CRITICAL CARE

NETCCN: Delivering Needed Critical Care Expertise "From Anywhere, to Anywhere"

By Matt Quinn, MBA; Jarone Lee, MD, MPH; and Jeremy Pamplin, MD on behalf of the SAEM Critical Care Interest Group

The National Emergency and Critical Care Network (NETCCN)

The COVID-19 pandemic stressed the U.S. health care system. In response, many health care systems rapidly expanded Intensive Care Unit (ICU) beds and scrambled to find ventilators and other specialized equipment. Urban centers with abundant resources were overwhelmed and rural areas that lacked ICUs were forced to manage patients beyond their normal scope of expertise. Informed by experience in combat casualty care and work by the Society of Critical Care Medicine's Tele-Critical Care Committee, the Army's Telemedicine & Advanced Technology

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Research Center (TATRC) formulated an approach to deliver needed critical care expertise "from anywhere to anywhere" in support of local-, regional-, and national-level demands imposed by the COVID-19 pandemic.

Building NETCCN

With funding from The Coronavirus Aid, Relief, and Economic Security (CARES) Act, TATRC developed and deployed a National Tele-Critical Care Network (NETCCN) to assist hospitals and other

sites in the care of severely ill COVID patients. NETCCN consists of teams of remote experts supporting patient care anywhere via secure, HIPAA compliant, live video, messaging, phone, and file sharing. NETCCN delivers on-demand expertise using simple smartphone applications that require only cellular networks to operate and delivers support faster than "boots on the ground" contracted or federal response clinicians.

In June 2020, TATRC awarded nine clinical-technical teams funding to build NETCCN. Through two "sprints" and 82 days during which teams configured their systems, gathered feedback from local and distance clinicians, and conducted care simulations with their teams and systems, TATRC selected four finalists to begin supporting care across the nation.

Capabilities and Successes

NETCCN teams have supported hospitals in Guam, Puerto Rico, North Dakota, South Dakota, Iowa, and Minnesota. Hospitals that received support from NETCCN can have virtual clinical teams assisting them within hours, as there is no need for hardware beyond a smart phone.

NETCCN has filled in multiple clinical gaps over the last year. Primarily, NETCCN has helped with services that would ordinarily be unavailable at the supported hospital: palliative services, ventilator expertise and critical care expertise. One hospital had a nurse caring for multiple, intubated COVID patients and no local physician available. NETCCN's remote physician helped this bedside nurse diagnose and treat a tension pneumothorax — something she had not seen before. Other hospitals used NETCCN to cover shifts during nights and weekends, which offered relief to over-extended staff. NETCCN has also helped manage patients at home and kept them out of emergency departments and hospitals. For this, NETCCN clinicians communicated with patients at home, who otherwise would have been hospitalized, to monitor their pulse oximeter readings and deliver oxygen when needed. Finally, NETCCN has been available and provided continuity when other systems fail, such as during a local power and network outage. As COVID continues to surge with the Delta variant, NETCCN continues to support hospitals throughout the U.S.

Beyond COVID-19

In September 2020, TATRC established a four-year partnership with the U.S. Department of Health and Human Services Assistant Secretary for Preparedness and Response (HHS/ASPR) to provide additional funding to not only scale and enhance NETCCN for COVID-19, but also to integrate NETCCN into ASPR programs for future national all-hazard responses, including conducting joint simulation exercises to optimize use of technology in disaster environments. ◗

ABOUT THE AUTHORS

Matt Quinn is the science director for the U.S. Army's Telemedicine & Advanced Technology Research Center (TATRC). Prior, he served as senior advisor for health technology at the Health Resources and Services Administration (HRSA) and managing director for healthcare and life sciences at Intel Corporation.

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Dr. Pamplin is the commander of the U.S. Army's Telemedicine and Advanced Technology Research Center. He deployed to Iraq and Afghanistan, has directed medical, surgical, trauma, and burn ICUs, leads development of the military's synchronous operational virtual health solution, and cofounded the Joint Tele-Critical Care Network.

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