Robotics: making knee surgery more accurate and cost-effective

Robotics are revolutionising the way knee surgeries are carried out. Mr Simon Jennings says the benefits were immediately obvious.

Robot-assisted surgery may seem futuristic, but it's already making a huge difference for total knee replacements and is proving to be something of a hit among specialists.

The technology works by first enabling the surgeon to build – in real-time – a three-dimensional image of the knee via sensors attached to the thigh and shin bones. Surgeons are able to



Mr Simon Jennings MB BS, FRCS (Orth), Dip Sports Med, MFSEM (UK)

Deputy Clinical Director, Orthopaedics, Lead For Orthopaedic Enhanced Recovery, London North West Hospitals NHS Trust "The improved accuracy of implant placement will further improve the longevity of implants, too." build an accurate blueprint of the knee and the leg's alignment, as well as plan their course of action.

"On the computer, during the operation, I create a patient-specific plan. I've mapped out the knee, I've worked out what sizes of implants I need. I position them on the model to work out the perfect position and shape to restore the patient's anatomy and functional range of movement," Mr Jennings says.

The robotic handpiece improves accuracy

"The clever bit at the end of it, and the more robotic part, is the handpiece – a computer-controlled, high-speed burr that cuts exactly and only where I have planned on the knee model I created."

The level of accuracy for surgeons is what sets this technology apart from the older, more 'analogue' techniques. That accuracy allows surgeons to replicate exactly what they've planned, which simply wasn't as accurately achievable when using the naked eye.

Faster recovery time likely for total knee replacement patients

Mr Jennings thinks that improving the accuracy of implant

The power of robotics-assisted knee replacement

The NAVIO Surgical System brings the benefits of CT-free navigation, intraoperative surgical planning and handheld robotics to knee replacement surgery.



Supporting healthcare professionals



placement is likely to have a hugely positive knock-on effect for patients and the NHS.

"Patients actually get up and out a bit quicker, and the knee should feel normal a bit quicker," he says.

"The robotic system will limit your cutting to just what you need to cut, and fine-tune it to a greater degree of accuracy. It is a huge leap forward."

This new method could be presumed to be more expensive than the traditional forms of surgery. In fact, Mr Jennings believes the practice will prove more costeffective for patients and the NHS in the long-term.

Previously, trays upon trays of

instruments would be wheeled in to surgery in order to fit all shapes and sizes of knee. "We just don't have to do that any-

more. I can work out exactly what size I want to use, saving the costs of sterilising unrequired instruments."

The improved accuracy of implant placement will further improve the longevity of implants, too. By ensuring they are placed correctly and in a balanced fashion, they'll be less likely to wear.

"It definitely gives me a degree of precision we never previously had," Mr Jennings said.

We are looking closely at our patients to show how the whole package of the total knee replacement process can be improved. From patient experience in the clinic and in-patient admission, to the post-surgery outcome, satisfaction and longevity.

"The ultimate

goal is for people to

forget they've had

a knee

replacement."

"It's early days, but the initial signs are incredibly positive."

James Alder

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A less invasive patient experience



Mr Matthew Bartlett BA FRCS(Orth) Consultant Orthopaedic Surgeon, London North

West Hospitals NHS Trust

Navigation systems have been in use since 2005, but the new robotics element will mean greater accuracy, less invasive surgery and should lead to less hospital time for patients.

Robotics are already making a tangible difference to total knee replacements, according to Consultant Orthopaedic Surgeon, Mr Matthew Bartlett. He says, improving surgeons' ability to perform more accurate and less invasive surgeries can improve patient outcomes in the long run. "What we hope is that this will make total knee replacements more consistent and reproducible across the board," he said. That could, in time, lead to the NHS being able to offer implants that feel far more like a normal knee. "The ultimate goal is for people to forget they've had a knee replacement. Hopefully, this technique will allow us to use implants with a greater functional range in the future."

Increased accuracy to reduce recovery times

Increased accuracy is a key benefit of the new technique, with anecdotal evidence already pointing towards better patient outcomes. Mr Bartlett stressed that it is early days, but he expects the improved leg alignment that comes with using the technology to have a positive knock-on effect for recovery times and long-term mobility.

Use of the robotic hand piece also means a less invasive experience for patients, reducing swelling and stiffness. Traditional techniques would often cause substantial bleeding, leading to swelling after the operation. Mr Bartlett hopes this effect will be less prominent with the use of robotics.

Less radiation and less costly scans

Other similarly accurate systems use a CT scan for planning, which exposes patients to substantial doses of radiation. Avoiding this also means fewer hospital appointments for the patient and a more cost-effective solution for the NHS. Time will prove how much patient outcomes can be improved by robotics,

but Mr Bartlett says his patients are mobilising better in the short-term, which should lead to a brighter long-term outlook.

James Alder



JOURNEY PFJ Knee System

JOURNEY UNI

Knee System

