



Certification for minimally invasive thoracic surgery: is your surgeon ready?

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The introduction of minimally invasive approaches in thoracic surgery has shown continued promise through a myriad of quality and oncology metrics. Studies have shown favorable comparative effectiveness between minimally invasive approaches and open resection of both benign and malignant pathology. Video-assisted thoracoscopic surgery continues to expand since the early 1990's with versatility in its applications. Similarly, robotic-assisted thoracoscopic surgery ushered in another instrument into the thoracic surgeon's armamentarium since its debut in 2000 with ongoing support and application for thoracic surgery with favorable results. Ongoing investigation and debate continues regarding advantages/disadvantages and cost effectiveness of video assisted versus robotic assisted thoracic surgery. Regardless, robotic thoracic surgery is here to stay with applications based on individual patient selection and surgeon preference. More recently, fast track or enhanced recovery after surgery pathways are pushing the limits of perioperative care with reduced length of stay, improved pain, and faster recovery with higher patient reported satisfaction and outcomes when paired with minimally invasive surgery. As such, surgical training for thoracic surgery presents new challenges for proficiency in both open and minimally invasive techniques in a realm where open approaches are utilized less often.

Liu and colleagues (1) should be highly commended for their efforts to propose novel guidelines towards answering a long over due call-to-action for standardized training regimens and proficiency for minimally invasive thoracic surgery certification (2,3). There remains a

paucity of evidence based on this topic and the majority of conclusions are based on expert opinion. We agree with Liu *et al.* (1) and acknowledge the importance of preparation through didactics, observation, simulation, and hands-on experience (4). Didactics should include basic thoracoscopic and robotic principles/technology, function and ergonomics, patient selection for appropriate approach, troubleshooting with indications for open conversion, and team communication. Training modules should include simulation credits that reflect skill proficiency and an understanding of operative steps through dry and cadaveric/perfused biologic models. Operative observation and hands-on experience occurs in a stepwise fashion through demonstration of progressive understanding obtained by graduated responsibility. While demonstration of case counts as second assist/first assist/surgeon proposed by Liu *et al.* (1) quantify necessary objective exposures through case volume, self-teaching and mentor review are key to gaining proficiency. Such models suggest utility of preceptor-based education and highlights the opportunity for surgical coaching in minimally invasive thoracic surgery (5-7). Liu *et al.* recognize that each of the individual lobectomies presents unique challenges in terms of anatomy and conduct of the operation, a point that is underemphasized by guidelines or case minimums referring to "lobectomy" without specification of location.

Similar to the fundamentals of laparoscopic surgery (FLS) course proposed by the American College of Surgery, the Society of Thoracic Surgery (STS) and/or American Association for Thoracic Surgery (AATS) in concert with

the American Board of Thoracic Surgery (ABTS) can refine and standardize modules that demonstrate global Fundamentals of Minimally Invasive Thoracic Surgery, both thoracoscopic and robotic, for trainees in North America. These standardized certifications can then be implemented into a consensus-training paradigm endorsed by the STS, AATS, and ABTS that will be evidence of proficiency and ultimately global certification of minimally invasive surgery. Certification of minimally invasive technique may not always translate into proficiency of completing minimally invasive surgeries safely, just as the FLS certification does not guarantee a surgeon can safely complete any laparoscopic surgery. Beyond the continued auditing of surgeon volumes beyond the training period, we suggest that attention to surgeon outcomes may be a better indicator of proficient surgical technique: these metrics could include duration of operation, blood loss, rate of conversion, pathologic metrics such as lymph node stations harvested and rate of R0 resection, and intraoperative and postoperative complications. Of course, this is a difficult task, as these variables are highly dependent on patient and case selection.

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Footnote

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