

## AI in the ER: This Software-Engineer-Turned-Doctor Helped Design A New Ultrasound Tool



Each year, Emergency Departments (ED) across the United States see more than 145 million visits, according to Centers for Disease Control and Prevention data. Nearly two-and-a-half million ED patients end up getting some kind of diagnostic exam, like ultrasound, that confirms if a hospital stay is needed. In highly populated areas, doctors often struggle to keep up with the pace of care and come to value tools that speed up the diagnostic process without sacrificing quality or outcomes.

So, what happens when a doctor needs a tool that doesn't exist? One ER doctor helped to create it himself, marrying his expertise as a former software engineer and emergency physician in Austin, Texas, one of the fastest growing cities in the United States.

"There's not a lot of downtime," said Sohan Parekh, M.D., of his practice at the Dell Seton Medical Center at the University of Texas, where he's the director of emergency and critical care ultrasound. "I'm busy with patients from all walks of life, with different needs, from the moment I walk in until I hand-off to a colleague at the end of a nine-hour shift."

Often, doctors like Parekh must do more with less, taking on tasks they might not otherwise do. In that dynamic, AI can play a big role by creating efficiencies and providing diagnostic support for clinicians, who can now measure, diagnose, and even improve outcomes in one click.

Parekh has been an ED doc for 15 years, but before entering medicine, he worked as a software engineer, which taught him a lot about user interface and product design.

That unique perspective made him the ideal candidate to work with [GE Healthcare](#) as it developed its Point of Care Ultrasound (POCUS) offering called [Venue Go](#).

"The IVC Auto Tool\*, for example, is one I use during nearly every shift," he said. "Our hospital tends to serve as a safety net for a lot of patients, so we provide a good deal of primary care."

Parekh described the value of the IVC Auto Tool, which measures if there's enough fluid in a patient's body, as a time-saver that can have meaningful impact on outcomes.

"There's a manual way to check for IVC collapsibility that's not terribly difficult, but it takes time and effort for set-up, which includes measurement, calculation, switching of modes and other steps on an ultrasound machine," he said. "Clinicians don't really like to do it, or they simply choose not to do it at all."

With the IVC Auto Tool, the clinician merely needs to obtain the right image and hit a single button to secure a measurement of the IVC collapsibility. The AI of the ultrasound machine automates the process, meaning the clinician doesn't need to set-up multiple images, make a calculation or even know how to execute those steps.

"The automation opens up the possibility of gaining an assessment the clinician might not otherwise use," Parekh said.

He knows that's true, based on his own experience.

"In one case that comes to mind, we had a clinical inkling about a patient experiencing shortness of breath," he said. "Use of ultrasound helped us to corroborate our suspicion, and we determined the person had a problem with cardiac function that required admission to the ICU."

Parekh started collaborating with GE Healthcare in 2016.

"I definitely was not interested in simply helping to market products," he said. "What piqued my interest was the opportunity to be able to participate in the design of the product and to provide input on workflow to fit our emergency department as well as improve ultrasound for emergency departments around the globe."

The GE Healthcare POCUS team brought Parekh initial mockups and ideas, initially focusing on industrial design and work factors: How should Venue handle cable management? How should the cart should be created? How should the wheels roll? Should buttons be tactile or touch?

Then the team moved on to user experience and interface, including clinician pain points: What if the user is sterile? Can you perform an exam and then archive it seamlessly and quickly? How might an intensivist or anesthesiologist use the machine?

“In the ED, you have lots of patients with different needs – often having the worst day of their lives – in small, confined spaces,” Parekh said. “If you have hinderances from your equipment, you have unnecessary delays, which are not just frustrating for a clinician but can also impact your ability to provide proper care.”

The GE Healthcare Venue family of POCUS products has won several recent design awards, including from [IDSA](#); [Good Design Australia](#); and [UX](#).

\*Available on [Venue](#) and [Venue Go](#)

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