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Editorial

Editorial note on 15-Haptics in Surgical Robots

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EDITORIAL

This chapter focuses on the use of haptics in soft-tissue surgery robots, with the goal of bringing together the clinical context, underlying technologies, and cutting-edge applications in this area. First, the fundamentals of haptics are presented, using the human sensory system as an example that serves as a technology development benchmark. A review of the clinical context is then presented in the chapter, which identifies surgical areas and procedures of particular interest to robotics before presenting key clinical issues with the potential to be solved through the application of haptic technology. The basic building blocks of haptics, sensing and feedback systems are then applied to provide an understanding of the fundamental haptics, sensing and feedback systems. A study of haptics applied to surgical robots is provided from this base, highlighting key commercial systems along with research advances. The chapter concludes with a review of emerging developments in the field as well as the remaining technical and clinical challenges.

The instruments are completely operated by the surgeon by tele-operation in the conventional Robot-assisted minimally invasive surgery (RMIS) scenario. Recent work has thoroughly explored surgical intelligence by applying innovative methods to increase the results of the surgical operating room (OR). No curricula have been identified for training novices, non-clinical raters of non-technical skills in the operating room to our knowledge (OR). The objective was to report the reliability of Oxford Non-Technical Skills (NOTECHS) ratings provided by inexperienced raters undergoing a scalable learning programme to determine the non-technical skills of OR teams.For semi-autonomous suturing tasks, we suggest a new single-master dual-slave structure, laparoscope information is implemented to feed back into the robotic control loop to direct the movement of the surgical instrument.

The semi-autonomous operation can be accomplished by incorporating vision information to the robotic control loop, increasing the surgical OR performance, resulting in a new level of intelligence for the RMIS. Laparoscopic box simulators provide a cost-effective and usable learning platform for surgical residents to practise basic laparoscopic skills. Despite the availability of reliable, high-fidelity simulators for robotic surgery training, a low-fidelity alternative simulation method is missing. This teaching method is intended to enable surgical trainees and those new to robotic surgery to learn the initial dexterity and motion economy for simple tasks to be performed. Before I sat for individual cases, I used these tools to boost my surgical trust and expertise anecdotally. I'm hoping that a motivated trainee would find the same value. A low-fidelity simulation method can improve a learner's initial proficiency in robotic-assisted surgery, but more research on this method is required. The purpose of this report and accompanying video is to implement a method of low fidelity to assist those new to robotic-assisted surgery to learn basic skills even before sitting on the console.

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