

# Robotic Surgery: The Dilemma for Resident Training

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This article addresses the challenges of training physicians in robotic-assisted surgery.

We previously presented a review of robotic-assisted surgery as related to deployment of a new *da Vinci*<sup>®</sup> Surgical System ("So You Think You Want A Robot? Analyzing Cost and Implementation," *The Female Patient*. 2011;36[7]:28-32).<sup>1</sup> Cost aside, robotic assistance provides several advantages over traditional laparoscopy when applied to more challenging surgical cases. Facilities with residency training programs will face several dilemmas when incorporating robotic technology.

However, robotic training is not universally included in the present obstetrics and gynecology training curriculum; this is similar to the introduction of laparoscopy when it was a new technology. Nevertheless, one survey reports 70% of residents have

participated in a robotic-assisted procedure, and 44% plan to utilize robotic assistance following residency.<sup>2</sup> Robotic surgery represents a modality that is likely to increase its contribution to gynecology in the future, so resident exposure and experience is important.

The balance between resident surgical training and attending physician robotic training is a significant hurdle in the development of a robotic surgery program. Brenot and Goyert identified a significant decrease in hysterectomy cases available to residents following the introduction of robotic surgery.<sup>3</sup> Robotic surgery also reduces the meaningful experience of the bedside surgical assistant, requires attending experience at the expense of resident training, and precludes training in more traditional surgical approaches.<sup>3</sup> There is a valid concern that training in additional surgical approaches and robotics will dilute the proficiency of residents across the entire spectrum of surgical procedures.

## FOCUSPOINT

Robotic training is not universally included in the present obstetrics and gynecology curriculum.

## RESIDENT EXPOSURE

Even in the absence of live patient console experience, resident exposure to robotic cases in the operating room does provide valuable training for patient selection, patient positioning, trocar placement, work flow, and complication management. In our opinion, these are actually the more critical lessons to ensure a safe *da Vinci* procedure.

Learning to troubleshoot issues with the equipment is also invaluable to trainees' experience. If resident experience on the *da Vinci* console is desired, suture practice and dexterity drills have been validated to im-

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prove robotic skills quickly.<sup>4</sup> A newly marketed robotic surgery simulator (Mimic's *dV-Trainer*<sup>™</sup>) may also contribute to resident training on the *da Vinci* surgical console without impacting operating room time, patient safety, and attending experience.<sup>5,6</sup>

Finan and colleagues have described a plausible alternative to porcine lab training with dry lab models constructed using readily available materials.<sup>7</sup> A foam beer-can koozie was used to replicate the vaginal cuff, and balloons were positioned to replicate the bowel and bladder. The authors were able to provide effective robotic skills training to residents in a safe, realistic, and cost-effective environment.<sup>7</sup>

The new *da Vinci Si*<sup>™</sup> model does provide additional training enhancements, including a telestration monitor and the option of a teaching console with dual access to the operative field. Neither will make a poorly prepared surgeon a capable trainee, and the need for task training and simulation training prior to live patient use is fundamental to safety.

The telestration monitor allows a mentor surgeon to create more explicit instructions by drawing on the surgical image monitor. These illustrations overlay the training surgeon's view and may provide more effective direction than verbal communication alone.

Though an additional expense, a dual console allows collaboration and training without the need to unseat the surgeon or trainee during the surgical procedure. This co-operator approach to training is likely more efficient and effective, but the capability is not universally available in the current robotic-assisted surgery environment.

## TRAINING METHODS

Several authors advocate and have validated a systematic approach to surgical training of residents for robotic procedures. Though not specific to robotic training, Sachdeva advocated introducing the conceptual understanding of a procedure, followed by segmental proficiency under close supervision, and finally the autonomous stage for skill refinement.<sup>8</sup> This systematic method follows the traditional approach to training in surgical specialties, with discrete elements of a procedure assigned to junior residents until proficiency with each step allows the trainee to work toward com-

petency in the entire case.<sup>9</sup> Such stepwise training includes the residents in robotic cases, yet limits the degree to which such training interferes with work flow, case duration, and patient outcome.

In the absence of a formal postresidency minimally invasive fellowship, training tomorrow's robotically assisted laparoscopic surgeons will require an adequate curriculum that complements the existing surgical training.

Our approach to a training curriculum is a hybrid of traditional surgical training and robotic-specific techniques. This is similar to the graded approach validated by Finan et al.<sup>10</sup> Resident skill building with simulation tasks is followed by observation and participation as an assistant. As progress allows, we introduce judicious mentor-guided use of the robot for portions of live patient surgical cases. Ultimately, independent surgical use is allowed as proficiency is demonstrated.

This model works for attending physicians as well, though those with more surgical experience may move directly from simulator or animal lab to independent use for complete cases under the guidance of a mentor.

## TRAINING PROCTORS

One main challenge in the traditional residency model is the ability to train competent attending physicians who then would become the proctors for residents. In many residency programs, the patients scheduled for surgery are recruited from resident's continuity clinics and not necessarily from the private practice of the faculty. This in turn creates a dilemma for proper training of faculty, as it requires that their own training in robotics come from patients traditionally managed by residents, temporarily decreasing the surgical volume available to the residents.

This is particularly critical during the initial period required to train a significant number of faculty to run a program, which could jeopardize the experience of the residents for a period of time. Possible solutions could include a sharing program from the master proctor case load. This would allow the faculty trainee to be assessed on patients from the local proctor rather than the resident population, as it would be more ef-

## FOCUSPOINT

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efficient and quicker to obtain, with less intrusion in the educational experience of senior residents.

### CONCLUSION

A standardized curriculum for teaching and evaluating residents would need to be designed and would require the input of the Residency Review Committee from Obstetrics and Gynecology and the Accreditation Council for Graduate Medical Education (ACGME) in order to fulfill the objectives set forth by the Council on Resident Education in Obstetrics and Gynecology (CREOG). This curriculum would likely be similar to the faculty training program but would have to expand through the 4 years of training in preparation for independent practice as well as commitment from the company to certify these graduating residents to be able to use the device in their final place of practice.

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