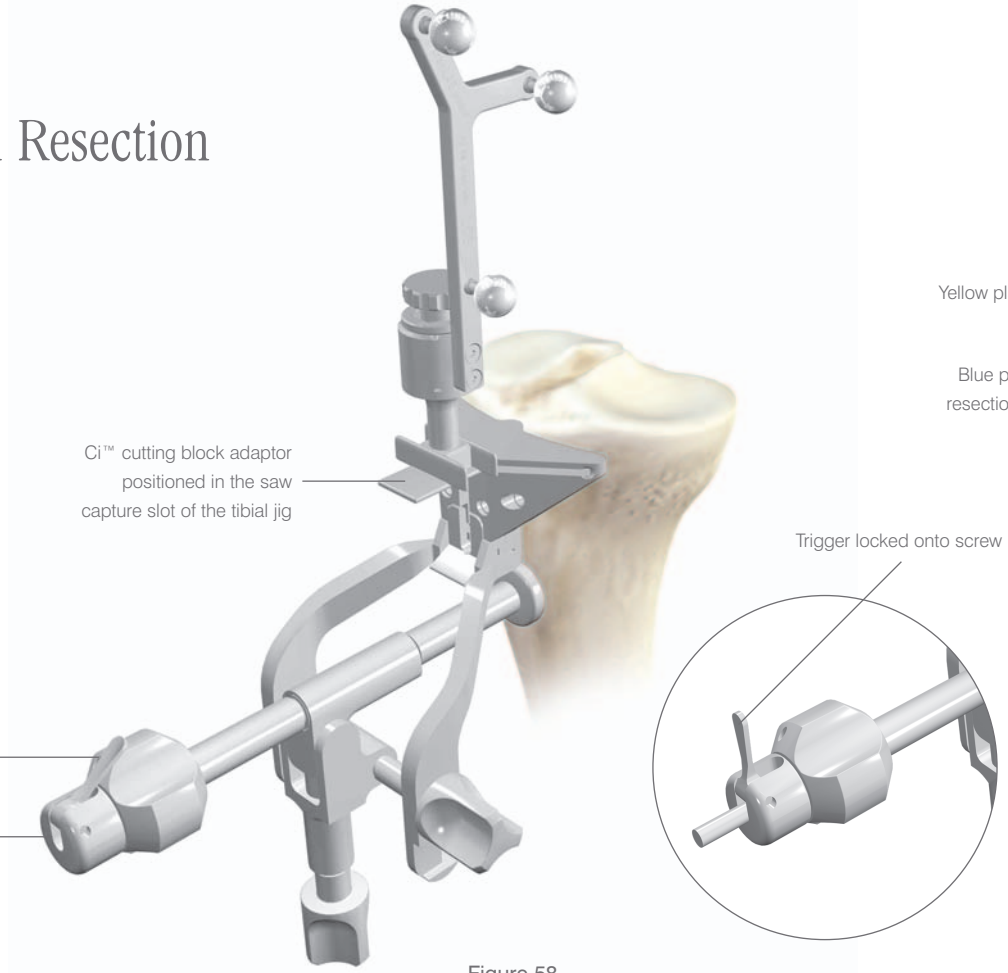


Figure 58

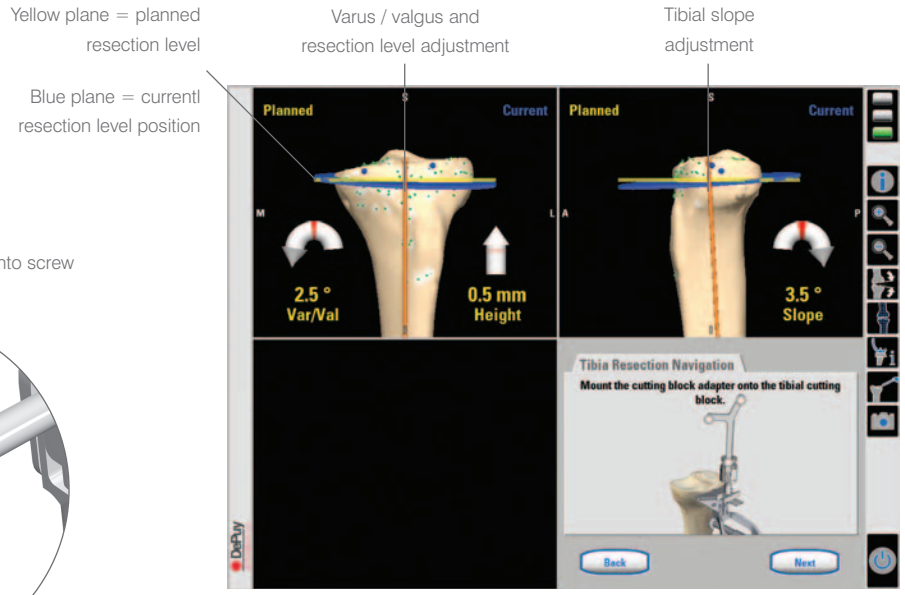


Figure 59

Before placing the Ci™ MI cutting jig on the tibia, its varus / valgus, A/P and proximal translation positions should be set as close to a mid-position as possible to allow for fine-tune adjustment in all directions. The grooves on the adjuster threads should be used as a reference for the mid-position.

The insertion plate on the navigated Ci™ cutting block adaptor is placed into the saw capture on the Ci™ MI cutting jig (Figure 58). The yellow plane represents the planned plane and the blue plane represents the current plane (Figure 59).

The screen data is used to guide the jig into an approximate position (in line with the mechanical axis of the tibia and close to the desired tibial resection level).

The jig is fixed in place on the tibia using a Schantz screw. The locking trigger is pulled forward to secure the jig to the screw.

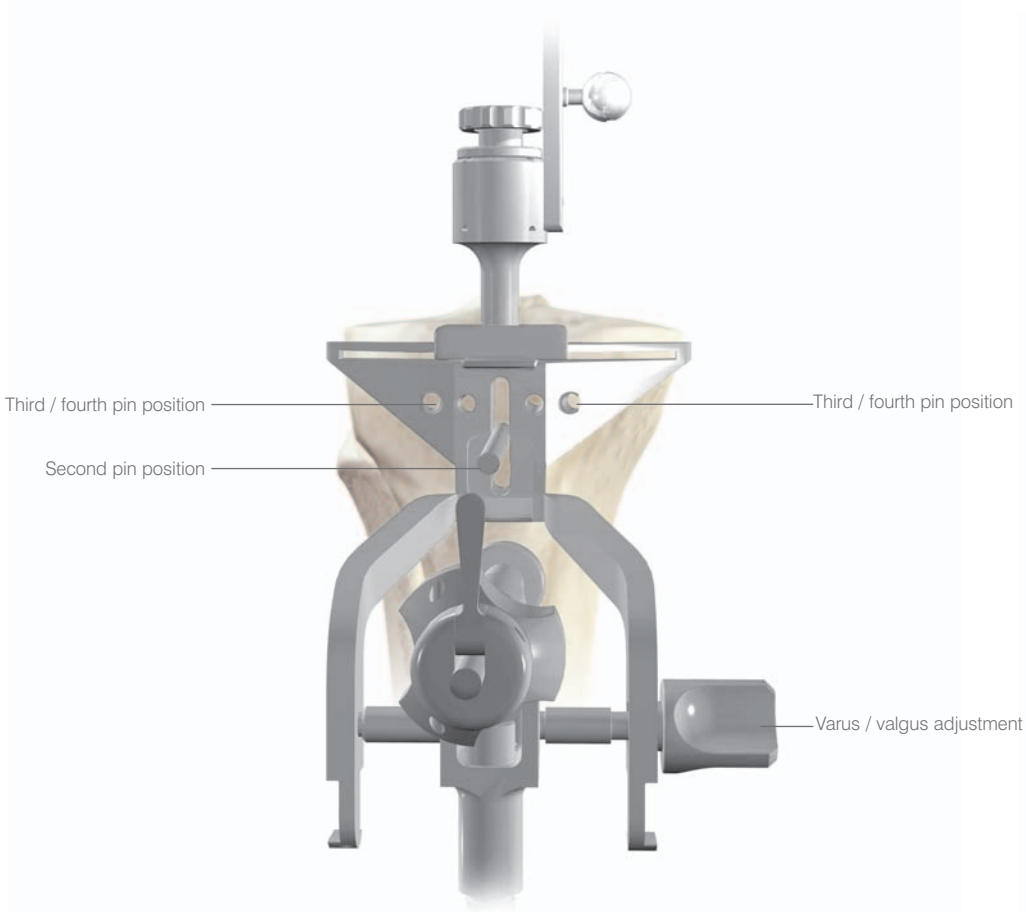


Figure 60

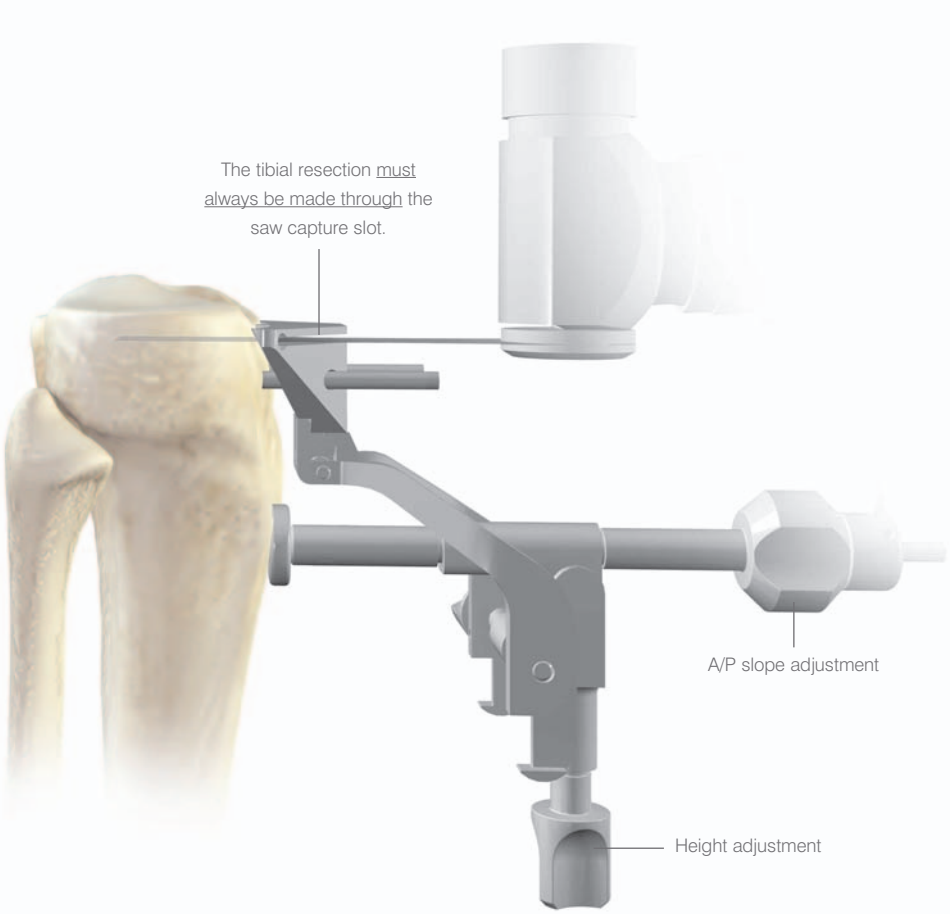


Figure 61

The varus / valgus alignment of the instrument should be checked and adjusted if necessary. When this is complete, a second pin is positioned in the middle of the slot to support the instrument in this position (Figure 60).

The tibial slope, varus / valgus and proximal translation adjustments can now be made using the three adjustment screws, with reference to the on screen data.

Once accurately positioned, the jig is secured using extra pins below the saw capture (Figure 61).

The navigated Ci™ cutting block adaptor is removed and the tibial resection completed with a 1.47 mm saw blade.

The tibial resection must always be made through the saw capture slot.

The leg is placed in approximately 10-15 degrees of flexion and the resected tibia is removed.

Tibial Resection Verification

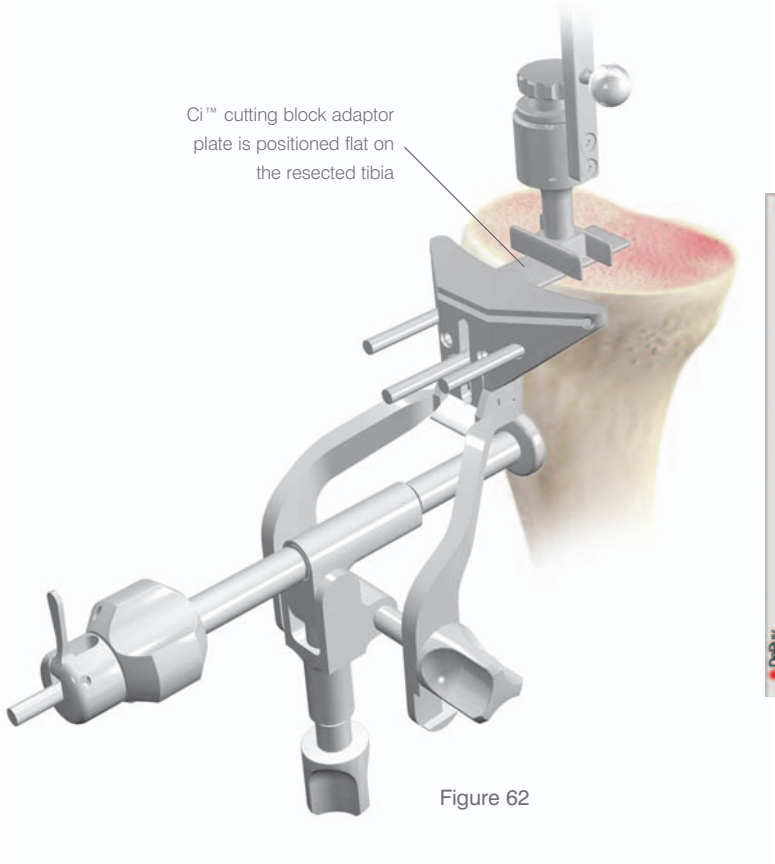


Figure 62

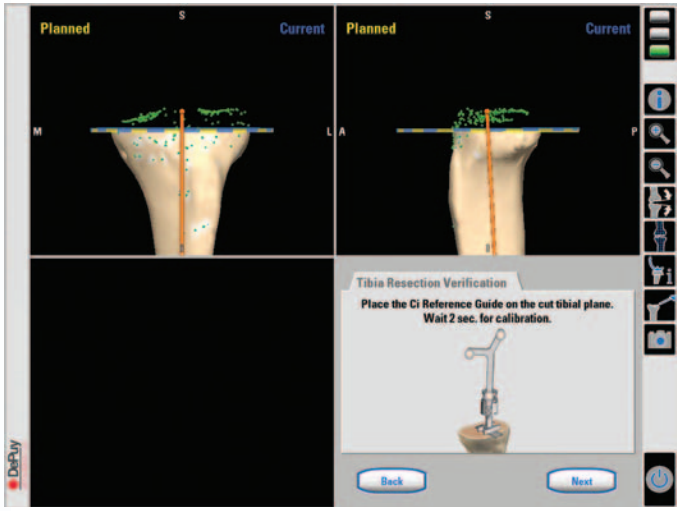


Figure 63

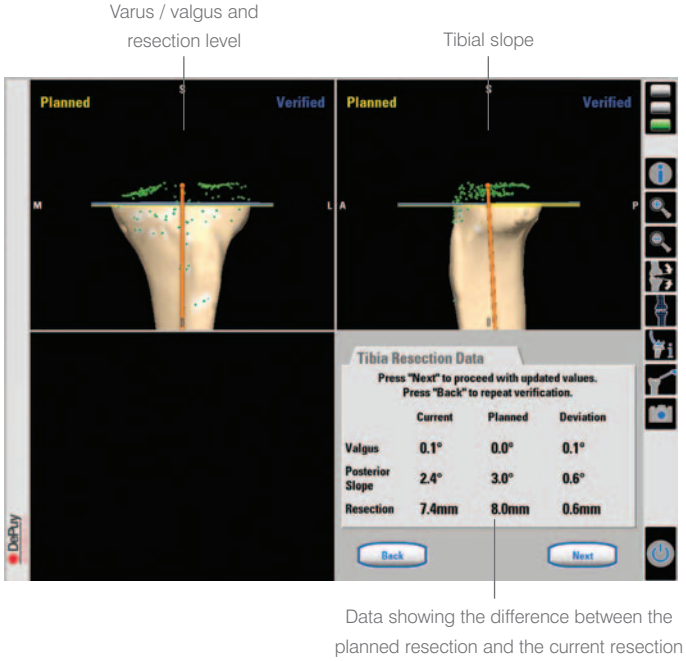


Figure 64

The insertion plate of the Ci™ cutting block adaptor is placed flat on the resected plane (Figure 62).

Any difference between planned and current resection planes can be seen on screen (Figure 63).

The yellow plane represents the planned plane and the blue plane represents the current plane.

The tibial resection numeric data is displayed by pressing ‘next’. The tibial resection can be repeated if necessary (Figure 64).

Registration of Epicondyles

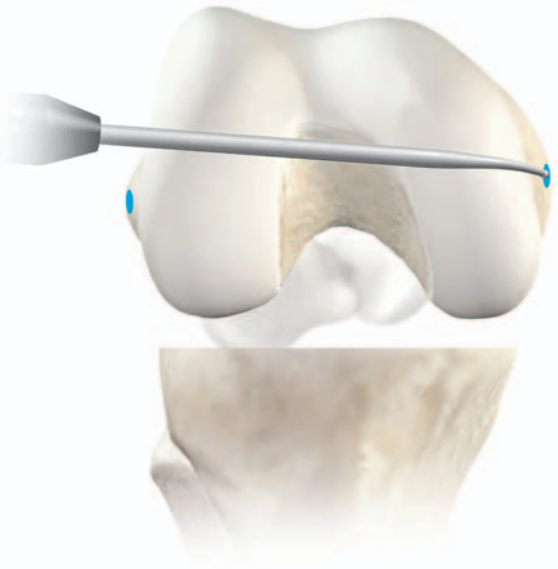
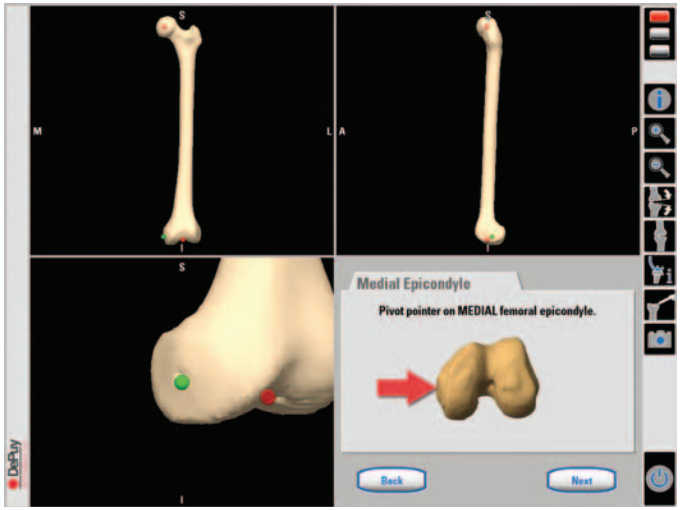


Figure 65



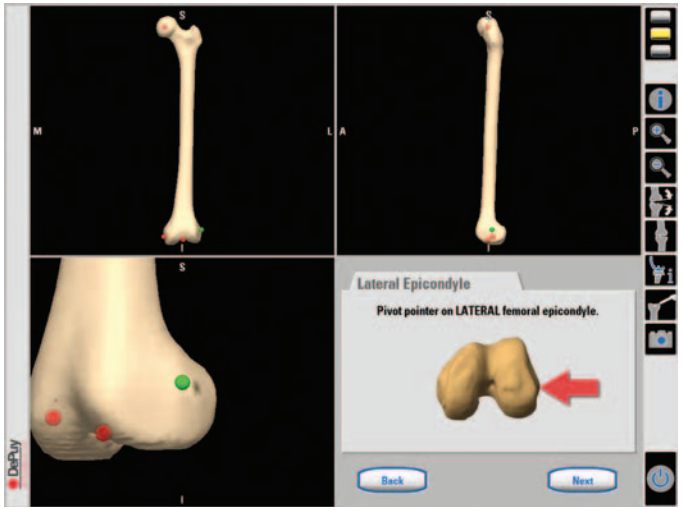


Figure 66

Registration of the femur begins once the tibial resection has been verified. Acquisition of the most medial and lateral epicondylar points are used to define the epicondylar axis (Figures 65 & 66).

