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Army CRNA Uses Ingenuity and Perseverance to Save Lives in New York

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By Melissa
Ramirez
Cooper
Director,
AANA
Public
Relations &

Communications

U.S. Army Major Timothy Yourk, DNP, CRNA, was given 24-hour notice to gather gear and equipment before his deployment with the 11th Field Hospital (1st Medical Brigade) from Fort Hood, Texas, to New York City in March.

“At the time, very little was known. I didn’t know what equipment or supplies I would be falling in on,” said Yourk who, during his 15-year tenure in the Army, has been deployed to Iraq, Kuwait, and Yemen.

Upon his arrival in New York, however, it was apparent to Yourk and his team of CRNAs that they were embarking on a “completely unprecedented” mission—one that would require “flexibility and adaptability in a rapidly changing environment,” while safely and effectively caring for COVID-19 patients, he said.

“Shortly after arriving at the Javits New York Medical Station (JNYMS), I went to the basement to survey the medical supplies. I dug through hundreds of crates full of supplies, which were poorly categorized and itemized. There was a very small amount of anesthesia-related equipment and supplies, and very few face shields or impermeable gowns and no intubation boxes or GlideScopes,” said Yourk.

Assigned to serve as the chief of anesthesia for a team of 27 CRNAs, Yourk grew concerned about their safety. “I felt a strong sense of personal responsibility in preventing the transmission” of the virus.

Drawing from his education, clinical care experience, and Army training, Yourk got to work and created the “Rona” (named after the coronavirus)—a portable negative-pressure intubation hood with HEPA filtration. “Intubating a patient is one of the highest-risk procedures for COVID-19 transmission,” he said. “We had to have something to protect the CRNAs,” who were responsible for intubating patients.

Fashioned with materials primarily bought at Home Depot, Yourk and his colleagues, Allan Bolido, DNP, CRNA, and Alexa Koenig, DNP, CRNA, CPT, assembled the “Rona 1.0.”

The device consisted of “PVC pipe and plastic sheeting with adapters to use as the portable impact suction. Every change and adjustment, along with real-time feedback and after-action reviews of every intubation, was used to make improvements to the original design,” said Yourk. By mid-April, the fourth and final version of the Rona was created. This version consisted of plexiglass, plumbing couplers, HEPA filters and a portable ShopVac, Yourk recounts.

“I viewed several photos and videos and collaborated with Cameron Good from the Army Research Lab and with David Turer, a UPMC physician, who were both working on a very similar project,” Yourk said. “Our device had to have the appropriate suction,

which we anticipated was minimal with Rona 1.0, but we had no way of testing the device. In an in-hospital negative pressure room, between 150 and 200 CFM (cubic feet per minute) is needed to maintain a pressure differential.”

“This was the quickest and best plan I could think of given our timeline and limitations, but we made it work,” said Yourk.

“Soldiers are great at adapting and using their ingenuity to overcome limitations. My goal was to prevent the transmission of COVID-19 to all 27 CRNAs which, I initially thought, was unobtainable,” he said. But at the end of his two-month deployment, Yourk and team came home COVID-19 free. “Not one of the 27 CRNAs tested positive for COVID-19.”

Yourk credits many people in helping him build the device. The CRNAs’ capacity for teamwork and the constant feedback and collaborations served as “the entire reason for the successful evolution of the Rona devices and the prevention of COVID-19 transmission,” he said. To his knowledge, the device “is the only portable, negative pressure intubation hood used in a non-hospital setting in New York—the epicenter of the pandemic, and possibly in the United States.”

Yourk, who intends to donate the device to the U.S. Army Medical Museum in San Antonio, admits that the historical significance of the “unprecedented mission and the Rona device” did not occur to him until he left New York.

“The lessons learned, and lifelong friendships made during this mission are invaluable,” said Yourk. “Working alongside my brothers and sisters from all military services, including more than 30 units and organizations, was a once-in-a-lifetime experience. We literally did something that had never been done in the history of the United States, and we did it quickly, efficiently, and safely. It was an honor and privilege to serve and work side-by-side with everyone involved in the JNYMS mission.”

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