



The role of the surgical care practitioner in robotic thoracic surgery

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It is now over 20 years since the first cases of robotic lung resection were reported and there has since been a growing body of literature supporting robotic assisted thoracic surgery (RATS) with good clinical outcomes¹. A 2014 Society Thoracic Surgeons database study demonstrated potential benefits to RATS when compared with open or video-assisted thoracoscopic (VATS) surgery, through decreased mortality and reduced length of hospital stay². VATS has long been compared with open surgery, and randomised trial evidence now shows that VATS performs favourably, with lower in-hospital complication rates, less pain, and reduced readmissions³. Both are minimally invasive, using small incisions and no rib spreading. However, with current technology, robotic surgery offers several technical advantages, with high resolution and magnified binocular vision providing a stable, immersive field and clear benefits during complex dissection.

Successfully implementing a robotic thoracic surgical program is reliant on many factors and like all surgery, on the full theatre team working efficiently and harmoniously. A trusted, skilled bedside assistant is essential in robotic surgery. They must pair strong operative skills with comprehensive knowledge of the robotic system, including troubleshooting. Surgical Care Practitioners (SCPs) have a long track record in cardiothoracic surgery and can provide this support, forming a core part of successful robotic thoracic programmes.

The unit's senior surgeon recognised that, when introducing the programme, it was vital to maintain

excellent clinical outcomes and uphold patient safety while ensuring the same high standard of service delivery seen in non-robotic thoracic surgery. With these priorities in mind, the decision was made to appoint an SCP as the surgical assistant. Established professional relationships further strengthened cooperation, promoting the efficient use of theatre time. The program has flourished with our robotic access fully utilised, regularly undertaking three robotic cases per working day and the need for more access to robot lists as our only limiting factor. With three SCPs now supporting the program, the process is streamlined and resilient.

A review of our data shows that a typical time from positioning the patient for surgery to the console surgeon starting to operate of under 10 minutes. This is a result of well-established ways of working, familiarity in the process, and SCP competence in inserting ports and docking the robot efficiently. This streamlined process allows for increased productivity during operating lists. It is our experience that SCPs show a great pride in the work they are delivering which is another positive factor in delivering high quality surgical care.

The landscape in thoracic surgery is constantly changing, with the results of two randomised controlled trials demonstrating the benefit of pulmonary segmentectomy. Short- and longer-term results of patients operated upon for early stage non-small cell lung cancer (2cm or less) are proving favourable^{4,5}. This is on the background of increased detection of early stage lung cancers within screening programs. Our unit covers areas with active



lung screening programs with an increased workload over recent years is related to both diagnostic and resectional workloads. This necessitates consideration being made as to how to continue improving productivity and output.

Thoracic cancer pathways are increasingly complex as personalised care embeds technologies such as electromagnetic navigational bronchoscopy and molecular profiling. Personalisation adds value, but can prolong care, for example when a small pulmonary lesion undergoes navigational bronchoscopy, returns negative, then still requires diagnostic wedge resection and, after non-small cell lung cancer is confirmed, a completion lobectomy, adding time, burden and resource use. A streamlined alternative is direct to segmentectomy to diagnose and treat small nodules. Robotic segmentectomy has been shown to be safe and effective⁶. Because segmentectomy is technically demanding, especially via closed chest approaches, expert consensus highlights its challenge relative to lobectomy⁷. This is precisely where a trusted SCP assistant is critical for safety, troubleshooting and theatre efficiency. A review of our robotic segmentectomy data with an SCP assistant shows an average procedure console time of 67 minutes with no conversion to open procedures. Essentially this is a procedure that definitively manages a patient and can be done safely and effectively. It is perfectly reasonable that three such procedures could be done in a working day.

Changes in thoracic surgery affect patient care, service delivery, and training. The range of procedures now requires focused training, and trainees must also gain expertise with an increasingly diverse set of devices. Training in robotic thoracic surgery is a current priority, with work under way to understand perspectives and challenges⁸. Robotic surgery presents different training issues from open surgery and VATS. A dual console allows two surgeons to operate together and share the same view, which alters how skills are taught. For trainers, the key concern remains remoteness from the table if a complication arises. Training is best supported by an SCP at the table, allowing trainer and trainee to concentrate fully on the procedure with an experienced assistant present.

There is also the training of the SCP to consider, where the Royal College of Surgeons has produced a curriculum framework for the surgical care practitioner⁹. It outlines the role and scope of practice in a wide-ranging document, acknowledging the benefits they can bring to surgical services complementing medically trained colleagues. Our program has utilised SCPs who are all experienced in thoracic surgery, skilled in assisting during open surgery, and piloting the camera during VATS anatomical lung resections. Hospital governance protocols were followed on initially proposing this approach and the training followed as recommended by Intuitive. The program has now become self-sufficient and such that experienced robotic SCPs are able to teach and train both trainee SCPs and also surgical trainees on key aspects of being the bedside assistant. An increased number of trained SCPs means being very well placed to increase robotic work into additional days as access allows.

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