

Navigation for accuracy

Navigation during orthopaedic operations can help surgeons achieve greater accuracy, but the system must be affordable and user friendly in order to be efficient. Orthopaedic surgeon Dr Karl-Heinz Widmer of Spitaler Schaffhausen in Switzerland and Christian Calame, head of sales and marketing at **Naviswiss**, discuss a new way to tackle navigation.

To what extent can navigation improve post-surgery quality of life?

Dr Karl-Heinz Widmer: After total hip replacement, the patient should almost feel like they are living with an unaffected hip joint. This requires optimal surgical techniques for restoring or correcting anatomy, and navigation plays a key role in achieving the component positioning for best joint stability and tribology. We intend to minimise the risk of complications while maximising the patient's comfort and implant longevity. 3D planning is evolving in prosthetics, and navigation is the proper tool to transfer this patient-individual planning into surgery.

What do surgeons look for in a surgical navigation system?

KW: I have used navigation systems throughout my career as an orthopaedic surgeon. They have given me additional confidence in all surgeries, but particularly in the difficult ones. It helps me to implement my pre-operative planning individually for every patient. I am a great advocate of the combined safe zone, which – with a total hip replacement – describes the matched alignment of cup and stem from a functional point of view. I expect navigation to provide this information in a simple and understandable form.

Can you please give us a quick rundown of the Naviswiss navigation unit and how it's used?

Christian Calame: Think of the navigation unit as an additional surgical instrument. It enters the surgical field for a certain task and goes back to the instrument table right afterwards. In a total hip replacement, for example, it is briefly used to measure some anatomical landmarks at the beginning. Later on, it is used to indicate inclination and anteversion during cup impaction, and also to control leg length and offset during stem implantation.

What has been your experience using the Naviswiss unit during surgery?

KW: We had stopped using navigation for total hip replacement because the burden was outweighing the benefits. When Naviswiss approached us with its concept, we found it very appealing. It provides all the information we need, and yet it is simple and smart enough to be used on a routine basis. Operating room (OR) personnel quickly accepted it, which indicates that it is easy to use.

Can you tell us about Naviswiss as a company?

CC: We set out a while ago to make surgical navigation smaller and more affordable. Orthopaedic surgeons told us that they would use navigation more routinely if it wasn't so clumsy and expensive. They strive for better patient outcomes, and navigation is seen as a tool to avoid any occasional outlier, and to better control implant alignment



Naviswiss can afford surgeons greater accuracy when operating.

and leg length. So we miniaturised the technology and made it simpler, and in doing so it became more affordable.

What were some of the challenges of developing it to be simple, compact and affordable?

CC: The real challenge was the NAVItags. Similar to the arrays of reflective spheres or LEDs of conventional navigation systems, they are fixed to the patient's bone with screws, pins or clamps. So, they had to be small, robust and insensitive to disturbance such as blood, water and glaring OR lights. And most importantly, they had to be very precise to achieve accuracy of minimum 2mm for leg length or 3° for cup alignment.

Is this a worthwhile investment for hospitals?

KW: Every organisation and every health system faces its own challenges. What we all have in common are demanding patients, difficult cases, small incisions, busy schedules, and changing personnel, to name a few. I am convinced that the Naviswiss system addresses all these requirements; that it saves time in the OR, that it produces higher-quality results and that the small additional efforts will be rewarded by more happy patients.

What is next for Naviswiss?

CC: Our appearance at the American Academy of Orthopaedic Surgeons (AAOS) annual meeting will be an important milestone. Meanwhile, our new technology becomes available to healthcare providers in Europe where we work with distribution partners to ensure competent customer support. Research and development continues to access additional fields of surgical navigation such as knee replacement. ■

Further information

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