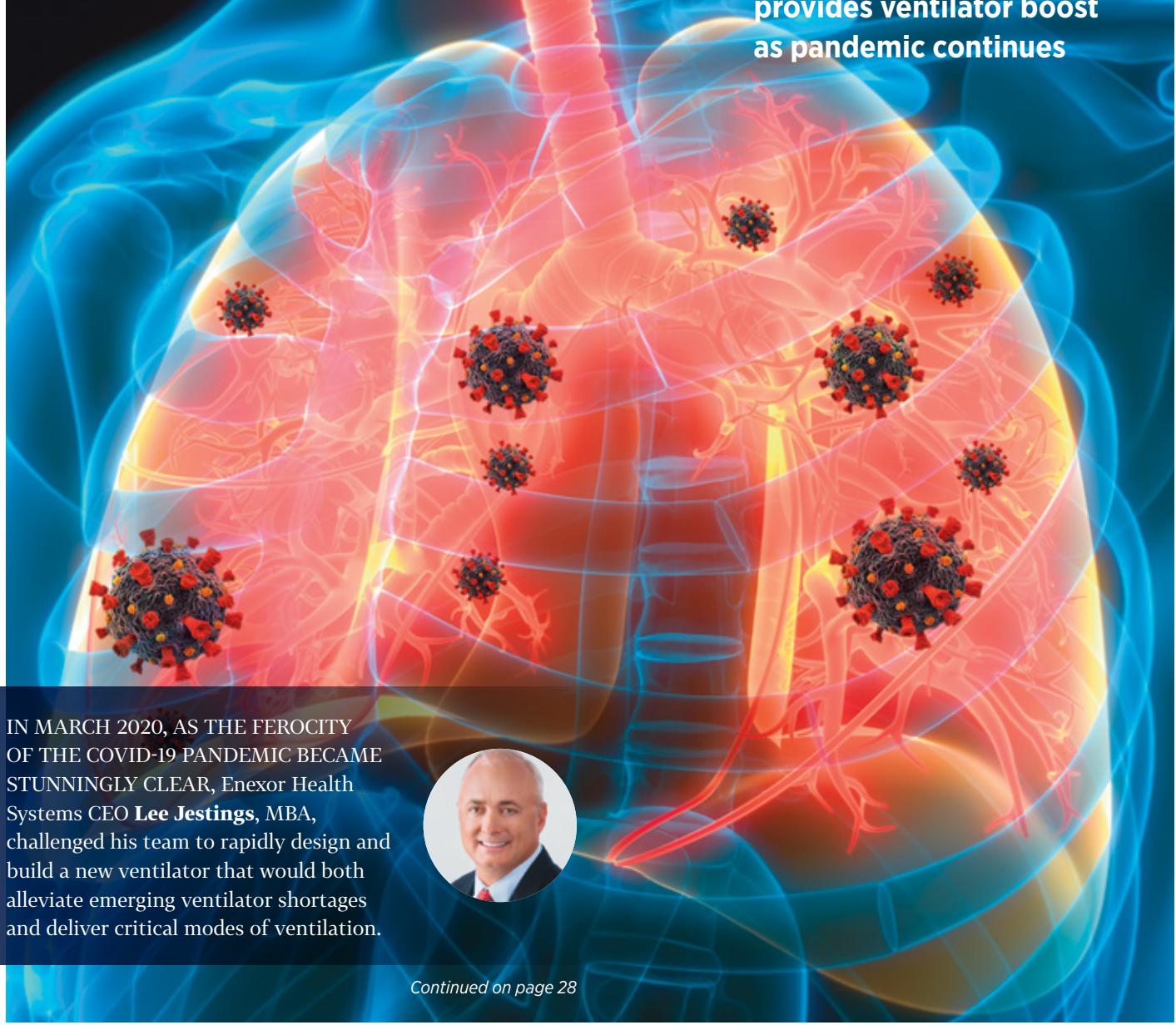


BREATHING LIFE into critical technology

Designed & produced in just weeks, the X-VENT provides ventilator boost as pandemic continues



IN MARCH 2020, AS THE FEROCITY OF THE COVID-19 PANDEMIC BECAME STUNNINGLY CLEAR, Enexor Health Systems CEO **Lee Jestings**, MBA, challenged his team to rapidly design and build a new ventilator that would both alleviate emerging ventilator shortages and deliver critical modes of ventilation.



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The result, the X-VENT, accomplished those ambitious goals and far more. Recently added to the HealthTrust portfolio (contract #64110), the innovative device was designed and produced in mere weeks by a team of physicians, respiratory therapists and engineers committed to helping patients and providers across the globe with a simple, inexpensive and easy-to-use ventilator.

