User Manual

Introduction

The Stryker Navigation System OrthoMap Versatile Hip software is an interactive monitoring system designed to improve the surgical performance and clinical outcome of total hip arthroplasty.

As a PC-based imageless guidance system, the Stryker Navigation System OrthoMap Versatile Hip software enables improved accuracy to be achieved for alignment and orientation of instruments, trials and ultimately implants. The Navigation System also enables intra-operative and post-implantation assessments of the patient's joint stability, ROM, and leg length and leg offset.

Long-term cost savings may result from possible shorter hospital stays, decreased morbidity, improved joint stability and decreased rehabilitation time.  

The Stryker Navigation System OrthoMap Versatile Hip software allows the user to customize workflow by selecting to navigate either the cup, the stem, or both. The user settings can be adjusted to match the surgeon's preferences.

The Stryker Navigation System enables navigation of dedicated Stryker Cup and Stem Instruments as well as generic navigation of various major cup instruments.

For the required safety information and contraindications, please refer to the Safety Information supplied with the OrthoMap Versatile Hip software package, and to the Instructions for Use, supplied with the system components. For information and tasks instructions related to conventional instrumentation, please refer to the safety information and the user documentation supplied with conventional instrumentation.


Important Notice

Only trained medical personnel may use the Stryker Navigation System. As with any technical guide, the surgeon should consider the particular condition of the patient and undertake any necessary adjustments. Stryker OrthoMap Versatile Hip software is not intended to replace the surgeon’s qualifications, expertise, and judgement. Safety and Caution Notes should be carefully reviewed prior to proceeding.

For information and tasks instructions related to conventional instrumentation, please refer to the safety information and the user documentation supplied with conventional instrumentation.

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For information and tasks instructions related to conventional instrumentation, please refer to the safety information and the user documentation supplied with conventional instrumentation.

1.1 System Setup

System Start Up

NOTE: The system and software setup can be completed by the OR support staff prior to operation.

1. To ensure instrument visibility, place the system opposite to the surgeon.
2. Plug in the main power cable of the navigation system.
3. Press the main power button on the front panel of the navigation system.
4. Enter or select the user name (navigation) and press Enter or click OK.
5. After Application Manager start-up, select OrthoMap Versatile Hip.

1.2 Set User Preferences

Set User Preferences

The User Preferences dialog allows the users to select features and customize surgical workflow in accordance with their preferences.

For each user, the preferences are individually stored and loaded at program start according to the login name. Individual login names can be set up by authorized personnel.

To access the User Preferences dialog, select the User Preferences button of the upper windows menu bar or on the intro screen.

For example, three pelvis registration options are offered in order to define the reference plane for cup alignment:

- Functional pelvic plane
- Standard anatomical frontal pelvic plane
- Patient/table registration

The functional pelvic plane and the patient/table registration options are similar to conventional OR table referencing. Considering the longitudinal body axis, the true coronal plane of the patient is defined as a reference. Unlike the anatomical frontal pelvic plane, a potential "patient specific pelvic tilt" is compensated for, and cup alignment with regard to the functional pelvis position is achieved.

Patient/table registration can be utilized for patients already in the lateral position. The functional pelvic plane and the anatomical frontal pelvic plane can be selected for patients in lateral or supine position.

The following chapters describe the required steps to navigate inclination/anteversion, depth to fovea, depth to seat, hip center change, and leg length change.
1.3 Software Setup/Software Symbol Definition

Software and Tool Preparation

Enter Patient Data and Confirm Data Summary

1. Open the Enter Patient Data screen.
2. Record the patient’s first and last name.
3. Indicate the leg side undergoing treatment.

Entering the patient’s name and indicating the leg side is mandatory.

Click Next to open the Data Summary screen, carefully check the displayed information and confirm the summary.

Prepare and Initialize Tools

The required tools are listed in the Setup System dialog.

- Load sterile batteries into the navigation tools.

**NOTE:**
One sterile battery will be needed for each tool used.

To initialize the navigation tools:

- Face the LEDs towards the camera and press and hold the SELECT button on the tool for 2-3 seconds.

Tool initialization is confirmed by an audible alert and a checkmark in front of the software button.

Upon pointer initialization, the Validate Pointer pop-up window appears.

Hot Spot Validation

Pointer Validation and Instrument Validation can be performed multiple times. The “Hot Spots” are the validation disk on the tracker and the validation point on the instrument.

