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OPTIHIP - A Guide System for Optimal Hip Component Placement

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Researchers and Surgeons at the University of Calgary have developed a surgical guide system which increases the accuracy of acetabular component placement during Hip Replacement Surgery.

Background

Total Hip Replacement is a common and effective surgery for hips damaged by injury or disease. This surgery frequently involves securing an acetabular cup in the pelvis. The optimal orientation for the acetabular cup is patient specific due to individual variation in pelvis geometry. The intended orientation is generally decided from pre-operative images. Accurately achieving this orientation during surgery is challenging due to the hemispherical shape of the cup and can be complicated by extensive soft tissue limiting the surgical access. Any inaccuracies in the placement can lead to pain, damage to the implant and risk of dislocation or revision surgery.

OPTIHIP is a guide system which is configured pre-operatively to the patient specific optimal orientation. During surgery, the OPTIHIP is inserted in the surgical site to establish the reference orientation against the bone of the pelvis. Orientation markers are then temporarily attached to bone. These orientation markers then form an accurate guide which can be followed by the acetabular reamer and/or impactor to ensure accurate orientation and position for the acetabular cup.

Areas of Application

- Total Hip Replacement surgery.
- Orthopedic training allowing a resident surgeon to illustrate their intended positioning of the acetabular cup for confirmation prior to component placement.

Competitive Advantages

- OPTIHIP forms an accurate reference to give precise alignment and orientation of an acetabular cup.
- The system does not constrain other surgery tools – allowing the surgeon flexibility, in cases where alternate placement is indicated during surgery.
- Position references are established relative to the bone itself, ensuring accuracy even if the patient moves during surgery.
- Compatible and useful during intra-operative X-ray.
- Simple and intuitive in use.
- Reference system is minimally invasive and removed during primary surgery.



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- Disposable device with modest manufacture costs.

Stage of Development

A prototype OPTIHIP device has been built and tested by an orthopedic surgeon using pre-operative patient images and an artificial pelvis.

Intellectual Property Status

Patent filed.

Publications

In review.