Earning an Emergency Use Authorization (EUA) by the Food and Drug Administration (FDA) in June, Enexor—a Franklin, Tennessee, company that also manufactures small-scale organic waste-to-energy systems for hospitals worldwide—formed an LLC called Breathe Strong to design the X-VENT. It's an EUA-approved ventilator that doesn't employ a bag valve mask resuscitator (dubbed an "ambu-bag"), but instead uses a piston-driven air system. The X-VENT also self-calibrates, so it's easily stored and saves money on pricey calibrating costs when restarted.

"You learn a lot when there are adverse conditions," Jestings says. "We became focused on saving lives. That's our theme here, and everyone chipped in and was very supportive and enthusiastic."

EAGER TO COLLABORATE

Led by ventilation technology pioneer **Bill Walsh, M.D.**, of the Monroe Carell Jr. Children's Hospital at Vanderbilt University, the Breathe Strong Project design team mobilized after Jestings received a call from a physician partner in a developing country asking for ventilators. The request drove home just how dire the ventilator shortage was becoming worldwide, inspiring and unifying Jestings and his collaborators.

"Enexor wanted to develop an effective, relatively inexpensive ventilator as fast as possible, which seemed like a very daunting task," says Dr. Walsh, who was one of the design team members of the original oscillating ventilator. "The motivation for them to do it is what attracted me—essentially making it a break-even, humanitarian effort to save lives. They saw a need and had the ability."

The X-VENT can save at least \$3,000 per unit, compared to standard ventilators with price tags of \$12,500 and upward.



It's less expensive to produce because it is made in the U.S. and incorporates industry-grade pistons and circuits instead of proprietary medical parts that are harder and more expensive to source, Dr. Walsh explains.

The X-VENT is also set apart from standard ventilators in other important ways. It's designed to use high-pressure or low-pressure oxygen, since many hospitals across the world don't have access to high-pressure oxygen, Jestings notes.

"Sometimes COVID-19 patients need a lot of positive end pressure to keep their lungs from collapsing at the end of each breath, and this ventilator can do that nicely," Dr. Walsh explains. "It's also easy to adjust those pressures."

A VALUABLE PARTNERSHIP

From the project's launch, HealthTrust personnel were an integral part of the X-VENT's development, Jestings says. Chief Medical Officer **John Young, M.D., MBA**, was joined twice by other clinical leaders onsite at Enexor after a working prototype of the ventilator was built, offering valuable feedback. During one of the trips, Dr. Young was accompanied by the HealthTrust COVID-19 respiratory therapy team.



"They liked the concept and that we were doing things not typical for medical manufacturers," Jestings explains. "Being a Nashville-based company, we'd already started talking to HealthTrust about our bioenergy product. They are our first and our favorite local partner."

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The X-VENT ventilator by Enexor is less expensive than traditional ventilators and is easy to use.

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This crucial input also paid off, Jestings says, by affirming a unique detail of the X-VENT that can improve safety and efficiency. As requested by respiratory therapists on the design team, the X-VENT features a remote operating screen (essentially, a tablet digitally connected to the unit) that can be monitored from outside a patient's room. This means clinicians can change the ventilator's settings and carefully watch patients' responses without entering, saving them increased exposure to the coronavirus as well as the need to repeatedly don personal protective equipment (PPE).

"The respiratory therapists love it because it is so simple to use. It has everything you need to take care of a patient with an easy, accessible layout," Dr. Walsh adds.

REACHING THE WORLD

So much demand has been expressed for the X-VENT in far-off regions of the world that Enexor is launching Project Breathe Strong Africa. With Enexor able to produce up to 200 units each day at the company's manufacturing facilities in Franklin and Huntsville, Alabama, Jestings plans to not only fulfill hospital purchases in the United States, but also to donate the X-VENT to countries such as Ghana, the Dominican Republic, Panama and elsewhere once export permission is granted.

"There's such high demand for American technology right now," Jestings explains. "What's unique is, it's one of the few ventilators designed and manufactured in the United States, so the supply chain is comforting to some of our customers." **HT**

FOR MORE INFORMATION about the X-VENT, visit the contract package (#64110) or contact your HealthTrust Account Manager.

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1. Andrea Bianco and others. UV-C irradiation is highly effective in inactivating and inhibiting SARS-CoV-2 replication. *medRxiv*. 2020 June 23;1-9.

2. Jeremy Starkweather, John Wynne, Jason Ylizalde. Purpose Built UV-C Enclosure for Portable Medical Equipment: Controlling the Environment Is the Key to Consistent Results. *NIST*. 2020 January 15;1-3.

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