**Pointer Validation**

The pointer validation is used to validate the accuracy of the pointer tip.

- Touch the center of any one of the tracker’s validation discs with the pointer’s tip and press the SELECT button on the pointer for 2-3 seconds to validate.

**Instrument Validation**

The instrument validation is used to validate the accuracy of the instrument.

- Move the pointer’s tip towards the instrument’s validation point and hold it until the validation is performed automatically.

Software Symbol Definition

The Stryker Navigation System OrthoMap Versatile Hip software provides three kinds of user messages:

- **The Information Message** informs about a condition or result.
- **The Error Message** informs about a problem that has already occurred and must be fixed to continue.
- **The Warning Message** informs about a condition that might cause a problem or a risk in the future.

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Patient Preparation

For navigated acetabular preparation, the patient preparation routine must include pelvic tracker fixation and patient registration. The described patient/table registration can be done with the patient positioned in the final lateral position, fully prepared and draped. For accurate patient/table registration, proper patient alignment with the OR table is essential.

- Position the patient in the final lateral position.
- Make sure the patient’s body is properly aligned with the OR table (see illustration): The spinal column of the patient (pelvic, lumbar, and thoracic area) should not be bent. The spinal column should be aligned similar to its natural alignment when the patient is standing.
- Make sure the pelvis is properly aligned. The trans-ASIS axis must be positioned perpendicular to the OR table.
- With the patient properly aligned complete patient preparation and draping.

Distal Skin Marker Definition

For leg length assessment without a femoral tracker, it is necessary to define a reproducible reference point on the lateral distal femur.

To define a reproducible reference point, an EKG lead may be placed onto the lateral distal femur and a bandage may be wrapped around it.

Anchoring Device Fixation

For navigated acetabular preparation, a Pelvic Tracker must be fixated onto the pelvic bone undergoing treatment. The OrthoLock anchoring device and OrthoLock Ex-Pins can be used for Tracker fixation.

It is recommended to use three OrthoLock Ex-Pins to fixate the OrthoLock anchoring device onto the pelvis. The first pin can be driven into the crest. The OrthoLock anchoring device can be slid over and the remaining navigation drill holes can be used for the second and third pin.

NOTE:
Avoid parallel pin placement. Drill between the inner and outer tables of the pelvic bone, aiming towards the sacrum.

Mount Patient Trackers

1. Before pelvic landmark registration, mount the Pelvic Tracker to OrthoLock anchoring device.
2. Align the tracker interface in order to ensure tracker visibility during registration, acetabular preparation and reduction.

NOTE:
For the surgeon’s convenience, trackers can be detached any time they are not needed.

NOTE:
Ensure to firmly reconnect the tracker.
Mid-axial Chest

Identify a point on the chest that lies on the patient’s mid-axis, touch this point with the pointer’s tip and press the pointer’s SELECT button to record.

Greater Trochanter

1. Make sure the leg is in neutral position.
2. Palpate and touch the greater trochanter with the pointer’s tip and press the pointer’s SELECT button to record.

NOTE: The line connecting the digitized greater trochanter and mid axial chest point in sagittal view should be parallel to the true coronal plane of the patient in upright standing position.

Positioning the Camera

Before starting the pelvis registration:

- Bring the camera towards the patient head and make sure the pelvic tracker is centered in the working volume of the camera signified by the grey circles in the Setup System dialog.

OR Table Reference

Before starting the digitization:

- Make sure the patient is properly aligned with the OR table.
  - The trans-ASS axis must be perpendicular to the OR table.
- Make sure the OR table is horizontal and not tilted.

With the patient properly aligned and the OR table horizontal:

1. Press the tracker’s SELECT button to activate OR table reference registration.
2. Move the OR table upwards or downwards and record pelvic tracker movement.

Register Pelvis

Cup navigation requires the digitization of a reference plane. The digitized plane is the reference for inclination and anteversion.
Register Femur/Distal Skin Marker

With Distal Skin Marker digitization, the reference for leg length is defined.

Before digitization:
1. Bring the leg into neutral position.
2. With leg in neutral position, place the pointer’s tip on the skin marker attached during preparation and press the SELECT button to record.

Register Acetabulum

The incision must be made prior to acetabular registration.

Fovea

The fovea (true floor of the acetabulum) is digitized to assess the reamer’s depth when navigating acetabular preparation.

- Place pointer’s tip on the fovea and begin digitizing by pressing the pointer’s SELECT button and moving tip slowly on the fovea’s surface.
- Ensure the most medial aspect of the fovea is included.