Registration of the Anterior Cortex

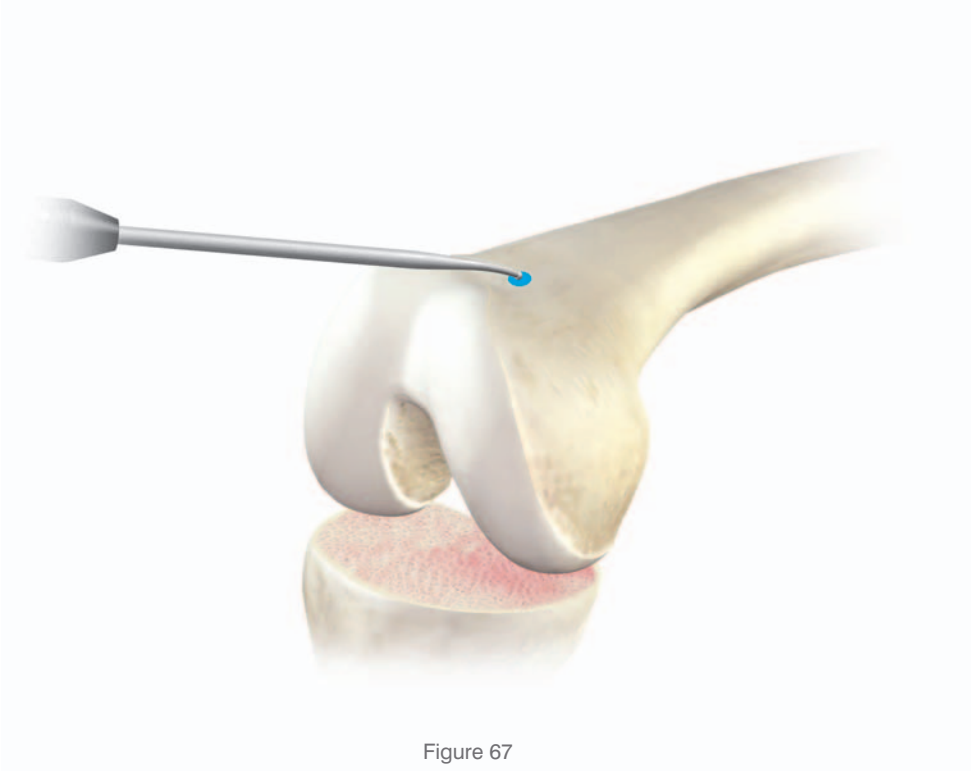


Figure 67

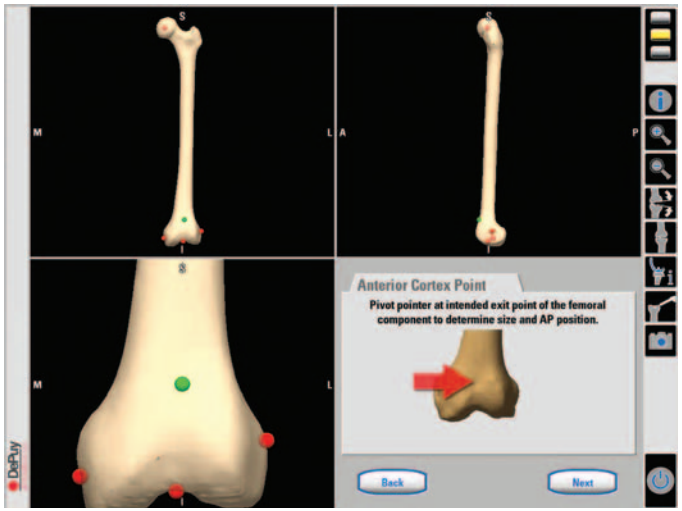


Figure 68

The anterior cortex is acquired using the Ci™ pointer. Ideally, the Ci™ pointer should be placed on a point on the anterior femoral cortex just above the superior border of the patello-femoral articular surface (Figure 67).

It should indicate the place where the anterior flange of the femoral component would sit if flush to the anterior cortex.

This will enable the system to determine the size of the femoral implant required (Figure 68).

It is important to acquire this accurately to avoid the intended cutting plane notching the femur.

Whiteside's Line

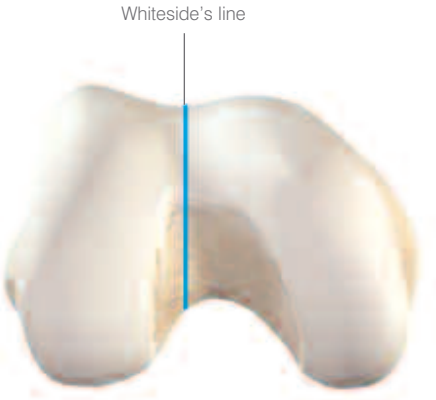


Figure 69

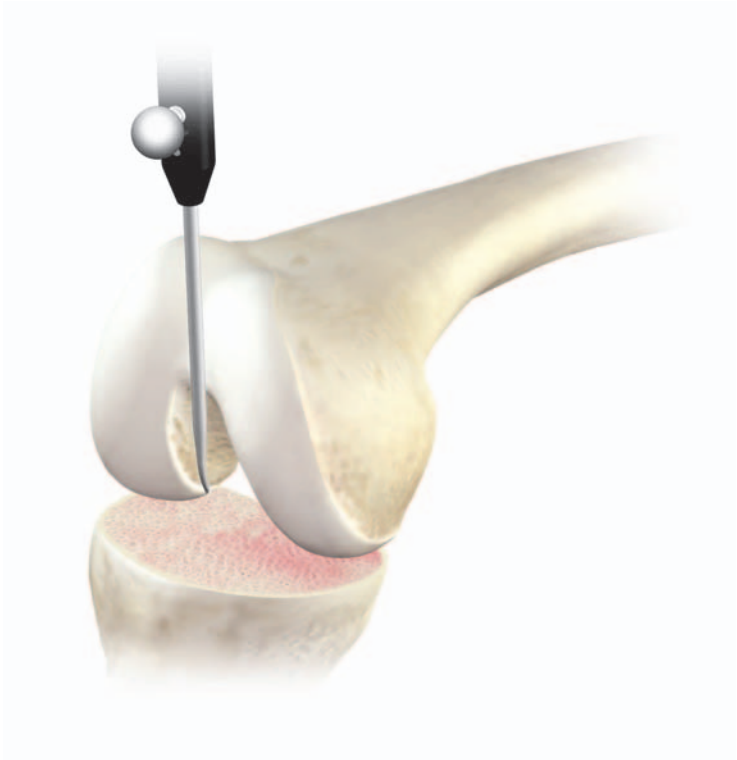


Figure 70

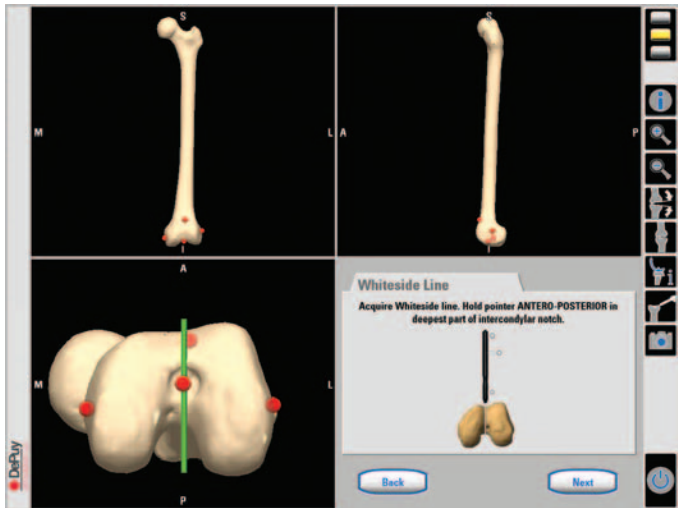


Figure 71

Whiteside's line is used as an optional reference for femoral component rotation alignment. It should be marked initially using electro-cautery. It is easiest to draw by looking along the horizon of the trochlear groove. Once the line is drawn the Ci™ pointer can be held along this line.

The Ci™ pointer must be held perfectly still while the system acquires this reference (Figures 69, 70 & 71). In the event of a system failure the marked line will be used as an alignment reference point for the back-up instrument set.

Femoral Condyle Modelling

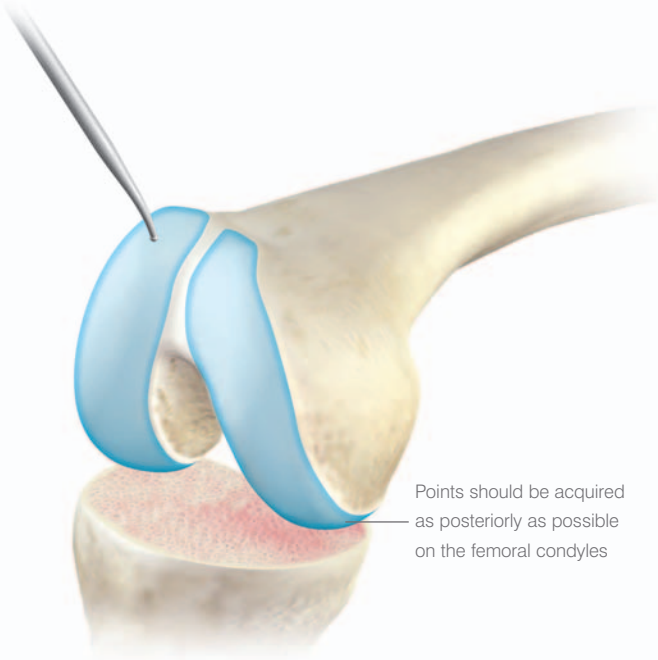


Figure 72

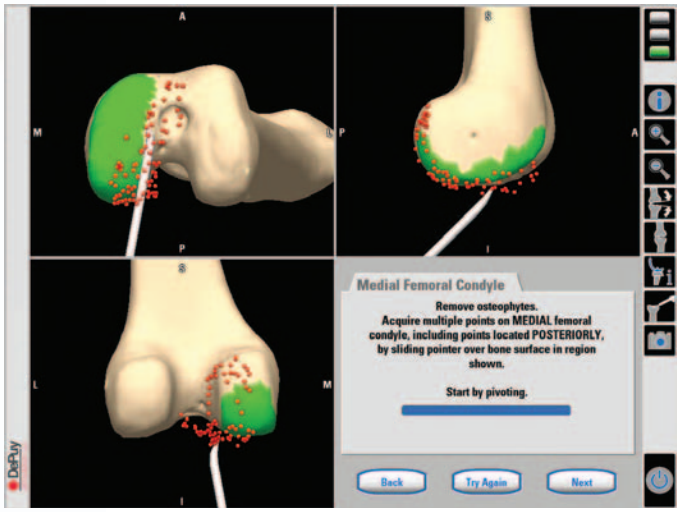
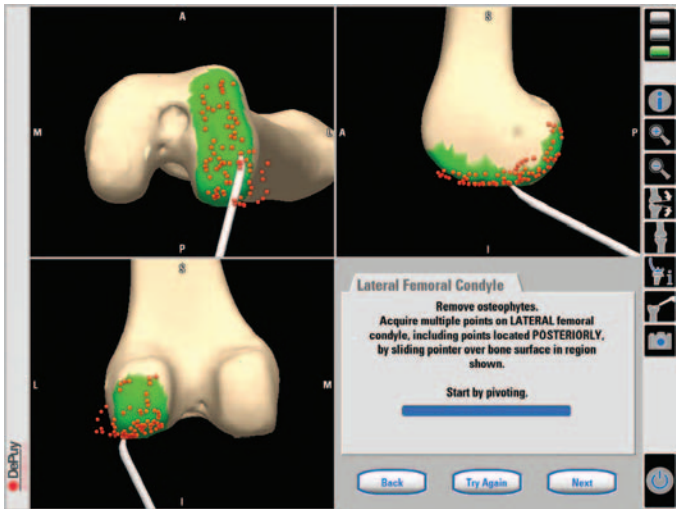


Figure 73



A fixed number of points along the surface of the medial and lateral condyles are acquired using the Ci™ pointer (Figures 72 & 73).

The tip of the Ci™ pointer should 'paint' the surface of the condyles. Points should be acquired as posteriorly as possible and along the distal part of the affected condyles. This allows the Ci™ System to accurately calculate both the size and distal resection level of the intended implant.

If insufficient posterior points are acquired the system will ask for the step to be repeated.

Anterior Cortex Modelling

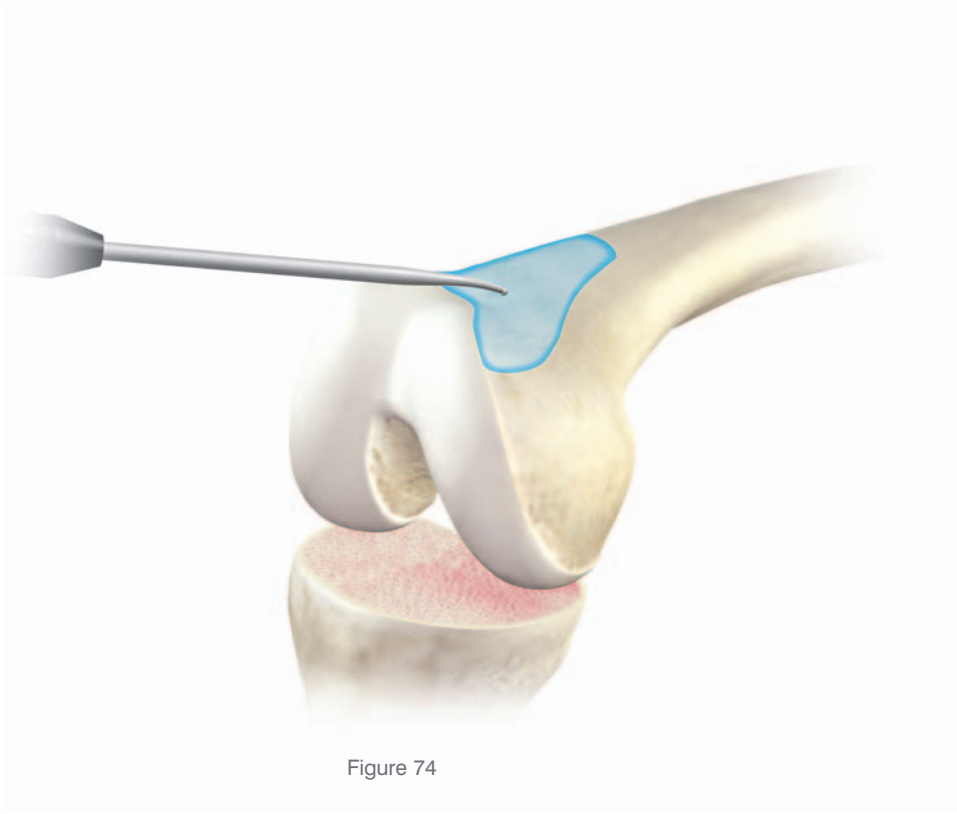


Figure 74

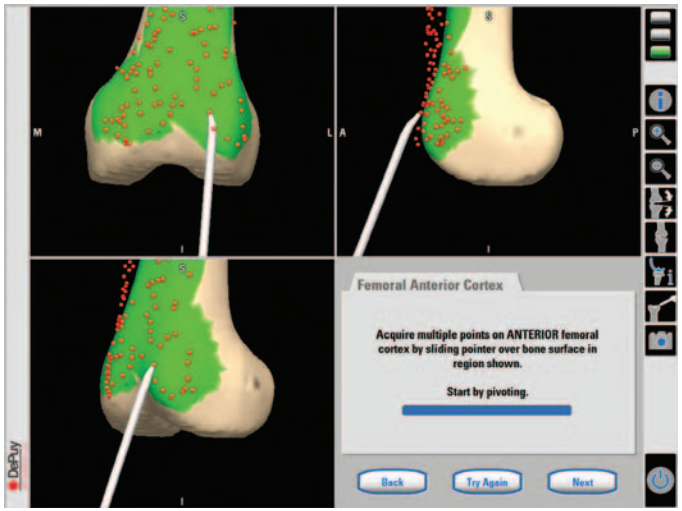


Figure 75

Multiple points along the anterior cortex are acquired using the Ci™ pointer. These points are used to define the surface and to help determine if the implant is likely to notch the femur (Figures 74 & 75).

Femoral Model Calculation and Verification

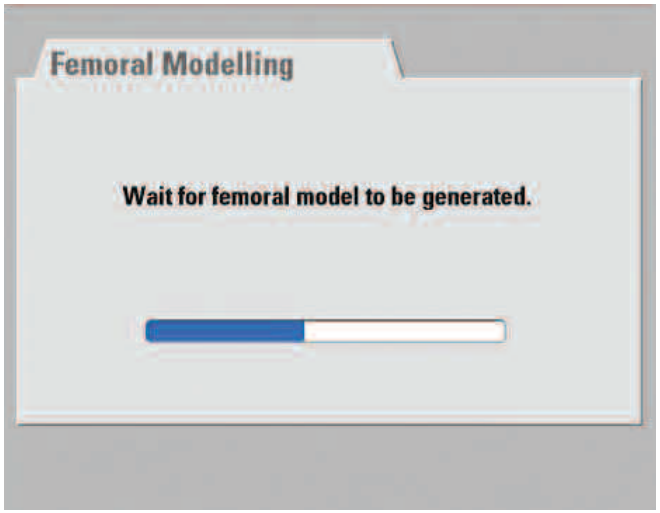
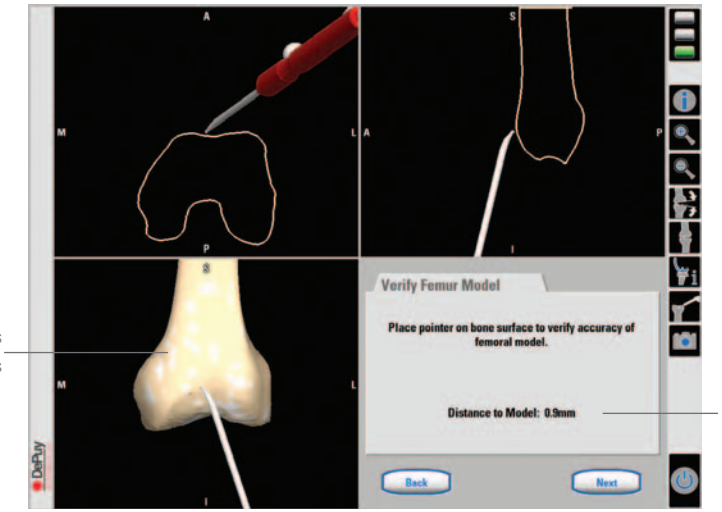


Figure 76



The white areas represent acquired points

The deviation from the tip of the Ci™ pointer to the bone is represented in mm

Figure 77

Following registration, the system adapts the femoral model (Figure 76).

