Product overview and surgical technique
Every patient moves differently\(^1\) and their total hip replacement should be optimised to account for this. The orientation of the acetabular cup is one of the most important factors under the surgeon’s control\(^2\), and acetabular cup orientation has a significant effect on device performance, including patient outcomes, impingement, edge loading, bearing wear, osteolysis and loosening\(^3,4\).

There remains two key issues with THR today:

1. **What is the target for a well orientated cup?**
2. **Are we able to achieve that orientation?**

Pelvic tilt is an important consideration for a patient’s physiological profile, and the arc of pelvic motion in some patients can be as mobile as 70° and in others as stiff as 5° during functional activities\(^1,10\). This can have significant impact on the functional orientation of the acetabular cup.

**Clinical issue**

**Safe zones**

There have been various attempts to define a ‘safe zone’ for the orientation of an acetabular cup, and increasing evidence to suggest that one generic zone is not applicable\(^5,6,7,8,9\).

**Pelvic tilt**

Figure demonstrating the variation in pelvic tilt (anterior red, posterior blue) for 100 patients throughout a range of daily activities. The variance observed can be greater than 70°.

**Clinical solution**

**What is the optimal cup orientation for an individual patient?**

OPS™ is a state-of-the-art technology platform that delivers potential target orientations unique for each individual. These target orientations are calculated from a dynamic pre-operative functional simulation, which accounts for the patient’s physiological profile throughout a range of daily activities.

Get the full picture. Scan to view the OPS™ introductory video.
Intra-operative tools
It is inherently difficult to position the cup during surgery and achieving a target position is a considerable challenge in THR. It has been shown that up to 50% of surgeries miss the intended orientation\(^\text{11}\) and the chance of hitting a target to within 5° can be as low as 21.5%\(^\text{12}\).

Clinical issue

How is the optimised position delivered during surgery?
Once the target orientation for a specific patient has been decided, a unique guide is produced for the individual. The planned orientation is built into the axis of the guide which is used intra-operatively with a simple laser system to allow the surgeon to deliver on the planned cup orientation.

The following surgical technique outlines this procedure.
Optimizing your practice

The Corin OPS™ is a state-of-the-art pre-operative planning technology and delivery system, designed to enable you to deliver on an optimised acetabular cup position for each of your patients.
Functional safe zone

Every patient moves differently, and the amount of pelvic tilt through functional activities should be accounted for with total hip replacement. OPS™ is designed to optimally orientate a cup within a safe zone, and for the cup to remain within that safe zone as the pelvis rotates throughout functional activity.
Operative technique

1. Laser canister assembly
The laser is inserted into the lower housing and the cap is screwed on securely. The laser should now be permanently on, and the laser dot should be visible across the theatre with the naked eye.

⚠️ Please consult the laser unit safety instructions for the correct handling protocol.

2. Pelvic construct preparation
Assemble the pelvic screw onto the T-handle inserter and place either around the acetabulum within the incision or percutaneously in the iliac crest. Ensure the screw is rigidly fixed into bone.

3. Assessment of guide and model
Screw the bolt into the guide and tighten with the hex handle driver, then place the guide into the acetabular model. There are five reference markings on the acetabular model to assist with locating the guide.
   a. The transverse plane is marked on the back of the acetabular model
   b. The identification of where the guide arms will sit
   c. A projection of the rim of the acetabular component at the planned orientation
   d. A reference line along the top of the fossa which is parallel to the transverse plane
   e. A reference line perpendicular to d

For further visual confirmation refer to the electronic report.
4. Acetabular preparation
Remove the fat pad and remnants of the ligamentum teres from the acetabular fossa. Ensure the thin layer of cartilage is removed from the fossa lip. Identify where the arms of the guide will sit within the acetabulum and ensure all cartilage has been removed from these areas.

5. Guide insertion
Place the guide assembly into the acetabulum using the guide holding forceps and apply a superomedial pressure to ensure it is rigidly stable.
Note: Ensure the guide is fully seated in the fossa.

6. Laser introducer
Attach a laser to the end of the curved guide handle. Holding the guide firmly in place with the forceps, slide the curved guide handle over the guide assembly.
7. Laser alignment
Attach a laser canister onto the adjustable clamp. Lower the assembly onto the pelvic post and secure with dial. Lower the assembly onto the pelvic screw.

Adjust the alignment of the pelvic laser to converge with the acetabular guide laser as projected on the ceiling or wall and secure with dial.

Note: Ensure that the pelvic laser setting is not accidentally altered between alignment and cup impaction.

8. Acetabular reaming
Ream the acetabulum as per the routine technique.

Note: It is recommended to remove pelvic laser assembly from pelvic screw during reaming.
9. Identification of target orientation
After reaming place the pelvic laser assembly back onto the pelvic screw. The position of the pelvic laser on the ceiling or wall may have moved as a consequence of the pelvis moving on the table during reaming and retraction.

10. Cup impaction
Screw a laser canister into the magnetic impactor adaptor and attach to the end of the cup introducer. Place the cup in the acetabulum and adjust the orientation until the laser converges with the pelvic laser on the ceiling or wall. Remove the laser adaptor from the end of the inserter and impact. The laser adaptor can be repeatedly attached and removed between mallet blows to control alignment deviation during impaction.

Note: Ensure the laser adaptor and pelvic laser assembly are always removed during impaction.

Note: It may be helpful to impact lightly to achieve purchase in the desired orientation before full impaction.

11. Orientation confirmation
Visual confirmation of the target orientation can be achieved by verifying that similar amounts of native bone/osteophyte are above or below the cup rim by referring to the reference markings on the acetabular model.

For further visual confirmation refer to the electronic report.
Compatibility guide

Trinity™ shell outer diameter

Taper size

Ceramic liner

Polyethylene liner
(UHMWPE, HXLPE and ECiMa™)

Polyethylene liner
(HXLPE and ECiMa™ only)

Note: Trinity™ compatible with BIOLOX® delta and ECiMa™ only

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Trinity™ 46mm

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Corin
Description
The Corin Optimized Positioning System™ consists of a software component and hardware components. The software component assists the surgeon in determining a target orientation for the acetabular cup through a functional, dynamic and patient specific simulation. The hardware components consist of a patient specific guide, bone model and reusable instrumentation to deliver the target orientation. The system is designed to assist the surgeon in total hip arthroplasty, and is appropriate for all surgical approaches.

The Optimized Positioning System™ can be used with the Trinity™ Acetabular System and the respective compatible components.

Indications for use
The Corin Optimized Positioning System™ is intended to be used as a patient specific surgical instrument to assist in the orientation of the acetabular cup intra-operatively using anatomical landmarks of the pelvis that are clearly identifiable on pre-operative X-rays and CT scans.

The Optimized Positioning System™ including the Patient Specific Guides is intended for use with the Corin Trinity™ Acetabular System for total hip arthroplasty.

The Patient Specific Guides are intended for single use only.

Contraindications
The Optimized Positioning System™ is contraindicated for:
- Patients in which total hip arthroplasty is contraindicated
- Patients with significant orthopaedic deformities, (e.g. fused knee, hip or ankle) anatomical disruption or distortion of the pelvis
- Patients who are unable to comply with imaging requirements
- Patients currently receiving ionising radiation treatment or scans for other medical conditions
- Patients with insufficient bone structure or quality, which may not allow for rigid attachment of instruments
- Obesity, where ability to carry out operative technique using Optimized Positioning System™ components is compromised
- Other disorders that affect pelvic anatomy and bony landmark recognition
- Patients with active infection
- Any other implant system apart from the Corin Trinity™ Acetabular System referenced above.
References:


