

## **PRINT-Researchers developing mixed-reality training to combat opioid overdose deaths**

Iowa was the only state where opioid-related deaths did not increase last year. The American Medical Association says more than 105,000 opioid overdose deaths were reported in the United States between December 2021 and December 2022.

Federal health officials blame the steep increase in opioid overdose deaths, in part, to the rapid growth of highly potent and often deadly fentanyl that can be added to look-alike opioid drugs. The surgeon general recommends more individuals, including family, friends and those personally at risk for opioid overdose, keep on hand and know how to use naloxone, a safe antidote to a suspected overdose. When given in time, naloxone can save a life.

Scott Barrows, director of the OSF Innovation Design Lab at [Jump Trading Simulation & Education Center](#), is working on an [Illinois Innovation Network](#)-funded education project called *Virtual Reality Embedded Naloxone Training (VENT)*. It includes researchers at Illinois State University (ISU) in Normal and Southern Illinois University (SIU) in Carbondale, Illinois. The work centers around developing [mixed-use or augmented reality](#) education for an immersive, engaging approach to train people on how to give someone naloxone, often sold as a nasal spray under the name Narcan.

Barrows says the research will make use of cutting-edge technology, which blends the virtual and physical worlds.

“The mixed-reality portion of this being physical and virtual, will combine the actual spray device and a manikin so that people can practice the actual physical spraying with a manikin as well as having this virtual world that is valuable at the same time.”

The opioid epidemic is affecting all demographics, but Barrows points out underserved populations have the least access to resources for prevention, education and treatment. So, the training will be designed with input from a variety of stakeholders.

### **Keeping it simple and realistic**

“It has to be simple. It has to be easy to use. It has to be intuitive, but it also needs to be sensitive to the community experience whether it's rural, urban, suburban, no matter what age, so that's going to be the trick of the design process,” Barrows stresses.

The U.S. Food and Drug Administration made naloxone nasal spray available over the counter in March. It's part of a strategy that includes harm reduction through innovation and education.

Joanna Willett, MSN, RN, a certified nurse educator who directs the nursing simulation lab at ISU's Mennonite College of Nursing, believes research and development of innovative training can result in education that an average citizen, using a virtual reality headset, could use fairly easily.

“I've seen dozens of adults of all ages, parents, grandparents, sim lab visitors, etc. navigate our current nursing VR software without issue, and without nurses' training, take lifesaving steps to save a patient with respiratory distress,” Willett says. “I personally have no doubt that the intended audience of non-medical adults of all ages will benefit from this experience.”

Virtual reality training has an advantage because it can be easily accessible and repeatable without significant setup or cost. Willett believes once it is developed, the simulation training will be easy to maintain as an educational program. A prototype will be field-tested in community settings and at the Illinois State University simulation lab using 15 average citizens and five experts with diverse backgrounds.

Roy Magnuson, an assistant professor of Creative Technologies at ISU, will work with graduate students to design a prototype and make adjustments based on feedback. Magnuson has already developed music composition and conducting software for virtual reality. He'll work with graduate students to create an immersive world, swapping out medical variables for ones he's used for his other software development.

Magnuson is thrilled to take on the challenge.

"The immediacy and quantitative nature of working on a project like this is thrilling, humbling and inspiring in a completely new way. To say I am excited to spend my creative energy to have a chance to literally save a life is an understatement."

Barrows believes the more immersive training will help people recall important best practices while in a high-stress, opioid overdose situation in real life.

"Providing as realistic a situation as possible, we think is more effective than certainly a classroom situation or watching a video or something that doesn't really provide that as-close-to-reality experience that we think we're doing."

The second phase of research would seek additional funding to conduct a randomized, controlled trial to determine if VENT *is* more effective than traditional education approaches, in addition to examining whether the training is easier to use and accessible to the target audience.

But during the initial development phase, Wasantha Jayawardene, MD, PhD, will tap resources at the Social Perception Lab at SIU to assess the degree to which an individual's subconscious bias against people with drug addiction influences how they would respond when someone suffers an overdose. Individuals trying the new education prototype will be given an evaluation called an [Implicit Association Test](#) (IAT) that can reveal their implicit bias before they test-drive the VENT prototype.

According to Jayawardene, "Based on the IAT results, the VENT will include a model that addresses implicit bias, which can help the layperson responders to become more conscious of their own biases and their potential impact on helping a victim in a real-life scenario."

There is \$54 billion available in lawsuit settlement money tied to companies for their role in fueling the opioid crisis through actions such as downplaying the risks of prescription opioids and promoting the use of the drugs. States are required to spend 85% of settlement funds on opioid remediation and Barrows hopes to explore the potential of tapping that source in the future to make training available using VENT.