- White areas are parts of the model with deviations no greater than 2 mm from the points acquired during registration.
- Brown areas are parts of the model where no points have been acquired.

The accuracy of the model is checked by holding the Ci™ pointer to the tibia. The exact deviation from the tip of the Ci™ pointer to the model is displayed on the screen. The maximum acceptable deviation is less than 1 mm. Acquired points will normally show a deviation of less than 1 mm Verification of the model will only be accurate in white areas where points have been acquired (Figure 77).

Note: Femoral implant sizing is based on acquired points only. The accuracy of the model should be checked on the areas responsible for implant sizing and position.

Definition of the Anatomic Axis (Femoral Bow)

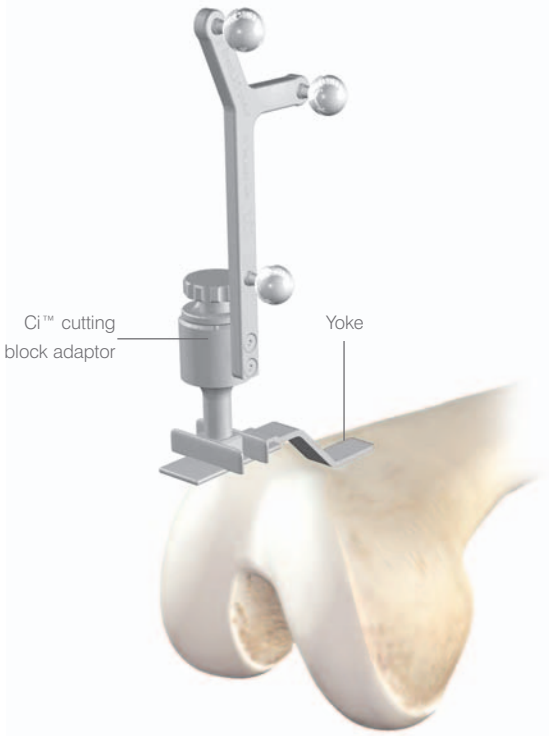
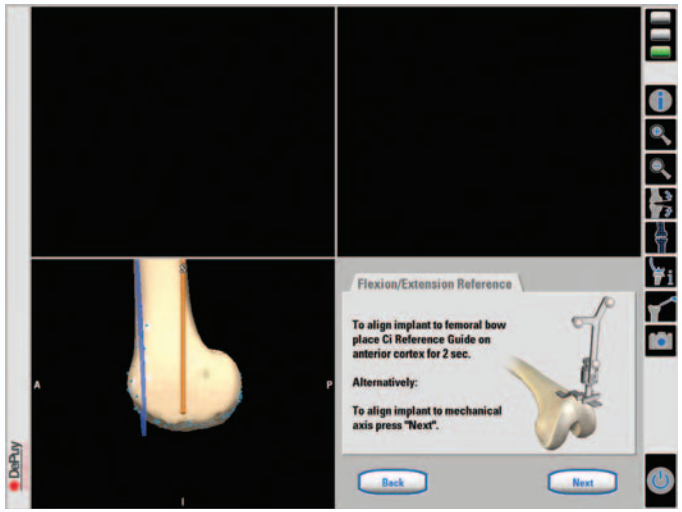
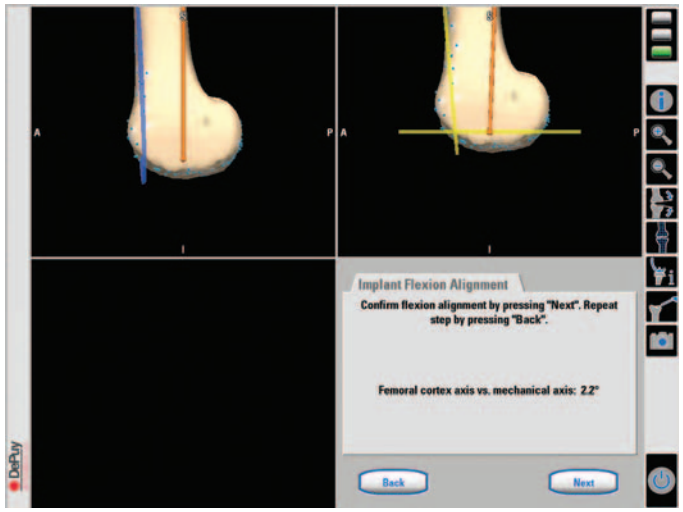


Figure 78



Anatomic axis (femoral bow) acquisition screen

Figure 79



Anatomic and mechanical axis positions

Figure 80

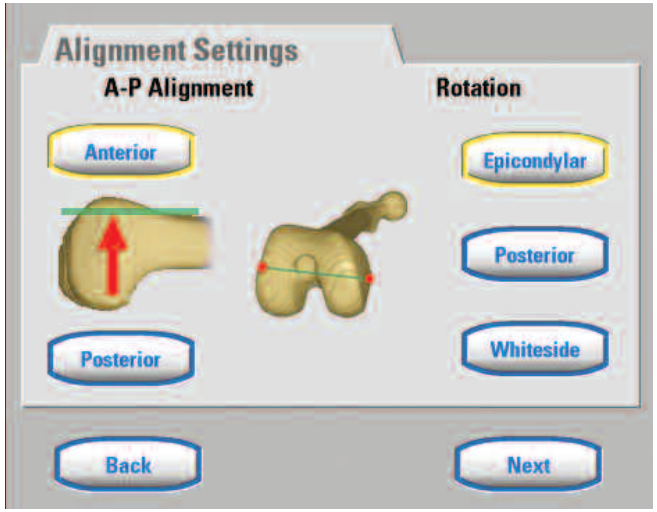
The flexion / extension and rotation position of the femoral implant can be positioned according to the anatomic or mechanical axis. If the mechanical axis is required, continue to the next step. If the anatomic axis is required the Ci™ cutting block adaptor is placed in the yoke on the anterior femur and held still for 2 - 3 seconds to register the anatomic axis (Figure 78).

A blue plane is displayed on the screen indicating the position of the Ci™ cutting block adaptor (Figure 79).

The software will display the angular difference between the mechanical and anatomic axes in the sagittal plane (Figure 80). The femoral component position will be rotated by the same angle to ensure accurate anterior alignment.

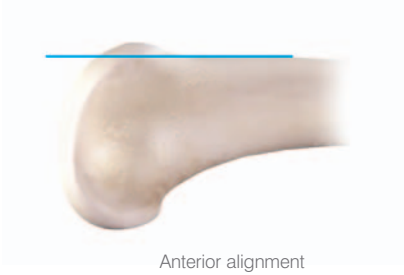
If a negative angle is recorded the implant will be positioned according to the mechanical axis to avoid femoral notching.

Alignment Settings (P.F.C.® Sigma™ Knee System Tibia First - Non-Optimised Workflow Only)

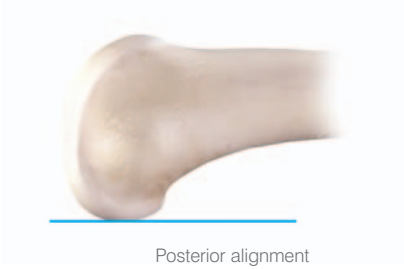


Implant alignment and rotation reference settings

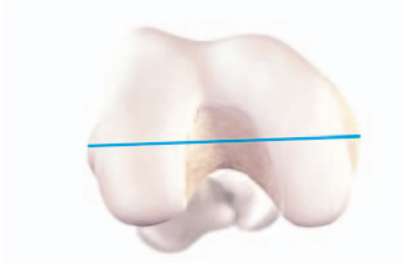
Figure 81



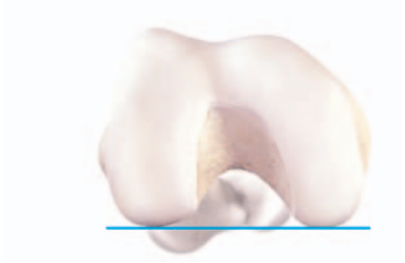
Anterior alignment



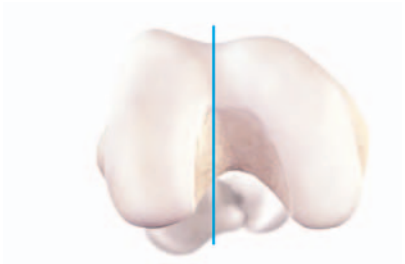
Posterior alignment



Epicondylar rotation reference



Posterior rotation reference



Whiteside's line rotation reference

Figure 82

If the tibia first workflow was selected at the start of the procedure, a choice of anterior or posterior alignment options are displayed for positioning the femoral implant. Rotation can be referenced to either the epicondylar line, posterior line, or Whiteside's line (Figures 81 & 82).

Ligament Balancing

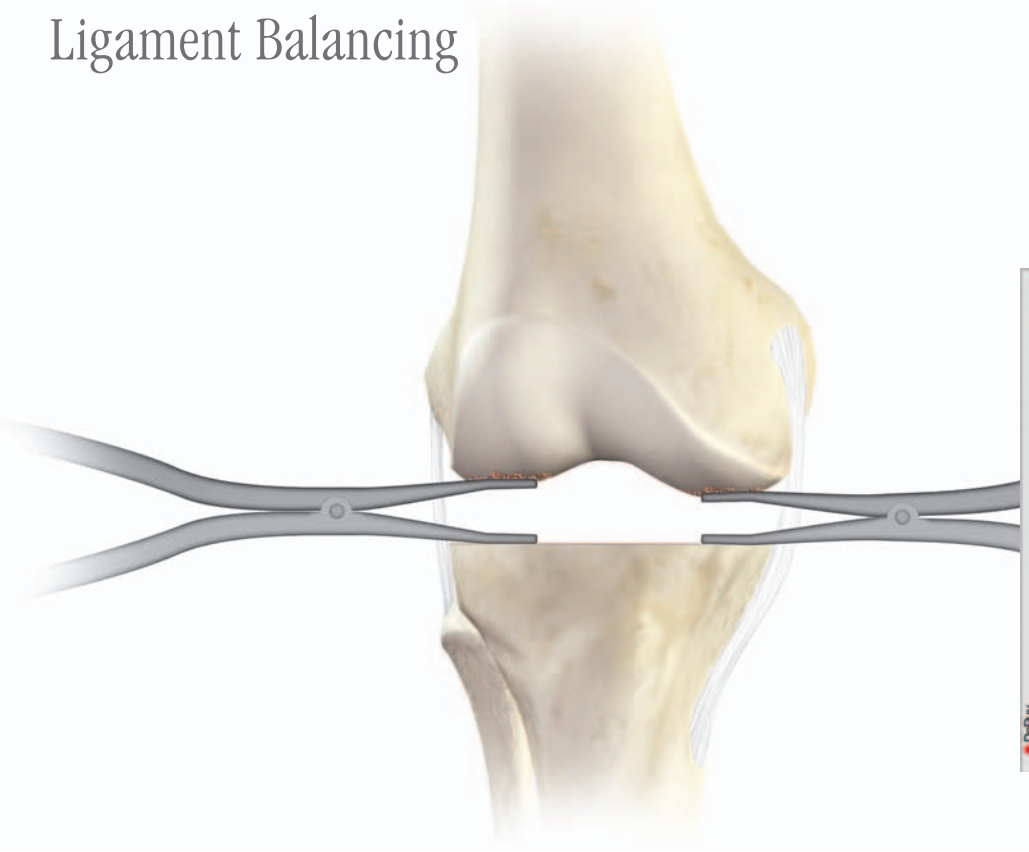
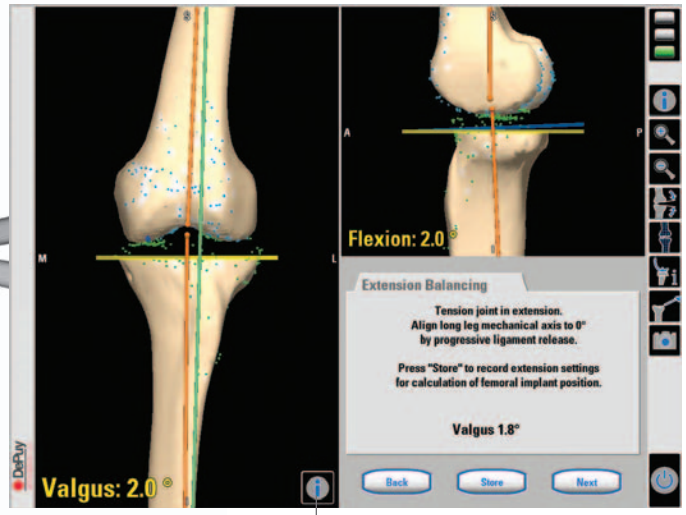
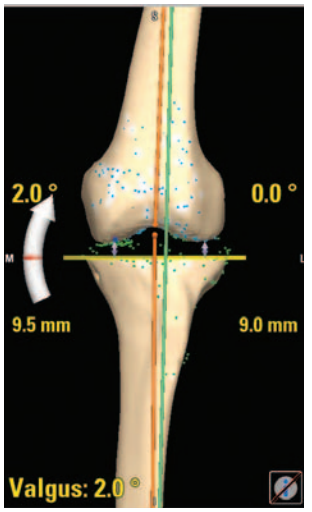


Figure 83

Ligament balancing in extension



Information button



Pressing the information button displays the gap information and additional angular values

Figure 84

Ligament balancing allows the ligament tension on the medial and lateral collateral ligaments to be assessed. A tensioning device such as laminar spreaders, knee tensioners or Moreland knee retractors should be used to balance the joint.

Ligament balancing in extension

The leg is placed in extension and distracted. Varus and valgus stresses are applied to the knee joint. The laminar spreaders can be used to achieve this (Figure 83).

The Ci™ System displays the varus / valgus and flexion angle. Pressing the information button will display the gap information and additional angular values.

The values for the extension gap, varus / valgus angle and flexion angle are stored on the system by pressing the 'store' button and are used as the basis for femoral planning (Figure 84).

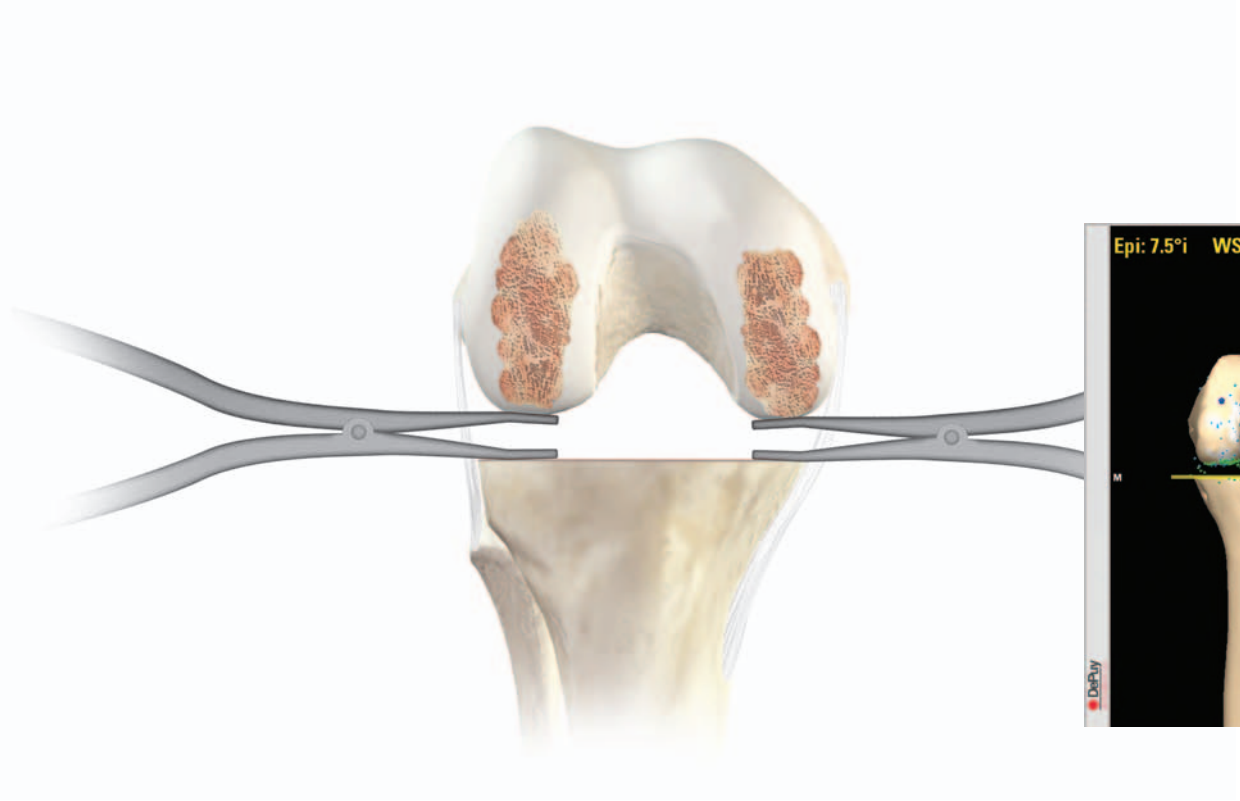
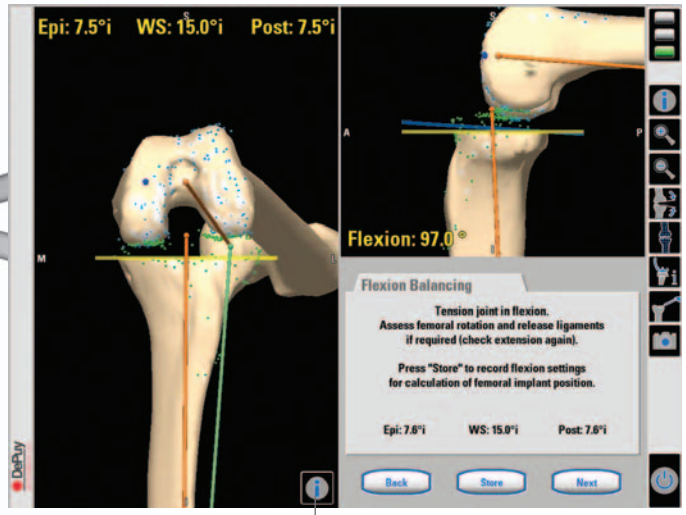


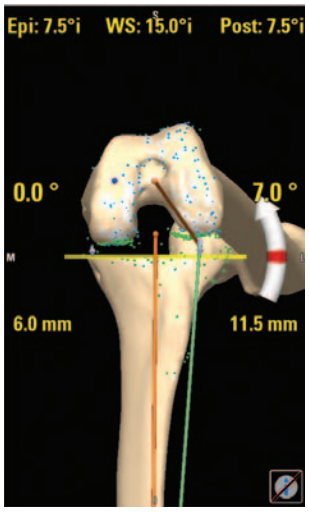
Figure 85

Ligament balancing in flexion



Information button

Figure 86



Pressing the information button displays the gap information and additional angular values

Ligament balancing in flexion

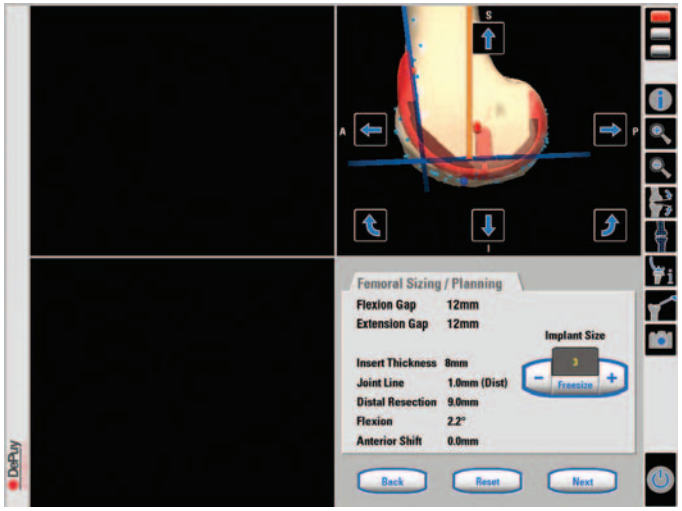
The leg is placed in flexion. Independent but equal pressure is applied to the medial and lateral compartments of the knee (Figure 85).

