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## Business

# PATIENT PORTAL



ILLUSTRATION BY ALLISON TALIAFERRO/GLOBE STAFF/ADOBE STOCK IMAGES AND LABSTER

**Computer-generated images from UbiSim show what nursing students are likely to see when they use an immersive 3-D simulation program. As the number of trained nurses falls dangerously behind, Labster, a Danish-owned company headquartered in Boston, seeks to solve the problem by aiding students in getting ready for patient care.**

## A Shortage of nurses has educators turning to virtual reality for training

By Hiawatha Bray

**T**he man in the hospital bed is named Morgan Therin. He's obese, sixtyish, and Black, with symptoms of Alzheimer's disease. The student assigned to care for him has hardly any real-world experience. Yet the student was expected to record the man's vital signs, give him an injection, and explain what's happening to a patient who can barely understand him.

It's the kind of challenge faced by countless nursing students. But it's a little easier when the patient doesn't exist.

Morgan Therin only lives inside UbiSim, a system that lets nursing students improve their diagnostic and people skills by practicing on virtual patients. With UbiSim,

students wearing Meta Quest VR headsets enter an immersive 3-D simulation of a hospital. There, the students learn to treat a diverse array of simulated patients facing a multitude of medical crises.

For Shawn Boom, chief executive of UbiSim's parent company, Labster, it's all about finding a solution to one of the nation's most daunting workforce challenges — a shortage of nurses that's only getting worse as the baby boomer generation ages.

"We need to make sure that we get more nurses into the field," said Boom, "and that when they get there, they've got the competence, but also the confidence to show up and be able to treat and practice."

Labster, a Danish-owned company headquartered in Boston, is tackling a

double-edged problem. First, the United States isn't training nurses anywhere near fast enough. The US Census Bureau predicts that eight years from now, a total of 177,400 new nurses will have entered the labor force. But the same agency says the United States will need more nurses than that every year, largely because so many are retiring.

In addition, there's evidence that too few nursing school graduates are ready for work. A 2021 study by the American Nurses Association found that the competency of new nursing graduates "is declining at an alarming rate," with only 9 percent of recent graduates fully prepared to safely treat patients.

UbiSim is designed to ease the burden of human instructors, allowing nursing



PHOTOS BY LABSTER

**Computer-generated images from UbiSim, a system that uses virtual reality goggles to train nursing students by displaying virtual patients. Students can virtually apply a blood pressure cuff, insert a hypodermic needle, or listen to a patient's heart through a virtual stethoscope.**



schools to serve more students. The company says nursing schools that have adopted the technology have been able to increase enrollment between 5 and 25 percent. In addition, UbiSim can simulate a great variety of medical scenarios, enabling students to hone their skills without putting patients at risk.

Doctors and nurses have long been trained on simulated patients. Often it's an anatomically-correct plastic manikin; sometimes it's a living human who acts out the symptoms like a stage performer. But living simulators aren't always available and medical manikins are costly, with prices that can run to the hundreds of thousands of dollars. For instance, the school of nursing at Simmons University in Boston just replaced a manikin that can simulate childbirth and is used to train obstetrics nurses. Cost: about \$130,000.

By contrast, a Meta Quest headset costs as little as \$300. And nursing schools can provide the UbiSim software at a cost of less than \$200 per student per year.

Putting on the Quest headset transports the user to a virtual hospital room, featuring standard monitoring equipment, and a bed occupied by a simulated patient. A pair of handheld controllers, normally used for zapping aliens, can now be used to apply a blood pressure cuff or insert a hypodermic needle. You can listen to a patient's heart through a virtual stethoscope; the throbbing sound emerges from the Quest goggles' stereo speakers.

During a recent demonstration, UbiSim nurse educator Christine Vogel kept everything within normal ranges. But with a few keystrokes she could have set the virtual patient's pulse racing or dropped his blood pressure, leaving it to the student to make the right moves. It's like an airline pilot practicing in a flight simulator, so she'll instantly do the right thing if an engine fails.

UbiSim offers 54 treatment scenarios, enabling students to practice on a host of virtual patients. And this year, the company has begun offering scenarios to prepare students for more diverse patient populations. For instance, there's the overweight Black Alzheimer's patient Morgan Therin. Nursing students can ask Morgan how he's feeling or how he slept; the instructor running the simulation

responds with pre-recorded dialog in which Morgan sounds confused and disoriented, good practice for working with Alzheimer's patients. "You may need to repeat yourself, you may need to explain a little further to him," Vogel said.

There's also the challenge of obtaining vital information from a transgender patient. "Asking someone who identifies as a male about their last menstrual period, asking about their history of ovarian cysts ... addressing this patient by their preferred name," said Vogel. "That's the question that the nurses would have." With UbiSim, the students can practice on a virtual transgender patient named Skylar Holmes who's controlled by an instructor who verbally answers the student's questions and corrects any accidental misgendering mistakes.

"We really want to highlight those opportunities to develop cultural humility and be able to talk to patients of different populations," Vogel said.

The UbiSim system has been deployed at about 200 hospitals and nursing schools, including Boston Children's Hospital and the Simmons University School of Nursing in Boston.

"This is a really fabulous way for us to supplement and augment our clinical experiences for our students," said Heather Shlosser, dean of the nursing school. "It really helps to bridge the gap between theoretical knowledge and application."

Jeffrey Jacobson, the virtual reality lead in the Immersive Design Systems group at Boston Children's Hospital, said the hospital isn't allowed to endorse products. "However," he added, "I can tell you that we are using UbiSim to great and good effect."

The hospital has developed six customized training scenarios, including four devoted to blood transfusion. In one harrowing example, trainees work with a virtual 10-year-old who's having an adverse reaction to a transfusion. "The nurses have to step up and save the kid's life," Jacobson said.

The hospital uses six different simulation technologies, said Jacobson, and UbiSim is one of the most valuable. "We use it all the time," he said.

Boom said there's still plenty of room for expansion. UbiSim could be tailored for training physicians, for instance, or home health care workers. But for now, the company is all in on nursing. "We want to own and dominate that space," said Boom.

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