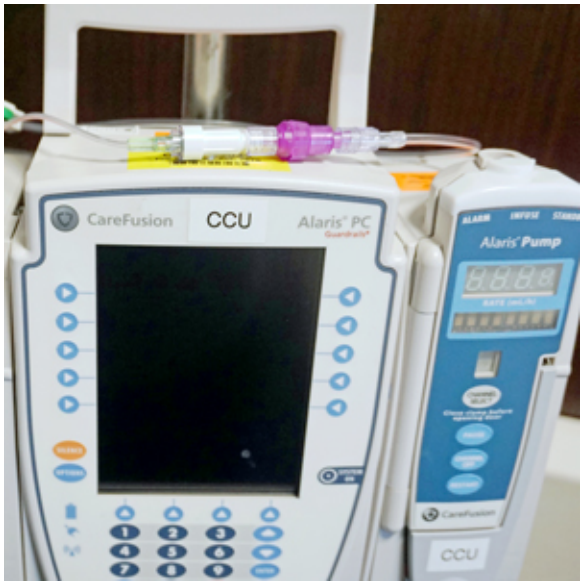
LINEAR HEALTH SCIENCES

Breakaway Success
OKC startup pioneers technology that prevents accidental IV disconnects for hospital patients



Let's say that you roll into the local gas station, insert the nozzle of the gas pump into your vehicle and begin filling the fuel tank. Just as the tank is topped off and you are about to take the nozzle out of the car, your phone rings with an important call.

Distracted, you take the call, wander back to the driver's seat, start your car up and drive off with the nozzle still inserted.

Embarrassing, sure. But it's not a total disaster because fuel pumps at the nation's gas stations are equipped with breakaway valves that seal off on both ends. That ensures that a huge fuel spill doesn't happen and guards against a possible fire.

A similar scenario occurs every day in hospital rooms across the nation, says Ryan Dennis, M.D. Dennis works at an Oklahoma City hospital as a hospitalist, or a physician who specializes in caring for patients ill enough to be admitted.

Dennis is founder and CEO of Linear Health Sciences, which created patented breakaway technology called the Orchid Valve to prevent accidental disconnects of IV tubing from patients in the hospital.

The concept was conceived after Dennis witnessed repeated disconnections among his hospital patients. Statistics show that one in four IV lines is accidentally disconnected from patients, he said. It can be painful, messy, time consuming to replace. And costly.

As Dennis recently demonstrated the Orchid Valve, he described a scenario with one of his patients that the technology could have prevented.

"One night a patient had a chest tube for a collapsed lung," he said. "She got up to go to the bathroom. But when she did the chest tube got caught in the bedrail and ripped the chest tube out, causing her lung to collapse again."

The patient suffered a long, painful night with a partially collapsed lung before the situation was remedied the next morning.

"I thought it was ridiculous that we are relying on sutures or tape or other adhesives to hold in the very things that are connecting patients to life-sustaining treatment," Dennis said. "Ultimately, I was able to put together an all-star team and think outside of the box for a solution."

The brainstorming resulted in the Orchid Valve, composed entirely of silicon and plastic so that it can be used even when the patient has an MRI. Co-founder with Dennis in Linear Health Sciences is Dan Clark.

"We are trying to completely transform the way that patients are connected to their treatments," Dennis said. "It's costing the hospital about $50 every time one of these IVs is pulled out."

A native of Macomb, OK, and graduate of the Oklahoma School of Science and Mathematics, Dennis earned his undergraduate degree at the University of Chicago before returning to his native Oklahoma to earn his M.D. at the University of Oklahoma. Dennis is currently an MBA candidate at the University of Oklahoma.

The company has accomplished several critical milestones along the way. It has created a working prototype of its device. It has closed a $1.25 million investment round led by i2E Inc. that Dennis anticipates will support development of the Orchid Valve through the FDA approval process.

And in 2016, Linear Health Sciences was named one of 20 ventures chosen out of 430 candidates worldwide to become a Medtech Innovator company in Palo Alto, Calif.

However, Oklahoma's startup ecosystem has also benefited the company, from the local investment to i2E's Venture Assessment Program to support from the Oklahoma Center for the Advancement of Science and Technology (OCAST), Dennis said.

"Oklahoma is a viable place for startups to set their roots," he said. "We have organizations like i2E and OCAST that provide support from the bottom up. And we have the talent pool for excellence locally."

It should all come to fruition by next year for Linear Health Sciences when the Orchid Valve is FDA-approved and becomes an essential part of the hospital experience for patients.

"If we can provide a $2 solution, and patients are pulling out 25 percent of their IVs, hospitals will be making a significant dent in the problem and actually saving money," he said. "The Orchid Valve will add patient savings, satisfaction and convenience for the nurses."

Read the article in the 8-15-17 Oklahoman

Watch the video

Go to the Linear Health Sciences website