Pressing the information button will display the gap information and additional angular values.

The values for the flexion gap, varus / valgus angle and flexion angle are stored on the system by pressing the ‘store’ button (Figure 86).

In the optimised workflow this data will be used to rotate the implant with respect to the proximal tibial resection in order to achieve a parallel gap space in flexion.

Femoral Implant Planning



First femoral implant planning screen

Figure 87

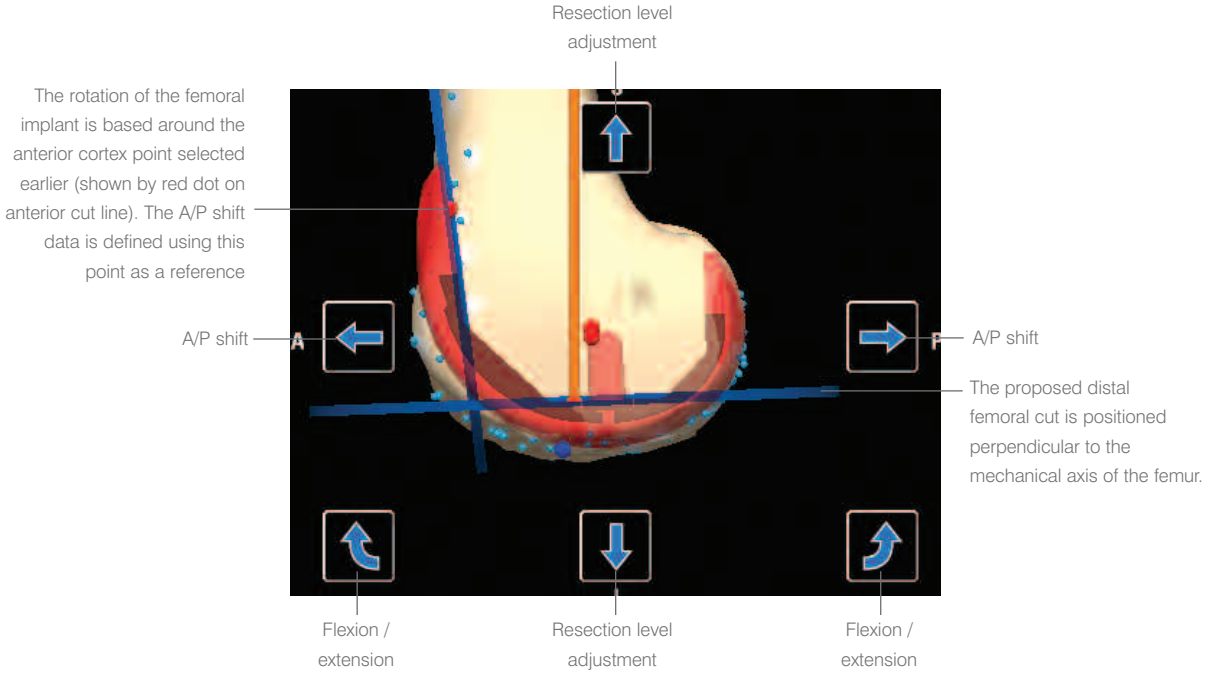


Figure 88

The data gathered during the registration and verification procedures is used to calculate the femoral implant size, position and resection levels. If the optimised workflow was selected, the system will size and position the femoral component in order to achieve equal and parallel flexion / extension gaps. If the tibia first workflow was selected the flexion / extension position may need to be manually adjusted. The gap values will only be available if they where stored during ligament balancing. Any recommendations made by the system should be thoroughly checked and adjusted as necessary.

Button functions and screen information:

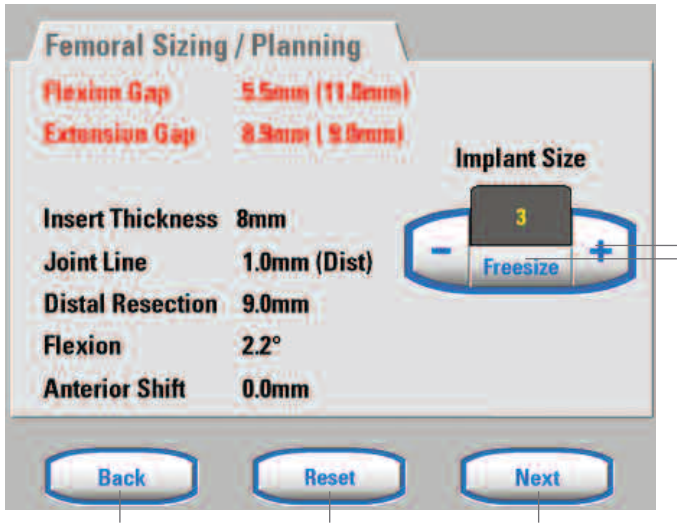
Blue arrows – allow repositioning of the femoral component.

Dark blue lines – proposed cutting planes of the femur.

Orange line - mechanical axis line.

The points acquired during registration provide the true reference for each of the fine tune functions. The 3D model only provides additional information and 3D orientation (Figure 87). The following adjustments to the plan can be made at this stage: flexion / extension, resection level and A/P shift (Figure 88).

Planning information



The implant size / freesize function is used to change the size of the femoral component.

Resets all adjustments

Returns to the previous step

Accepts all adjustments

Figure 89

Freesize warning screen

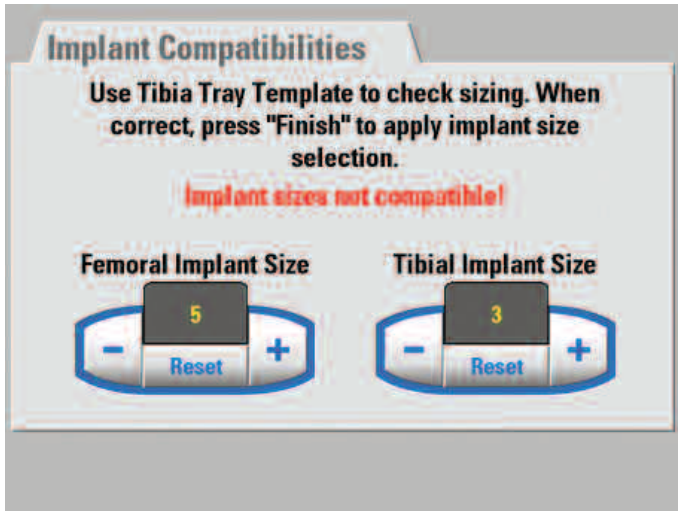
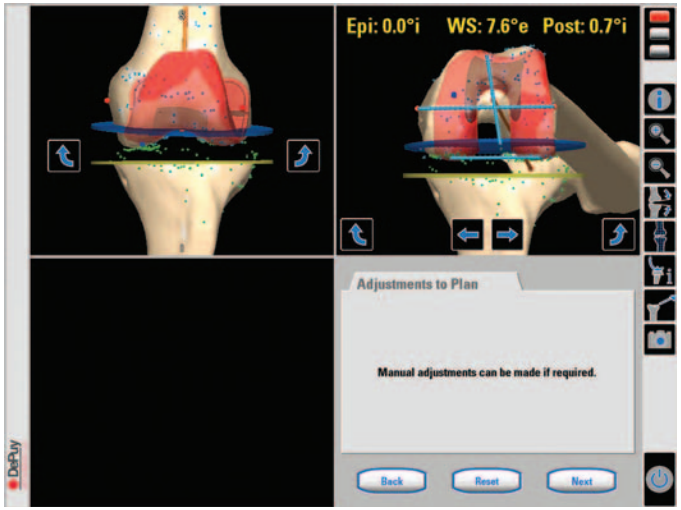


Figure 90

If the extension / flexion gap is too small for the thinnest available insert, the measurement(s) will be displayed in red. The minimum amount of extra bone resection will be displayed in millimetres (Figure 89).

The '+' and '–' buttons are used to change the femoral implant size. The 'freesize' option can be used to manually change both the tibial and femoral implant size. However, if inappropriate implants are selected, the system will display a warning message relating to implant compatibility.

The 'proceed' option will be removed at this stage to force the user to select compatible implants (Figure 90).



Second femoral implant planning screen

Figure 91

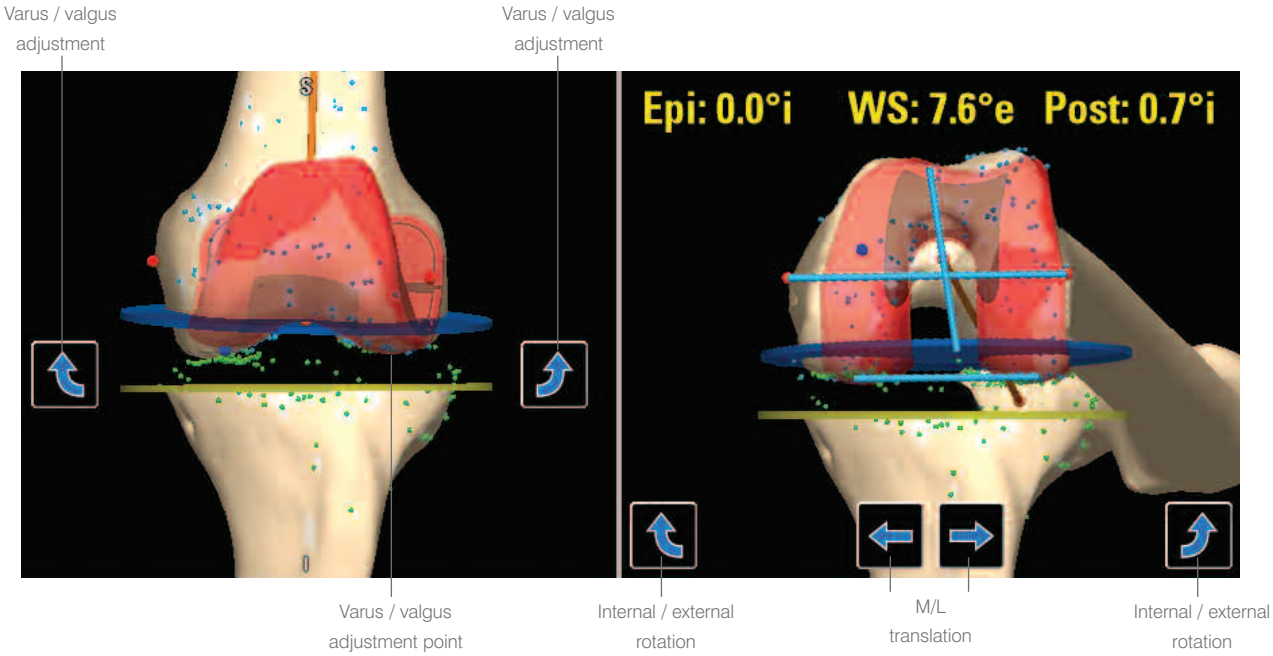


Figure 92

The second femoral planning screen allows any of the following adjustments to the femoral component to be made if required: M/L position, varus / valgus and internal / external rotation (Figure 91).

The M/L position can be adjusted on screen with the blue arrows (a neutral position is recommended by the system – central to the mechanical axis).

Varus / valgus can be adjusted with the blue arrows. Rotational adjustment is made around the most distal point on the condyle (indicated by a blue dot).

The internal / external rotation value is set in relation to the chosen alignment (epicondylar / posterior / Whiteside's line). Deviation from other rotational references are displayed on screen (Figure 92).

Distal Femoral Resection Navigation

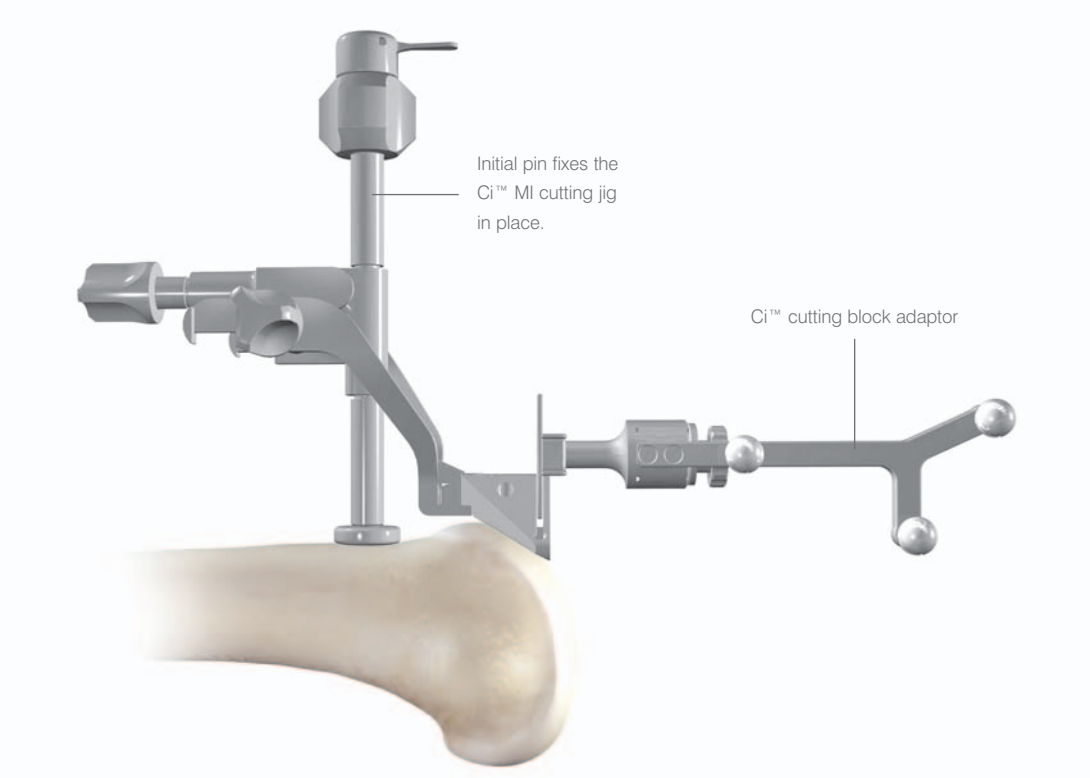


Figure 93

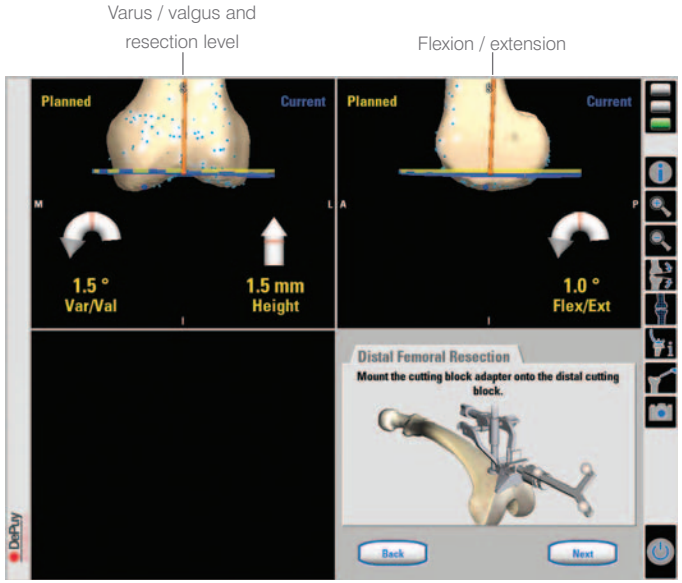


Figure 94

The Ci™ MI cutting jig is rotated 180° and positioned on the femur. The varus / valgus, flexion / extension and internal / external rotation positions should be set as close to neutral as possible. The grooves on the adjuster threads should be used as a reference for the mid-position.

The Ci™ cutting block adaptor is placed in the saw capture slot of the cutting jig and the assembly is approximately navigated into position on the femur using the on-screen data (Figures 93 & 94).
An initial pin is introduced to fix the jig and the lock is applied.

The varus / valgus alignment of the Ci™ MI cutting jig should be checked and adjusted if necessary.

