ISAKOS
International Society of Arthroscopy,
Knee Surgery and Orthopaedic Sports Medicine

Accuracy of Implant Size Planning using CT-based OTS Hip System in Total Hip Arthroplasty

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improved performance

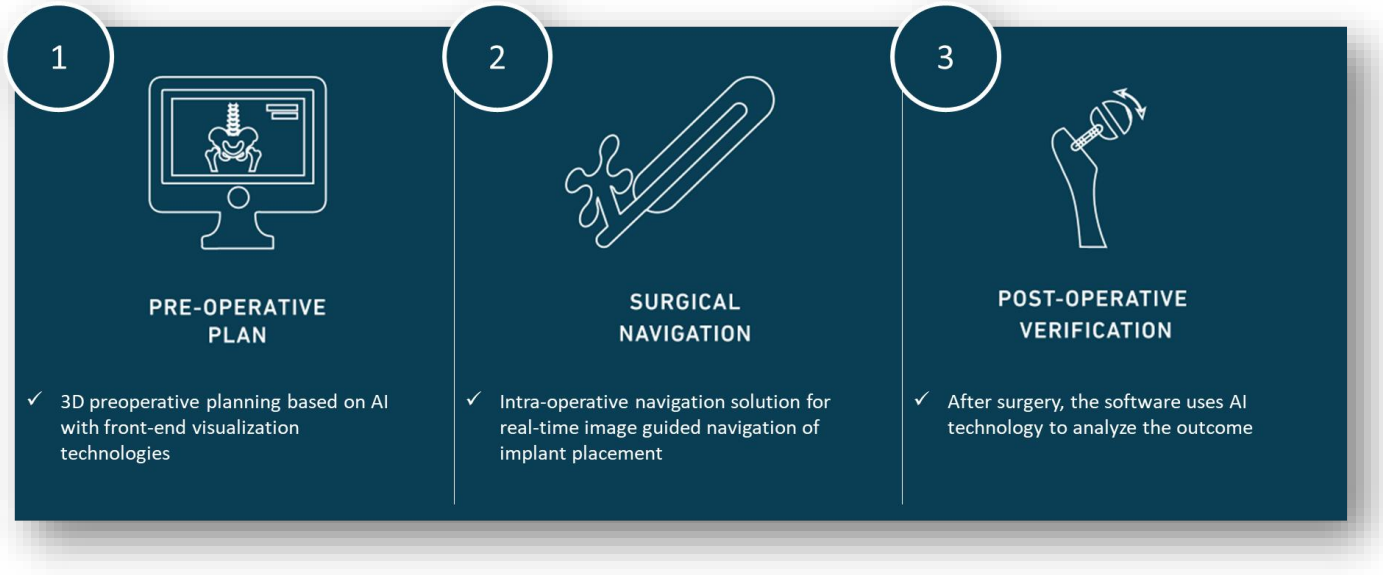
Faculty Disclosure Information

- Two of the authors are employed by Ortoma
- One author has been advisory consultant for Ortoma

Ortoma: Revolutionizing Orthopedic Surgery with AI

Ortoma is a medical device company providing AI-assisted platforms for orthopedic surgeries.

