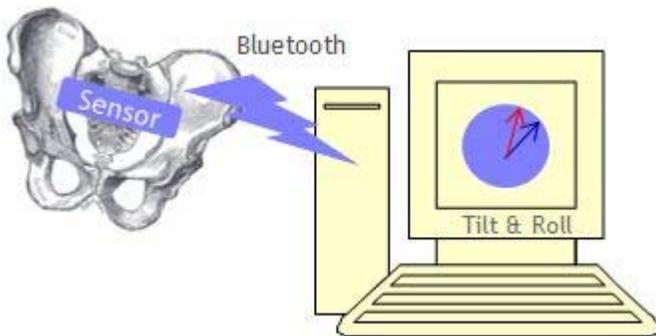


How is Your Patient Lying?

Summary

Orthopaedic surgeries are some of the most successful interventions currently performed. Hip replacements in particular are now expected to exceed twenty years of use when properly implanted. However, during the surgery the patient is usually fully covered in sterile drapes and therefore the true orientation of the hip cannot be determined accurately. An error of only a few degrees can result in malpositioned implants and substantially reduced device longevity. In collaboration with Massachusetts General Hospital, CPG has developed a low-cost, disposable solution to this problem.



Description

Implant position is critical for patient comfort and device longevity. More experienced surgeons generally are more reliable at achieving the manufacturers tolerances, but even they can have difficulty compensating for the one variable they have no control over. Once the patient has been initially positioned, they are covered in surgical drapes. Although usually they are held in place by rigid posts or bags, the surgical procedure can often involve drastic motions during the dislocation and reaming steps of the surgery. It is highly likely that the patient has moved during these steps but with no external reference it is virtually impossible for the surgeon to determine this without the addition of expensive hardware. The device described here addresses this concern without the need for expensive and complex ancillary equipment.

Discussion

A simple battery powered system comprised of orientation sensors and wireless communications can be built on an adhesive pad not much bigger than a quarter. This system can be used to stream orientation data to monitor station or hand-held unit to either warn of incorrect patient orientation or allow the surgeon to orient the patient within the acceptable range of angles. This tool would help all surgeons, but in particular lower-volume surgeons would benefit from this additional feedback in helping optimize their implant positioning without substantially changing surgical procedures.

Markets

- Improved implant position decreases wear and increases longevity
- Literature evidence suggests all surgeons would benefit
- Low-volume and inexperienced surgeons likely to benefit the most

