A Patient's Guide to Robot-Assisted Hip and Knee Arthroplasty

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WHAT IS HIP AND KNEE REPLACEMENT SURGERY?

Hip and knee replacement surgery involves replacing arthritic (worn out) parts of the hip and knee joints with implants call prostheses. These implants are made of metal or ceramic and have a specialist plastic (polyethylene) liner between them to enable the joint to move as normally as possible.

CURRENT REPLACEMENT SURGERY?

The accuracy with which these implants are placed may influence both how well the hip or knee joint replacement functions and how long it lasts. For many years jigs have been used to guide the surgeon. These are placed in or along the bone. There is occasional some movement in the system and potentially small inaccuracies in implant positioning may not be obvious at the time of surgery. Additionally, the jigs are set with limited range and aim to set the implant in the same place for every patient, which may not always suit everybody as people come in different shapes. It is not known if this makes any significant difference.

WHAT IS DIFFERENT ABOUT ROBOTIC SURGERY?

Robot-assisted surgery uses computer software to analyse x-rays or CT scans to create virtual models of the joint. These are used to map out, potentially the best position for the implants for that individual patient, based some predetermined measures thought to be optimal. During surgery, the surgeon can map out the anatomy and cross compare with the model and can try different positions of the implant to match the patient's anatomy before any cuts are made. When ready, some robots may also help the surgeon to make the cuts for the implants with possibly more accuracy. The robot isn't doing the operation, the surgeon is right there operating as usual, but the robot will help guide them to do so according to the predetermined plan.

DOES ROBOTIC SURGERY MAKE ANY DIFFERENCE?

The evidence so far suggests that Robot-assisted hip and knee replacement surgery achieves the target alignment of implant positioning more often than conventional non robotic hip and knee replacement surgery. However, the technology is still relatively new, and so we do not know if this will mean any difference in clinical outcomes or longer lasting joint replacements. Studies investigating this are ongoing.

WHAT ARE THE DIFFERENT TYPES OF ROBOTIC SYSTEMS?

There are various types of robotic hip and knee systems in use. These systems differ based on the type of imaging (x-rays or CT scans) needed, the computer software used, and the level of help provided during surgery. It is important to remember that with almost all modern robotic systems, the surgeon will still do the operation, and the robotic machine will only assist with the accuracy of implant positioning.

WHAT ARE RISKS ASSOCIATED WITH ROBOTIC SURGERY?

Robot-assisted surgery has some extra risks compared with non-robotic conventional hip and knee replacement surgery. Robotic surgery may require additional x-rays or CT scans, which are associated with extra radiation exposure. Some robotic systems also require additional skin incisions for the insertion of pins to track bones around the joint during surgery. These pins leave holes in the bone after surgery which means a small additional risk of the bone breaking or infection. It is important to speak directly with your Orthopaedic Surgeon about the robotic system in use within your hospital and the additional risks and complications specific to this.

WHERE CAN I GET MORE INFORMATION?

If you have any specific questions related to the robotic system in your hospital, it is best to directly contact your Orthopaedic Surgeon for more information.