

# ROSA<sup>®</sup> Hip System

## DELIVERING IMPROVED ACCURACY AND REPRODUCIBILITY VERSUS MANUAL INSTRUMENTATION<sup>1</sup>



A matched-pair cadaveric study compared the accuracy of ROSA<sup>®</sup> Hip to conventional instrumentation (33 hips per group) for direct anterior total hip arthroplasty (THA), both using the assistance of fluoroscopic imaging, in a group of fourteen high-volume surgeons. ROSA Hip was found to be more accurate and more reproducible (fewer outliers) for the acetabular component orientation and leg length discrepancy (LLD).<sup>1</sup>

The advantages of ROSA Hip include: no need for special imaging (no CT or MRI), no bone references (system does not use optical navigation), and no change to the surgeon's individual workflow or surgical approach.

### Acetabular Component Orientation

ROSA Hip demonstrated a lower mean absolute error and a lower variance (fewer outliers) for the acetabular component inclination and version compared to manual instrumentation (Figure 1).

- Acetabular component inclination was significantly more accurate and more reproducible (fewer outliers)<sup>1</sup>

### Leg Length Discrepancy (LLD)

ROSA Hip demonstrated a lower mean absolute error and a lower variance (fewer outliers) for LLD compared to manual instrumentation (Figure 1).

- Leg length discrepancy was significantly more reproducible (fewer outliers)<sup>1</sup>



### Improved Accuracy and Reproducibility of All Parameters for ROSA<sup>®</sup> Hip Cases

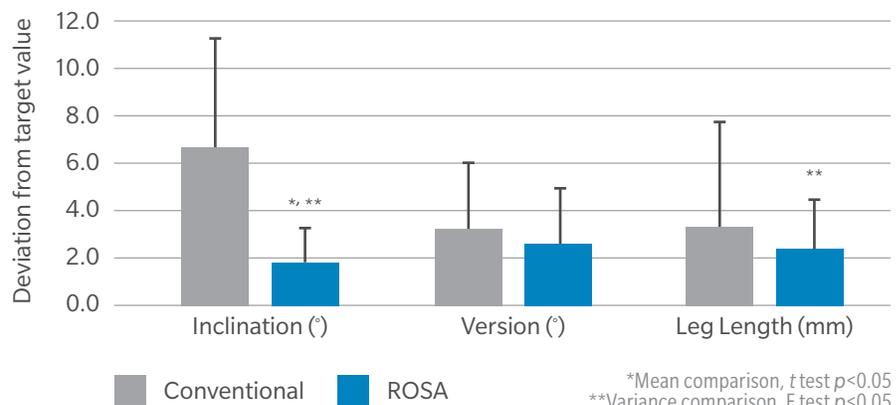


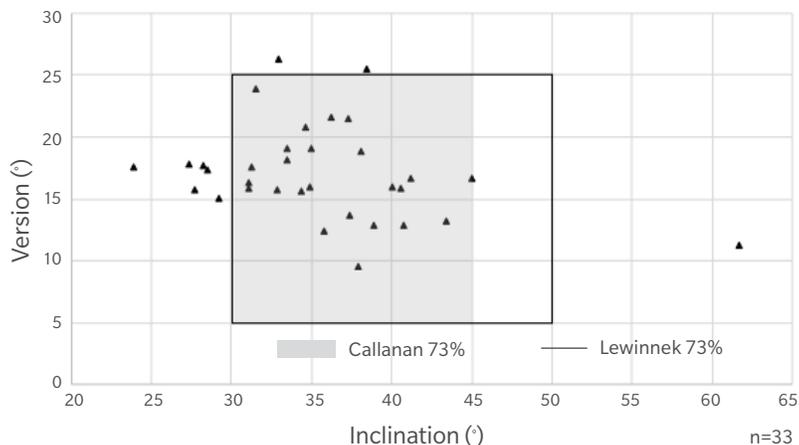
Figure 1. The accuracy of inclination, version and leg length discrepancy (LLD) was determined as the mean absolute error between the intraoperative and target values. \*Significantly lower mean absolute error using Student t test ( $p < 0.05$ ). \*\*Significantly lower variance using F test ( $p < 0.05$ ).

### Percentage of Cases within the Safe Zones

ROSA Hip resulted in significantly more cases within the Lewinnek/Callanan safe zones (fewer outliers) for the acetabular component orientation compared to manual instrumentation (Figure 2).

- 100% of robotic cases versus 73% for manual instrumentation ( $p < 0.05$ )<sup>1</sup>

### Cup Orientation - Manual Cases



### Cup Orientation - ROSA® Hip Cases

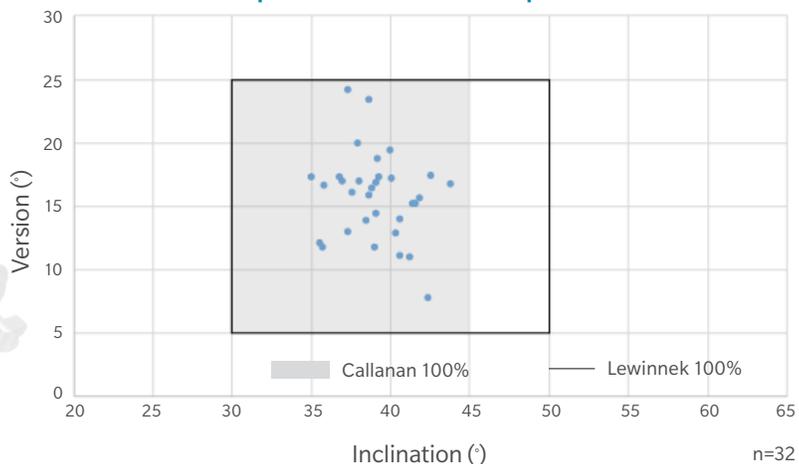


Figure 2. Scatterplots of manual (top) and robotic (bottom) cases within the Lewinnek and Callanan safe zones. The acetabular component orientation is significantly more reproducible (fewer outliers) in the robotic group compared to the manual group ( $p = 0.002$ ).

### References

1. Kamath AF, Durbhakula SM, Pickering T, Cafferky NL, Murray TG, Wind Jr. MA, Méthot S.\* Improved Accuracy and Fewer Outliers with a Novel CT-free Robotic THA System in Matched-pair Analysis with Manual THA. *Journal of Robotic Surgery*. 2021 Oct 28. doi: 10.1007/s11701-021-01315-3. Epub ahead of print. PMID: 34709535.

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Cadaveric studies are not necessarily indicative of clinical performance. Study was funded by Zimmer Biomet.

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