

## **Key Facts about Computer Navigated Orthopaedic Surgery**

### **Computers have become widespread in all areas of life over the last few decades so why not orthopaedic surgery?**

Knee replacements rank as one of the most successful operations available in the NHS today. Returning patients to standing and walking on a pain free knee means allowing them to return to the activities that make life worthwhile such as playing with grandchildren, or return to work. As demographics change towards an older, more active population, the techniques used in knee replacement need to be suitable for the baby boomers—or baby zoomers as the more active and wealthy older folk have been dubbed.

Traditionally knee replacements have been implanted using a variety of mechanical jigs which allow a surgeon to shape the bones of the knee so that the components of the knee replacement fit securely on the bones. These mechanical instruments do a great job in making what was once a variable operation into a reproducible procedure, however they are made to fit a wide proportion of the population and so are based on anatomical averages. Now surgeons are using computers to take the procedure one step further making each patient's knee replacement bespoke; it is this small but significant difference that appears to make the difference in patient function.

### **How does the computer navigation work?**

Trackers are attached to the patient's bones allowing a camera to see their relative position.

Smart instruments allow the surgeon to position cutting blocks with respect to the anatomy. Cuts can be measured for their accuracy and the kinematic function of the knee can be assessed on the operating table.

### **How does the patient benefit?**

Studies have shown that patients with better aligned knee replacements leave hospital faster and have better function<sup>1</sup>. Navigation has been shown to align knees better when compared to ordinary instruments<sup>2</sup>. It is this combination which gives clinicians such hope that patients stand to benefit from having their knee replacements put in with computer navigation.

### **So is this the future of knee replacement?**

Looking at the way computers have added to all of our lives it is hard to say that they will stay out of orthopaedic surgery — they are already common place in other disciplines such as neurosurgery. Having said that it is clear that progress must be led by patient benefits and as the evidence around computer navigation grows the future looks certain to be better for at least some of the 60,000 plus<sup>3</sup> knee replacement patients who undergo surgery every year.

<sup>1</sup> Longstaff L. M., Sloan K., Stamp N., Scaddan M. Beaver R. J. **Good Alignment After Total Knee Arthroplasty Leads to Faster Rehabilitation and Better Function.** *The Journal of Arthroplasty* Vol. 00 No. 0 2008.

<sup>2</sup> Chauhan S.K., Scott R.G., Breidahl W. Beaver R.J. **Computer-assisted knee arthroplasty versus a conventional jig-based Technique: a randomised, prospective trial.** *J Bone Joint Surg [Br]* 2004;86-B:372-7.

<sup>3</sup> NJR Annual 4th Annual Report