Every patient moves differently\(^1\), and the amount of pelvic rotation through functional activities should be accounted for with total hip replacement. Pelvic tilt can change significantly through daily activities\(^2,3\); the arc of pelvic motion has been shown to be as great as 70° through sit to stand activities\(^1\), changing the functional orientation of the implant. No safe zone has ever accounted for this.

\(\text{Cup anteverision (°)}\)

\(\text{Cup inclination (°)}\)

\(\text{Safe zone}\)

\(\text{OPS™ is designed to optimally orientate a cup within a safe zone, and for the cup to remain within that safe zone as the pelvis rotates throughout functional activity.}\)
The arc of pelvic motion has been shown to be as great as 70° through sit to stand activities¹ – DiGioia CORR 2006
Overview

Every patient moves differently 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, and acetabular cup orientation has a significant effect on device performance, including patient outcomes, impingement, edge loading, bearing wear, osteolysis and loosening.

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?

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.

Pelvic tilt
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. This can have significant impact on the functional orientation of the acetabular cup.

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.
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\(^\text{13}\) and the chance of hitting a target to within 5° can be as low as 21.5%\(^\text{14}\).

Clinical issue

Clinical solution

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.
Reference:


3. Au J, Perriman DM, Neeman TM, Smith PN. Standing or supine x-rays after total hip replacement - when is the safe zone not safe? Hip International. 2014