Articular Surface

The hip center and diameter of the acetabulum are calculated with the digitization of the articular surface. In the reduction dialog, the initial hip center is part of the leg length change calculation.

- Place pointer’s tip on the articular surface and begin digitizing by pressing the pointer’s SELECT button and moving tip slowly on the articular surface.
Navigated Acetabular Preparation & Leg Length Assessment

2.2 Patient Registration

**Initial Hip Center**

The initial hip center serves as a reference for hip center shift when navigating acetabular preparation.

The initial hip center is digitized by using the dedicated reamer and reamer head that fits best into the acetabulum.

1. Attach instrument tracker to the reamer handle.
2. Place reamer in the acetabulum and press the instrument tracker’s SELECT button to record.

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**Acetabular Rim**

The acetabular rim serves as visual enhancement when navigating acetabular preparation.

- Place the pointer’s tip on the acetabular rim and begin digitizing by pressing the pointer’s SELECT button and moving tip slowly along the rim.

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**Transversal Acetabular Ligament (TAL) Points**

Landmarks are only available when Display acetabular shape is selected in the User Preferences.

The registration of the TAL points allows a later visual alignment of the cup and the TAL points together with the acetabular rim profile.

1. Place the pointer’s tip on the anterior TAL point and press the SELECT button to record.
2. Place the pointer’s tip on the posterior TAL point and press the SELECT button to record.

**NOTE:**

The Transversal Acetabular Ligament is a couple of millimeters thick. Make sure to register the anterior and posterior TAL points at the same height.
Acetabular Reaming

- Make sure the software’s reamer diameter settings are in accordance with the size of reamer being used. If necessary click plus or minus to make adjustments.
- Position the reamer, align inclination and anteversion, and start reaming.
- During reaming, monitor depth to fovea and hip center change.

When changing the reamer head:

- Redo adjustments to the software’s reamer diameter settings.
- Select the Record button to record the final reamer position.

Cup Insertion

Perform cup insertion similar to acetabular reaming.

- Attach instrument tracker and cup to dedicated cup inserter.
- Make sure the software’s cup diameter settings are in accordance with the cup size being used. If necessary click plus or minus to make adjustments.
- Position the cup impactor, align inclination and anteversion, and start impacting.
- During cup impacting, monitor the insertion depth. (The reference for the insertion depth is the recorded final reamer position shown as the blue transparent hemisphere.)
- Select the Record button to record the final cup position.

Final Reduction/ Leg Length Assessment

For assessing leg length change:

1. Bring the leg into neutral position using the guidance mode integrated in the dialog.
2. Place the pointer’s tip on the distal skin marker.
3. Highlight the Distal skin marker button and press the pointer’s SELECT button to record.

NOTE: Avoid any skin shift when digitizing the distal skin marker.

NOTE: The leg is in the original neutral position when the yellow cross is directly in the middle of the black circle. Hip center changes during acetabular preparation may affect leg length accuracy if the leg is not in the exact neutral position.

NOTE: To ensure accuracy no leg length values are shown by the software if the current leg position deviates too much from the exact neutral position.
Report

The report is created automatically when the patient file is saved. It compiles all relevant surgery data including the reamer, cup, broach, and stem alignment as well as leg changes if navigated.

After completion of the surgery, select Show Report in the Main Menu to open.

The report is saved as a .pdf file on the hard drive under D:\HipData\patients/...

Cup Alignment - Reference Options

The OrthoMap Versatile Hip software allows the selection between three different reference planes for cup alignment.

Anatomical Frontal Pelvic Plane
The anatomical frontal pelvic plane is defined by digitizing both ASIS and either both pubic tubercles, or the pubic symphysis. The anatomical frontal pelvic plane can be selected for patients in lateral and supine position.

Functional Plane
The functional pelvic plane is defined by digitizing both ASIS and the integration of the longitudinal body axis. The functional pelvic plane represents the true coronal plane of the patient. Unlike the anatomical frontal pelvic plane, the functional pelvic plane compensates for a possible patient-specific pelvic tilt when the patient is in upright position.

The manner in which the functional plane is digitized depends on the patient position.

Patient/Table Registration
Patient/table registration is a time-efficient registration option. It can be easily defined with the patient in the final lateral position, fully prepared and draped. It may serve as an alternative functional reference, in the event that the downside ASIS is difficult to access.

In this registration option, a plane aligned to the longitudinal body axis and perpendicular to the OR table is defined. Similar to the functional pelvic plane, the patient/table reference compensates for a potential patient specific pelvic tilt.
2.6 Cup Alignment - Reference Options

Digitization of the Anatomical Frontal Pelvic Plane

- **Left ASIS**
  - Palpate and touch the left ASIS with the pointer’s tip and press the SELECT button to record.
- **Right ASIS**
  - Palpate and touch the right ASIS with the pointer’s tip and press the SELECT button to record.
- **Pubic Symphysis**
  - Palpate and touch the furthest anterior superior aspect of the pubic symphysis with the pointer’s tip and press the SELECT button to record.

Digitization of Functional Plane

- **Digitization of the Functional Plane with Patient in Supine**
  1. Move the OR table upwards and record pelvic tracker movement.
  2. Palpate and touch the left ASIS with the pointer’s tip and press the pointer’s SELECT button to record.
  3. Palpate and touch the right ASIS with the pointer’s tip and press the pointer’s SELECT button to record.

**NOTE:**
Make sure the OR table is not tilted when recording the movement.

- **Digitization of the Functional Plane with Patient in Lateral**
  1. Before starting the digitization:
     - Make sure the leg is in neutral position.
  2. To digitize the functional plane:
     1. Identify a point on the chest that lies on the patient’s mid axis, touch this point with the pointer’s tip and press the pointer’s SELECT button to record.
     2. Palpate and touch the greater trochanter with the pointer’s tip and press the pointer’s SELECT button to record.
     3. Palpate and touch the left ASIS with the pointer’s tip and press the pointer’s SELECT button to record.
     4. Palpate and touch the right ASIS with the pointer’s tip and press the pointer’s SELECT button to record.
Navigated Acetabular Preparation & Leg Length Assessment

2.7 Cup Navigation – Options

Cup Insertion for Generic Cup
- Attach the Patient Tracker (green) to the Axis Guide.
- Hold the Axis Guide against a portion of the cup inserter which is parallel to the transpolar cup axis.
- Position the cup inserter, adjust inclination and anteversion, and start impacting.
- To record the final cup alignment select Record Position.

Depth to Seat for Generic Cup
To measure the depth of the cup:
- Ensure the final reamer position was recorded.
- Ensure the cup height settings are in accordance with the size of the cup being used.

To record the depth to seat of the cup:
1. Highlight Depth to Seat.
2. Palpate and touch the rim of the cup with the pointer’s tip and press the pointer’s SELECT button to record.

2.8 Reference System and Calculations

Cup Alignment & Position
There are three distinct definitions of inclination and (ante-)version: the anatomical, the radiographic and the surgical definition*).

Stryker OrthoMap Versatile Hip software’s calculations are based on the anatomical definition of cup alignment.

Anatomical Inclination is defined as the spatial angle between the cup axis and the longitudinal axis derived from the digitized pelvic plane.

Anatomical Anteversion is defined as the angle between the cup axis when projected onto the axial plane and the medial lateral axis derived from the digitized pelvic plane.

Hip Center Shift
Reference for hip center shift is the digitized “Initial hip center”. Medial/lateral and superior/inferior describe the translation of the cup’s center relative to the initial hip center in frontal view. Anterior/posterior describes the translation in lateral view.

Depth to Fovea

The Fovea value in the reaming dialog gives the medial lateral distance between the most medial part of the reamer head and the most medial of the digitized fovea points.

NOTE: If the reamer diameter settings are not in accordance with the size of the reamer head used, the depth to fovea calculation might be compromised.

Depth to Seat

The Seat value in the cup insertion dialog gives the distance between the cup's pole and the intersection point of the cup axis on the final reamer position of the acetabular surface.

For generic cups cup height is needed for depth to seat calculation. For cups integrated in the software only the cup size is necessary for depth to seat calculation.

NOTE: If the final reamer position was not recorded correctly or the cup height/size settings are not correct, the depth to seat calculation might be compromised.

Stem Alignment & Position

Varus/valgus is the angle between anatomical femur axis and the stem axis projected onto the frontal plane.

Version is the angle between the stem's neck axis projected onto the axial femoral plane and the normal of the digitized femoral sagittal plane, representing the posterior condylar axis.

The femoral sagittal plane is defined by the achilles midpoint, popliteal fossa and piriformis fossa.

