



## **Position Statement regarding Robotically-Assisted Knee Replacement Surgery**

***This position statement has been modified from one developed by the Arthroplasty Society of Australia (ASA) in collaboration with the Australian Knee Society (AKS), both being Subspecialist Groups within the auspices of the Australian Orthopaedic Association (AOA).***

### **Background**

*All knee replacement surgery requires the creation of an operative plan and a means of executing that plan. Historically, mechanical alignment instruments were, and still are, used successfully to prepare the bone for the joint replacement prostheses. First introduced and reported in the late 1990s, Computer Assisted Surgery (CAS), otherwise known as Computer Navigation, gradually became the Gold Standard for this: and indeed, has now been proven to be more accurate with bone preparation and alignment. In some studies, including a review of cases recorded in the Australian National Joint Replacement Registry (NJRR), it has also been shown to produce improved survivorship, with a lower revision rate in younger patients, compared to surgery using conventional mechanical alignment instruments.*

*In the early 2000's came the development of Patient Specific Guides (Image-derived customised alignment and cutting guides) as another means of achieving accurate bone preparation. Whilst making the surgery simpler and quicker, the accuracy of these guides has been shown to be less reliable than Computer Navigation which still remains the Gold Standard.*

### **Robotically-assisted Surgery**

*Robotic technologies have been developed with the aim of improving surgical precision, component alignment and soft-tissue balance, with the expectation that this improvement will result in better patient outcomes. Robotically-assisted Joint Replacement Surgery may include an image-derived preoperative plan, the use of computer-assisted orientation for positioning (based on Computer Navigation), and the use of robotically-assisted cutting or burring tools for bone preparation.*

*Whilst robotically-assisted surgery has been met with optimism, it will take time to obtain the necessary scientific data to be able to clearly outline its role, as it may be many years before the benefits of improved alignment and balance are realised. These changes come with added costs to the health budget and a potential for increased operating time with its attendant risks: hence, close monitoring of outcome data will be imperative when trying to see if such technology is leading to improved results.*

*There are encouraging 2-year results from the NJRR which show that robotically-assisted partial knee replacement has an improved revision rate when compared to non-robotically-assisted partial knee replacements, but of course, that is a very short follow up period.*

*As robotically-assisted total knee replacement has only more recently been introduced, results for this technology in those scenarios are not yet known.*

### **Conclusion**

*All new technologies and techniques require ongoing research and continual assessment of outcomes before a definitive role can be established for them.*

*There is currently insufficient evidence to show that Robotically-Assisted Surgery delivers better outcomes for Total Knee Replacement, but there are some early results which may suggest that it benefits Uni-Compartmental Knee Replacement*

### **Disclaimer**

*This statement is a modified expression of the policy of the Arthroplasty Society of Australia, made in consultation with, and supported by, the Australian Knee Society. It is not a comprehensive review of the subject nor is it intended as medical advice for the treatment of individual patients. More detailed information representing Dr Holt's current views can be found under Patient Information / Knee Replacement / Robotic Surgery.*