

Medical simulators can breathe, bleed, give birth -- and help students hone skills

December 21 2009, By Scott Travis

It was a high-stress situation for three nurses who had never delivered babies: A woman was 32 weeks pregnant, in pain and having contractions.

The doctor was running late, stuck in traffic. The nurses calmly checked the woman's vital signs, told her to push and even gave her moral support. "You're doing great, Mom," nurse Jascinth Brown, of Plantation General Hospital, told the patient. Fifteen minutes later, a premature but healthy baby girl came out feet first, a breech delivery.

Although the scenario felt real, the patient was a lifelike mannequin named Noele. Inside her was a baby mannequin, equipped with an [umbilical cord](#) and all.

Medical simulators have come a long way since the 1960s, when a lifeless dummy named Annie was first used to help teach CPR. Using computerized sensors to imitate real-life organs and human reactions, they can respond to real anesthesia gases, and mimic heart attacks and irregular heartbeats. They can breathe, bleed, cry, pass urine, speak some words and give birth.

And their use has been growing fast in South Florida, with dozens of hospitals, universities, community colleges, high schools and fire-rescue departments using the devices.

"It's close to lifelike," said Brown, who watched as her patient's vital

signs were displayed on monitors during a recent training drill run by Florida Atlantic University. "I've worked in labs in nursing school, but I've never actually seen a delivery. Here we're simulating a baby actually coming out."

Experts say the simulators improve medical care by giving students a chance to learn crucial skills and make mistakes in a realistic setting, without any actual patients' lives hanging in the balance. Students are assessed, and sometimes even videotaped, during the drills. Instructors then discuss ways the students can improve their skills.

The nurses from Plantation hospital said they didn't take blood from the pregnant patient, a mistake they won't repeat.

"They gain the experience and confidence they need before being placed in a situation where their actions could mean the difference between the life and death of a patient," said Mark Goldstein, director of FAU's simulation center.

After six weeks of classroom and simulation experience, the nurses will train with human patients.

FAU has two simulation centers, one on its Boca Raton campus and one at St. Mary's Medical Center in West Palm Beach, where the recent training took place. The labor and delivery exercise was part of a new partnership in which the university helps train nurses from 12 Hospital Corporation of America medical centers throughout South Florida and the Treasure Coast.

The Michael S. Gordon Center for Research in Medical Education at the University of Miami medical school is one of the oldest and most established simulation centers in the country. Gordon, a UM professor and physician, invented a frequently used cardiac patient simulator

known Harvey in 1968.

In recent years, Nova Southeastern University has opened three simulation centers. Florida International University, which opened a medical school this year, recently contracted with UM to use simulators at the Gordon Center to train FIU students.

"It's a very efficient way to learn. You'd have to listen to 100 different patients to get all the skills that students can learn from a simulator," said George Dambach, associate dean for curriculum and medical education at FIU.

Sarasota-based Medical Education Technologies Inc., one of the vendors of the devices, has seen its demand explode since it started in 1996 with 13 simulators. Now there are 6,000 around the world, said Tess Mitchell, marketing director of METI.

She said the devices have become more popular as prices have come down. The first simulator cost about \$250,000; now they go for as low as \$29,000.

"The use of simulation is growing tremendously, and has become the standard at teaching institutions," Mitchell said.

NSU bought three high-tech simulators named Stan, which are being used by first- and second-year medical students in the classroom and by the school's surgery club. Stan's eyes can dilate. His thumb can twitch. His lungs expand and contract.

Students can listen for the same sounds they would hear in a human patient, and they don't have to feel bad if they don't get it the first time, said Assistant Dean Marti Echols.

Students "spend so much time studying," she said. "It's exciting when they can do things that make them feel like a doctor. The more students feel motivated to practice, the more we're going to improve the quality of patient care."

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