News and Perspectives

How Lifelike Patient Simulators Are Training US Rural Care Teams for Emergencies

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Abstract

Advanced robotics are not just in the operating theater or at the bedside—they're in the bed, helping rural clinicians rehearse high-stakes medical scenarios without real patient risk. In this *News and Perspectives* article, JMIR Correspondent Anika Nayak reports on how lifelike patient simulators and innovative simulation programs are bringing emergency medical training to rural American communities.

Key Takeaways:

- Lifelike patient manikins let rural teams rehearse rare, high-stakes emergencies without a patient's life at stake.
- Mobile training units bring that training directly to rural hospitals, and telesimulation extends the reach further, keeping hands-on manikin practice local while looping in specialists from hundreds of miles away.

When you picture medical robots, you may be thinking of the multiarmed surgical systems inside operating rooms. But a different class of medical robotics is reshaping how the rural health workforce prepares for the emergencies it rarely sees yet can least afford to mishandle. These patient robots are wireless, tetherless manikins that blink, breathe, speak, and bleed in real time, letting clinicians rehearse rare, high-stakes crises without a patient's life at stake.

Gaumard Scientific's VICTORIA, an advanced tetherless maternal-fetal simulator, runs high-risk delivery scenarios through a lifelike birthing mechanism, for example, while pediatric simulators such as Pediatric HAL convey distress through facial expressions, movement, and speech. Together, they allow physicians, nurses, and technicians to practice a postpartum hemorrhage or a neonatal resuscitation as a choreographed drill rather than a first-time improvisation.

Dr Nirvana Manning, Chair, Department of Obstetrics and Gynecology at the University of Arkansas for Medical Sciences in Little Rock, demonstrates to the author and others how the medical manikin VICTORIA works. Photo credit: Nelson Chenault for Every Mother Counts, 2026.

This shift is arriving alongside the largest US federal investment in rural health in decades, the $50 billion Rural Health Transformation Program, awarded to all 50 states in December 2025. It explicitly names technology-enabled training such as remote monitoring, robotics, and other advanced tools among what the funding can be used for; several states have signaled interest in simulation-based training in their plans, including Alabama, Nebraska, and South Dakota.

What Training for Rural Emergencies Looks Like

As labor and delivery units close across the United States, more patients are forced to give birth in emergency departments that may not have expected them, forcing clinicians who don't routinely catch babies to manage a shoulder dystocia or breech delivery on short notice, says the Center for Healthcare Quality and Payment Reform. This problem is acute in Arkansas, where the number of hospitals offering labor and delivery services has fallen sharply, leaving just 30 statewide.

Manikins are especially valuable instructional tools in this context, giving rural clinicians a way to practice treating emergencies they may otherwise rarely encounter.

"When these kind[s] of emergencies happen, you've seen it, you've done it, you've got a little bit of muscle memory with regards to what to do next," said Nirvana Manning, MD, who chairs the Department of Obstetrics and Gynecology at the University of Arkansas for Medical Sciences (UAMS) and uses the manikin VICTORIA in her clinical practice.

UAMS, through its Institute for Digital Health & Innovation High-Risk Pregnancy Program, brings the manikins out to those rural communities. Working with the Arkansas Center for Women's and Infants' Health and the state's Perinatal

Quality Collaborative, the team runs sessions in emergency rooms, labor and delivery units, and federally qualified health centers as well as unaffiliated hospitals across the state.

Training is tailored to the specific clinical team they're working with. With emergency medicine physicians, they run through the standardized bundles for hypertensive emergencies and hemorrhage designed by the Alliance for Innovation on Maternal Health (AIM); with labor and delivery teams, the focus shifts to roles, communication, and who does what when a patient crashes.

Rolling Past Barriers: Simulation Labs on Wheels

At Texas Health Harris Methodist Hospital in Fort Worth, a similar philosophy runs out of the Amon G. Carter Medical Simulation Training Center, known as the "Sim Lab," and its mobile counterpart, the Medical Simulation Training Unit.

Rhonda Thompson, MSN-Ed, RN, CA-SANE, the center's program manager, oversees a roughly 5500-square-foot lab above the emergency department and a fleet of over 15 high-fidelity manikins, including an AI-driven simulator the staff nicknamed "Geri Atric" that interacts with clinicians both verbally and physically.

"The manikin can sweat, cry, talk, vomit, urinate, and bleed. Almost anything a human can do, we can mimic on these high-fidelity manikins," said Thompson.

Thompson has watched the technology transform since her own nursing school days, when a training "dummy" was little more than a department store mannequin laid on a bed. Today's simulators, she said, react to the wrong medication and let teams rehearse a resuscitation that could never be practiced on a living person.

Rising demand for obstetric and pediatric preparedness prompted the Center to add a pediatric manikin and purchase VICTORIA to train clinicians on how to treat postpartum bleeding, one of the most common preventable causes of maternal mortality.

The mobile unit meets health care workers where they are by driving directly to their communities. Appearing like an emergency department with an attached classroom, the truck lets clinicians step into the parking lot of their hospital, complete a 4-hour training block, and return to their patients. When the unit visits volunteer firefighters and emergency services districts in counties beyond Tarrant County, first responders practice intubation and IV insertion between calls.

"That's the best part about this truck. There's no long distance traveling, no time away from the workplace," Thompson said.

David Jeffcoat, EMT-B, Simulation Specialist, in the simulated ambulance located inside the Amon G. Carter Medical Simulation Training Center at Texas Health Harris Methodist Hospital, Fort Worth. Photo credit: Chandra Caradine for Texas Health Resources.

Thompson also trains health care workers from the surrounding areas of Fort Worth, Texas. "We do see other hospital emergency residents come here that are not affiliated with Texas Health at all. They are just in the community. They need the education, they need the training, and perhaps they don't have a training area within their hospital," said Thompson.

When the Expert Can't Be in the Room

Even a mobile lab can't be everywhere, which is why telesimulation has emerged as another way to reach rural teams. Running a scenario over live video with a remote facilitator keeps learners in their own clinical environment while connecting them to instructors and specialists who may be hundreds of miles away, and it pairs naturally with the teleobstetric and teleneonatology consult services that increasingly back up rural delivery rooms in real time. For maternal and neonatal emergencies, in which minutes matter and the nearest specialist may be a video screen away, that extended reach is precisely the point.

A 2025 study of MOOSE: Maine Ongoing Outreach Simulation Education, a longitudinal neonatal-resuscitation telesimulation program delivered to rural Maine hospitals, found the model feasible and effective at reaching clinicians who otherwise lacked regular access to simulation, using recurring monthly sessions to support adherence to the Neonatal Resuscitation Program.

In the original pilot, a manikin and audio-visual equipment were purchased, and a nurse, respiratory therapist, and physician were trained together with the simulation.

The delivery room teams at the rural hospitals practiced full-code resuscitations using advanced neonatal manikins while neonatologists and simulation educators observed

remotely, providing presimulation orientation and postsimulation education and debriefing.

After each scenario, a designated notetaker's observations anchor a structured conversation for reflection. "The most important part is that debrief that we do afterwards. What did we do right? What did we not do right? What did we miss?" said Manning.

While these manikins are no substitute for the real patients clinicians will face, they are key stand-ins, and the preparation they leave behind travels into every emergency that does arrive. With mobile units and telesimulation widening that reach, no delivery room is too remote to be ready.

Keywords: patient simulation; manikins; rural health services; telemedicine; education, medical; simulation training; maternal health services; emergency medicine

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