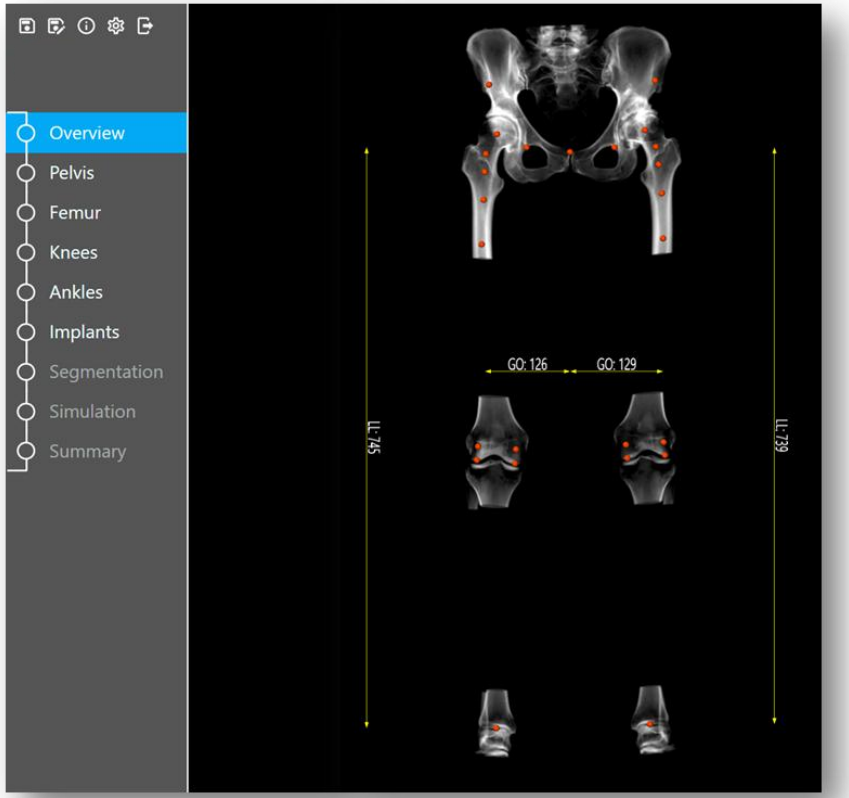
- FDA 510(k), US
  - OTS Hip Plan, Guide
- MDR CE, EU
  - OTS Hip Plan, Guide, Follow-up
  - OTS Spine Plan
- PMDA, Japan
  - OTS Hip Plan, Guide, Follow-up



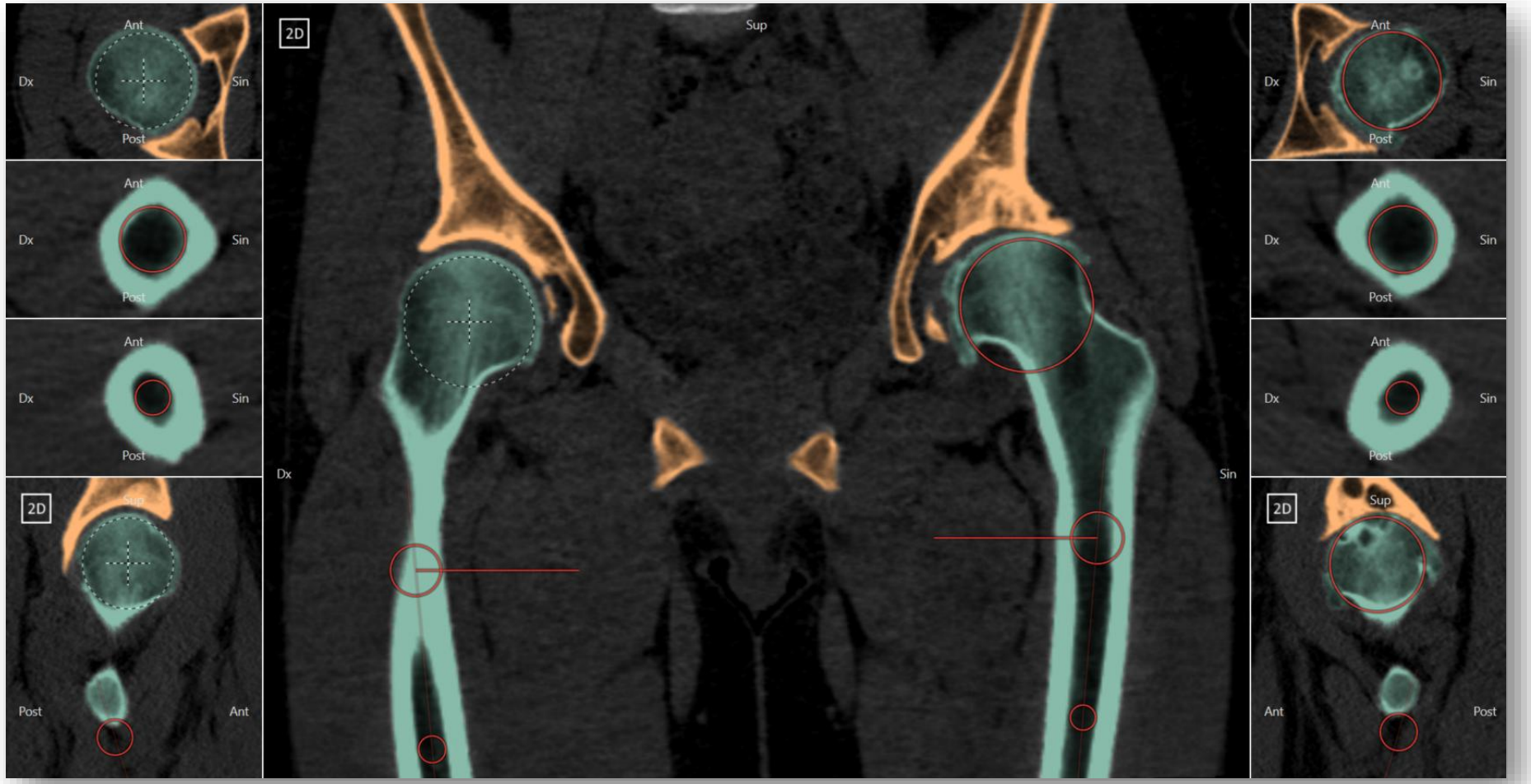
CT-based 3D planning (OTS Hip)