The anatomical femur axis is defined by the piriformis fossa and the intersection of the transepicondylar line with the femoral sagittal plane. Depending on the software settings, it may also be defined by the piriformis fossa and popliteal fossa projected 50 mm anterior along the femoral sagittal plane.

Femoral Leg Length and Offset Change

The manner in which leg length and offset change is defined depends on the dialog.

During femoral preparation, the femoral head center shift is calculated. Reference is the “Initial hip center” transformed into the femoral coordinate system.

During trial and final reduction, the femur tracker shift is assessed. Reference is the initial femur tracker position digitized with “Leg in neutral position”.
### 2.8 Reference System and Calculations

#### Stem Optimization Algorithm

The algorithm suggests the best combination of parameters following the rules, that long is better than short, lateral is better than medial and leg length has more weight than leg offset.

The diagram shows the different priorities of the parameters for leg length and leg offset.

- The first priority of the algorithm is to avoid leg shortening.
- The second priority is to avoid leg lengthening.
- The third priority is to avoid leg medialization.
- The last priority of the algorithm is to avoid leg lateralization.

The origin mark of the diagram is defined by the planned leg length and leg offset changes.

In the diagram are four possible combinations marked (green points). The algorithm suggests the combination with the smallest number of squares as the best combination.

As the anteversion has a negligible effect on leg length and leg offset, the anteversion is optimized independently if a planned combined anteversion is available.

If available for the implant, the head offset and the neck angle are optimized by the algorithm.

### 2.9 Patient Preparation for Anatomical or Functional Plane Registration

#### Patient Preparation for Anatomical or Functional Plane Registration with Final Patient Position: Supine

If the anatomical or functional plane registration option is selected, the patient preparation routine must include pelvic tracker fixation and patient registration.

The patient preparation workflow depends upon the final patient position and the preferred registration technique.

If the final patient position is supine, the standard patient preparation sequence can be employed, followed by Pelvic Tracker fixation and landmark digitization.

For a direct anterior approach, it is acceptable to place the pelvic tracker on the contra-lateral iliac crest.

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![Diagram showing the different priorities of the parameters for leg length and leg offset.](image-url)
NOTE: Take care to not contaminate the OrthoLock anchoring device when moving the patient into final lateral position.

Option I: Patient fully prepared and in supine for registration

First orient the patient in a supine position for preliminary preparation. After fixating the pelvic tracker and establishing registration, the patient may be moved to a lateral position.

If the final patient position is lateral, there are four possible workflow options to fixate the Pelvic Tracker and digitize the pelvic landmarks.

Option II: Patient partially prepared and in supine for registration

First orient the patient in a supine position. Partially prepare the patient for Pelvic Tracker fixation and pelvic landmark digitization before moving the patient into final lateral position for final preparation.

NOTE: Take care to not contaminate the OrthoLock anchoring device when moving the patient into final lateral position.
3.1 Patient Preparation

Patient Preparation for Stem Navigation & Advanced Reduction

Compared to the standard workflow as described above, advanced features such as stem navigation and reduction with range of motion and joint stability analysis require a Femoral Tracker and digitization of femoral landmarks.

**Femoral Anchoring Device Fixation**

When preparing the leg, a Femoral Tracker must be attached onto the femur using the OrthoLock anchoring device and OrthoLock Ex-Pins. Femoral OrthoLock fixation is accomplished with the patient in final position after pelvic tracker fixation and patient preparation is completed.

It is recommended that the knee be in flexed position during fixation. For an optimal stability use two 4 mm pins and one 3 mm pin to fixate the OrthoLock anchoring device to the bone.

The OrthoLock anchoring device can be fixated to the lateral distal metaphysis of the femur.

The first pin can be placed and the OrthoLock anchoring device can be slid over the pin. The remaining navigation pin holes can be used as drill guides for the second and third pin.

**NOTE:**

Engage the second cortex only. Avoid parallel pin placement.
**Proximal Tracker Fixation**

The femoral tracker can be placed proximal within the main incision.

The OrthoLock anchoring device can be fixated in the lateral proximal aspect of the greater trochanter. The pins shall be placed from posterior to anterior.

**NOTE:**
Engage the second cortex only. Avoid parallel pin placement.

**NOTE:**
Do not obstruct intramedullary canal for broaching and stem insertion.

**Interface Alignment**
To ensure an uncompromised femoral tracker visibility throughout the case, the tracker interface of the OrthoLock must be properly aligned.