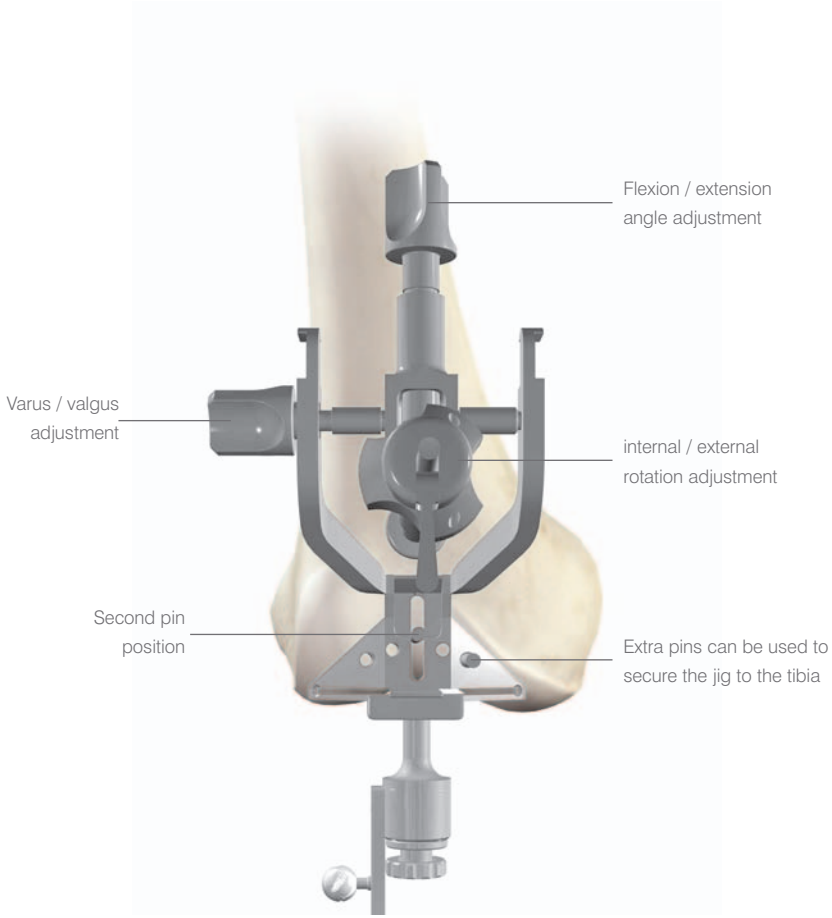


Figure 95

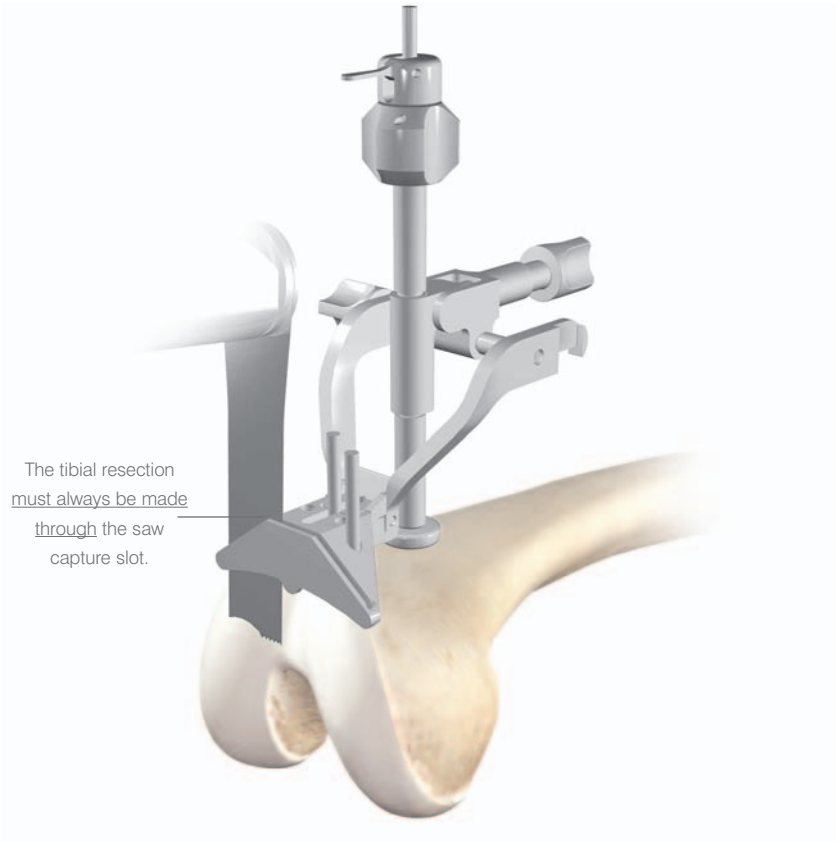


Figure 96

With the Ci™ MI cutting jig in the correct position, a second pin is placed in the middle of the slot to support the instrument.

Final fine tuning of varus / valgus, flexion / extension and distal femoral resection level can be carried out using the three adjustment screws (Figure 95). The Ci™ MI cutting jig is secured using additional pins in to the saw capture block.

The navigated Ci™ cutting block adaptor is removed and the distal femoral resection completed with the knee in extension using a 1.47 mm saw blade (Figure 96).

The distal femoral resection must always be made through the saw capture slot.

Distal Femoral Resection Verification

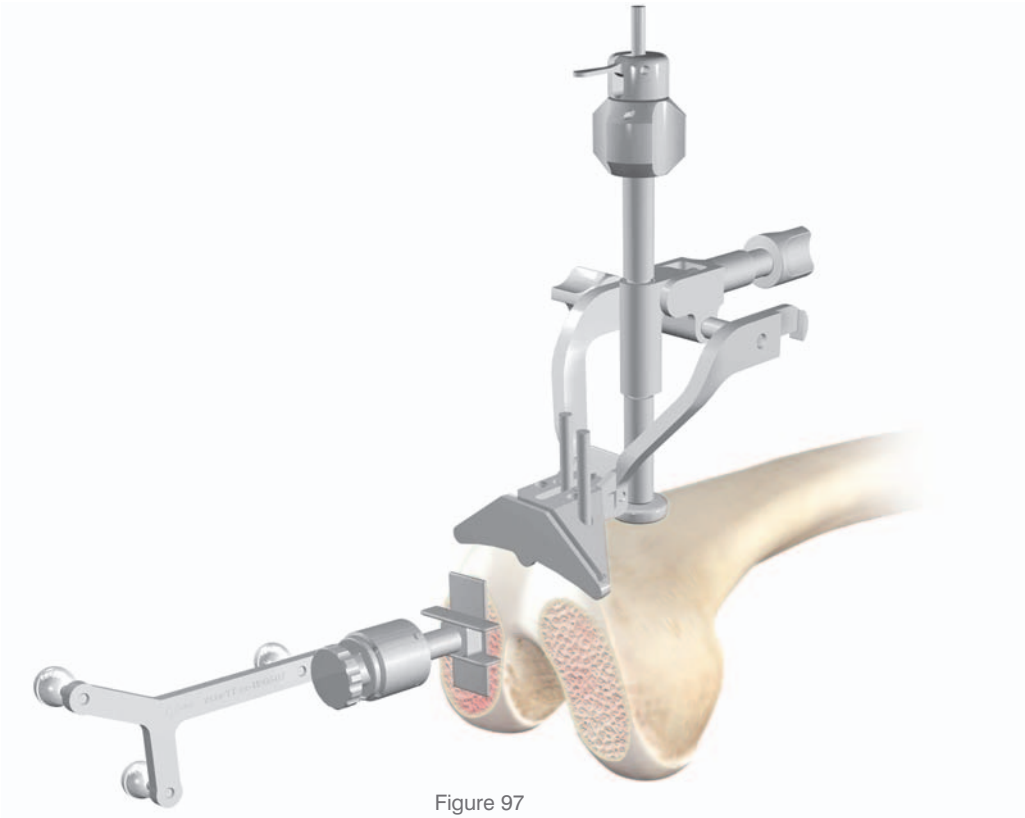


Figure 97

The insertion plate of the Ci™ cutting block adaptor is placed flat on the resected plane (Figure 97).

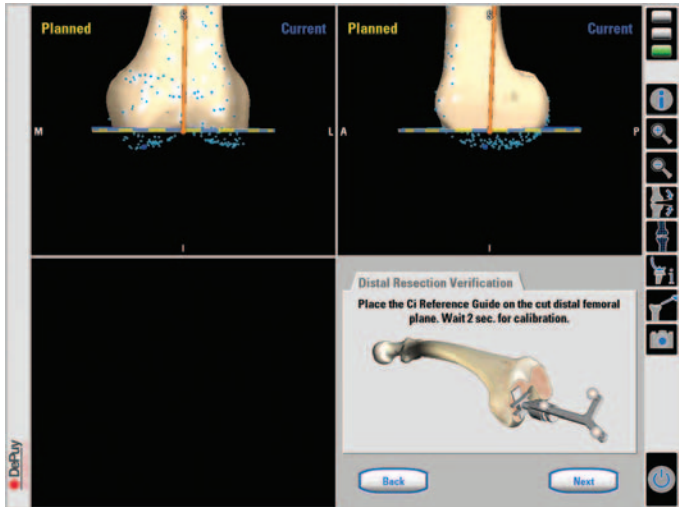
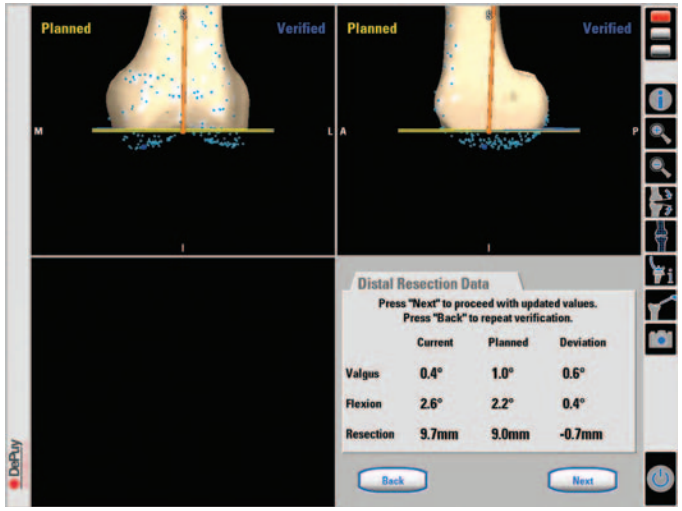


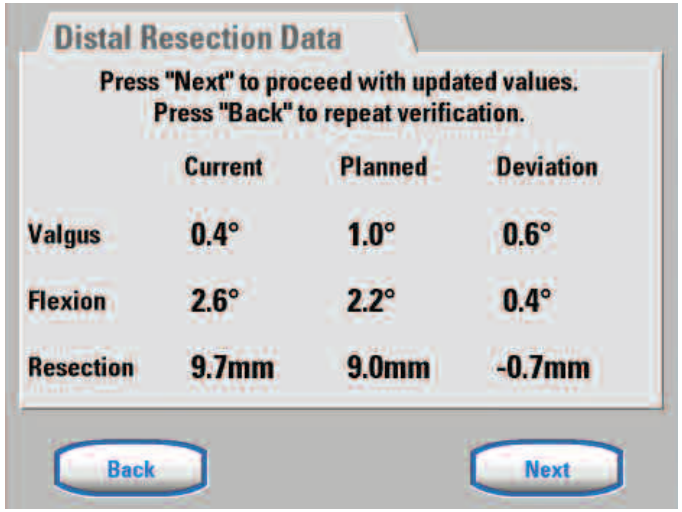
Figure 98

Any difference between the planned and current resection planes can be seen on screen (Figure 98).



Distal femoral resection verification screen

Figure 99



Data showing the difference between the planned resection and the current resection

Figure 100

The yellow plane represents the planned cut.

The blue plane represents the current cut.

The resection numeric data is displayed by pressing ‘next’ (Figures 99 & 100).

The resection can be repeated if necessary.

Anterior Femoral Resection Navigation

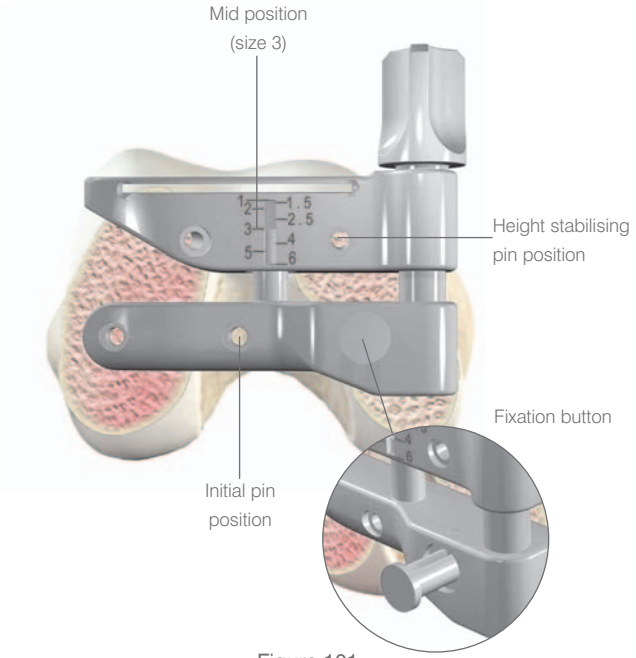


Figure 101

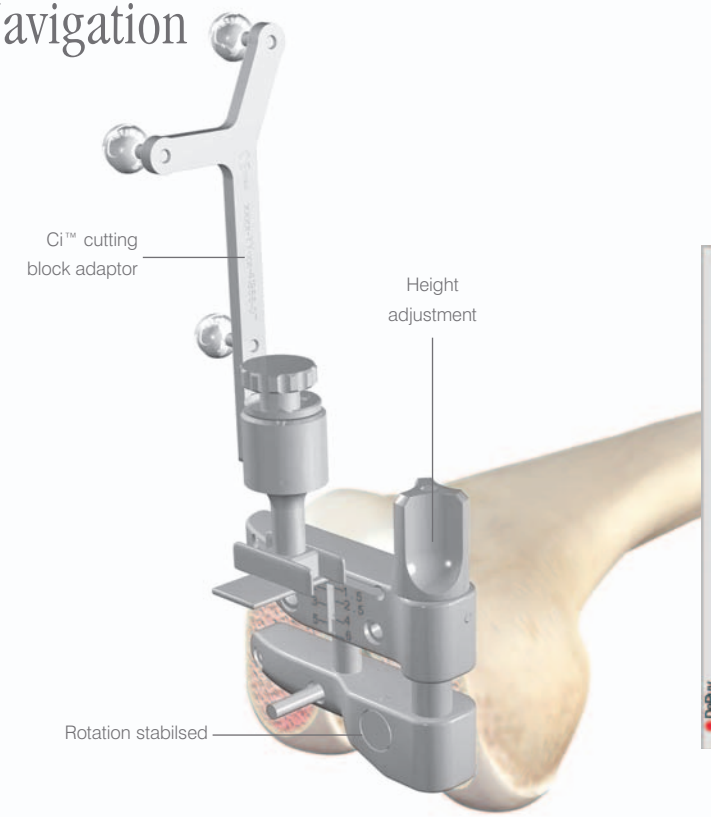


Figure 102

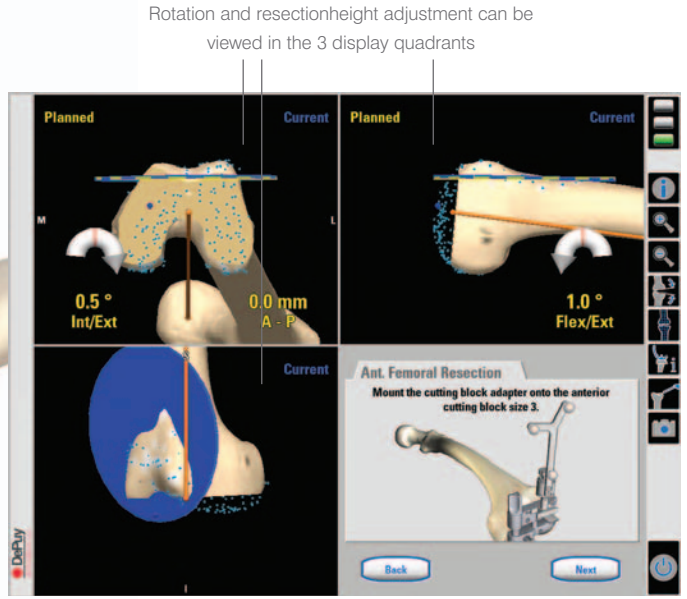


Figure 103

The appropriate side anterior resection cutting guide is selected (left or right) and positioned flush to the resected distal femur. The cutting guide should be set to the mid position (size 3), using the scale as a reference (Figure 101).

The Ci™ cutting block adaptor is placed into the slot on the cutting guide.
The screen data is used to approximately position the instrument in the correct place.

The initial pin is introduced to fix the cutting guide on the resected femur. Rotation is navigated using the on-screen data (Figure 103). When complete, the fixation button is pressed to secure the lower half of the jig (Figure 102).

The resection height is navigated using the adjustment screw and the cutting guide is fixed in place with a final pin (Figures 102 & 103).

Anterior Femoral Resection Verification

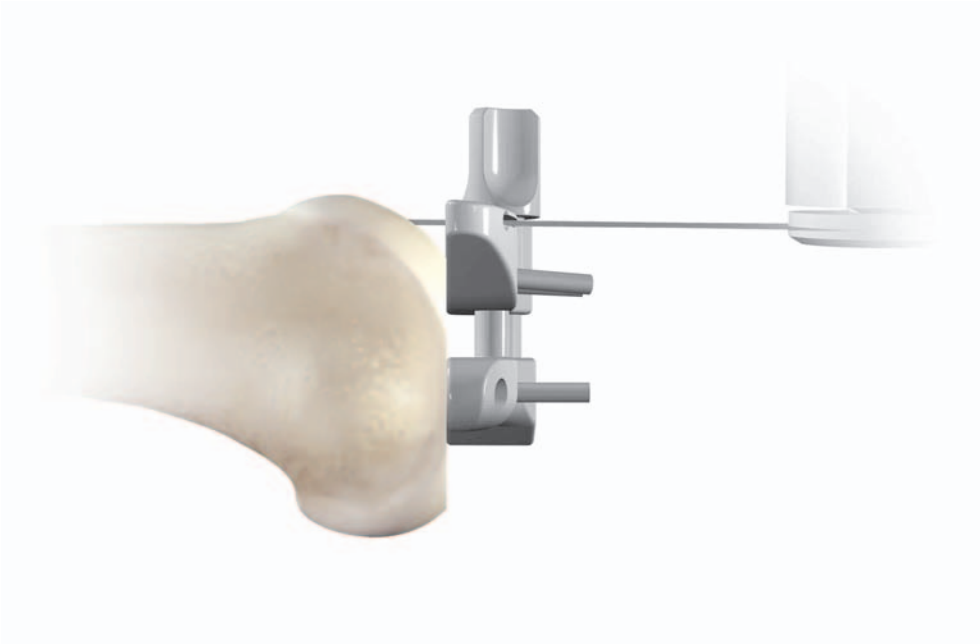


Figure 104

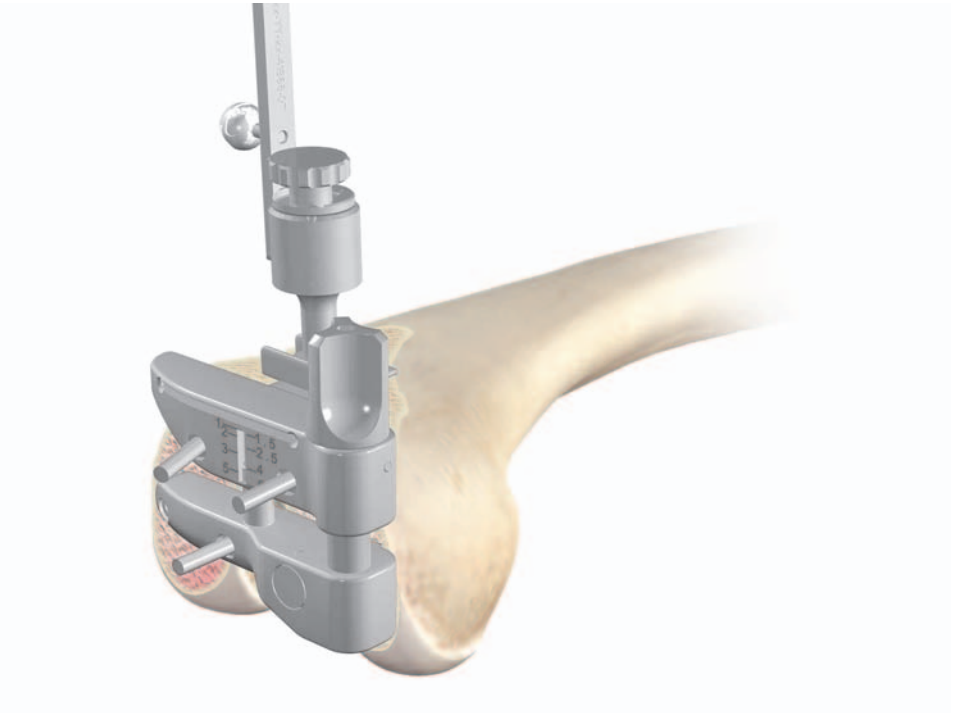
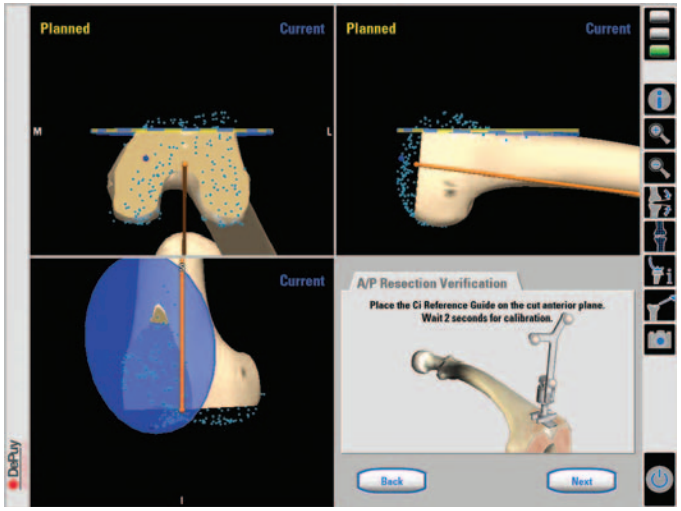


