

Teaching To Technology: Will Robots In The OR Shift The Surgical Instruction Model?

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👤 by Daniel Seeger



OR Technology

It's well understood that robotic-assisted surgical systems are transforming the work that happens in the operating room. But does the increasing prominence of the devices in the healthcare field also require a transformation in how surgical instruction takes place?

Courtney Green, MD, a research fellow in the general surgery program at the University of California, San Francisco, has been trying to answer that very question. She presented the results of her research at the Society of Laparoendoscopic Surgeons Minimally Invasive Surgery Week conference in the fall.

"With robotics, I started getting interested in it because of the unique teaching component of it," Green says. "Because it's so separate, because the surgeon's

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at a console separate from the patient — and separate from the resident sometimes — there has to be a lot more active teaching or active engagement, which surgeons aren't necessarily ever taught how to do. The whole surgical educational model has always been an apprenticeship model: you see one, do one, teach one."

That model of increasing autonomy has served the field well. But Green's research suggests robotic-assisted surgery calls for a different approach.

As a key step in her study, Green sought specific input from attendees at the SAGES conference, determining it would provide a broad range of data in terms of experience and geographic home base.

Although opinions were understandably diverse, a few concerns kept recurring. When it came to instruction around robotic-assisted surgical systems, doctors felt it was especially important to draw a differentiation between learning a surgical technique and learning as surgical tool, with special attention given to where a resident was in their educational progression.

One key to properly initiating a resident into working with a surgical robot is being mindful about how the process is distinctly different than other surgeries. Primarily, the dynamic in the OR is significantly altered by basic proximity factors.

"The process of performing a surgery may not be all that different with robotics; but the process of observing an expert and learning to recreate that performance — well,

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that has changed dramatically,” Green says. “One must observe the surgeon’s movements on the console and simultaneously process the consequential actions in the operative field located some distance away.”



As robotic-assisted surgical systems are becoming a more widespread tool, surgical residents are also far more likely to encounter them. Getting the training protocols correct becomes imperative.

Although there are some who view developing facility with robotic systems as basically similar to the learning curve experienced with previous advances such as laparoscopy, Green’s research suggests otherwise.

“Unlike in laparoscopy, where you’re still assisting a

surgeon and still playing a role in the surgical field, robotics creates so much autonomy for an individual surgeon,” Green notes. “That’s great where resources are limited, but it results in a challenge in a training environment because the resident is no longer depended on to be that surgical assistant.”

Since the attending surgeon is the only person controlling the robotic arm, it’s incumbent on them to explain precisely what they’re doing, providing an ongoing narration that likely doesn’t come naturally.

“We’ve only got so many intraoperative hours as residents, with all these duty hours restrictions,” says Green. “Basically every intraoperative hour counts, as far as our skill acquisition.”

In teaching on a robotic-assisted surgical system, the dual console option is invaluable. Although the feature wasn’t necessarily developed with instruction in mind, that may be where it’s most impactful.

“It’s great because it allows opportunity to switch between a novice and an expert seamlessly,” Green says. “You don’t have to change tissue manipulation, you don’t have to pass instruments back and forth, you don’t have to change positioning around the table.”

The dual console configuration revives graded autonomy as an option in training residents, allowing them to take evolving ownership of different components on procedures. Because of the focused field of vision in the console, it’s still helpful if there are ongoing explanations from a skilled surgeon since the less experienced practitioner isn’t going to be able to easily observe how their teacher is interacting with the tool.

If the teaching paradigm has to shift, that doesn’t necessarily mean a drastic change in methodology should take place overnight, according to Green.

“It’s a field that can’t stop moving,” Green says. “You can’t stop and retrain the next generation of surgeons. Any sort of process of change has to roll out on multi-levels.”

Active surgeons should starting thinking about how their instructional approach can be adjusted. At the same time, residents must approach their experience as active learners.

As is usually the case when major technological advances are afoot, it’s just as important for those using the new devices to make their own leaps forward. That’s especially true with robotically-assisted surgical systems. No matter how impressive the device might be, it’s the person at the controls who makes all the difference.

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