The recommended alignment of the OrthoLock tracker interface depends on the final patient position and on the manner in which the hip joint is being dislocated:

- By external rotation (anterior/anterolateral approaches).
- By internal rotation (posterior approaches).

If the final patient position is supine and if the hip joint will be dislocated by external rotation, angle the tracker interface 80°–90° anterior to the frontal femur plane.

If the final patient position is lateral and if the hip joint will be dislocated by external rotation, angle the tracker interface 45° anterior to the frontal femur plane.

If the final patient position is lateral and if the hip joint will be dislocated by internal rotation, angle the tracker interface 45° posterior to the frontal femur plane.
Register Femur

Stem navigation and advanced reduction requires digitization of several femoral landmarks to establish the femoral sagittal plane, the reference for version, varus/valgus and flexion/extension.

Femur registration is done prior to dislocating the hip joint and digitizing the acetabulum.

Leg in Neutral Position

Bring leg into neutral position and press pointer’s SELECT button to record position.

NOTE:
To increase the overall accuracy of the system the recording of this landmark with the tracker is not accepted. Use pointer instead. Do not apply any forces on the patient tracker during registration.

Achilles Midpoint

Position the knee in 90° flexion. Palpate and touch the center of the achilles midpoint with the pointer’s tip and record.

In addition use the pointer to record:

- Medial Epicondyle
- Lateral Epicondyle
- Popliteal Fossa
- Piriformis Fossa

NOTE:
Depending on the approach, dislocate the hip joint to allow accurate piriformis fossa digitization.

Verify Model

With stem navigation, the Model Verification dialog includes the addition of the digitized femur and numerical display of the leg alignment.

For model confirmation, compare leg alignment in situ with the values calculated by the software and confirm.

Adjust Femur System

The Adjust Femur System feature allows to detect unintentional tracker rotation caused by soft tissue stress after registration and its compensation (medial/lateral) concerning the leg offset values.

The Adjust Femur System can be activated in the User Preferences.

For the Adjust Femur System feature a verification point is set during patient registration (leg in neutral position). During broaching, the verification point is registered again, so the system is able to detect an unintentional tracker rotation and to compensate it.
Femoral Broaching
- Attach the instrument tracker and the broach to the broach handle.
- Make sure that the software settings for stem type, head type, planned head offset, neck angle and broach size are in accordance with the implant system components being used.
- During broaching, monitor varus/valgus, version, leg length and offset change.

Changing Parameters Manually
- An orange icon indicates the parameters which are optimized by the algorithm.
- By clicking plus, minus, up and down the parameters can be selected manually.
- The optimization for manually selected parameters is deactivated. Click Optimize to activate the optimization for all parameters again.

When changing the broach:
- Readjust the software’s broach size setting by clicking Size.
- Select Record Position to record the final broach position.

Stem Insertion
- Attach instrument tracker and stem to dedicated stem inserter.
- Make sure that stem type and size, head type and size and head offset, and neck angle settings are in accordance with the implant components being used.
- During stem insertion, monitor varus/valgus, version, leg length and offset change.
- Select Record Position to record the final stem position.

Changing Parameters Manually
- An orange icon indicates the parameters which are optimized by the algorithm.
- By clicking plus, minus, up and down the parameters can be selected manually.
- The optimization for manually selected parameters is deactivated. Click Optimize to activate the optimization for all parameters again.
**Trial/Final Reduction**

The advanced **Trial** or **Final Reduction** facilitates the assessment of leg length and offset change, stability (lift off), and maximum range of motion of the hip joint.

Advanced reduction requires digitization of the hip center with the trial or final implants in place.

**Find Hip Center**

To digitize the hip center, press the femur tracker’s **SELECT** button and slowly circumduct the femur with changing radius.

**Leg length and offset of the hip joint will be calculated. Confirm Yes or No to change or keep the current implant configuration, respectively.**

**Maximum Flexion and Internal Rotation**

In addition, the advanced reduction dialog enables analysis of the range of motion and stability of the hip joint.

Proceed through range of motion as directed by the software, check for potential lift off and record.

**Adjust Leg Length & Offset**

With confirmation of implant configuration change, leg length and offset is displayed in real time.

Implant configuration change requires redigitization of the hip center.
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### Appendix

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(1) Order Dedicated Stem Instruments from Stryker Orthopaedics.

(2) NOTE: OrthoLock EX-Pin 3x110mm is not for femoral use.