Figure 105

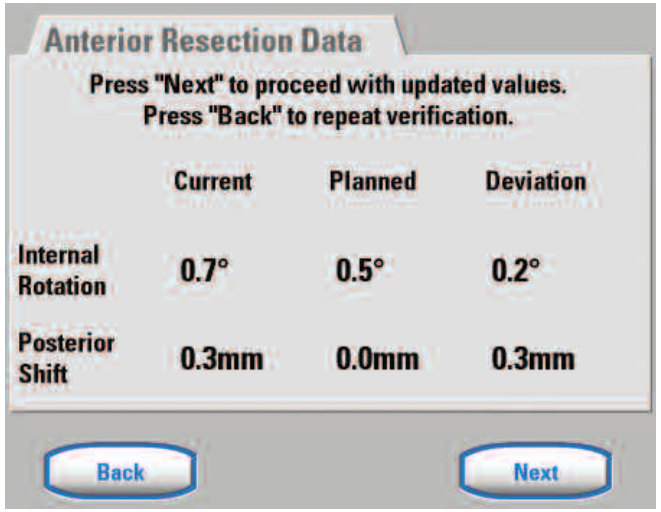
The anterior femoral resection is completed using an oscillating saw with a 1.47 mm blade (Figure 104).

The insertion plate of the Ci™ cutting block adaptor is placed flat on the resected surface (Figure 105).



Anterior femoral resection verification screen

Figure 106



Data showing the difference between the planned resection and the current resection

Figure 107

Any difference between the planned and current resection planes can be seen on screen (Figure 106).

The yellow plane represents the planned cut.

The blue plane represents the current cut.

The resection numeric data is displayed by pressing ‘next’ (Figure 107).

The resection can be repeated if necessary.

Final Femoral Preparation

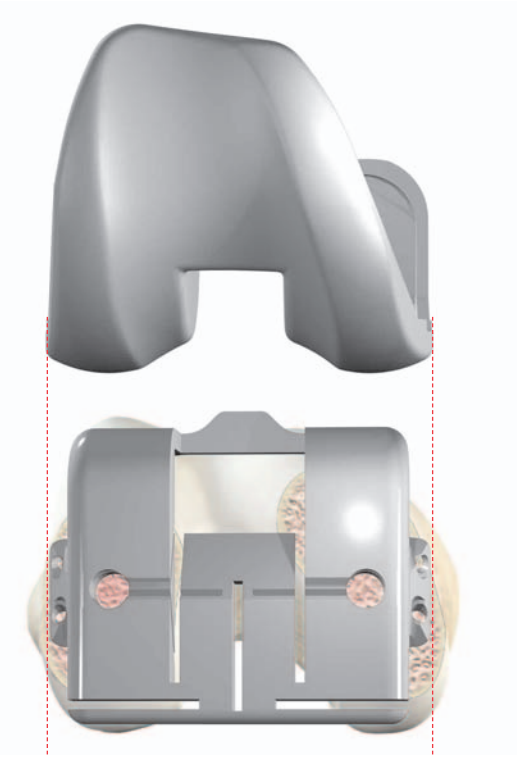


Figure 108

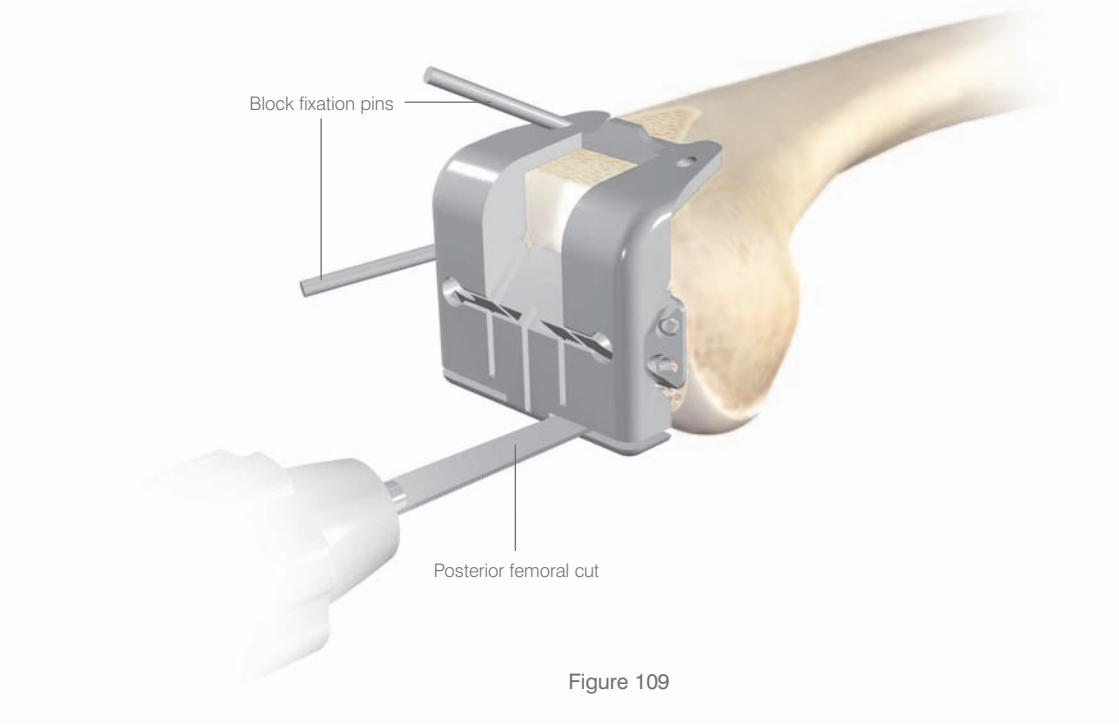


Figure 109

The appropriate sized finishing block is selected and positioned on the resected anterior and distal surfaces of the femur.

The fixation lugs on each side of the block correspond exactly to the M/L dimension of the final implant and are used to visually place the instrument in the correct M/L position (Figure 108).

The block is pinned in place through the fixation lugs before any bone cuts are made.

Final resections are made using a 1.47 mm saw blade in the following order: Posterior femoral (Figure 109), chamfer cuts, box cut / peg holes.

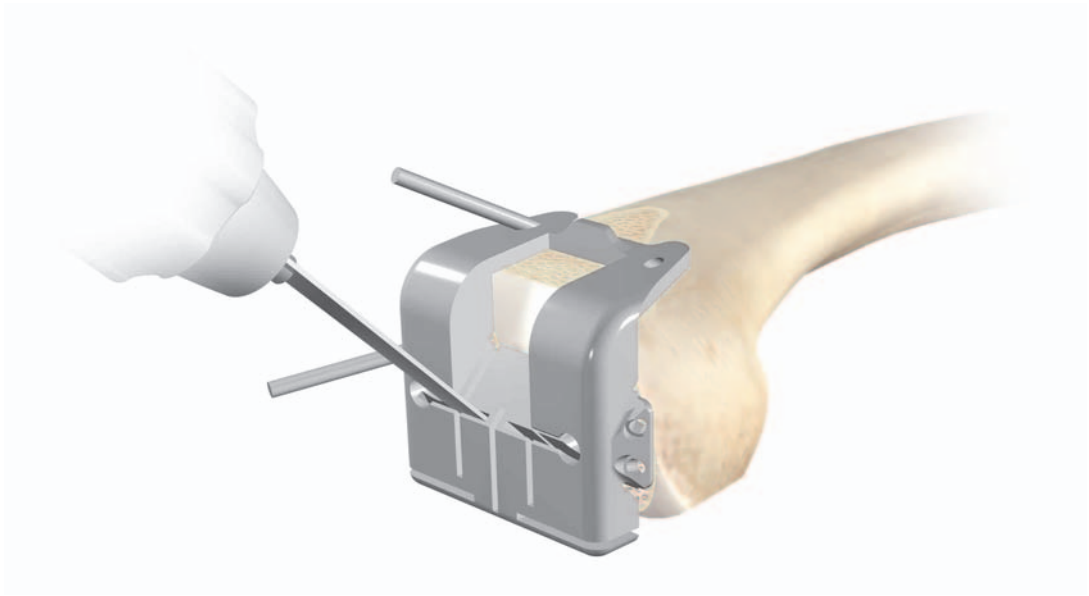


Figure 110

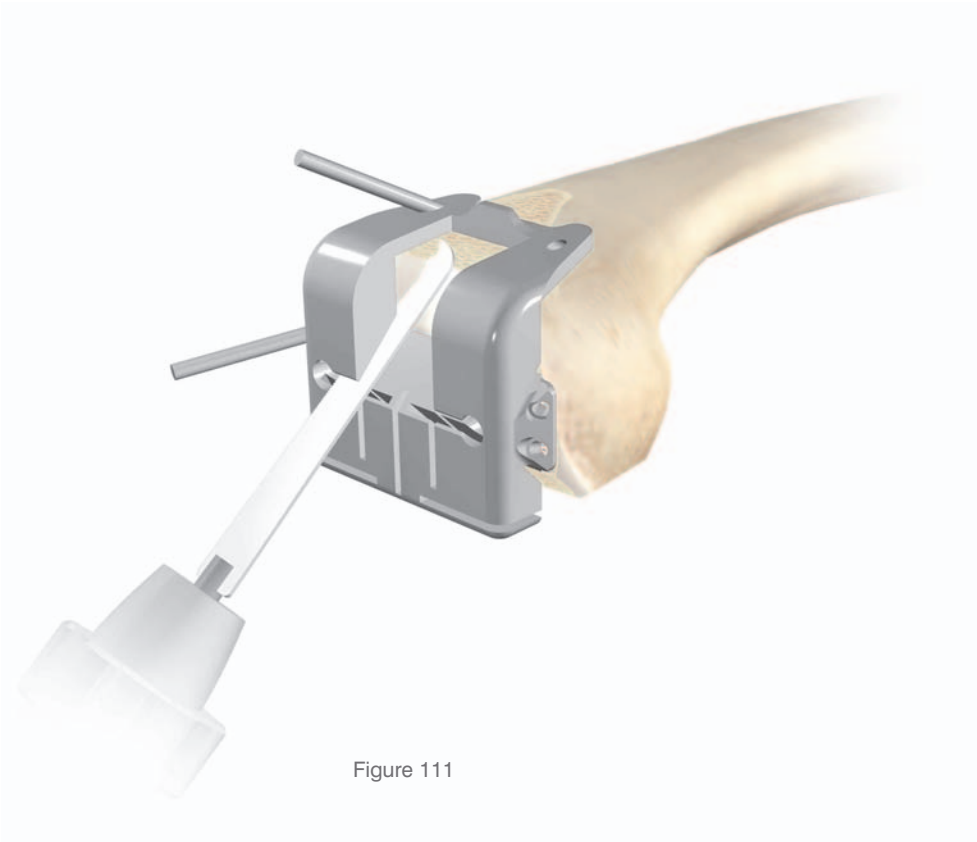


Figure 111

The chamfer cuts are made with the saw flush to the angled plates on the cutting block (Figures 110 & 111).

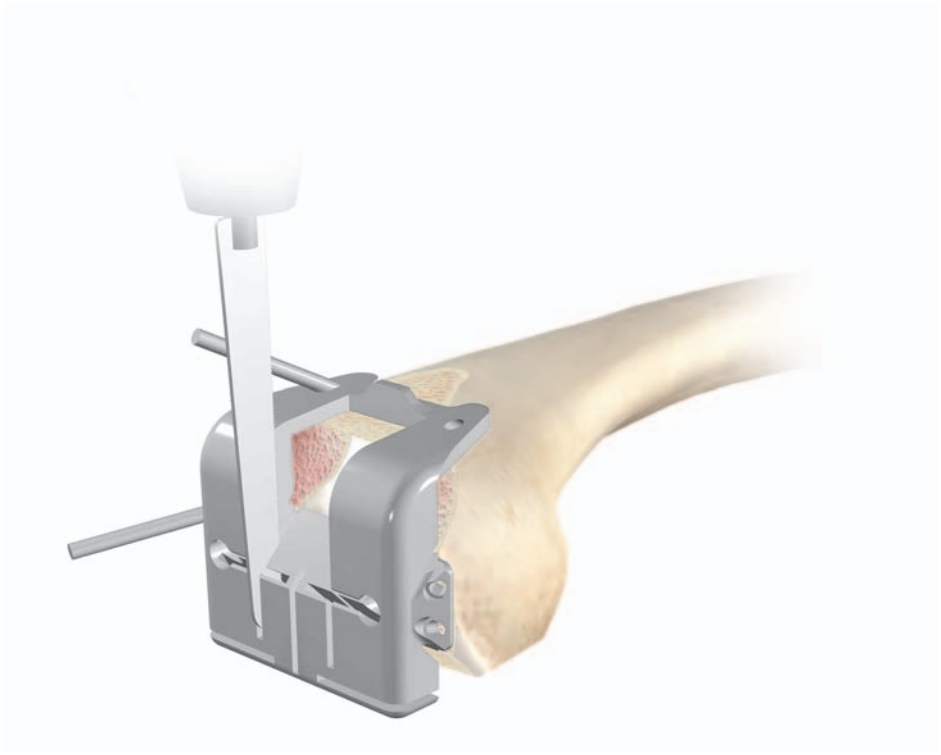


Figure 112

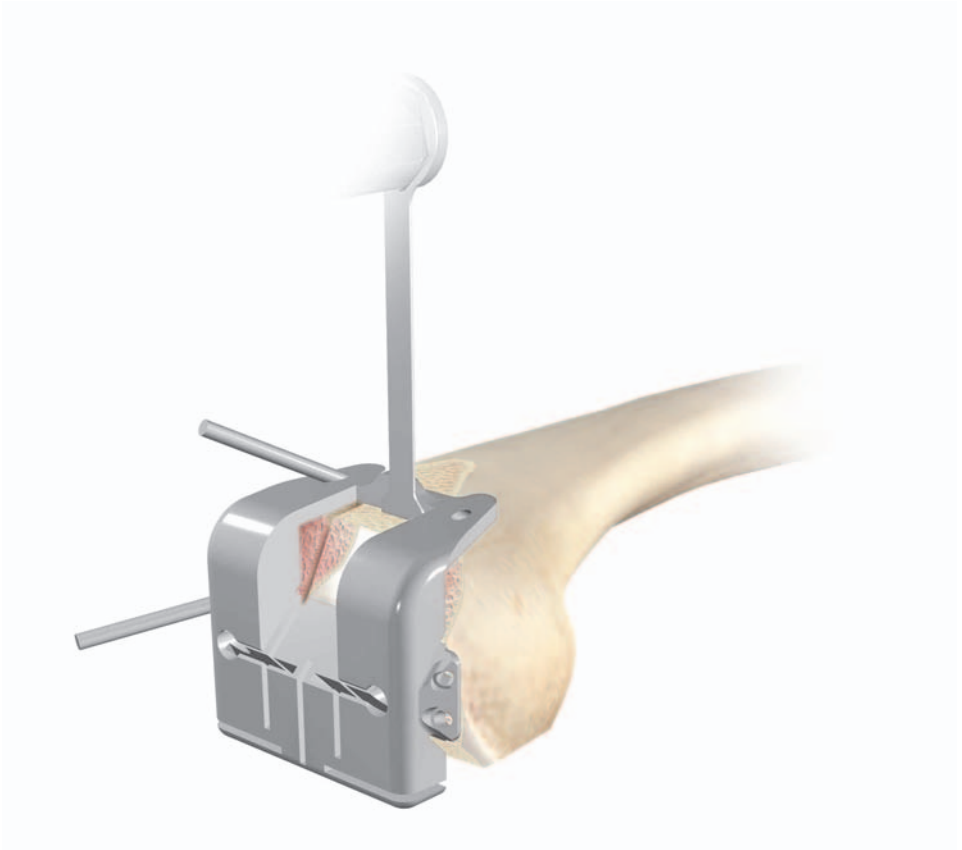


Figure 113

The box cut is made using an oscillating or reciprocating saw. An osteotome may be used to clear any remaining bone (Figures 112 & 113).

Tibial Preparation

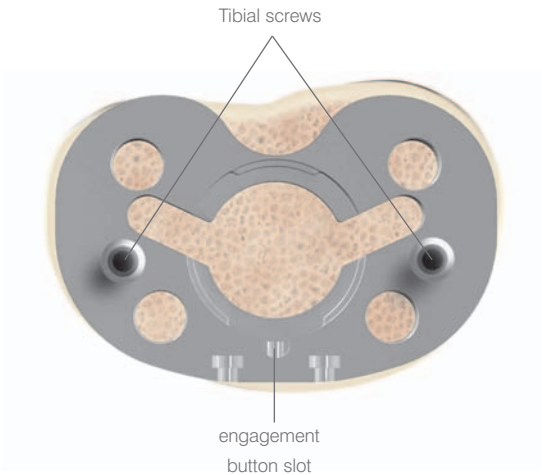


Figure 114

Figure 115

Figure 116

The tray trial allows for standard, M.B.T., keeled and 4 peg tray preparation (Figure 114). The MI reamer tower is attached to the tray trial by lifting the catch and rotating the tower until the button engages in the tray (Figure 115).

