Telementoring Key To Providing Remote Surgical Expertis

Telementoring may be an effective way for subspecialist surgeons to assist remotely located general surgeons, according to new research findings published in the September issue of the *Journal of the American College of Surgeons*. In the study, eight general surgery residents with no formal subspecialty training participated in three mock operations using animal cadavers intended to simulate live procedures. When telementored, the residents achieved higher overall mean performance scores.

Wounds suffered in combat often require the expertise of several surgical subspecialists but the ability to provide that level of emergency care in military field hospitals is often not possible. In a civilian setting, telementoring could have wide-ranging applications for general surgeons in rural medical centers where they must treat a wide range of conditions, often without the breadth of subspecialty expertise needed for all cases.

“We wanted to determine if a robotic telementoring platform using real-time audio and video could impact the ability of onsite surgeons to deliver subspecialty surgical care,” said lead author Alexander Q. Ereso, MD, resident physician at Wayne State University, Detroit. “This study demonstrates how telementoring could be successfully applied in these surgical settings.”

General surgery residents had 20 minutes to perform each operation, first with no assistance from subspecialty surgeons and then immediately afterwards with telerobotic mentoring. The three surgical procedures performed were a suture repair of a penetrating right ventricular injury in a cadaveric bovine heart, simulating a stab wound to the chest; an operative external fixation of a cadaveric porcine open tibial fracture, simulating an injury consistent with a fall; and a craniectomy on a cadaveric porcine skull, simulating an injury caused by a traumatic fall.

Mean performance scores for individual metrics, including tissue handling, instrument handling, speed of completion and knowledge of anatomy, were all superior when residents were telementored. Telementoring also led to the greatest improvement in performance during the cardiac scenario. When surveyed after the un-mentored scenario, residents believed that they would be unable to complete the surgical objectives if asked to do so in a similar real-world clinical setting. When surveyed after completing the same scenario with telementoring, residents believed they would be much more comfortable if asked to complete the surgical objectives in a similar real-world clinical setting.

“Not only did residents show improvement during telementoring, but when surveyed afterwards they also felt more competent in all three scenarios,” said T. Sloane Guy, MD, FACS, the study’s senior author and cardiovascular surgeon at Saint Joseph's Hospital, Atlanta. “The study results demonstrate how we could feasibly use this technology to provide necessary advanced surgical care.”

The robotic platform consisted of a high-definition pan-and-tilt camera with a laser pointer controlled by a mouse. The camera and laser pointer were mounted to an overhead surgical light that was relatively fixed. With this setup, surgical subspecialists were able to remotely telementor the general surgery residents via a controlled robotic platform through a laptop computer. The study was conducted as a Telemedicine and Advanced Technology Research Center-funded collaboration between the U.S. Army, the San Francisco Veterans Affairs Hospital Department of Surgery, the University of California, San Francisco, the San Francisco Veterans Affairs Hospital and SRI International.

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