The core of Ortoma Treatment Solution (OTS) is AI-based algorithms developed for:

- Anatomical landmarks detection
- Bone Segmentation
- 3D representation
- Implant size/type/placement suggestion

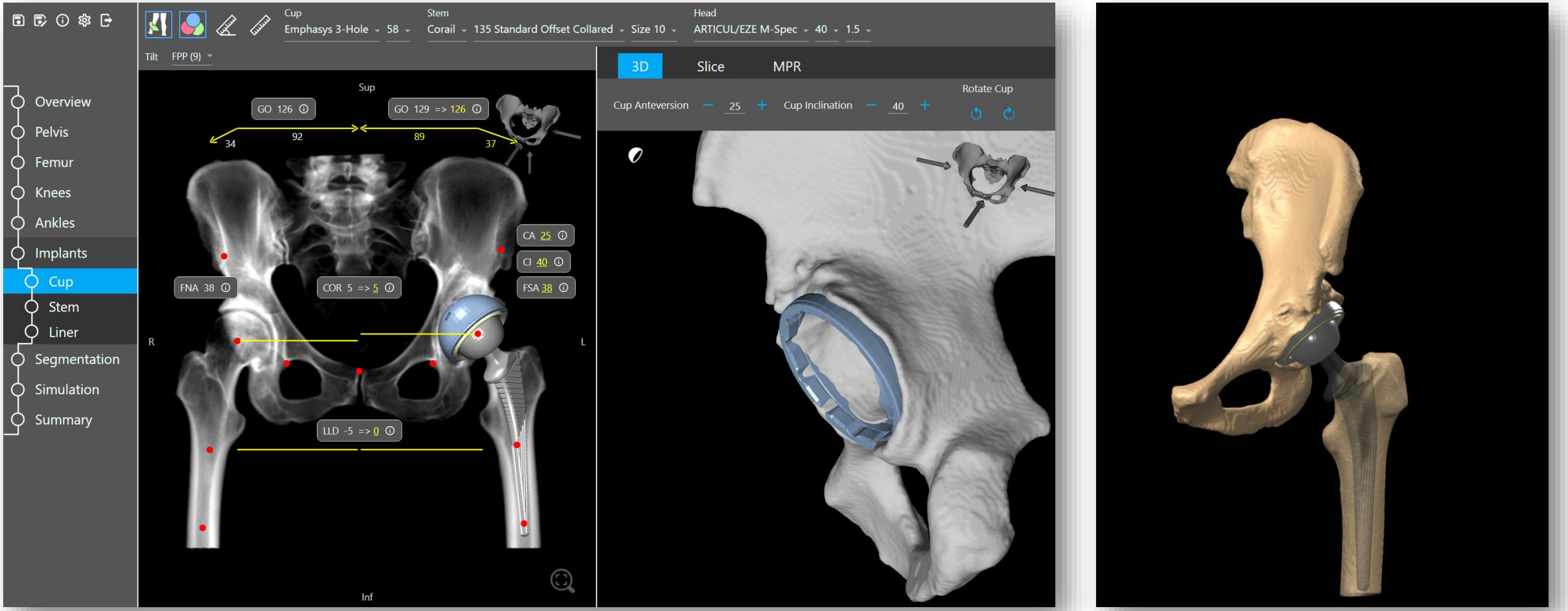


CT-based 3D planning (OTS Hip)



