

Dr. Robot enhances patient interaction

By Peter Pollack

Orthopaedists find “virtual visits” helpful; patients “love it!”

In the film “The Empire Strikes Back,” after hero Luke Skywalker’s hand is severed by a light sabre wielded by the villainous Darth Vader, a robot surgically attaches a fully functional prosthetic to the arm. Although the technology behind the robot surgeon (not to mention the prosthetic hand) remains the stuff of science fiction, two orthopaedic surgeons at Shawnee Mission Medical Center in Kansas are using robotic technology to help them check on patients during their off-hours.

The RP-7 robot, manufactured by InTouch Health (Goleta, Calif.), looks somewhat like a large, high-tech vacuum cleaner with a flat panel computer screen mounted on top. The device can be controlled remotely over a high-speed Internet connection via a computer workstation. A camera on the workstation projects the physician’s face on the robot’s screen, while another camera on the robot relays high quality images back to the physician sitting at home. The physician can “drive” the robot through the corridors of the hospital and use it to consult with patients and staff, and to perform visual examinations.

“It’s not really a substitute for rounds,” says **T.J. Rasmussen, MD**, who has been using the device for several years. “It’s kind of an additional component—if you want to talk to somebody or just check on people without driving back to the hospital. We still see every one of our patients in the hospital every day.”

“In my training at the Mayo Clinic, we always made rounds to see our patients twice a day,” explains his brother, **Mark R. Rasmussen, MD**, who also takes advantage of the robot. “In private practice, it’s just more practical to do rounds once a day. I do my normal rounds in the morning and, rather than wait until the next day to see how my patients are doing, I’ll sit down at my home office desk after dinner and make rounds with the robot. This enables me to see how a patient’s physical therapy went, how well my patients are doing, and whether there are any little things we can tweak that night.

“My patients just love having me come in and check on them at night,” he continues. “They just can’t believe that they can see me and I can see them through a little robot. It’s really been fun. If I tell patients that I’ll visit them with the robot and see how things are going, and my Internet connection isn’t working, I hear about it the next day. Patients are actually disappointed. They tell me, ‘My whole family was here and you didn’t show up with the robot,’” he laughs.

More than just an expensive toy

Having a robot roam the corridors may be exciting for patients, but it also serves a number of practical applications. For example, physicians are able to answer late night questions about the status of a



Orthopaedic surgeons Mark Rasmussen, MD, (left) and T.J. Rasmussen, MD, (right) use the RP-7 robot to make evening rounds and check in with patients at Shawnee Mission Medical Center.

postoperative patient without driving to the hospital and performing a personal examination. That not only saves time, it relieves stress.

"I remember one situation," recalls Dr. T.J. Rasmussen. "The emergency department staff were concerned about how a surgical incision looked—was it something significant or just normal postoperative bruising? They really couldn't give me a good description over the phone, so I drove the robot in, talked to the patient, watched as the patient moved the leg, and then zoomed in and took a high resolution photograph that was just about as good as being right there."

Having a computer screen for a "face" also enables the robot to perform other functions, such as displaying photographs to clarify a procedure to a patient.

"The robot is basically a computer head," explains Dr. Mark Rasmussen, "and I can drive it in to the patient's room and show the patient all of the X-rays on the screen. I have a whole library of X-rays of broken hips and how we fix them, so I can pull up a photo and show a patient what a broken hip looks like. I can show patients what we do during a hip replacement and how we pin a hip. Instead of drawing on a piece of paper or grease board, we can show patients what we actually plan to do."

Learning to drive

Sitting down at the controls of an advanced piece of hardware for the first time is often an intimidating experience, but both Drs. Rasmussen agree that learning how to operate the robot was fairly simple.

"It was very easy," Dr. Mark Rasmussen says. "I'm not one of the newer generation who is familiar with computer games—I think my children could probably drive it quicker and better than I can—but it was very self-explanatory and easy to use."

Yet progressive as it may be, the robot faces challenges that a human would hardly notice.

"Many patients keep their room doors closed," explains Dr. T.J. Rasmussen, "or the door may be open but they've pulled the curtain around the bed. The robot can get wrapped up in the curtain. So the nurses have to come and open things up to make sure we can drive the robot in the room."

Both Drs. Rasmussen are pleased with the hospital's robot investment, along with their own decision to purchase the control stations. (Robots cost between \$100,000 and \$150,000; the per physician cost for a control unit is about \$1,000.) But neither of them sees it as a revolution so much as an additional way they can interact with patients.

"I think some people would look at the robot and ask, 'Can we use this instead of going to the hospital and making rounds?'" says Dr. Mark Rasmussen. "I wouldn't want to because I still believe in the personal aspect of physically being there. It just adds another little step the patients like."

"I think it's like a lot of things in medicine," agrees Dr. T.J. Rasmussen. "The robot has made things a little bit easier and it's an incremental improvement, but it's not like we're performing surgery across continents or anything like that."

Is there any important capability the robot still lacks?

"You have to put it away," responds Dr. T.J. Rasmussen. "I can remotely maneuver it back to its 'parking' space. But because it has rechargeable batteries, I have to ask the nurses to go plug it in."

Peter Pollack is a staff writer for AAOS Now. He can be reached at ppollack@aaos.org.

<http://www.aaos.org/news/bulletin/sep07/clinical4.asp>