Training in Robotic Surgery

Simulators, Surgery, and Credentialing

Clinton D. Bahler, MD, Chandru P. Sundaram, MD*

KEYWORDS

• Computer simulation • Curriculum • Teaching • Robotics • Credentialing

KEY POINTS

- Recently, increased attention has been given to reports of adverse events related to robotic surgery, which has put an emphasis on robotic training and credentialing.
- Robotic training should include cognitive, psychomotor, and teamwork/communication skills.
- Simulation should be an integral part of a robotic surgical curriculum and could use inanimate models, animal models, or virtual reality simulators.
- Assessments for credentialing and certification should not be based only on number of surgeries performed but also on proven proficiency.

INTRODUCTION

As technology brings new tools to the operating room, there is increasing pressure to ensure patient safety and cost-effectiveness. The Halstedian motto of "see one, do one, teach one" is inadequate as new complex tools such as robot-assisted surgery are adopted.[1] On the other hand, the even older motto of *primum non nocere* or "above all, do no harm" remains a guiding principle for the adoption of new tools.[2]

Since its approval by the US Food and Drug Administration (FDA) in 2000, the use of robot-assisted laparoscopic surgery has surpassed that of pure laparoscopy for not only radical prostatectomy but also dismembered pyeloplasty and partial nephrectomy.[3,4] Between 2007 and 2011, the annual number of total robotics cases according to Intuitive Surgical increased by nearly 400% in the United States (**Fig. 1**).[5,6] Despite numerous institutional and surgical societal efforts to define a standardized curriculum for training and certification of robotic surgeons, no unifying pathway exists. Thus, robotics residency training is heterogeneous and certification requirements vary by hospital, as was reported in a recent FDA survey.[7]

Adverse Events in Robotic Surgery

In 2013, public awareness of complications related to robotic surgery increased through information released by the FDA and other media outlets. The FDA updated their Web site on computer-assisted surgical systems to note that an increasing number of medical device reports were being filed.[8] The FDA stated that it was not clear whether this increase represented worse complication rates or was the result of the increasing number of overall procedures and improved reporting. More recently, a report by Alemzadeh and colleagues[9] on 5374 adverse robotic events (86 deaths and 455 injuries) reported to the FDA between 2000 and 2012 noted conflicting trends. Although the overall likelihood of adverse events reported has been decreasing, the

Disclosure statement: nothing to disclose (C.D. Bahler); received grant (T145023) from Intuitive Surgical for simulation study (C.P. Sundaram).
Department of Urology, Indiana University, 535 North Barnhill Drive, STE 420, Indianapolis, IN 46202, USA
* Corresponding author.
E-mail address: sundaram@iupui.edu

Urol Clin N Am 41 (2014) 581–589
http://dx.doi.org/10.1016/j.ucl.2014.07.012
0094-0143/14/$ – see front matter © 2014 Elsevier Inc. All rights reserved.

urologic.theclinics.com

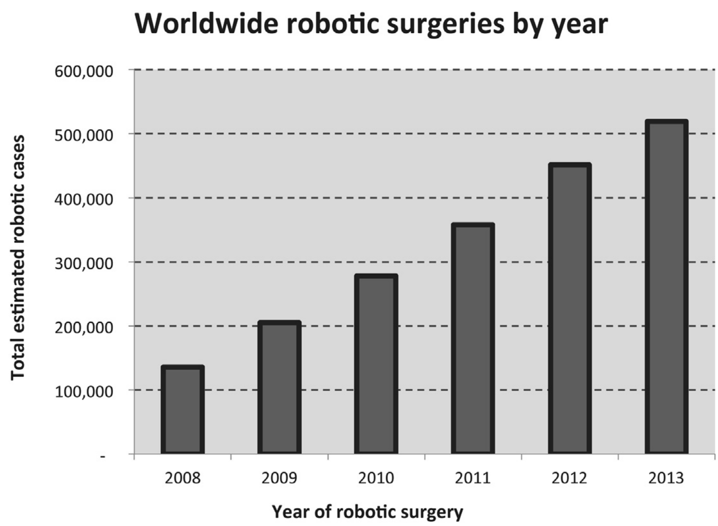

Fig. 1. Estimated number of robot-assisted cases worldwide. (*Data from* Intuitive Surgical investor presentation, 2014. Available at: http://investor.intuitivesurgical.com/phoenix.zhtml?c=122359&p=irol-irhome. Accessed April 21, 2014.)

trend of significant events (injury or death) increased from 12.8 events per 100,000 in 2004 to 35 events per 100,000 in 2012. The report noted that lower-risk urologic and gynecologic procedures had a lower rate of injury or death than higher risk cardiothoracic surgeries.

Also in 2013, a study compared reports of robotic complications in an FDA database with reports found in the Public Access to Court Electronic Records and LexisNexis. Finding that 8 of 253 (3%) complications were improperly reported to the FDA, the study[10] questioned whether the true incidence of robotic complications is known. This question prompted editorials and articles[5,11] in prominent publications to question the safety of robotic surgery and the training methods used. That same year, the Massachusetts Board of Registration in Medicine[12] made recommendations on training, patient selection, and credentialing in response to an increasing number of reports of patient complications related to robotic surgery.

This review focuses on the progress toward creating a unified curriculum for training and credentialing in robotic surgery. The following topics are addressed:

- Available cognitive resources
- Efforts to validate and incorporate surgical simulation
- Examples of currently used institutional curricula
- The Fundamentals of Robotic Surgery (FRS): a 14-society consensus template of outcomes measures and curriculum development
- Credentialing models

COGNITIVE RESOURCES

The American Urological Association (AUA)[13] recommends that residency program directors document satisfactory training and competence of residents to independently perform robotic surgery. Although simulators are not specifically addressed, recommendations are made regarding online curriculum and case participation. The AUA has included a section on robotics in their core curriculum (*The Basics of Urologic Laparoscopy and Robotics*) and also have separate e-learning modules.[14] The e-learning site has both a general module (*Fundamentals of Urologic Robotic Surgery*) and multiple procedure specific modules. The AUA recommends 80% or higher on the module posttests to show proficiency. These modules are also recommended for practicing urologists who have no formal training in robotic surgery.

The AUA also recommends completing online modules provided by Intuitive Surgical. The da Vinci Online Community offers technical modules and evaluations on topics such as operating room setup, docking, draping, safety features, and troubleshooting. Platform-specific modules for each generation of the robot are also provided.

SURGICAL SIMULATION

Simulation is a critical component of avoiding patient harm and adopting complex surgical technologies. Operating room time is viewed as both a limited and expensive commodity. Surveys of program directors in both the United Kingdom and the

Download English Version:

https://daneshyari.com/en/article/4275230

Download Persian Version:

https://daneshyari.com/article/4275230

Daneshyari.com