The tower is locked in place when the catch is released. The tibial reaming depth is controlled by a series of modular collars attached to the reamer tower.

With the correct collar attached, the tibia is reamed to the appropriate depth.

The stem punch is advanced into the tower and impacted into the cancellous bone until the appropriate tray size marking is reached (Figure 116).

M.B.T. Tray Preparation

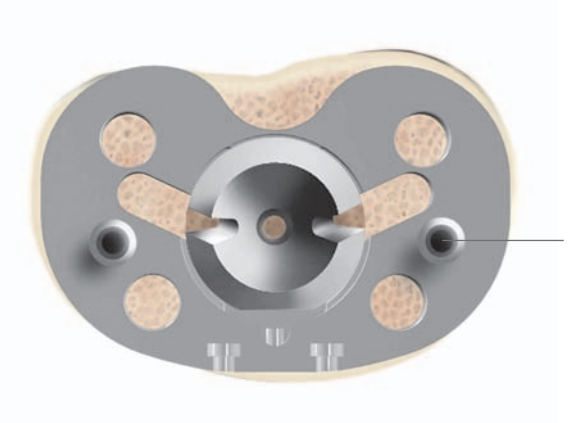


Figure 117

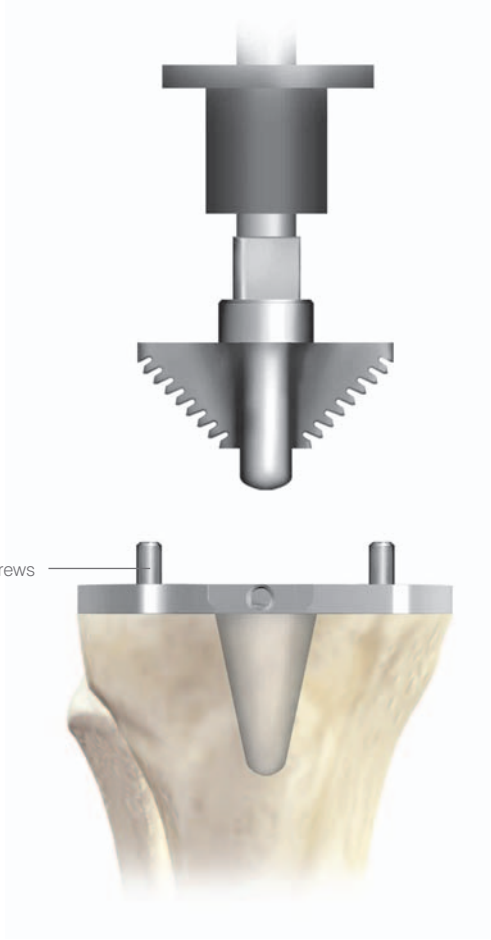


Figure 118

Figure 119

Keeled Tray Option

If a keeled M.B.T. tray is to be employed, and the bone of the medial or lateral plateau is sclerotic, it is helpful to initially prepare the keel slot with an oscillating saw or high speed burr.

The universal handle is assembled to the appropriately sized M.B.T. keel punch and inserted into the M.B.T. punch bushing, taking care to avoid malrotation.

The assembly is impacted into the cancellous bone until the shoulder of the punch is in even contact with the M.B.T. punch bushing (Figures 117 & 118).

Non-Keeled Tray Option

The RP adaptor is inserted into the punch bushing (Figure 119).

M.B.T. DuoFix™ Tray Preparation

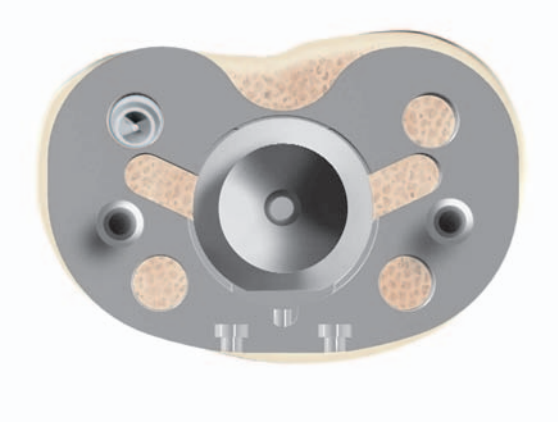


Figure 120

Figure 121

To finalise the rotational position, the four peg holes must be prepared. Remove the insert trial, femoral trial and APG or RP adaptor. Attach the tibial alignment guide handle, and verify that orientation of the tibial trial corresponds to the markings on the tibia (Figure 120).

Pin the tibial template, and drill the four peg holes (Figure 121).

Trial Reduction

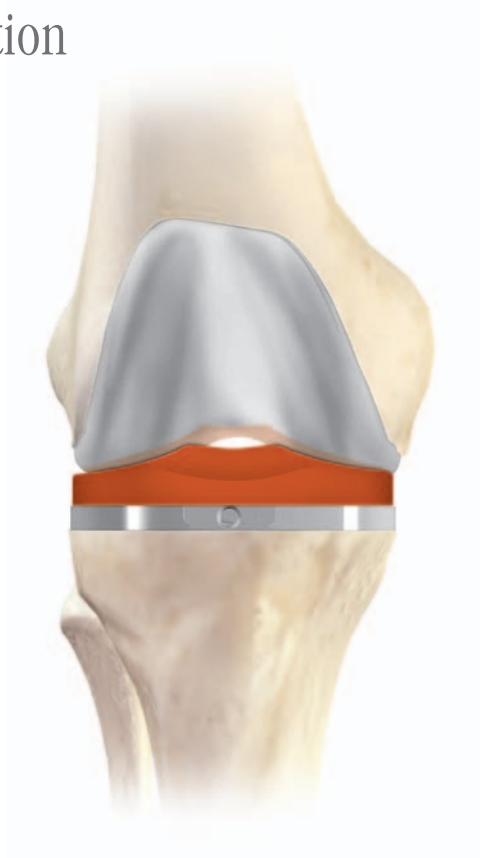


Figure 122
(cruciate retaining)

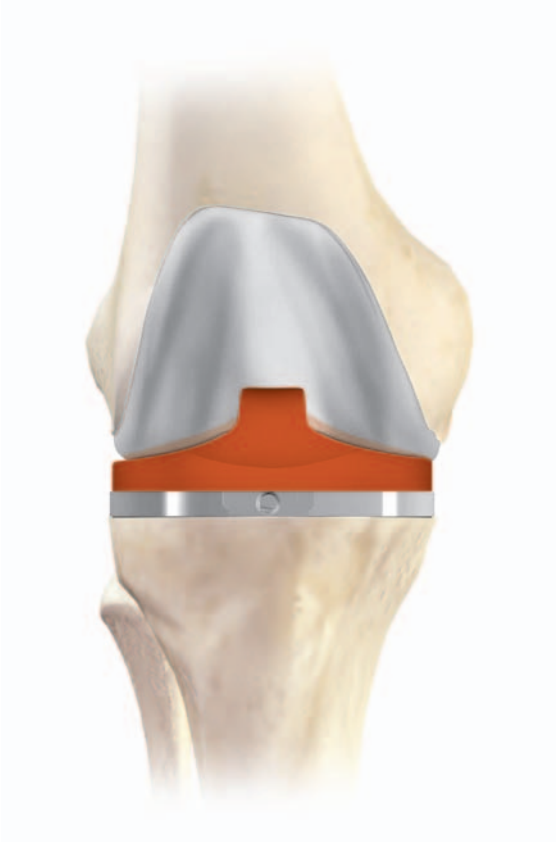
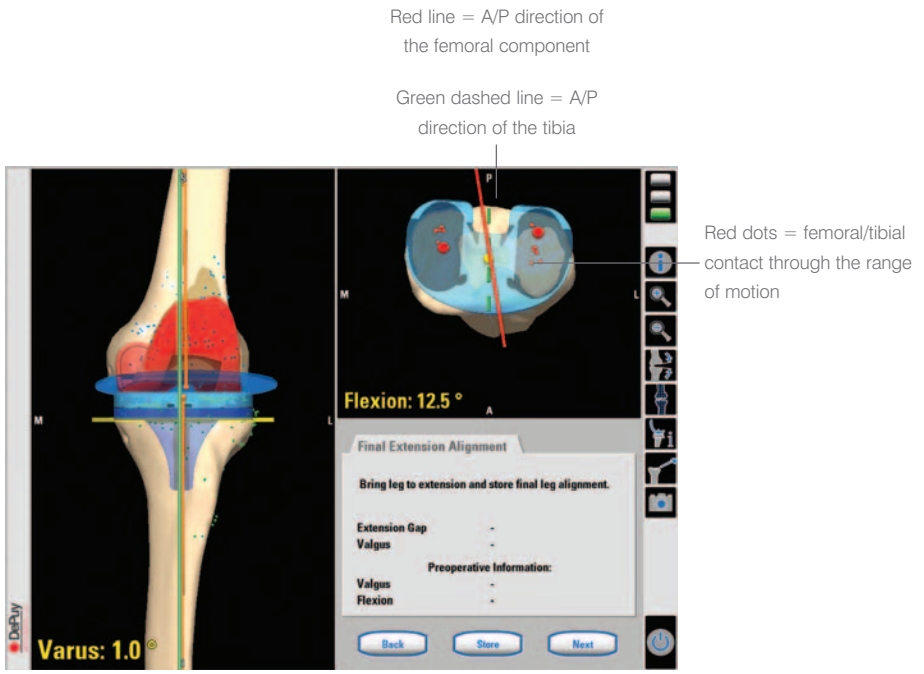


Figure 123
(cruciate substituting)

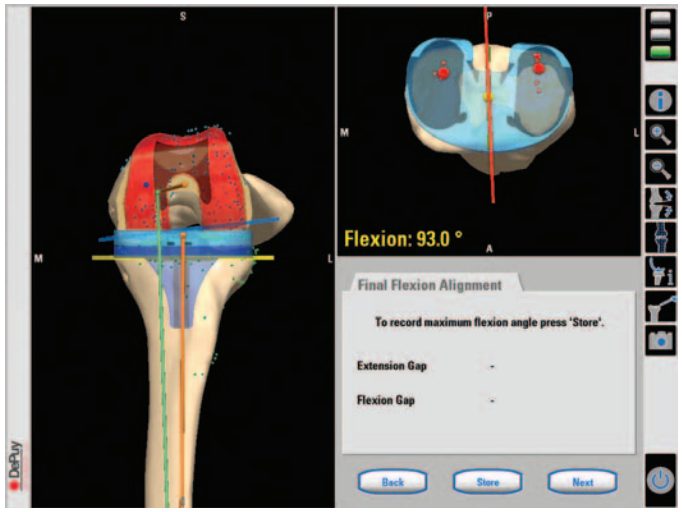
The trial bearing size determined during implant planning is selected and inserted onto the M.B.T. tray trial.

The knee is placed in deep flexion. The femoral trial is inserted onto the distal femur (Figures 122 & 123).



Motion analysis with trial components in extension

Figure 124



Motion analysis with trial components in flexion

Figure 125

With the trial components in place, the tracking pattern is assessed through a full flexion cycle. The Ci™ pointer should be held along the tibial tray to check rotation. If the position of the Ci™ pointer matches the motion analysis pattern, the rotation position of the tray should be marked on the tibia (Figures 124 & 125).

The following points should also be assessed:

- Adequate range of motion
- Medial and lateral lift-off (using gap data)
- Proper ligamentous tension in extension and in flexion
- Correct mechanical alignment of the extremity
- Natural motion without restrictions

The green dashed line represents the registered A/P direction of the tibial bone. The solid red line represents the A/P direction of the femoral component. The red dots mark femoral/tibial contact through the flexion cycle. The pattern can be cleared by pressing 'reset'.

Final Component Implantation

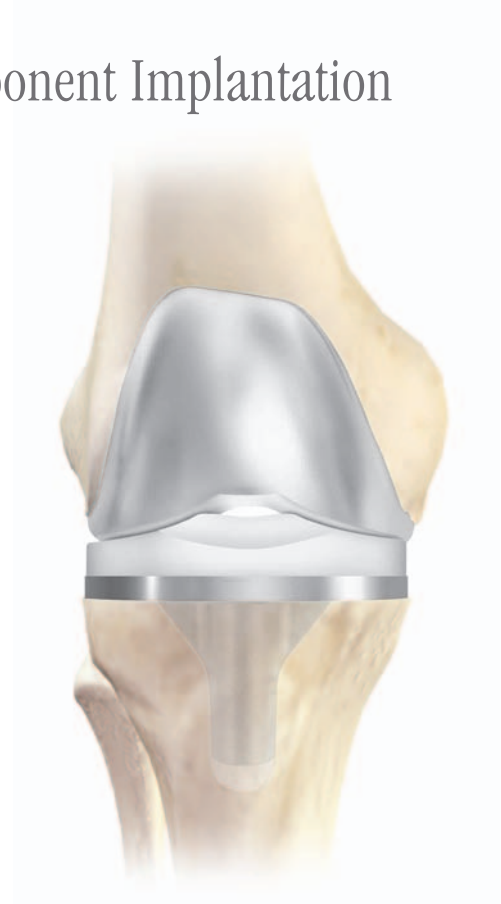


Figure 126
(cruciate retaining)

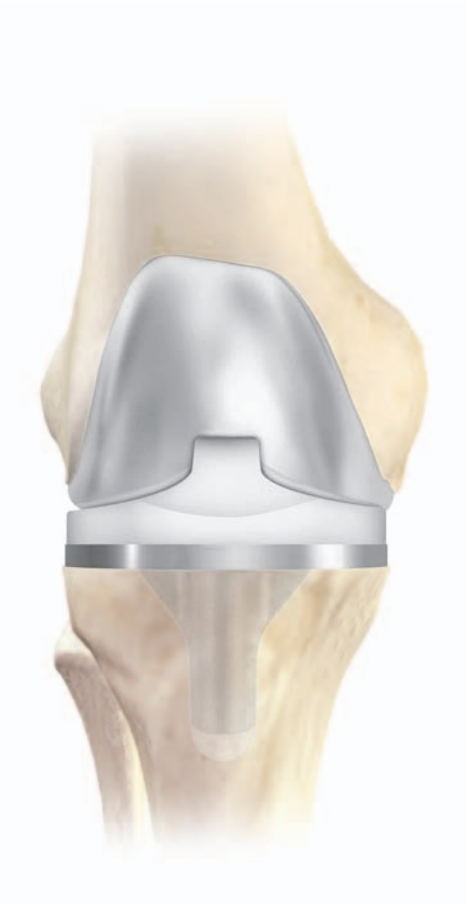


Figure 127
(cruciate substituting)

The components are implanted in the following order (Figures 126 & 127).

Tibial Implantation

The entire site should be thoroughly cleansed using pulsatile lavage. Bone cement is prepared and applied by syringe or with digital pressure in its low viscous state to assure maximal penetration into the trabecular bone. The universal handle is attached to the tray inserter. The tibial tray is carefully inserted, avoiding malrotation. When fully inserted, several mallet blows may be delivered to the top of the universal handle. All extruded cement is removed using a curette.

Polyethylene Implantation

Loose fragments or particulates should be removed from the permanent tibial tray. The appropriate permanent tibial insert can be inserted at any time during the cementing procedure.

Femoral Implantation

The entire site should be thoroughly cleansed using pulsatile lavage. Bone cement is prepared and applied to the femur. The femur is hyperflexed and the tibia is subluxed forward. The implant is attached to the femoral inserter and inserted onto the femur. The knee is extended to approximately 90˚ for final impaction. The inserter is released and any extruded cement is cleared using a curette.

Final Patella Implantation

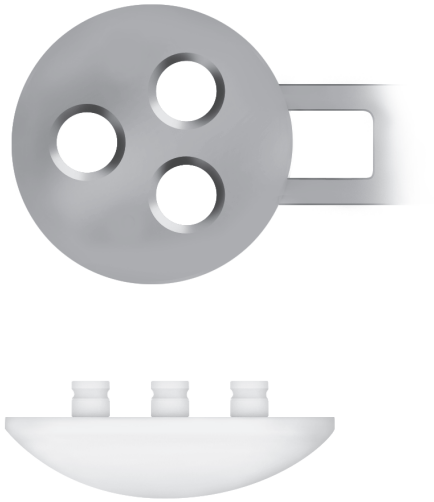


Figure 128

Figure 129

A template is selected that most adequately covers the articular surface without overhang. The patella wafer is removed from the patella and the handle positioned on the medial side of the everted patella.

Where bone is deficient on the lateral side, the next smaller size is selected and positioned slightly medially to enhance patellar tracking (Figure 128).

The template is firmly engaged to the resected surface and the holes made with the appropriate drill bit (Figure 129).

