

News and Perspectives

From Cardiopulmonary Resuscitation Training to Guiding Bystanders: The Growing Role of AI in Resuscitation

Michelle Falci, JMIR Correspondent

Abstract

Cardiopulmonary resuscitation (CPR) can be lifesaving, but it's not always administered correctly, if at all. In this *News and Perspectives* article, JMIR Correspondent Michelle Falci reports on how AI may help improve education around CPR.

Key Takeaways:

- AI-powered tools can coach bystanders through cardiopulmonary resuscitation (CPR) instructions, potentially improving survival outcomes.
- Integrating technology into CPR training can enhance learner experiences.
- Researchers remain optimistic about future roles for AI and other technologies in resuscitation.

Most (90%) people who experience cardiac arrest outside of a hospital will not survive, but [receiving immediate cardiopulmonary resuscitation](#) (CPR) can triple a person's chances of survival.

Though the proportion of people who received CPR from a bystander rose from 41.7% in 2024 to 42.5% in 2025, evidence shows that [some bystanders are afraid](#) to administer CPR, citing concerns about lacking adequate skills and, for female patients, concerns about exposing the patient's breasts.

"People don't like to do things where they feel that they may be judged and [have] their shortcomings pointed out. However, in an emergency, we do not rise to the level of our intentions, but we sink to the level of our training. Without practice, the skills needed to save another's life are perishable," said Thomas Sather, EdD—chair, Education Sub-Council, American Red Cross Scientific Advisory Council.

AI is creating new opportunities to enhance bystanders' abilities to perform CPR in both real emergencies and educational settings.

For example, the [Elevate SMART Manikin](#) provides objective feedback for first aid, CPR, automated external defibrillator, and basic life support skills. It uses evidence-based algorithms to evaluate performance. Other tools, like [ChatCPR](#), use generative AI to coach bystanders through CPR, outperforming 911 dispatchers.



However, in an emergency, we do not rise to the level of our intentions, but we sink to the level of our training.

Thomas Sather, EdD

AI-Powered CPR Coach

Researchers from the University of California San Diego, the University of Pittsburgh School of Medicine, Johns Hopkins University, and other institutions collaborated to create ChatCPR—an open-source AI model that scored 100% on guideline-based CPR checklists.

The team first evaluated AI models, including ChatGPT, Claude, Grok, Gemini, Llama, and Mixtral, against the criteria for CPR instructions in an out-of-hospital cardiac arrest scenario.

"We reached for publicly available models, with the notion being that whatever we created, we'd want to show that this could be readily accessible on anyone's smartphone or, increasingly, augmented reality glasses that people are wearing. We thought if we have a high-performing solution with one of these publicly available models that makes it that much closer to a real-world eventual deployment," said

[Christopher M Horvat](#), MD—director of Medical Emergency Response Teams at UPMC Children’s Hospital of Pittsburgh.

Overall, Horvat and his colleagues [found](#) that publicly available AI models performed the task of giving basic CPR instructions well; the average score across all models for delivering essential instructions was approximately 90%, but for advanced instructions, the average score was approximately 70%. To close the gap, they turned to contextual prompt engineering and gave their AI model the same instructions found in manuals for emergency dispatchers.

“We developed a database of what we felt like were the best instructions for how to do CPR: not the instructions that are used in the wild, but the instructions that are used by people who perform CPR in the clinic routinely,” said [John W Ayers, PhD](#)—head of AI at the UC San Diego Altman Clinical and Translational Research Institute and professor at the UC San Diego School of Medicine.

The team also fed transcripts of real cardiac arrest 911 calls into ChatCPR. “I saw that the responses that ChatCPR provided were not only correct in terms of what we would consider the fundamental aspects of coaching, but actually adhered incredibly well to even the nuances of the American Heart Association guidelines, in a way that, at least in this retrospective study, surpassed...real-world 911 dispatcher performance,” Horvat said.

Specifically, for basic CPR steps, dispatchers met approximately 85% of the guideline recommendations, and ChatCPR met 100%. For more advanced steps, ChatCPR scored approximately 99% and dispatchers scored approximately 63%.

Though AI-generated instructions outperformed human dispatchers in this proof-of-concept study, Horvat, Ayers, and colleagues are careful to avoid suggesting that AI should replace emergency dispatchers. Rather, they see tools like ChatCPR as something that could support dispatchers or be deployed if a dispatcher isn’t immediately available.

More testing is needed before ChatCPR can be deployed in real-world emergency scenarios, the study authors explained, but initial results point toward a future with AI adding value in CPR instruction.

Role of SMART Manikins in CPR Training

In collaboration with Elevate Healthcare, the American Red Cross created the Elevate SMART Manikin to improve precision in lifesaving training.

“I believe that one of the bigger advantages of a technology-enhanced manikin is that it changes how we go about practice,” said Thomas Newman, PhD—Education Sub-Council, American Red Cross Scientific Advisory Council. “Traditionally, CPR training has been very instructor-dependent, with students having to attend a course at a specific time, demonstrate the skill and receive varied feedback. They then may not practice again until their certification comes

due. I believe this technology allows for increased access for certification training opportunities and could be integrated into providing periodic trainings for responders to maintain proficiency.”

From an educational standpoint, Newman also believes that the manikin can make practicing lifesaving skills less intimidating. He added that learners can immediately see and hear how they are performing and make corrections in real time, creating a continuous feedback loop.

This repetition, combined with the convenience of not having to attend a class to become proficient or even certified in lifesaving skills, is a key advantage of using a smart manikin compared to traditional instruction, according to Sather. “You can get all the knowledge on how to do these lifesaving skills just by interacting with the manikin and integrated tablet. It makes getting the training done convenient and gives you accurate coaching every time, every repetition, and every evaluation,” he said.

More Opportunities for Technology Integration in Resuscitation

“

Just as internet search engines revolutionized the internet, I suspect that AI will also have a similar or even greater impact on education and training.

Thomas Sather, EdD

As new tools like ChatCPR and the Elevate SMART Manikin emerge, the full extent of how technology will shape resuscitation remains to be seen, according to Sather.

[Virtual reality](#) may also have a place in the future of CPR training, with proponents arguing that practicing lifesaving skills in a simulated environment may better prepare bystanders for real-world emergencies.

Meanwhile, researchers continue to assess how [machine learning](#) can help emergency dispatchers quickly recognize and accurately handle out-of-hospital cardiac arrest scenarios.

“There will undoubtedly be advances using technology in education and training spheres. We are already seeing this in customized curriculum design tailored specifically to learners’ preferences,” Sather said. “We see education being done online and via personal devices such as tablets and

smartphones. We see utilization of dynamically responsive algorithms being incorporated into medical responses. Just as internet search engines revolutionized the internet, I suspect that AI will also have a similar or even greater impact on education and training.”

Keywords: CPR; cardiopulmonary resuscitation; resuscitation; artificial intelligence; chatbot; CPR training

Please cite as:

Falci M

From Cardiopulmonary Resuscitation Training to Guiding Bystanders: The Growing Role of AI in Resuscitation

J Med Internet Res 2026;28:e113397

URL: <https://www.jmir.org/2026/1/e113397>

doi: [10.2196/113397](https://doi.org/10.2196/113397)

© JMIR Publications. Originally published in the Journal of Medical Internet Research (<https://www.jmir.org>), 19.Oct.2026