

January 29, 2010

DOCTOR AND PATIENT

Practicing on Patients, Real and Otherwise

By PAULINE W. CHEN, M.D.

Near the end of my surgical training, I spent three months as chief resident of a hospital trauma team. Two other doctors-in-training and I formed the first-line emergency room response, assessing and resuscitating patients who had been mangled, burned or otherwise injured. It was my first experience as a leader, but each of us was already fairly proficient and we all got along. I was confident that we would work well together.

I was wrong.

During our first week, one of the senior trauma surgeons played a video of one of our resuscitations, and I was reminded not of some slick made-for-television emergency room scene, but of the Three Stooges. In white coats.

One resident stood at the patient's side, holding a rubber tube in one hand and a syringe in the other, unsure of which to use first. The other resident kept bumping into the nurses and the respiratory therapist as he paced alongside the patient. I watched myself standing at the head of the bed mumbling orders that no one could hear. The patient had sustained only minor injuries and ultimately survived; but his outcome had little to do with our team. Other than the one experienced nurse in the room and the senior surgeon who showed up 10 minutes into the resuscitation, no one seemed to know what to do or how to coordinate their actions with everyone else's.

Although my team quickly gained the experience that would truly help us save patients, our growing competence came because we were submerging ourselves in trauma resuscitations day after day and night after night. We were learning as generations of doctors before us had — under the supervision of more experienced doctors, through trial and error, and on real patients.

Now it appears that this old paradigm of sinking or swimming with real patients is beginning to change, thanks to a growing field in medical education.

Medical simulation training, which is similar to that used in aviation and in the military, uses mannequins, computers, virtual reality or actors posing as patients to teach doctors, nurses and other clinicians. While simulation training has been used in medicine for nearly 40 years, it has until recently been limited primarily to teaching standard techniques like [chest compressions](#) in [cardiopulmonary resuscitation](#) or pelvic exams.

But over the last few years, as the technology and training techniques have advanced, experts in the field have begun to broaden the scope of training. No longer confined to isolated procedures, simulation can now recreate entire clinical situations, giving clinicians the opportunity to develop skills in what is often identified as one of the major causes of errors and quality issues in health care: poor teamwork and communication.

“Even if we are good individually, we are not always good at working collectively as a team,” said Dr. David M. Gaba, one of the earliest proponents of simulation in medical training and now associate dean for immersive and simulation-based learning at [Stanford University](#) School of Medicine. “Simulation can help develop decision-making, teamwork and team management skills.”

Anesthesia residents at Stanford, for example, must go through an extensive simulated situation in which the “patient,” a specialized mannequin, develops a severe, unexpected allergic reaction and then dies. During this training, the residents must provide and coordinate medical care with other members of the team and then conduct the difficult conversation with the patient’s “wife,” a live actor who has been trained to play the role of a shocked and then grieving widow.

“One of the beauties of simulation is you can let people practice those skills necessary in real-life medicine,” Dr. Gaba said. “You have to be able to handle more than just the cognitive or procedural skills; you have to be able to execute all those things while talking to the patient or the patient’s family.”

Not all doctors, however, are eager to train in a simulated environment, since even the most sophisticated simulations require suspending belief. The “patient” with low oxygen levels does not have bluish lips but a little blue light shining in her mouth. The grieving “spouse” is a well-versed but hired actor. And the dying trauma “victim” appears as flushed — and rubbery — as he was on arrival.

“It’s not the real thing, and doctors are often hesitant at first,” said Dr. Mark Smith, senior director of simulation and innovation at Banner Health, a nonprofit system that just opened a 55,000-square-foot simulation training center in Arizona, the largest of its kind in the United States. “But pretty quickly, doctors realize how nice it is to practice in an environment without consequences.”

The training can be quite challenging, too. Some of the simulated situations at the Banner Simulation Medical Center require as long as four hours to complete and take place in one of the center’s operating rooms, intensive care units or emergency department.

While research has shown that simulation training in specific procedures like the placement of catheters into a central vein can significantly decrease errors, it has been difficult to design and conduct studies that assess the effects of improved teamwork. Nonetheless, medical simulation experts believe that such training can only help clinicians.

“In sports, we would never have all the team members practice alone and then go off to perform,” said Dr. Haru Okuda, executive director of the New York City Health and Hospitals Corporation Institute of Medical Simulation and Advanced Learning. “It doesn’t make sense to have clinicians training alone either.”

The company will be opening a 10,000-square-foot training facility this fall at the Jacobi Medical Center in the Bronx, and Dr. Okuda plans to instruct some 14,000 clinicians over the next three years. “In the simulation world, you can practice to mastery,” he said. “In this way we can standardize the quality of care across our

[hospitals](#) so that if, for example, a patient went to one hospital to deliver a baby, she would get the same level of care available at any other hospital in our system.”

The cost of these innovative training centers is high. The Banner Simulation Center cost \$12 million to build, and the New York City Health and Hospitals Corporation Institute will require \$10 million to complete. And unlike other investments, medical simulation training centers rarely generate revenue.

“Some people might ask, ‘Where’s my return on investment?’ ” Dr. Smith said. “But it’s really all about cost savings and patient care. We take such better care of our patients when we’ve got these skills. It’s no longer acceptable to learn on patients. It’s just not right.”

Which is true, though with one important caveat.

“Simulation allows you to do a lot of things safely and in a controlled fashion,” Dr. Gaba said. “But simulation will never completely replace practicing the craft of medicine under more experienced hands. People aren’t airplanes or machines. People are human beings, and we don’t come with instruction manuals.”

Or, as a friend who flies for a major international carrier told me recently: “You can get everything in a simulation except for the feeling, the *real* feeling, of the last 200 feet of landing.”



Mike Mergen for The New York Times

Nursing student Lia Welsch checks the blood pressure on a SimMan, a simulated patient.