Automatic landmarks detection and bone segmentation

CT-based 3D planning (OTS Hip)



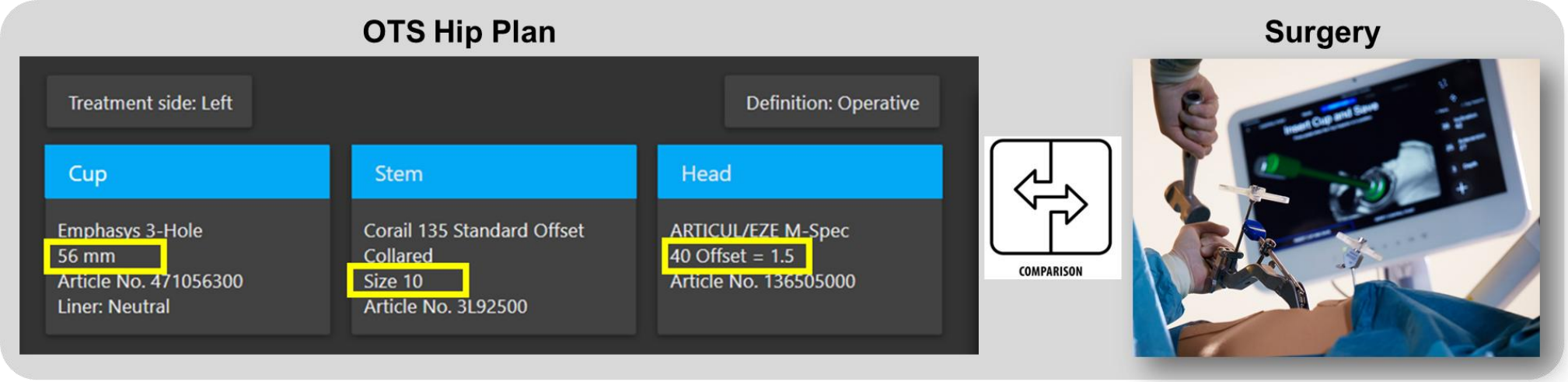
Implant selection and placement & simulation of range of motion

Accuracy Evaluation of Implant Size Planning in OTS Hip

Whether the implant size chosen with OTS Hip Plan accurately matches the actual implant size utilized during surgery?

For accuracy evaluation we are comparing:

- Size of the cup/stem/head implant in pre-op planning, with
- Size of implants utilized during surgery.



Accuracy Evaluation of Implant Size Planning in OTS Hip Patient Data

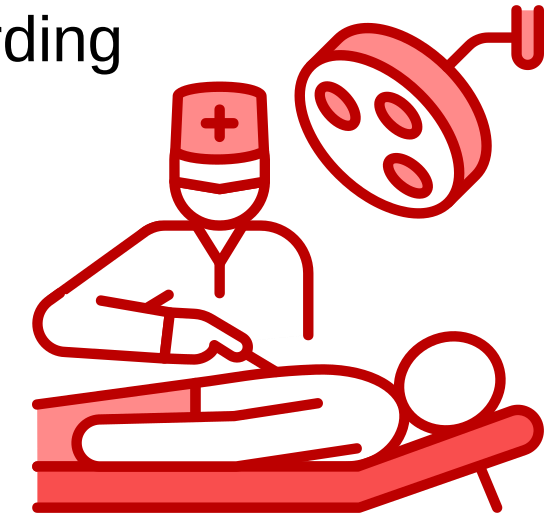
- Clinical study was performed on 32 patients (mean age 59 years, 7 females) who underwent total hip replacement from March 2020 to May 2023 using OTS Hip.
  - One patient was excluded from the evaluation due to severe Legg-Calve-Perthes disease.
- Inclusion criteria:
  - patients eligible for THA.
- Exclusion criteria:
  - patients younger than 18 years old,
  - patients with previous hip surgery or fractures on the treatment side.

