Brief Report
Volume 13:5, 2022

Global Journal of Technology and Optimization

ISSN: 2229-8711 Open Access

Robotic Surgery's Use, Limitations and Impact on Surgical Education

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Introduction

Urologists' use of robotic surgery has been followed by a growing understanding of the need of formal training. Early studies on the use of robotic surgery showed that this technology's future application was unclear. A study of 372 residents and 56 programme directors found that there was little experience and a lot of confusion regarding the current function of robots. A little over 15% thought robots was a "trend that would fail," 35% said it was "here to stay," and 50% were "unsure." Before doing surgery at the console, preparation is necessary for robotic surgery mastery. Proconsul training comprises making sure the learner is at ease in three areas: bedside support, knowing the robotic system, and fundamental laparoscopic abilities. The console and secondary console, if available, the remote manipulator arms, the visualization support system (the "tower"), and robotic accessories, cables, and connectors must all be understood for a robotic training programme to be effective. Before performing their first robotic surgery, trainees should be comfortable with the different customizable console settings. These include programmable features for the camera, motion scaling, digital zoom, energy control, secondary console control, and communication, among others. Residents get the chance to understand how the console surgeon does the surgery since they are immediately exposed to and involved in the surgical process as bedside trainees. Second, performing as the bedside assistance teaches the learner how to troubleshoot any difficulties that can prevent the operation from going as planned and how the robotic arms interact with the patient to facilitate effective surgical performance. Compared to surgeons without expertise, those with bedside experience may be able to manage difficult cases early [1].

Description

Learners should master laparoscopic access, port insertion, and pneumoperitoneum generation. The effects of insufflation on the body's physiology have been widely researched, and during laparoscopic surgery, trainees should feel at ease with both anticipated and unanticipated hemodynamic changes. The detection and treatment of both frequent and rare problems should be understood by trainees, even if serious complications only occur in a tiny number of laparoscopic patients. The American Urologic Association (AUA) BLUS Handbook of Laparoscopic and Robotic Fundamentals10 and its related approved curriculum are fantastic resources for laparoscopic foundations. The majority of robotic surgery education focuses on honing the cognitive and technical abilities needed to operate at the surgical console. This training should continue along with bedside instruction once the fundamentals of robotic and laparoscopic surgery have been mastered in order to aid the learner's development. Through VR exercises, wet lab exercises, and dry lab exercises, surgical simulation may be accomplished in preclinical robotic surgery training. Each has particular benefits and drawbacks, and they are routinely integrated in the current robotic surgery curricula. Dry laboratories are used to practise skills on inanimate models, such as sewing on a sponge or moving rings between pegs. Dry labs are typically the recommended starting point in surgical skills courses because they are a very affordable approach to teach fundamental psychomotor abilities. However, once these fundamental abilities have been learned, continuing practise is of little use because dry laboratory activities are also the most removed from actual surgery [2-4].

Numerous organisations and professional associations have released their own robotics curriculum that use different arrangements of the teaching resources mentioned above. There are a few noteworthy professionally backed and/or thoroughly proven robotic curricula worth commenting on here given the abundance of available curricula on the subject. These can be used entirely or as helpful templates to design a curriculum that best satisfies the requirements of a particular institution or learner population. This extensive curriculum was created over the course of three consensus conferences with the help of multidisciplinary contributors from 14 professional societies, including the AUA and Society of American Gastrointestinal and Endoscopic Surgeons. Other contributors included psychologists, educators, scientists, and representatives from the surgical and scientific fields. The RoSS team used their simulator to create the Fundamental Skills of Robotic Surgery (FSRS), a completely VR curriculum with 4 modules covering fundamental console orientation, psychomotor skills training, basic surgical skills, and intermediate surgical skills. This is only one of several significant curricula. The organisation has research that support the construct, face, and content validity of its programme. The development of a rigorous 5-day "mini-residency" for robot-assisted laparoscopic prostatectomy (RALP) by postgraduate urologists was described. It included didactic lectures, wet and dry labs, and operating room (OR) observation, with the option of a proctored experience for attendees' first RALP at their home institution. The percentage of participants who performed RALP grew from 25% to 95% and 25% throughout the short-term follow-up [5].

It is important to discuss how nontechnical abilities contribute to the success of robotic surgery. Examining a sequence of 146 postoperative adverse events and the fundamental underlying variables involves situational awareness, management, teamwork, and excellent communication. Despite the fact that inexperience or an incapability was the most frequently cited cause, the next five most frequent causes were all non-technical skills-related: a breakdown in communication, an excessive workload or a lack of staff, a lack of supervision, fatigue, and interruptions or distractions. These difficulties are not exclusive to robotic surgery, but they may become more difficult if the surgeon works from a console that is physically apart from the operating room table since this changes the dynamics of the room [2,4].

Conclusion

Even though solid and liquid laboratories remain to aid students in developing an intuition for the interaction in between physical and virtual, advances in processing power and hardware development have thrust VR to the forefront of preclinical training. There is general consensus about a supervised, proficiency-based development in the clinical phase that begins with case observation, continues with bedside assistance, and ends with progressively difficult duties at the console. However, the decision to progress

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Date of Submission: 03 May, 2022, Manuscript No. GJTO-22-70921; Editor Assigned: 05 May, 2022, PreQC No. P-70921; Reviewed: 10 May, 2022, QC No. Q-70921; Revised: 15 May, 2022, Manuscript No. R-70921; Published: 20 May, 2022, DOI: 10.37421/2229-8711.2022.13.294

ultimately rests with those in charge of monitoring the trainees. Although there is a widespread understanding of the essential elements of robotic surgery training, no one standard has evolved as a foundation around which institutions may base their curricula. While the FRS and ERUS curriculum seem promising, they haven't yet been adopted widely.

Acknowledgement

None.

Conflict of Interest

The authors reported no potential conflict of interest.

References

1. Ashrafian, Hutan, Olivia Clancy, Vimal Grover and Atefe Darzi. "The evolution of robotic surgery: Surgical and anaesthetic aspects." *Br J Anaesthesia* 119 (2017): i72-i84.
2. Morris, Bishoy. "Robotic surgery: Applications, limitations, and impact on surgical education." *Medscape Gen Med* 7 (2005): 72.
3. Wang, Robert S and Sapan N. Ambani. "Robotic surgery training: Current trends and future directions." *Urol Clin* 48 (2021): 137-146.
4. Daskalaki, Despoina, Fabiola Aguilera, Kristin Patton and Pier Cristoforo Giulianotti. "Fluorescence in robotic surgery." *J Surg Oncol* 112 (2015): 250-256.
5. Hashizume, Makoto, Kouzou Konishi, Norifumi Tsutsumi and Rinshyun Shimabukuro. "A new era of robotic surgery assisted by a computer-enhanced surgical system." *Surg* 131 (2002): S330-S333.

How to cite this article: Zheng, Siyang. “Robotic Surgery's Use, Limitations and Impact on Surgical Education.” Glob J Tech Optim 13 (2022): 294.