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Accuracy Of The Navbit Sprint®: An Inertial Portable Navigation System For Cup Positioning In THA

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INTRODUCTION

Navigation improves the accuracy of cup positioning; however, it remains underutilised; approximately 6% of hips are computer navigated worldwide[1,2]. Despite low usage, the growing role of technology in THA has generated a surge in the availability of navigation devices.

Three independent studies on the accuracy of the Navbit Sprint® were reviewed and analysed.

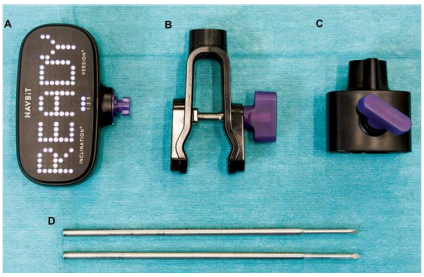


Fig 1: Navbit Sprint® components – the device (A), impactor fitting (B), device mount (C), 2 x 3.2mm pelvic bone pins (D)

NAVBIT SPRINT

The Navbit Sprint system is an accelerometer-based hand-held navigation system for cup positioning in THA.

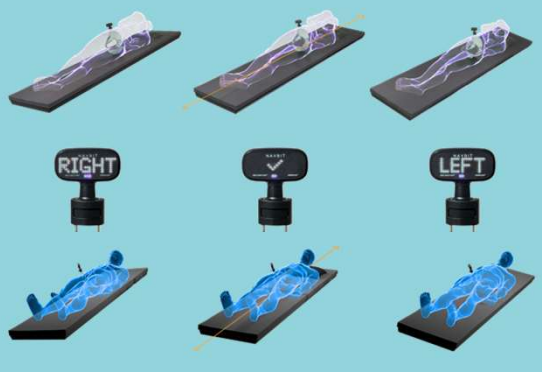


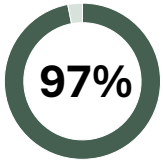
Fig 2: Navbit Sprint uses a novel table tilt method for registration of the functional pelvic plane (FPP):
a) device initially detects the gravity axis.
b) operating table is rotated around patient's longitudinal axis.
c) Third and final axis is calculated when the table returns to starting point (level).

Navbit Sprint® is simple

Adds 3-6 mins[3,4]

Despite concerns around longer operating times with navigation, all studies inferred a low learning curve.

Navbit Sprint® is accurate



Maes & Cossetto[3]
Navigation with the Navbit Sprint was significantly more accurate compared to manual techniques (97% within **10° of target** compared to 88%).

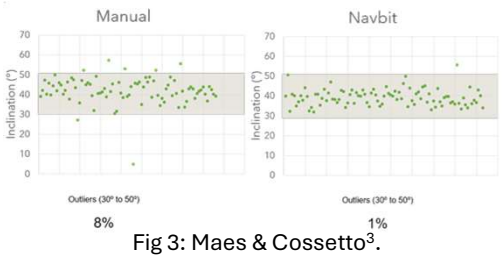


Fig 3: Maes & Cossetto[3].

Tanino et al[4]
Measurement **accuracy within 10° in 98% of inclination and 96% of anteversion.**

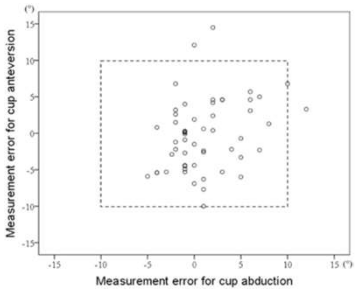
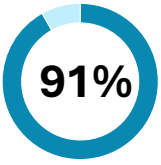


Fig 4: Tanino et al[4].



Tetsunaga et al[5]
91% of were **within 5°** of the post-operative orientation.

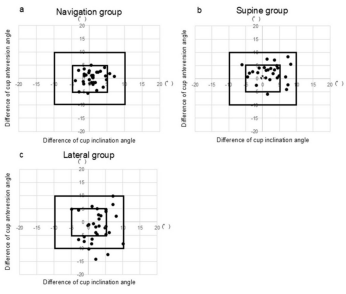


Fig 5: Tetsunaga et al[5].

CONCLUSION

Navbit Sprint® is an accurate and reliable cup positioning tool for THA.

These results support the broader adoption of navigation technology to enhance surgical precision and improve patient outcomes in THA.

REFERENCES

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