Medical students learn practical skills with unique tools

September 4 2013, by Sarah Zhang

The pregnant patient was first confused, then unresponsive. All of a sudden, she started to shake.

Dr. Laura Jacques, in only her second year as an obstetrician on her own, had never seen this type of seizure before in a patient. But she wasn't nervous. She had rehearsed this emergency before.

"It just felt like another day in ISIS."

The Institute for Simulation and Interprofessional Studies, or ISIS, at the University of Washington is home to video-game-like simulations, fake body parts and mannequins - all housed in its two main facilities at Harborview and the University of Washington Medical Center.

It's where physicians such as Jacques can react to emergencies in nonemergency situations.

The institute opened in 2005 as a central hub for simulation training at the University of Washington, and it now partners with 31 departments across the university. Ten thousand medical students, residents, physicians, nurses, paramedics and other health-care professionals train at the institute every year.

Patients used to be guinea pigs for students and residents, but that's changing as simulation becomes an important part of medical education. Turns out it's much easier to learn technical and communication skills in

a safe environment without the added stress of possibly harming a patient.

Brian Ross is an energetic man of 64, prone to peppering his speech with sound effects. ISIS is his vision, and he's been the executive director from its inception.

Trained in anesthesiology, he likens his work to piloting a plane: "95 percent boredom and 5 percent sheer terror." Putting patients under and bringing them back out, like takeoff and landing, are nerve-wracking, but the hours in between are just boring.

The comparison is especially apt because anesthesiology has been on the forefront of medical simulation, and airlines with their flight trainers were the original pioneers of simulation technology. In the early stages of ISIS, Ross hit up Boeing's simulation center for advice. The first manufacturers of medical-simulation technology made flight simulators, too.

Today, the institute is home to everything from real medical equipment to fake body parts. As a nod to the spirit of things, four versions of the game "Operation" line a glass case welcoming students to the institute.

Propped against one wall is white board that says "TOP GUN" above a bracket full of names. Second- and third-year residents had just crowned a winner of the lapropscopic-surgery skills tournament, where residents manipulate small graspers to move blocks while looking through a camera. Video-game experience helps.

Next door is an operating room outfitted with all the lights and monitors of a real hospital.

A plastic mannequin lies on the operating table. Controlled by

technicians, it can cry, cough, breathe and even speak through an embedded microphone.

Farther down the hall is a machine Ross jokingly calls "buttface," which switches between simulations for colonoscopies and bronchoscopes.

A headless upper torso is used to practice placing central venous catheters, which run from the neck to a vein near the heart and were notoriously prone to infection. In 2008, the hospital required doctors to get certified in the procedure at ISIS, and the number of infections per 1,000 catheter days fell from 8.3 to 2.6, translating to shorter hospital stays and more than a half-million dollars saved per year.

At 6 o'clock on a Wednesday morning, Dr. Michael Fialkow stood in ISIS prepping $70 worth of cow tongues and flank steak.

OB-GYN residents filed into the institute a few hours later. The skills they were scheduled to practice included repairing an episiotomy or a tear through the vagina and perineum during childbirth. This was the purpose of the cow tongue.

A more realistic-looking rubber model sat above the residents' heads as they practiced suturing, but the market purchase had its advantages. A strip of flank steak that was threaded through the tongue even mimicked the different texture of the sphincter muscle. "When you have a rubber model, they don't sew right," said Fialkow.

Other simulations are geared toward teaching how to communicate with nurses and patients during an emergency.

In a neighboring room, residents were dealing with shoulder dystocia, a situation that requires special maneuvers to deliver a baby. As each resident approached a plastic pelvis, they had to explain the situation to

the imaginary mom. Then they calmly said, "I need two nurses standing here and a stool," taking charge of the situation.

Plastic babies lubed with vegetable oil came out of the plastic pelvis. It looked neither high-tech nor realistic.

But all the parts moved exactly as they should - like when a doctor grasps the baby's arm just the right way.

"Over the years I've had a lot of people call me and say, 'It was just like you said!'" said Dr. Thomas Benedetti, who teaches this simulation.

Because the university's School of Medicine serves the five-state region of Alaska, Idaho, Montana, Washington and Wyoming, it has to prepare students and residents for rural areas where there are fewer health-care resources.

A low-cost suturing kit, for example, is sent out across the region. The rubbery material simulates skin just fine, but the real innovation is on a sticker in the box, which is printed with the URLs of instructional videos developed at ISIS.

Sara Kim, director of educational innovations and strategic programs at ISIS, says they also hope to apply curriculum innovations from the institute to global health. An Ethiopian surgeon recently spent several months as the first international ISIS fellow, leaving with five new curricula to use in residency training at his medical school in Addis Ababa.

What Ross, the executive director, and other ISIS staff stress is that the story of medical simulation is not simply about technology. ISIS does have some of the most advanced simulation systems, but it's really about developing the curriculum to put any tool - from a full mannequin to a

cow tongue - to its best use.