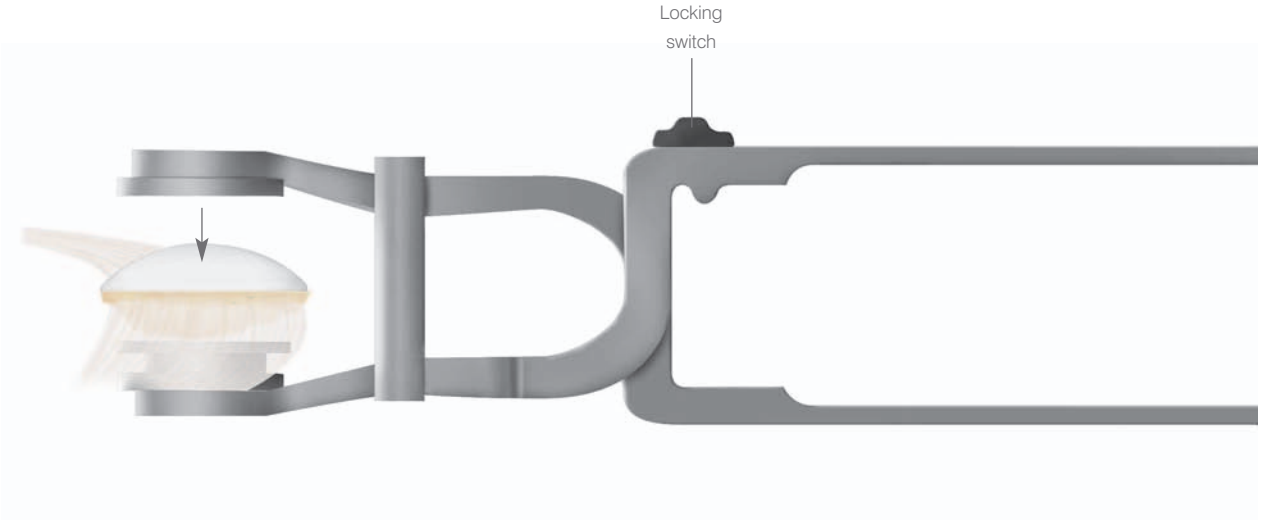


Figure 130

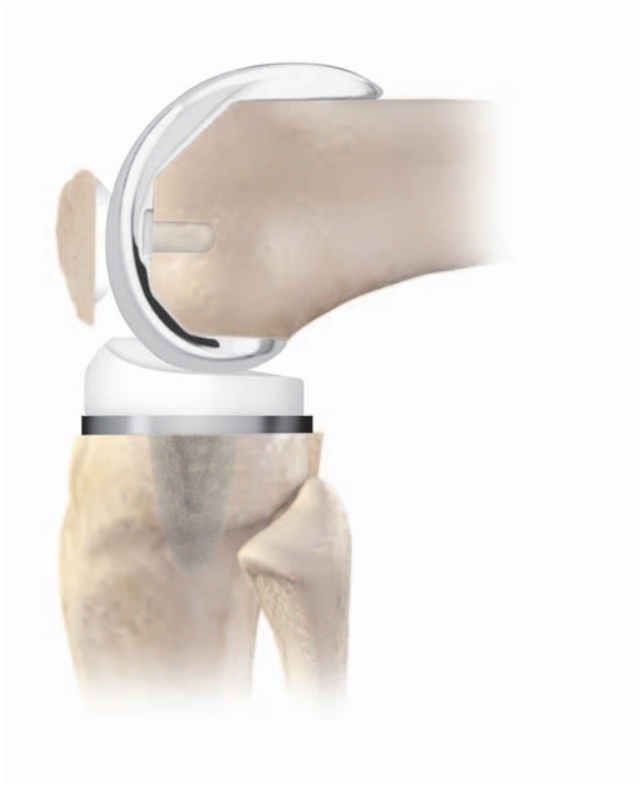


Figure 131

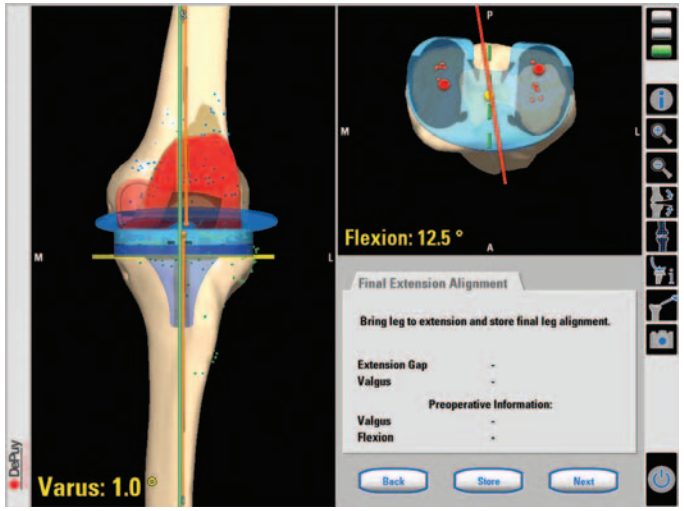
The patellar implant may now be cemented. The cut surface is thoroughly cleansed with pulsatile lavage. Cement is applied to the surface and the component is inserted.

The patellar clamp is designed to fully seat and stabilise the implant as the cement polymerises. It is positioned with the silicon O-ring, centred over the articular surface of the implant and the metal backing plate against the anterior cortex, avoiding skin entrapment.

When snug, the handles are closed and held by the ratchet until polymerisation is complete. All extruded cement is removed with a curette.

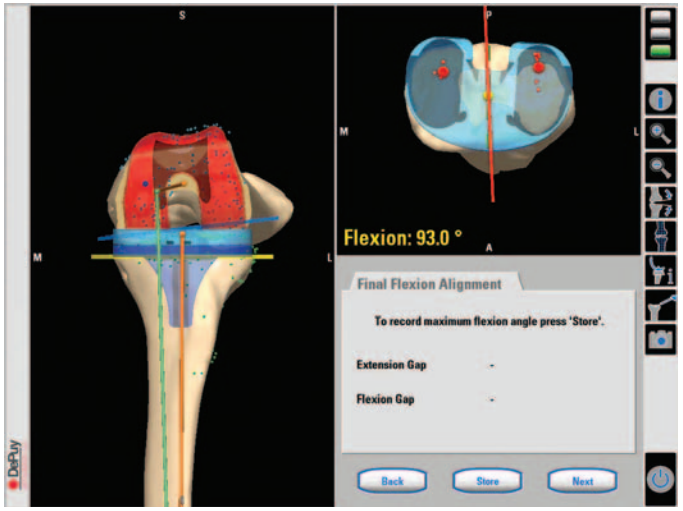
The clamp is released by unlocking the LOCK switch and squeezing the handles together (Figure 130). The patella is reduced and the patella implant is evaluated. An unrestricted range of motion, free bearing movement and proper patellar tracking should be evident (Figure 131).

Final Extension and Flexion Checks



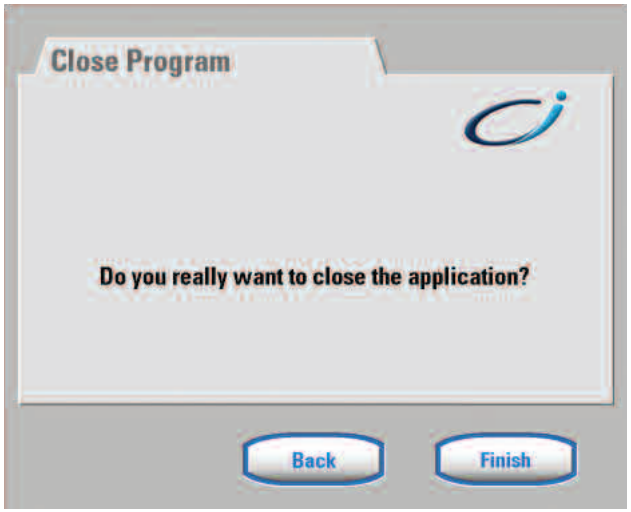
Motion analysis with final components in extension

Figure 132



Motion analysis with final components in flexion

Figure 133



Shut down screen

Figure 134

Final motion analysis checks are made in both extension and flexion to assess joint kinematics (Figures 132 & 133).

All planning information, screenshots and therapy reports can now be recorded to the CD-R.

This information can be saved prior to shut-down. The system shut-down begins after pressing the 'close' button on the final screen.

On the close application screen, press 'finish' to exit the Ci™ software (Figure 134).

Instruments and Ordering Information

MI 8200	**Base Kit MI CAS**
950501543	MITKR CAS Tibial / Femoral Jig
950501545	MITKR CAS 0 Degree 55 mm Cutting Block
MI 8300	**P.F.C.® Sigma™ Femoral MI CAS**
950501541	MITKR CAS Anterior Jig Sigma™ Assembly
950501528	MITKR CAS Femoral 3-in-1 Sigma™ Size 2
950501529	MITKR CAS Femoral 3-in-1 Sigma™ Size 2.5
950501530	MITKR CAS Femoral 3-in-1 Sigma™ Size 3
950501531	MITKR CAS Femoral 3-in-1 Sigma™ Size 4
950501532	MITKR CAS Femoral 3-in-1 Sigma™ Size 5
MI 8400	**M.B.T. MI CAS**
950501502	MITKR CAS Tibial Template Size 2
950501503	MITKR CAS Tibial Template Size 2.5
950501504	MITKR CAS Tibial Template Size 3
950501506	MITKR CAS Tibial Template Size 4
950501508	MITKR CAS Tibial Template Size 5
950501511	MITKR CAS Bayonet Tower Assembly
950501512	MITKR CAS Bushing Extractor
950501514	MITKR CAS KL Punch Bushing Size 2-3
950501515	MITKR CAS KL Punch Bushing Size 4-7
950501516	MITKR CAS M.B.T. Bullet WO Pegs Size 1-3
950501517	MITKR CAS M.B.T. Bullet WO Pegs Size 4-7
950501518	MITKR CAS M.B.T. Evaluation Bullet Size 1-3
950501519	MITKR CAS M.B.T. Evaluation Bullet Size 4-7
950501523	MITKR CAS RP Tibial Bullet Size 2-3.5
950501524	MITKR CAS RP Tibial Bullet Size 4-7
966520	Universal Handle
217830118	M.B.T. Central Drill
217830119	M.B.T. Central Stem Punch
250025000	M.B.T. Modular Depth Stop Ring
217830121	M.B.T. Plateau Trial Post
217830137	M.B.T. RP Trial Button
965383	M.B.T. tray impactor
MI 8500	**LCS® Femoral MI CAS**
950501542	MITKR CAS Anterior Jig LCS® Assembly
950501535	MITKR CAS Femoral 4-in-1 LCS® Small+
950501536	MITKR CAS Femoral 4-in-1 LCS® Medium
950501537	MITKR CAS Femoral 4-in-1 LCS® Standard
950501538	MITKR CAS Femoral 4-in-1 LCS® Standard+
950501539	MITKR CAS Femoral 4-in-1 LCS® Large
950501547	MITKR CAS 15 Degree 55 mm Cutting Block
MI 8600	**P.F.C.® Sigma™ RP-F MI CAS**
950501552	MITKR CAS Femoral 3-in-1 RP-F Size 2
950501553	MITKR CAS Femoral 3-in-1 RP-F Size 2.5
950501554	MITKR CAS Femoral 3-in-1 RP-F Size 3
950501555	MITKR CAS Femoral 3-in-1 RP-F Size 4

950501556	MITKR CAS Femoral 3-in-1 RP-F Size 5
954120	RP-F Tibial Insert Trial 10 mm Size 2
954121	RP-F Tibial Insert Trial 12.5 mm Size 2
954122	RP-F Tibial Insert Trial 15 mm Size 2
954123	RP-F Tibial Insert Trial 17.5 mm Size 2
954125	RP-F Tibial Insert Trial 10 mm Size 2.5
954126	RP-F Tibial Insert Trial 12.5 mm Size 2.5
954127	RP-F Tibial Insert Trial 15 mm Size 2.5
954128	RP-F Tibial Insert Trial 17.5 mm Size 2.5
954130	RP-F Tibial Insert Trial 10 mm Size 3
954131	RP-F Tibial Insert Trial 12.5 mm Size 3
954132	RP-F Tibial Insert Trial 15 mm Size 3
954133	RP-F Tibial Insert Trial 17.5 mm Size 3
954140	RP-F Tibial Insert Trial 10 mm Size 4
954141	RP-F Tibial Insert Trial 12.5 mm Size 4
954142	RP-F Tibial Insert Trial 15 mm Size 4
954143	RP-F Tibial Insert Trial 17.5 mm Size 4
954150	RP-F Tibial Insert Trial 10 mm Size 5
954151	RP-F Tibial Insert Trial 12.5 mm Size 5
954152	RP-F Tibial Insert Trial 15 mm Size 5
954153	RP-F Tibial Insert Trial 17.5 mm Size 5
954212	RP-F Trial Femur Size 2 Left
954213	RP-F Trial Femur Size 2.5 Left
954214	RP-F Trial Femur Size 3 Left
954215	RP-F Trial Femur Size 4 Left
954216	RP-F Trial Femur Size 5 Left
954222	RP-F Trial Femur Size 2 Right
954223	RP-F Trial Femur Size 2.5 Right
954224	RP-F Trial Femur Size 3 Right
954225	RP-F Trial Femur Size 4 Right
954226	RP-F Trial Femur Size 5 Right
MI 7400	P.F.C.® Sigma™ Fixed Bearing MI CAS
966554	Base Tibial Instruments
966341	Tibial Tray Trials Size 2
966343	Tibial Tray Trials Size 3
966344	Tibial Tray Trials Size 4
966345	Tibial Tray Trials Size 5
860590	Trial Tray Fixation Pins (pack of 4)
966430	Tibial Trial Insert Remover
966520	Universal Handle
966342	Tibial Tray Trial Size 2.5
SP 2714	Specialist® 2 Standard Tibial
966350	Standard Tibial Punch Guide Size 1.54
966351	Standard Tibial Punch Guide Size 5 & 6
966355	Standard Non Cementeded Tibial Punch Size 1.52
966356	Standard Non Cementeded Tibial Punch Size 2.54
966357	Standard Non Cementeded Tibial Punch Size 56

966358	Standard Cemented Tibial Punch Size 1.52
966359	Standard Cemented Tibial Punch Size 2.56
966564	Cruciform Keel Punch Sterile Tray Insert
SP 2715	Specialist® 2 Modular Cemented Punch Instruments
966360	Modular Tibial Cementeded Punch Guide Size 1.5-3
966361	Modular Tibial Cemented Punch Guide Size 4-6
966370	Modular Tibial Cemented Punch Size 1.5-3
966371	Modular Tibial Cemented Punch Size 4-5
966376	Specialist® 2 Modular Tibial Drill Bush Cemented Size 1.5-3 (13 mm)
966378	Specialist® 2 Modular Tibial Cemented Drill Bush Size 4-5 (15 mm)
966380	Modular Tibial Drill Size 1.5-3 13 mm Cemented
966381	Modular Tibial Drill Size 4-6 15 mm Cemented
966566	Cemented Modular Punch
MI 8800	Demo MI CAS (International Only)
950501504	MITKR CAS Tibial Template Size 3
950501511	MITKR CAS Bayonet Tower Assembly
950501512	MITKR CAS Bush Extractor
950501514	MITKR CAS Keel Punch Bush Size 2-3
950501516	MITKR CAS M.B.T. Bullet WO Pegs Size 1-3
950501518	MITKR CAS M.B.T. EVAL Bullet Size 1-3
950501521	MITKR CAS DuoFix™ Tibial Reamer
950501523	MITKR CAS RP Tibial Bullet Size 2-3.5
950501541	MITKR CAS Anterior Jig Sigma™ Assembly
950501542	MITKR CAS Anterior Jig LCS® Assembly
950501530	MITKR CAS Femoral 3-in-1 Sigma™ Size 3
950501537	MITKR CAS Femoral 4-in-1 LCS® Standard
950501554	MITKR CAS Femoral 3-in-1 RP-F Size 3
950501543	MITKR CAS Tibial/Femoral Jig
950501545	MITKR CAS 0 Degree 55 mm Cutting Block
950501547	MITKR CAS 15 Degree 55 mm Cutting Block
MI 8000	LCS® Mobile Bearing MI CAS Instruments
180118000	1/8 Inch Drill Bit
228769000	Calliper
217856025	LCS® Completion Femoral Impactor/Extractor
864348	Bone File
966515	Specialist® 2 Pin Puller
966520	Universal Handle
869189	P.F.C.® J&J Tibial Retractor
217842005	Completion™ QDrill Driver
217842010	Completion™ QDrill Pin Pack
228748000	Femoral Lug Drill
258919000	Visualisation Wing
966180	Modular Femoral Impactor Head

Individual codes

950501500	MITKR CAS Tibial Template Size 1
950501501	MITKR CAS Tibial Template Size 1.5
950501505	MITKR CAS Tibial Template Size 3.5
950501507	MITKR CAS Tibial Template Size 4.5
950501509	MITKR CAS Tibial Template Size 6
950501510	MITKR CAS Tibial Template Size 7
950501513	MITKR CAS Keel Punch Bush Size 1-1.5
950501522	MITKR CAS RP Tibial Bullet Size 1-1.5
950501527	MITKR CAS Femoral 3-in-1 Sigma™ Size 1.5
950501533	MITKR CAS Femoral 3-in-1 Sigma™ Size 6
950501534	MITKR CAS Femoral 4-in-1 LCS® Small
950501540	MITKR CAS Femoral 4-in-1 LCS® Large+
950501565	MITKR CAS Patella Track Assembly
950501567	MITKR CAS System Screw
950501568	MI CAS NC Keel Punch Bush Size 1-1.5
950501569	MI CAS NC Keel Punch Bush Size 2-3
950501570	MI CAS NC Keel Punch Bush Size 4-7
950501571	MITKR CAS System Screw
950501572	MITKR CAS Prefixation Screw
950501573	MITKR CAS Patella Trial - LCS® Small
950501574	MITKR CAS Patella Trial - LCS® Small+
950501575	MITKR CAS Patella Trial - LCS® Standard
950501576	MITKR CAS Patella Trial - LCS® Standard+
950501577	MITKR CAS Patella Trial - LCS® Large
950501578	MITKR CAS Patella Trial - LCS® Large+
950501579	MITKR CAS Patella Trial - Sigma™ 25 mm
950501580	MITKR CAS Patella Trial - Sigma™ 28 mm
950501581	MITKR CAS Patella Trial - Sigma™ 32 mm
950501582	MITKR CAS Patella Trial - Sigma™ 35 mm
950501583	MITKR CAS Patella Trial - Sigma™ 38 mm
950501584	MITKR CAS Patella Trial - Sigma™ 41 mm
950501585	Tibial Impactor
950501586	Femoral Introducer
950501587	Femoral Anterior Bow Yoke
950501597	MI LCS® Patella Instruments - Small/Small+ Medial
950501598	MI LCS® Patella Instruments - Small/Small+ Lateral
950501608	Tibial/Femoral RM/LL x 15 Degree Cutting Block
950501609	MITKR CAS Patellar Wafer
950501610	MITKR CAS/Specialist® 2 Tibial Adapter
950501611	Quick Drill Pin - MI
950501612	MI - Patella Resection Guide - P.F.C.®
950501613	MI- Patella Resection Guide - LCS®
129901061	Tibial Screws
129901030	Manual Driver
950501606	Tibial/Femoral LM/RL x 15 Degree Cutting Block
217842005	Completion Qdrill Driver
217842010	Completion Qdrill Pin Pack

950501599	MI LCS® Patella Instruments - Standard/Standard+ Medial
950501544	MITKR CAS 0 Degree 45 mm Cutting Block
950501546	MITKR CAS 15 Degree 45 mm Cutting Block
950501602	MI LCS® Patella Instruments - Large/Large+ Lateral
950501604	Tibial/Femoral 65 mm x 15 Degree Cutting Block
950501550	MITKR CAS Femoral 3-in-1 RP-F Size 1
950501551	MITKR CAS Femoral 3-in-1 RP-F Size 1.5
950501557	MITKR CAS Femoral 3-in-1 RP-F Size 6
950501600	MI LCS® Patella Instruments - Standard/Standard+ Lateral
950501601	MI LCS® Patella Instruments - Large/Large+ Medial
950501603	Tibial/Femoral 65 mm x 0 Degree Cutting Block
950501605	Tibial/Femoral LM/RL x 0 Degree Cutting Block
950501607	Tibial/Femoral RM/LL x 0 Degree Cutting Block
950501549	MITKR CAS Tibial/Femoral Jig Clamp
129901052	CAS Ligament Tensor Size 2 (12 Kg)
129901053	CAS Ligament Tensor Size 4 (12 Kg)
129901054	CAS Ligament Tensor Handle
129901055	CAS Tensor Spacer 5 mm
129901056	CAS Tensor Spacer 10 mm
	CAS Ligament Tensor Size 2 (18 Kg)
	CAS Ligament Tensor Size 4 (18 Kg)
	CAS Ligament Tensor Size 2 (24 Kg)
	CAS Ligament Tensor Size 4 (24 Kg)

Saw blades

950501591	MITKR CAS Saw Blade - Old Stryker
950501592	MITKR CAS Saw Blade - New Stryker
950501593	MITKR CAS Saw Blade - Old Zimmer
950501594	MITKR CAS Saw Blade - New Zimmer
950501595	MITKR CAS Saw Blade - AO/Sod
950501596	MITKR CAS Saw Blade - 3M
229910000	MITKR CAS Double Side Recip Stryker
229910001	MITKR CAS Double Side Recip Zimmer
229910002	MITKR CAS Double Side Recip Hall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