Accuracy Evaluation of Implant Size Planning in OTS Hip Surgical Approach

- Uncemented Pinnacle cup and Corail stems (Pinnacle®, Corail®, DePuy Synthes, Warsaw, IN, USA) were used.

- Posterior surgical approach with implantation technique according to the manufacturer’s instructions and protocol.

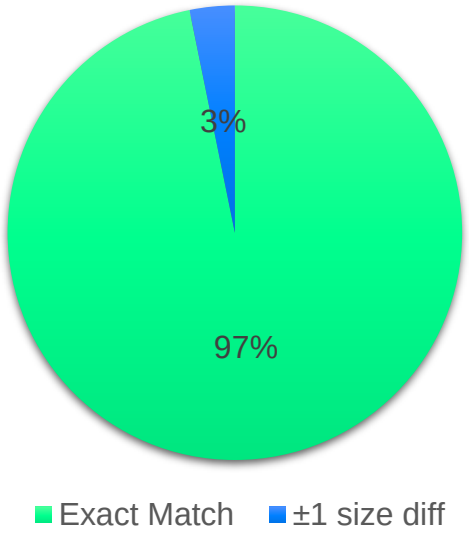
- One experienced surgeon performed all the surgeries.



Accuracy Evaluation of Implant Size Planning in OTS Hip Results

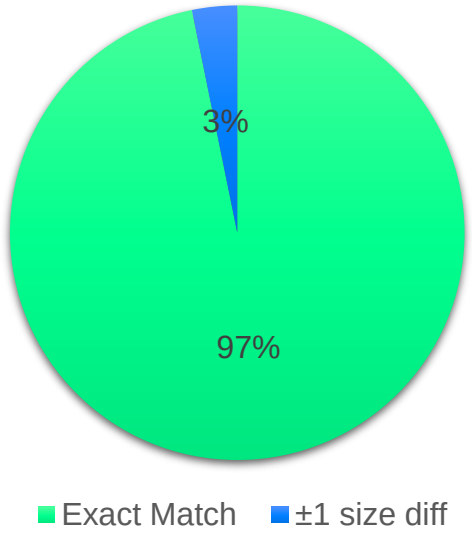
Size of the cup/stem/head implant in OTS Hip plan were compared with the size of implants utilized during surgery (n=31).

Cup Implant



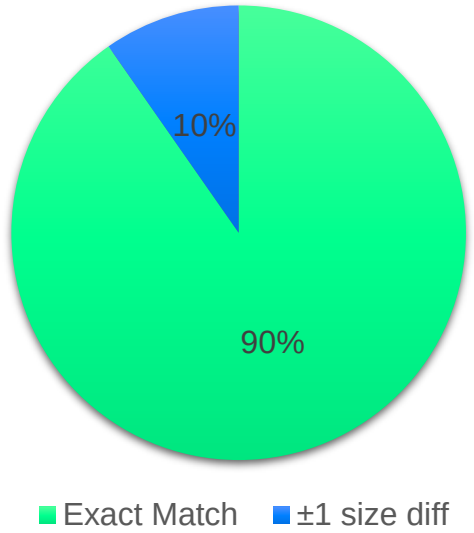
Exact match in 96.8% cases

Head Implant



Exact match in 96.8% cases

Stem Implant



Exact match in 90.3% cases

Conclusion

- OTS Hip planning provides clinically accurate 3D models of the hip joint for surgery preparation.
- Using OTS Hip results in **implant size accuracy of 100% within a margin of ±1 size**.
- Additional possibilities with 3D planning using OTS Hip:
  - Simulation of hip joint kinematic and range of motion
  - Placement of the cup in the “safe zone”
  - Reducing surgery time associated with accurate planning in 3D
  - Improved patient satisfaction

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