COMMENTARY

Robotic VR simulation to measure competency: a step in the right direction

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There is widespread consensus on the vast potential of virtual reality (VR) simulation for robotic surgery; however, there is some debate on its current role in education and clinical practice. One of the conclusions that is consistently drawn across available validation studies is that VR simulation for robotic surgery in its current form appears to most benefit novice surgeons who do not have significant robotic surgery experience and who, amongst other things, require instruction on basic actions of the robot, such as camera movement, clutching, and arm coordination.[1] Clinical translations of these skills include: training junior residents who are first being introduced to robotic cases; and educating an experienced surgeon who does not have formal robotic surgical training and is either seeking credentialing or maintenance of certification. However, once a surgeon has gained some outside experience with a robotic surgical system, whether in the dry lab, wet lab, or operating room settings (i.e. an intermediate or experienced robotic surgeon), there are currently less VR simulation applications.

Noureldin, et al introduces another viable application of VR simulation using the da Vinci Surgical Skills Simulator (dVSSS), namely incorporating VR simulation into the Canadian Objective Structured Clinical Examinations (OSCE) to assess the basic robotic skills of urology Post-Graduate Trainees (PGTs).[2] The authors are astute to transfer the current capabilities of the dVSSS for this utilization. During the OSCE, the station for this segment was only 20 minutes in length, allowing for only two of the less complex dVSSS skills tests. The authors also utilized the MScore performance metrics inherent to the system to evaluate for competency. Their definition of competency was based on the norm-referenced method, in which experts performed the tasks prior to the trainees, and a passing score was defined as the average of the experts' total scores minus one standard deviation for each task. Although that cut off passed only one-third of their trainees, the test's ability to discriminate between less and more experienced trainees should be considered a measure of success.

This manuscript suffers from the same drawbacks of many of the published robotic VR simulator validation studies, specifically low study numbers, limited points of comparison, and less discrimination between more advanced surgeons.[3] However, where it differs and thus becomes potentially more useful is that it advocates VR simulation to be used solely to measure competency, much like the hands-on component of Fundamentals of Laparoscopic Surgery (FLS), which US general surgery residents must complete prior to graduation.[4] A more appropriate point of comparison would actually be the psychomotor skills curriculum of the yet to be fully validated Fundamentals of Robotic Surgery (FRS).[5] It should be noted, however, that FLS and FRS are comprehensive programs to evaluate competency, replete with web-based study guides, hands-on manual skills practice and training, and an assessment tool that measures cognitive and technical skills. This study was two simple skills sets on a VR simulator. All considered, robotic VR simulation can be a valuable tool to measure competency in trainees, but should be one part of an inclusive evaluation program. ☐

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References

1. Abboudi H, Khan MS, Aboumarzouk O et al. Current status of validation for robotic surgery simulators - a systematic review. *BJU Int* 2013;111(2):194-205.
2. Noureldin YA, Stoica A, Kassouf W, Tanguay S, Bladou F, Andonian S. Incorporation of the da Vinci Surgical Skills Simulator at urology Objective Structured Clinical Examinations (OSCEs): a pilot study. *Can J Urol* 2016;23(1):8160-8166.
3. Moglia A, Ferrari V, Morelli L, Ferrari M, Mosca F, Cuschieri A. A systematic review of virtual reality simulators for robot-assisted surgery. *Eur Urol* 2015 Sep 30 [Epub ahead of print].
4. Fundamentals of Laparoscopic Surgery (FLS). http://www.flsprogram.org . Accessed 1/20/2016.
5. FRS. Fundamentals of Robotic Surgery. http://frsurgery.org . Accessed 1/30/2016.